**Big Quakes in Sierra**

*San Francisco Chronicle*  
Mon., May 26, 1980

**Art Felt Across State**  
**Both 6 on the Richter — Damage to Resort**

By William Looney

Two major earthquakes struck east of Yosemite National Park shock much of California and Nevada yesterday and caused considerable damage in the resort town of Mammoth Lakes.

At least 16 people were injured at Yosemite, several others were injured at Mammoth Lakes and throughout the area. One person was killed at Yosemite.

The quakes were felt at 9:33 a.m. and 6:10 p.m. Numerous aftershocks occurred after the first report, with officials predicting they could continue for days.

**Mammoth Lakes was epicenter, but much of state felt it**

In addition to many rock slides, Mammoth Lakes officials had recorded severe river and water line ruptures, power outages, and gas leaks on the area. At least six people were injured in the area.

The State Office of Emergency Services in Sacramento said the sharp earthquakes were felt from Lake Tahoe, south to Los Angeles and San Bernardino in the south, and from the San Francisco Bay Area, Carson City and Las Vegas in Nevada.

**Four Quakes in Mammoth Lakes Area Jolt State**

By ROBYN HIEFFLER  
and KRISTINA LINDGREN

**Three big quakes in 2 days shakes Yosemite**

Mon. Turner a long-time resident of El...
**Quake Pattern:**

**May Point to Big Tensquake**

**By George Alexander and Jerry Belcher**

The pattern of earthquakes, including a brace of Magnitude 6 tectonic quakes Sunday, that has struck the Mammoth Lakes area of Mono County in recent days is similar to other seismic sequences in California and Nevada that were eventually followed by a magnitude 7 or larger aftershock, according to Prof. Alan Ruffell, a University of Nevada, Reno, geophysicist, who has been studying the region.

The pattern of seismicity, which has been recorded by the seismograph stations that detect tectonic quakes, has been followed by a large and destructive shock, has been observed in the past. The 1995 Kern County earthquake, the 1985 Fairview Peak (Nev.) earthquake and the 1971 San Fernando earthquake.

The Fairview Peak earthquake of Dec. 16, 1954, was a 7.1 on the Richter scale that had been preceded by a series of Magnitude 6.5 tectonic quakes in July and August of that same year. Those Magnitude 6.5 shocks occurred after the period of nearly two years of very little seismic activity along the approximately 200-mile-long stretch of fault in Nevada.

However, Ruffell noted that there were no significant aftershocks in 1955 and 1956 and that the tectonic quakes were not followed by a large shock.

"I wouldn't be surprised if a bigger event happens," Ruffell said, "if the right conditions are met."
Swarm of earthquakes rattles Mammoth area

MAMMOTH LAKES (UPI) — A swarm of earthquakes, some reaching over 5 on the Richter scale through the snow-capped Sierra Nevada range and its alpine lake resorts yesterday, following three large quakes that jarred most of central California in as many days.

Hundreds of smaller quakes continued to shake more than a 100-mile stretch of mountain slopes below the eastern slopes of the range.

"There have been 15 quakes between magnitude 5 and 5.1 yesterday," a spokesman for Caltech's seismological lab said, and every one 5.2. "There's probably a huge number below 4 we haven't got around to counting yet."

A quake of 6.1 yesterday rattled California from Nevada to the sea and from Sacramento to Los Angeles. It was the third tremor measuring 6.0 or over within a week in the Mammoth Lakes resort area in three days.

About 12 people were injured, two seriously, in Calaveras County. A 6.0 quake Sunday sent rocks and boulders crashing down mountains onto hiking trails in Yosemite National Park.

A couple, Larry and Belinda Samuels, suffered serious injuries last Sunday when an avalanche of boulders roared over them in the park. Samuels suffered two broken legs and head injuries and his wife, eight months pregnant, lost her unborn child and suffered a crushed leg.

The Hilton Creek Fault is one of a series that runs roughly north and south. On a map, looking north, one short fault ends another seems to begin a few miles to the west of it, according to geologist Alan Rury of the University of Nevada at Reno. This step-by-step progression of active faults, he believes, extends as far north as Susaville, and makes the Sierra crest a swinging candidate for another strong earthquake in the future.

According to Robert E. Wallace of the USGS, who flew low overhead in a helicopter yesterday, "It feels like an earthquake every 15 minutes."

The continuing quakes that broke loose yesterday last Sunday were centered in an ancient fault zone that displayed an almost identical series nearly 40 years ago, and — in historic times, at least — once previously, in 1927.

The quake series of 1941, known collectively as the Diablo Dam Earthquake, was monitored by a three-turbine team with Richter magnitudes of 6.5, 6.8 and 8.5. They were felt from San Diego to the Bay Area on September 14 of that year.

The seismic rupture area, known as the Hilton Creek Fault, has not been studied intensively until recently, but the last summer dozens of seismologists and geophysicists were swarming through the mountainous terrain to find evidence of surface breaks that are to constant movement like rafters floating along deeper, more viscous mantle of semi-solid rock that lies beneath.

West of the North American Plate lies the Pacific plate, much of which is in a state of constant motion. The plate is pushing against the North American Plate, expands much of its energy of motion as it pushes against the Sierra Nevada Fault system. It is this build-up of tension between the "tectonic plates" that they grind against each other that causes the big quakes on the San Andreas.

But not all the pent-up energy of the Pacific plate is released along the San Andreas. Some of the energy is released along the Sierra Nevada fault system. This is known as the "focus" of the earthquake.

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Big New Sierra Quake — 6.1 on the Richter

Hundreds Of Campers Head Home

By H. G. Rewa
Chronicle Correspondent

Mammoth Lakes, Mono County

Another big earthquake — the third in as many days and felt through much of the state — gave a powerful shaking to this central Sierra region yesterday, setting off fresh slides and prompting hundreds of vacationers to pack up their camping gear and head to quieter ground.

The temblor measured 6.1 on most seismographs, and was the latest of more than 500 shocks since Sunday, including more than 80 with a magnitude greater than 4 on the Richter Scale.

"You have to understand," said a Mono County Sheriff's Department spokesman, "the earth quakes just don't stop. It's constant.

Yesterday's earth quake, which came at 7:51 a.m. and was felt as far away as San Francisco and Los Angeles, injured at least seven persons, forced the closing of six miles of highway 91, and was blamed for the fiery explosion of a garbage truck.

Beyond that and the usual assortment of broken dishes and broken windows, principal damage was confined to rock slides that raised columns of dust in remote areas.

Many residents of the area seemed to be taking the series of shocks in good spirit. A group of six sat around two television sets in a Mammoth Lakes sporting goods store, watching network news coverage of the quake and cheering each time they saw themselves or people they knew on the screen.

One of the viewers, Kim Gerriard, said that since the steady stream of quakes started Sunday morning, "We have renamed the town — we're now calling it Mammoth Quakes.

Don Dewey's sporting goods store suffered extensive damage during the quake. The ceiling tiles buckled and fell after Sunday's shock and the store caused the fire sprinkler system to leak for a day and a half afterward, leaving the floor covered with six inches of water.

The quake also wiped out Dewey's burglary alarm system. Asked if he was concerned about looters, Dewey said, "There's a sense of frontier justice up here — meaning lynchings — so I don't think we'll have any problems."

Jim Greenleaf, who runs the town's ice cream stand with his wife, Eta, said that Sunday's quake smashed a large picture window in the lobby and knocked the television sets off tables onto the floors. All the inn's mirrors were shattered by the quake, and the drapes in the guest rooms were dumped on the floor.

I was in the lobby with a seismologist from the University of Nevada at Reno and a group of other seismologists when the quake hit this morning," Greenleaf said yesterday. "Everybody took off running out the door."

"I told the seismologist from the university that I thought it had been about a six on the Richter scale," Greenleaf grinned. "He came back later in the day and told me I was right — and offered me a job as a portable seismograph."

Elsewhere, the mood was not so lighthearted.

Hardware store owner Dale Watson said, "These last few days have been too much for some of the residents here. Yesterday, a friend of mine packed it all up and moved his family to Bishop, where he says he's going to open a motel."

Mammoth Elementary School, which was closed, had a big crack in the playground from the 4500-resident mountain community already appear to have begun. Yesterday, the local Bank of America branch had to close its doors because so many residents had withdrawn money to leave the area that the bank had run short of cash.

Bambi Tidwell, a kindergarten teacher at Mammoth Elementary School, spent yesterday trying to straighten out the mess the quake had made in her classroom. Two 8-foot-tall cabinets had been thrown open by the temblor, pitching blocks, toys, papers and the rest of their contents all over the floors.

"Oh — look at this. This is the pis," she fumed as she struggled to clean the place.

"We really were lucky that we weren't in school when the quake hit," she added, looking at the disarray surrounding her.

The school has remained closed since Sunday's shake. Elementary students are slated to start classes again tomorrow at Mammoth High School, and both high school and grade school children will attend staggered sessions to avoid overcrowding.

After the newest quake, geologists, who were drawn to the area Sunday when the Hilton Creek Fault slipped for the first time in 30 years, discovered that a 15-mile crack had opened up along the fault line.

This latest series of tremors is south of the epicenter of a quake that in 1872 raised the elevation of the Sierra 20 feet along a 70-mile span in the Owens Valley, said the California Division of Mines.

Yosemite National Park chief ranger Bill Wendt said boulders came tumbling down on several hiking trails yesterday. Because of this, the park closed all trails leading from Yosemite Valley, and rangers were sent out to see if anyone was injured. Convict Lake was declared off-limits at least until Sunday because of the recurrence.

A man and a woman caught by a side loosed in Yosemite by one of Sunday's two earthquakes remained homeless Westside Friday, yesterday. Belinda Samuel, 26, who was eight months pregnant, lost her child. One of her legs was crushed. Her husband, Larry, had two legs broken, and injuries to the head.

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Earthquake Damages Could Reach 2 Million Dollars
Office of Emergency Services representative, Guadalupe Davis, noted that the damages to Mammoth Lakes and the Mono County suffered the most from the recent earthquake. Davis' report indicated that damages to the area were estimated at $2 million. The damages included structural damage to buildings, cracks in roads, and other infrastructure issues. Davis advised residents to be prepared for future earthquakes and to ensure that their homes and properties are earthquake-resistant.

MAJOR EARTHQUAKE ROUND-UP
May 25 - 9:53 A.M. 6.5
May 25 - 9:59 A.M. 6.5
May 25 - 12:44 P.M. 6.0
May 26 - 1:35 P.M. 5.7
May 26 - 2:36 A.M. 5.2
May 26 - 2:31 A.M. 5.0
May 27 - 1:58 A.M. 5.4
May 27 - 7:00 A.M. 5.7
May 27 - 12:01 P.M. 4.8

The Review
The Weekly Newspaper of Mammoth and Mono County
Vol. 8 No. 22
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What Happened... What May Happen

Seismologists, Geologists Converge On Mammoth

Last Monday The Review contacted several of the seismologists and geologists who have been studying the effects of the earthquake on Mammoth and Mono County. They were following the reports coming in from throughout the West. They have been following the reports coming in from throughout the West. We literally followed them along the recent ground bumps in an attempt to report on the earthquakes that have rocked Mammoth and Mono County since Sunday. The effort has been somewhat challenging, as it is not known whether these earthquakes cause increased seismological activity or whether it is a matter of location. It is thought that we will have stronger quakes than occurred on Monday... but the earthquake swarm is expected to continue for some time.

Seismologists Dr. Thomas Toppo, Chris Clare, and Dr. James K. Hall from the California Division of Mines & Geology in Sacramento explained the geology of the area and the locations of the fault lines. They, along with geologist James K. Hall (also from the Division of Mines & Geology), theorized on the possible causes for the recent earthquakes and what might happen in the future.

There are two major faults affecting Mono County: both run almost parallel to the eastern slopes of the Sierra Nevada. There is an east-west fault along the Long Valley Caldera, eight miles long, which runs from the Mammoth Lakes area to Convict Lake near the town of June Lake. The fault has moved 800 to 3000 feet towards the east. The fault is still active, and it is thought that what is happening is a continuation of a fault that has been active for a long time. The fault is still active, and it is thought that what is happening is a continuation of a fault that has been active for a long time.

Old US 395 Closed
Old US 395 is closed between Swell Meadows and the new highway due to earthquake damage. Rock Creek Rd. is also closed.

Mammoth Lakes

Mammoth Lakes is located in the Mono County of California, in the Eastern Sierra Nevada. The town is known for its snow-capped mountains, ski resorts, and natural beauty. The area is known for its earthquakes, which are a common occurrence in the region. The most recent earthquake occurred on May 25, 1980, causing damages and injuries. The town is in the process of rebuilding and recovery.

Supervisors Declare State of Emergency
The Mono County Board of Supervisors passed a resolution Tuesday declaring a state of emergency in Mono County. The resolution requested the California Office of Emergency Services to acknowledge the occurrence of a state of emergency on May 25, 1980, and to provide necessary assistance to the county.

School District Reviews Damage
The Mono County School District reviewed the damage caused by the recent earthquake. The district is working to assess the damage and determine the necessary repairs. The district is also working to ensure the safety of students and staff in the affected areas.

Wings West Offers Aid in Crisis
Wings West Airways Vice President Mark Moore offered aid to Mono County during the earthquake crisis. The airline was able to provide assistance to the affected area, including airlifting supplies and personnel to the area.

Wings West Airlines Vice President Mark Moore offered aid to Mono County during the earthquake crisis. The airline was able to provide assistance to the affected area, including airlifting supplies and personnel to the area.

The backcountry flight crews of the Mono County, Mammoth Lakes and Lee Vining Ranger Districts are providing assistance to the affected area, including airlifting supplies and personnel to the area.

Tuesday, the Mono County Board of Education met in special session to review damages to the schools resulting from the recent earthquake. According to consultants, the damages are expected to be significant. The district is working to assess the damage and determine the necessary repairs. The district is also working to ensure the safety of students and staff in the affected areas.

Buttons on school supplies are planned to be in full session on the new schedule Thursday, the 19th, if recovery continues. The school is expected to reopen on Monday.
Scientists Converge on Mammoth

Continued from page 1

All of the scientists felt it was unlikely that a quake of larger proportions than the one at 2:45 p.m. today would occur in the next future. All felt that even magnitude earthquakes would continue—perhaps for several months as the readjustment in the earth takes place. Dr. Topozeda stated that the epicenter of the first quake was approximately halfway between the Sheffield’s Substation and Convict Lake. That quake measured 6.0. At press time, specific epicenters had not pinpointed pending thorough analysis of the data collected.

According to geologist Kuhle, it appears that the shift on sections of the Convict Lake fault moved 5 to 15 centimeters for two or six inches. The western side of the fault moved up, the eastern side down. However, Kuhle added express surprise that larger or same intensity quakes have occurred after the initial shock was recorded at 9:30 a.m. Topozeda remarked that the Hinton fault is probably not capable of an earthquake much greater than the magnitude of Sunday’s quake.

All of the scientists stated that there is no connection between the quakes being felt in Mammoth and the volcanic activity at Mt. St. Helens. Even though in the past there has been significant volcanic activity in the Mammoth Lakes area, Mammoth is an entirely different geological environment than the Cascadia Volcanic Chain of which Mt. St. Helens is a part. The underground sources of the volcanic eruptions are totally different.

There is evidence of volcanic activity in the southern Mono County, however, it is not known if there is an association between recent earthquake activity and the volcanic activity,” stated Rick McKinnon, geologist for the Geologic Division of Mines and Geology.

In addition to the major quakes reported on Sunday, the seismograph at the experimental station south of the airport recorded over 30 quakes registering 4.0 or more on the Richter scale during the first 24 hours after the first quake. McGuire Mountain, Laurel Mountain, and Little Morrison, all shown evidence of major rock slides and snow avalanches. All the cracks reported in roads and yards are secondary features resulting from the ground shaking and are not faults.

When questioned as to what to look forward to in the near future, geologist McKinnon answered:

Q. What is the prognosis? A. There are no signs of quakes and more ground cracking.

Q. Will volcanic eruptions occur? (Rumors have it that the area is on the verge of a volcanic eruption.) A. There is no evidence of the present that the earth quakes are being induced by volcanic activity. They appear to be induced by the movement of the Hinton Lake fault or sympathetic movement of the Convict Lake fault.

On May 10, ten days prior to the major earthquakes, the Scientists Marion Johnson took on the assignment of researching earthquake activities in Mono County. The Scientists Marion Johnson’s story on May 29—totally unaware of the 6.0 quakes that went off on May 25. Her interview with Dr. Malcolm Somerville, a volcanologist at the University of Nevada, adds to the information which the Scientists has gathered.

Dr. Tomosa Topozeda of the Survey of Mines and Geology in Sacramento said that there were no apparent reasons for the quakes that hit Mammoth last October and November which were followed by quiet periods in January and February, more earthquakes in March, a quiet period in March and April and then the big ones in May.

Somerville stated that there is no connection between the Mt. St. Helens quakes and volcanic activity. He further remarked that the quakes are not related to the Mammoth Lakes. Seismologists are not certain why some earthquakes cause geothermal activity or the reverse. Geothermal areas containing hot springs indicate heat, but no hot springs from the depths up natural fissures. Consequently, most geothermal areas experience earthquakes because of these fissures and hot springs.

Somerville did indicate that the Mammoth Lakes quakes are not unprecedented. In 1941-42, earthquakes of 5.0 magnitudes struck Wheeler Crot. For two years afterwards, 3.0 and 4.0 quakes occurred a magnitude similar to those which occurred in Mammoth last week.

After the swarms died, the area was quiet for 10 years. The same could be the case in Mammoth.

Although Somerville emphasized that he is not a volcanologist, he did say that all evidence points to the fact that the underground magma at Mammoth Mountain is materially rising and down in fact. He went on to say that the Mono Lake area is currently the most active volcanic section of Mono County.

He stated that the Mono Lake area is not volcanically dead but that there are no signs of fire events at this time. Somerville feels that some eruptions at Mono Lake may take place during the early 1960s.

Western Editorials... Others are Not

Earthquake Rumors Abound

At the height of the earthquake swarms which hit Mammoth on Sunday, rumors ran rampant. At times it was difficult to sort out the facts from fiction, which made it particularly difficult for the electronic media to accurately report the events as they occurred.

For instance was that of a plane crash at Convict Lake airport during the height of the quakes. It turned out to be a low-flying California Edison plane checking the power lines. There was no crash.

Then reports filtered in that a number of loons had turned over on Convict Lake and that fisherman were pulling fish from the water. Another report of numerous injuries at Convict Lake and people trapped in the backcountry were also reported.

Perhaps the wildest of all was that another quake at the Convict area made people think that the surrounding mountains to topple into the lake, washing away down Convict Road and onto US 395.

Reports of locusts at Sawley turned out to be anyone attempting to install a wind indicator on Convict Lake. A few of the rumors that turned out to be true:

- Bill Kelley of Mammoth Lakes related a harrowing experience at Convict Lake with boulders toppling above the canyon into the creek where he was fishing—when missing him by only a few feet.
- There is a confirmed account of hard running cows down the grade Saturday night prior to the quake. Some believe that animals can sense occurring seismic activity.
- Tom Smith of Mammoth observed one section of Crowley Lake bubbling like boiling water. Apparently this phenomenon is not uncommon during earthquakes.
- Pat Eaton of Convict Lake has large fissures in her yard as a result of the quakes.
- Mr. Benson of Los Angeles was fishing in Convict Lake when he was thrown to the ground by the force of the quakes.

SEISMOLOGIST DR. TOUSSON P. TOPOZEDA with Chris Cramer at Convict Creek. Dr. Topozeda is with the Division of Mines and Geology in Sacramento.

Photo developing by Wally Hofmann

SEISMOLOGIST CHRIS CRAMER describes the use of the seismograph set up in Old Mammoth.

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6.0 Earthquakes Rock Southern Mono

Southern Mono County residents were rocked by a 6.0 earthquake at 9:32 a.m. Sunday, March 25. Six other quakes registering between 5.0 and 4.9 quakes at 12:45 p.m. and a 6.1 quake at 7:50 a.m. on May 5, 2023, followed each major quake. According to Mono County Sheriff Martin Streible, a 5.0 quake took place at 9:40 a.m. and a 4.9 quake at 10:05 a.m. The 5.0 and 6.1 quakes occurred at 12:45 p.m. and another 5.0 at 1:30 p.m. Seven more quakes ranging between 4.0 and 3.5 quakes registered 4.0 or more have been recorded since Sunday—over 500 shocks in total.

No serious injuries were reported in Mono County, although hikers were injured in Yosemite. Damage to dwellings in Mammoth was minor to moderate. All major roads were functional without water, power, phone, etc. Mammoth Lakes was without power from 10 a.m. until noon on Sunday. Mammoth Mountain closed after the first quake. The 6.0 and 6.1 quakes triggered several ski lifts from the lift via auxiliary power.

Seismologists from Seismology Center at the University of Nevada at Reno told The Review that the quakes probably took place along the Foothills Fault that extends from Rock Creek Lake to Long Valley. This fault, dormant for many years, was thought to be inactive for the past 100 miles. Seismologists believe that the fault broke and that the area is over. However, aftershocks could occur for a couple of months or longer.

The last major quake in 1976 hit Mono County on Oct. 5, and registered 5.7 on the Richter Scale. No deaths or injuries occurred in the southern Mono area since September of last year.

The Sylmar quakes (Los Angeles) in 1971 registered 6.5 and was three times the intensity of the Mono County quakes. The 6.0 quakes in Mono had only one percent of the intensity of the 1976 quakes.

The Mono County quakes were felt from Los Angeles to Sierra County, but with much less intensity.

Mono County Sheriff Martin Streible, Defense Coordinator Greg Hanson declared a state of emergency at 11:15 a.m.

Earthquakes Continue in Mammoth

Mammoth Mono County Sheriff Martin Streible reports that hikers are continuing to strike Mono County. The area is requiring shocks ranging up to 5.0 on the Richter scale.

In an effort to determine the extent and degree of geological damage to the area and the probability of further damage as a result of the continuing shocks, teams of geologists are conducting studies and continuously monitoring. Representative of the California Department of Mines and Geology, the US Geological Survey, Cal Tech, University of Nevada at Reno and USC have set up seismographic devices throughout the area for continuous recordings.

To safeguard campers, hikers and sightseers, the US Forest Service upon the recommendations of law enforcement and geology experts has established a closure of the mountainous area south of Mammoth Lakes ranging from Sherwin Bowl on the north, Rock Creek on the south, the Sierra Crest on the west and Convict Lake Lodge on the east. Convict Lake Rd. is open to traffic to the lodge basin and closed to all traffic from that point, including Convict Lake campground.

Geologists predict continuing lesser shocks for a period of up to a week; it is recommended as precautionary measures that bottles of drinking water and emergency lighting such as Coleman lanterns be kept in residents' homes.

To determine the extent of damage to the Mammoth Lakes schools and the hospital, the California Office of Emergency Services has obtained the expertise of structural engineers from the Structural Engineers Assoc. of Calif., and San Diego Chaffey who were flown in to Mammoth Lakes the evening by the Civil Air Patrol. Their evaluation commenced immediately upon arrival.

In preparation for application for assistance from the California for financial assistance for the repair of damage to public facilities, the county has commenced assessment of damage.

SBA Loans Under Consideration

Mono County Supervisor Joel Green, local representative of the Small Business Administration, announced Tuesday that he had contacted Bob Calvary, Regional Disaster Coordinator in San Francisco to request partial financial aid and information on SBA disaster loans. The Board of Supervisors will decide Monday whether to declare a disaster area. If a disaster area is declared, contact Joel Green at 609-7247.

Incoming calls to 609-7247 are going unanswered due to the earthquake. Please call (415) 735-2234.

The Complete Foot

"Shoes for all seasons"

Village Center Wood Main Street
Burlington 604
824-2266

Some residents pitched tents and slept outside on Sunday and Monday nights.

2 Injuries Reported at Yosemite

Linda Abbott, public relations manager for Yosemite National Park, told The Review that only two serious injuries occurred at Yosemite National Park on Sunday. No injuries have occurred since there has been no structural damage. All roads and trails into the park are closed until Sunday, June 1.

Closures of Backcountry

Continued from page 1

The quakes measured 6.0 and 6.1 on the Richter scale. Epicenters of the quakes were pinpointed at the Convict Lake, Worldspine, and severe damage has occurred on the backcountry trails, especially in the Convict Canyon area. In places, 100 feet of rock debris covers the paths.

In the interest of public safety and with advice of geologists who expect continued strong earthquake activity, the closure will last through June 1. It will be extended if necessary.

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Major quakes rock Sierra

Inyo Register, 29, 1980

More earthquake photos inside

Three earthquakes, 6.9 on the Richter scale, rocked Mammoth-Crowley Lake area a week and were felt from San Francisco to Los Angeles.

The three massive quakes followed hundreds of lesser tremors that had been recorded in the Mammoth-Crowley area the past several years.

The first 6.0 quake hit about 9:33 a.m. Sunday, knocking out power in the Mammoth area, and causing loose items in stores, homes and offices, to fall off the floors. A 5.8 aftershock was recorded at 9:49 a.m. The second 6.0 quake was at 12:44 p.m. Sunday. The third large quake hit about 7:51 a.m. Tuesday, and drew a rating of 6.1 from the Berkeley seismograph, and 6.0 from Caltech.

Epicenter of the Tuesday quake was at Mooney Grove Park, near Visalia, on the west side of the Sierra.

Aftershocks since the 6.1 quake have registered as high as 4.5 and 4.2. The quakes closed several Mammoth business firms (for cleanup sessions), and closed the Mammoth elementary and high schools both Tuesday and Wednesday. The elementary school students will complete the school year in double sessions starting Thursday of this week... at the high school, Supre Marvin Heinsohn stated.

Potentially one of the biggest losses could be to Hot Creek hatchery. See story elsewhere in this issue.

Highway travel into Mammoth Village and Convict Lake was closed for periods, but was back to normal by press time.

Los Angeles Dept. of Water and Power checked their dams and installations on a 24-hour basis this week and report no deficiencies up to press time... despite rumors that Crowley "had a crack."

A round-up Tuesday afternoon showed eight water breaks had been reported in Mammoth since the three major quakes, only two were leaks, and 20 fire checks, most of them to report cracked chimneys, and other fire hazards. The gas companies asked that folks determine where and how to shut off gas, so gas can be shut off appropriately. The gas companies are maintaining phone and personnel service 24 hours daily during the emergency.

Sunday and Monday's quakes didn't dampen the enthusiasm of visiting skiers at Mammoth Mt. More than 3,000 were on the mountain Sunday, and more were issued "quack checks."

Saturday's 9:30 a.m. quake knocked out power at the substation. Dave McCoy of Mammoth Mt. Ski Area, said he was real proud of the mammoth way his crew handled the emergency, getting folks off the lifts. Power was restored about noon, and the next day more than 3,000 skiers were back on the slopes. There was a good crowd on Tuesday, despite that 6.1 quake at 7:51 a.m. Tuesday.

State Senator John Garamendi and Assemblyman Norm Waters were to fly to Mono Wednesday to confer with local officials and agencies and inspect damage.

Supervisor Joan Green of June Lake, who has been Mono County's liaison with the Small Business Administration during the drought years, conferred early this week with the SBA on disaster relief assistance, and said Mono's requests be handled by Robert Belloni, regional disaster coordinator, at the SBA office, San Francisco, phone (415) 356-4696. Belloni is forwarding to Mrs. Green the paper work for establishing eligibility in the county. Mono board of supervisors, which met Tuesday in Mammoth, toured some of the damaged sites Tuesday afternoon including Mammoth elementary school at Hot Creek fish hatchery.

Despite the severity of the quakes, May 23-26 at Mammoth Lakes and Crowley Lake southern California Edison Co. suffered relatively no damage, Charles Miller, district manager, stated.

Electrical service was interrupted following the initial quake Sunday morning in the Mammoth Lakes area, Miller reported, when the quake damaged lightning arresters at the Casa Diablo substation. This occurred at 9:45 Sunday morning and full power was restored by noon when the damage was repaired.

One plane and two helicopters were used Sunday and Monday by Edison personnel in an aerial inspection of the power lines but no further damage was found or reported.

At the Tri-County Fairgrounds in Bishop where the annual Mule Days Celebration was underway, there were no injuries or damage reported.

Persons in the grandstands reported feeling swaying motion but there was no mass exit. The situation was a bit different at the Charles Brown Auditorium, however, where a fire alarm was under way. Reporter Marilyn Fisher, who was in the auditorium when the 9:30 a.m. shake struck, said there were only 36 or so exhibitors in the building and many of those persons and displays were toppled in the auditorium.

When the 12:45 p.m. quake hit, however, there were several hundred persons in the building who began running for the door, causing a jam of traffic. Exhibitors who had been in the building earlier recognized the potential "stampede" danger and yelled to the crowd to quit running and instead calmly exit. The crowd obeyed and filed out of the building in an orderly fashion.

Don Austin, manager of Mammoth Safeway store, said that product damage, clean-up, and other costs of the quakes, may hit in the neighborhood of $50,000. The Lazy A Safeway store in Bishop, was closed twice briefly on Sunday for clean-up routines following the two big quakes. The downtown Bishop Safeway had only minor product loss from bottles tumbling from shelves.

MONO HERALD; CHRONICLE UNION - THURSDAY, MAY 29, 1980

T A B O O S E

by Todd Washington

WHAT A WILD WEEKEND... and since it started only that strong wind on Friday, talk for the east-facing slopes Sunday, Monday, Tuesday... and Tuesday earthquakes put us in the national limelight. Just the kind of thing we didn't need. As of this writing, no more quakes could have been worse... no one stilled, few injuries, and material damage far less than one would expect. The cold front setting in kept back damage to a minimum if not probably saving many lives that could have been lost in massive rock slides. The permit system for backcountry parties was not in this case. The permits are still in use, where in which numbers. In the early 1940s we didn't have the permit system, and the area was loaded with July 4 hikers. A strong earthquake made a dust storm out of the crumbling-crashing High Sierra granite rocks... a lot of injury... just a lot of obliterated and rock-torn trails. The media didn't even mention the early 1940s quakes in Inyo-Mono. Not so this week. We phoned out-of-state media outlets Sunday morning quickly to assure them the area had survived. None had any figure on the severity of the 9:30 a.m. quake, not even the seismic center here. That didn't stop the media. They had huge buses to fly to Mammoth and put us on TV... and the phones have been ringing since. Not sure how much this media overkill will affect our tourist cash flow. On the big island of Hawaii they have hundreds of earthquakes every 24 hours and the locals don't hardly shake. Hopefully, the pack trains this year won't suffer from a very late season and earthquake fever.

The system used to tally the 1983 quake in Long Beach, and the Nov. 26, 1975 quake of 7.3 on the big island of Hawaii; and saw the earthquake damaged areas of Anchorage, Alaska. But this week's shakes still give one that uneasy feeling that goes back to seeing brick walls fall on oooole in 1983 in Long Beach.

For those keeping score...

Earthquakes recorded by date and time at the University of Nevada at Reno's seismograph and the paleomagnetic recording station at UC Berkeley.

May 14, 12:49 p.m., 4.9, plus three events of 3.0 or larger.
May 15, five or more 3.0 to 3.9 events.
May 16, noon, 4.5, plus six events of 3.0 to 3.8.
May 17 No records
May 18, 5:47 a.m. 4.2, 11:41 a.m. 4.0; plus four events of 3.0.
May 19, 3:19 p.m., 4.0.
May 20, three events, 3.0 to 3.8.
May 21, no events over 3.0.
May 22, no events over 2.6.
May 23, no events over 2.2.
May 24, 9:24 a.m., 4.0; no other events over 2.3.
May 25, 9:24 a.m., 2.8, 9:33 a.m., 2.9, 9:33 a.m., 3.0; 3:00 p.m., 3.5, 9:14 a.m., 4.5, 1:31 p.m., 4:16 p.m., 1:31 p.m., 5:5, 1:19 p.m., 6:23 p.m., 4.5, 4:51 p.m., 1:31 p.m., 2.0; and hundreds of aftershocks ranging from 4.0 and downward.
May 26, 5:24 a.m., 4.9, 9:21 a.m., 4.7, 11:06 a.m., 4.5; 12:34 p.m., 4.6; and hundreds of 3.3 and lesser aftershocks.
May 27, 7:51 a.m., 6.0, 12:01 p.m., 4.6, 10:16 p.m., 4.5; 10:49 p.m., 4.3; and dozens of lesser magnitude aftershocks.

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16 Scary Quakes Shake
The Sierra in One Day

‘This Is Driving Us To the Brink’

By H. C. Eason
Chronicle Correspondent

Mammoth Lakes, Mono County

New earthquakes rolled through the Sierra Nevada with nerve-jangling regularity yesterday.

But no major injuries or property damage were reported in the Mono County district, despite the seemingly endless spate of minor quakes.

Scientists recorded more than 17 quakes measuring between 4.0 and 5.0 on the Richter scale, and one seismologist said there’s probably a large number below 4.0 that we haven’t got around to counting yet.

In this village just north of the Mammoth Elementary School, where classes were canceled due to the quake, Mammoth Lakes High School, five miles away.

But elementary principal Irene Maron, who has been at the school’s only elementary school for 31 years, wasn’t sure how many of her students will be attending.

“Some families are leaving town that I’ll be happy if 100 show up,” she said, sadly surveying broken glass and debris around Mammoth Lakes were closed yesterday by federal, state and local officials, who fear that the continuing quakes may damage the continuing quakes may damage more earth loose from the slopes.

On the western slope of the Sierra 50 miles to the northwest, hikers and blackbuck leading the group of Yosemite Valley were closed because of rock slides, but yesterday’s quakes were barely noticeable.

“It’s calm in Yosemite and we’re just trying to assess the damage,” said park manager Herb Samsam.

About 80 percent of the park’s 125-mile-long trail system had been closed because of snow when the big quake struck and should sustain little damage, he said.

Slightly more than half of the trails that had been open were put off limits because of actual or potential slides, Samsam said.

There were between 10,000 and 12,000 persons in the park when the quakes began Sunday, he said, and only 4,000 remained yesterday. But the exodus, he said, had been as much to do with increasing temperatures and the end of Memorial Day weekend as with the quakes.

“It looks pretty crowded in the valley,” he said. “There were about 3,000 people in Hiawatha and 2,000 in Tuolumne Meadows, and around Mono Lake and Big Pine.”

The most obvious quake damage occurred outside Visalia in Tulare County, more than 100 miles to the west in the San Joaquin Valley, where a famous statue crumpled in Mooney Grove Park.

The statue of a mountain man, “The Pioneer” by Solon Borglum, was created for the Panama-Pacific International Exposition in San Francisco in 1915, and then given to Tulare County.

“It was plaster-of-paris over chicken wire, wood and metal,” said county General Services Director Ernest Shives. “One of the legs of the horse was a way and it just toppled to pieces.”

Mon., May 29, 1980

Bancroft School, 10700 Kofel St., Concord.

E. C. Eason

The Convict Lake Road, like many others in the area, was closed because of unsafe conditions caused by the quakes.

The elementary school may never be rebuilt where it is, county school superintendent Marvin Hanson said. Damage is more than the $200,000 he originally estimated.

A fiasco half-inch wide zig-zag across the building’s cement foundation and floor, where it peeled off several vinyl tiles as made its way from the school parking lot through the building to the playground.

Quakes had sent books spilling from the walls of the library to the floor, where two volumes which came to rest right-side-up told the story of “Our Quaking Earth” and “One Thousand and One Questions Answered About Natural Disasters.”

“This is driving us to the brink,” said Nancy Shearer, a waitress at a local restaurant. “My husband is a deputy sheriff and he’s working a 12-hour day, while I’ve been sleeping with one eye open and the other open wondering if the next one will be the big one.”

Shearer said she took her two children out of school and sent them to stay with her parents at June Lake.

“It’s scary and it’s irritating,” said Janet Fron from a local liquor store. “Some scientists say these little ones are adding up to a big one—and others tell us not to worry. Who do you believe?”

“My husband and I go from mutual fear to individual irritation with each other. I wish the ground would either stop shaking or let’s get over with it and let the big one strike. This waiting for the unknown is ridiculous, and hell in a marriage.”

A quarter-mile south of the school, off Highway 206, workers at the state’s Hot Springs Fish Hatchery were transferring fish to tank cars from ponds made muddy by the rolling earth.

The chocolate-brown mud has suffocated an unknown number of the 500,000 rainbow trout, which the state has developed for bait breeders to provide year-round fishing. The plan is to move the fish to Black Rock 80 miles to the south.

“If we lose the fish we have here,” said hatchery original Neil Nyberg, “we won’t be able to breed fall trout for 10 years.”

Most recreational areas around Mammoth Lakes were closed yesterday by federal, state and local officials, who fear that the continuing quakes may damage more earth loose from the slopes.

On the western slope of the Sierra 50 miles to the northwest, hikers and blackbuck leading the group of Yosemite Valley were closed because of rock slides, but yesterday’s quakes were barely noticeable.

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Mon., May 29, 1980

Bancroft School, 10700 Kofel St., Concord.

E. C. Eason
Long holiday weekend in Mammoth Lakes area is marred by earthquakes on Sunday, Monday

Naval Weapons Center personnel who were enjoying their 3-day weekend camping, fishing, or skiing in the Mammoth Lakes-Crowley area had an unexpected thrill Sunday when two earthquakes registering more than 6 on the Richter scale hit the region.

While NWC and CalTech seismographs in the Earth and Planetary Sciences building at China Lake indicated that the earth activity was fairly steady during the day, a few shocks did occur between 2 and 10 minutes during the first quake at 8:34 a.m. Centerties were at Mammoth estimated that they felt the shock for about 18 seconds. C. E. Eron, who was on Crowley at the time, said that the lake felt like a giant fishbowl sloshing. (And, he added, the fish promptly stopped biting.)

UTILITY LINES DAMAGED

No Center personnel were among those reported injured by falling trees, landslides or mudslides. Buildings in that area withstood the quakes relatively well because they are built to stringent code due to heavy snowloads, but stores suffered losses when items on shelves tumbled to the floor, Power lines were downed, and some water mains broken.

Extensive landslides and rock slides were readily visible from the air when Glen Roquemore, LGDR, Jack Paschall, and PH2 Tony Garcia flew over the area Sunday afternoon in an NWC U-4 aircraft piloted by LGDr. Paschall.

Roquemore, a geologist in the Earth and Planetary Sciences Division of the Research Department, was looking to see if any fissures had opened in the earth. (None were visible from the air. He will join Malcolm Clark from the U.S. Geological Survey's Mono Park facility in a ground study of the shaked area this week.) Information gathered from these quakes will be helpful in seismological studies of the local area.

Preliminary studies of the earthquakes Sunday indicate that the epicenters were about 4 miles west of Lake Crowley. They are taking place on the Sierra Nevada fault line, a broad zone comprising hundreds of smaller segmented faults.

(The 1977 Owens Valley earthquake centered on a straight line fault between Lone Pine and Big Pine; this fault is also part of the same frontal system.)

Despite the magnitude and amplitude of the earthquakes taking place less than 20 miles north of China Lake, relatively few local people felt the shocks because the soil in the Indian Wells Valley is alluvial and the shock waves are refracted by a change in earth structure. The shocks were felt from Sacramento to San Diego, however, where the granitic Sierra structure carried them.

MILES OF TRAILS CLOSED

Hikers and campers are being advised to stay clear of areas where rock, mud or landslides could be triggered by aftershocks, and miles of trails have been closed temporarily by the Forest and Park Services until they can be inspected.

Some seismologists, notably Professor Alan Ryll, a geophysicist at the University of Nevada in Reno, have pointed out that the pattern of earthquakes in the Mammoth area indicates the possibility of a much larger tremor occurring shortly. The region has been shaken by a series of small quakes of increasing intensity for more than a year following a period of relative quiescence, with several shocks registering 5 to 6 on the Richter scale.

The sequence of earthquakes in the Mammoth area began about a year ago with a number of small earthquakes just to the north and west of Bishop, apparently on a branch of the Hilton Creek Fault. The number and frequency of aftershocks did not fit the usual pattern of California earthquakes. Usually, earthquake occurrence in California is marked by a period of relative calm in a given area, broken only by a few small shocks.

When an earthquake happens, the big one usually comes first. It is followed by a series of aftershocks that gradually decrease in strength and in frequency of occurrence. Sometimes some of the aftershocks are large, and may, in fact, be as large as the original quake.

The probability, in southern California, that a given main shock will be followed by an aftershock of the same magnitude or larger is almost exactly one half. This is called Ryll's law, after a senior seismologist who spent several years at CalTech's Seismic Laboratory.

The sequence of shocks in the Mammoth area has, however, consisted of a large number of shocks of different magnitudes spread over a long time.

Some of the shocks have apparently had aftershocks from their own, and the probability of an aftershock is not yet on the increase.

NEW ACTIVITY NOTED

As of Wednesday morning, increased activity and greater heat release is being noted in the hot springs on Hot Creek. Cracking has been reported on the Hilton Creek Fault zone and numerous landslides are still occurring in the mountains.

Hilton Creek Fault has long been recognized as active and shows some prominent dislocations on this surface on the west side of the valley opposite Lake Crowley. It is capable of producing earthquakes in excess of magnitude 7.

Epicenters are scattered all over the floor of Long Valley, and clearly a major readjustment of strain is taking place over a fairly wide area, according to Dr. Pierre St-Amand, head of the NWC Research Department's Earth and Planetary Sciences Division.

Local residents who own condominiums or cabins in the Mammoth area and who are not there when the quakes occur are advised to check carefully for gas leaks when they enter their vacation homes. Gas in an unoccupied place—especially one built of wood—should be turned off at the source before the vacation home is left unattended.

They are also advised to check fireplaces for structural damage before lighting fires.
THREE BIG QUAKES, HUNDREDS OF SMALLER ONES

A Week of Jolts Leaves Jangled Nerves in the Eastern Sierra

By JOHN KENDALL
Time's West Writer

MAMMOTH LAKES—When they talk about earthquakes, thousands of Eastern Sierra residents and visitors will remember this week as The Week That Was. As the trembling earth calmed down a bit, seismologists have recorded three magnitude 6 quakes and hundreds of magnitude 2 quakes in a recent 2-hour span on the Hilton Creek Fault, a few miles south of this resort.

For many, the memory of where they were when the first magnitude 6 quake struck last Sunday will remain as indelible as their memories of the day President Kennedy was assassinated.

Driving in a car and feeling it thump like four strong men bouncing its four wheels, fishing at normally calm Lake Crowley and suddenly realizing the waves are kicking up, ascending Mammot Mountain and realizing something is very wrong when the ski lift stops and the towers sway, enjoying Sunday morning at home one minute and hearing the house creak and moan and the dishes rattle and fall the next.

The first magnitude 6 quake was bad enough, but when a second of the same intensity came about three hours later, a Mono County Sheriff's lieutenant glanced outside at the long Valley Sheriff's substation rattled, and cursed if that would make it stop.

As the aftershocks continued by

'People who stayed here were getting on the ragged end of this. It's really hard on nerves.'

You have enough stress in your daily life without this. It's kind of hard to measure, though. Everyone reacts differently to stress.

"The school kids seem to be taking it really well. There's been a lot of people calling them, though."

Reaction to the week of quakes ran the gamut from attempts at humor, to fear, resignation, acceptance and a resolution to cope.

People placed a banner reading 'Hardhat County' on the Welcome to Mammoth sign. A grocer in Big Pine got up a 25-cent pool to predict the time and magnitude of the next shock.

'We are really frightened,' said Hilda Rutland, who operates the Ski Cafe in Mammot Lakes with her husband Max. "But it's better to work than sit at home.

More quakes predicted

Menlo Park (Upstate)

More earthquakes causing rockslides and avalanches probably will continue through the summer in the Mammoth Lakes area in the Eastern Sierra, Nevada, the U.S. Geological Survey says.

More than 200 temblors of magnitude 3.0 or greater have occurred since May 25 in the area, the USGS said in a report. The agency said seismic activity was expected to continue through the summer and fall of 1980, with many days with a "strong possibility" of quakes in the Richter magnitude 4 to 5 range.

The quakes have caused numerous slides and avalanches in the area, and several people have been injured or killed. There was local damage and minor injuries. The first big quake was felt as far north as San Francisco, 200 miles away.

As the snow melt season continues," the USGS said, "the mountainous areas could become increasingly vulnerable to additional slides and avalanches."

The latest readings showed the swarms of quakes have subsided considerably in size and number, the USGS said.

The USGS also said field studies concluded "The likelihood of an earthquake is at its lowest for the largest quakes, which have moved progressively southward through a series of smaller quakes."

"The fault has developed over at least a 6-mile length of the fault."

Government scientists said there was no relationship between the Mount St. Helens volcano in Washington and the Mammoth Lakes quakes.


5.2 Temblor Hits Mammoth Lakes

From Time's West Service

MAMMOTH LAKES—An earthquake registering 5.2 on the Richter scale shook this Sierra Nevada resort town early Saturday, but residents were taking it in stride.

"We haven't had any damage at all, no phone calls or anything," said Deputy Dwayne Pettite at the Mammoth Lakes Police Department. "Just a lot of people coming in and out of the store today."

The latest jolt occurred at 6:16 a.m. U.S. Geological Survey investigators said Mammoth Lakes, about 45 miles west of the Nevada border and 200 miles east of San Francisco, is being shaken by activity along the Hilton Creek Fault on the eastern side of the Sierra.