

SEISMOLOGY

Scientists, Not Surprised By Earthquakes, Expect Others

Though a Major Shock, Disturbance Probably Did Not Relieve Strain Elsewhere in Southern California

THE EARTHQUAKE which shook southern California March 10 was not much larger than the one that eight years ago (June 29, 1925) damaged Santa Barbara, and the great 1906 San Francisco earthquake was much larger. It will rank, however, as one of California's major earthquakes.

The probable origin of the quake, as determined from records at the Seismological Laboratory, Pasadena, was in the San Pedro Channel within the triangle formed by Point Firmin, Avalon on Catalina Island and Laguna Beach on the mainland.

Probably the worst is over in California so far as this earthquake is concerned. It is expected that shocks will continue for weeks, but it is usually the first shock that is strongest.

Drs. H. O. Wood and Charles O. Richter, seismologists in charge of the cooperatively maintained earthquake laboratory which is set in solid rock back of Pasadena, explained to Science Service.

"At just twenty second past 5:54 p. m. (March 10) our instruments began recording a moderately strong local shock which was sharply felt in the laboratory and which was evidently sufficient to cause damage near its source. The source appears to be sixty to seventy miles southeast of this laboratory, but because of peculiarities in the geological structure a precise distance cannot yet be given. A large number of aftershocks have been recorded with very brief interruptions. Three or four of these have been stronger than the rest and have been barely felt at the laboratory. One or two hundred shocks have been recorded on the less sensitive instruments and it is probable that the more sensitive instruments will record a great many more."

Six auxiliary seismologic stations placed at strategic points in California recorded the earth movements and Drs. Wood and Richter explained that a more precise location will be made after those stations report.

Seismographs from the width of the continent away from the stricken

California region confirmed the accuracy of the determination of the center of the earthquake made by the scientists at Pasadena. Data wired to Science Service from a number of observatories, interpreted by the U. S. Coast and Geodetic Survey, indicated that the epicenter was located in latitude 33.7 degrees north, longitude 118.9 west, and that the quake began at 5:54.2 p. m., Pacific Standard Time. The epicenter location determined by the Coast and Geodetic Survey is in the San Pedro Channel, about 25 miles west of San Pedro Point. The epicenter determined by the Jesuit Seismological Association with headquarters at St. Louis University, using Science Service data, was latitude 32.8 degrees north, longitude 118.5 degrees west.

Reporting to Science Service

Seismological observatories reporting to Science Service were those of the Dominion Observatory, Ottawa; the Dominion Meteorological Service, Victoria, B. C.; the Jesuit Seismological Association stations at Canisius College, Buffalo, N. Y.; Fordham University, New York City; Georgetown University, Washington, D. C., and Mt. St. Michaels, Spokane, Wash.; the stations of the U. S. Coast and Geodetic Survey at Tucson, Ariz., Chicago, and Honolulu, T. H.; and the University of Michigan.

This earthquake had been expected

by seismologists for over a decade, although few definite public predictions had been issued in consideration of public fears. Geologists studying the crust of the earth and earthquake specialists operating sensitive recording instruments and listing the past history of southern California earth movements felt that conditions were ripe for a serious earth disturbance in that region.

While residents of southern California had not in general recognized the existing earthquake danger, leading citizens and scientists cooperated to study the conditions.

Not for 78 years has the Los Angeles region suffered a large earthquake, although on July 8, 1929, a moderately severe shock was felt in the region surrounding Los Angeles and centering at Whittier. On June 21, 1920, the Inglewood earthquake occurred near Los Angeles and par- (Turn to Page 172)

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Earthquake Trapped By Watchful Recorders

THE EARTHQUAKE in the Southern California region was "trapped" by new, inexpensively constructed and automatic seismographs installed about a year ago as the result of cooperative research between the U. S. Coast and Geodetic Survey and California scientific institutions. (*SNL*, Aug. 6, '32, p. 81).

The new seismographs were intended to register only local quakes and they begin making a record when an earth shock rocks the spot where they are placed.

Although earthquakes have engaged the attention of scientific men for many years and delicate instruments have been devised to detect them at a distance and tell how far away and how violent they are, strangely enough there



EARTHQUAKE WATCHMAN

Automatic seismograph designed to wait years for opportunity to make a record of an earthquake beneath it.

coldest water we found was 31°, on the tail of the Bank, in April, about 100 miles from the nearest ice. . . .

In a light, low fog an observer can see a berg from aloft sooner than from deck, but in a dense fog we found that the lookout was best kept from the spar deck, as the first sight of the berg was the lapping of the water on its base.

Speaking about lookouts, it occurs to me that on a very large ship, with decks some 70 feet above water, bridge some

20 feet higher, and lookout posted higher up still, the lookout might well be higher than the top of a small berg; and hence on a dark night he would have an unobstructed view of the horizon over a berg half a mile or a mile away. In that case he might easily miss seeing the obstruction until too late to avoid it.

As a rule, we found little or no change in temperature of the air near a berg.

Science News Letter, March 18, 1933

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Earthquake Was Not Noticed By Einstein

PROF. Albert Einstein walked through the earthquake and did not notice it. He had just emerged from a California Institute of Technology building after attending his last seminar with Pasadena scientists before leaving for New York. Walking with Dr. Beno Gutenberg, the eminent authority on seismology, both he and Dr. Gutenberg were so absorbed that they said later they had not noticed the earthquake. This was ironical because Dr. Gutenberg had never before had an opportunity to experience an earthquake.

Prof. Einstein had a few hours previously announced that he would not return to Germany because he prefers to live where freedom prevails. He will spend next summer in Oxford and return to his new position at Princeton next fall.

Buildings of the California Institute of Technology at Pasadena creaked and swayed greatly in the earthquake but no damage was done to these structures especially designed to withstand earthquakes.

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A piece of silk goods which lay for ten years in the sunken steamship Egypt was recently examined and reported to have "no injuries as to resistance, feel, or luster, and only a slight loss of color in some places."

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Quake Centers on Sea Bottom Where Mountains are Growing

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tially destroyed some weakly constructed buildings. But the great earthquakes of Los Angeles recorded in history occurred in 1769, 1852 and 1855.

Four violent shocks, on July 28, 1769, with strong aftershocks on five days following, are listed in the records of the California missions. This earthquake was probably strongest along San Pedro Bay near the present harbor of Los Angeles. This is the location of the present earthquake center.

October and November, 1852, brought many earth shocks to the southern California of gold rush days. October 26 saw eleven severe shocks at Los Angeles. On July 10, 1855, a quite severe earthquake did considerable damage in Los Angeles.

The ocean region off the San Pedro-Long Beach coast near Los Angeles lying between the coast and Catalina Island is known as San Pedro Channel. Geologists describe it as the San Pedro submarine fault zone and they know that this is an area where the mountains are growing. It is probable that the recent earthquake was caused by a crustal adjustment in this area under the sea.

Although aftershocks from the earthquake will be felt for months, the disturbance was not a general one and probably did not relieve the strain in the earth's crust in other parts of Southern California. This is the opinion of Prof. Bailey Willis, eminent authority on geology and seismology who is professor emeritus at Stanford University.

There is, therefore, continued danger of severe earthquakes in Southern California. When these will come, whether tomorrow or a decade or more from now, neither Prof. Willis nor

other geologists can attempt to predict.

"The Long Beach earthquake appears to be a shock of moderate intensity on one of the several faults of the San Pedro fault zone," Prof. Willis said in response to a Science Service inquiry. "This fault zone was recognized by H. O. Wood, who described it in the Bulletin of the Seismological Society, 1916, in his account of the 1812 quake.

"Among the effects of movements on that zone we may recognize the elevation of the San Pedro point which is terraced by marine benches up to more than 1000 feet above sea and demonstrates activities extending back more than a million years. The zone has the earthquake habit and may be expected to behave accordingly from time to time as in the past.

"Aftershocks are likely to continue for several months and some of them may be strong. Measures of safety should be rigidly enforced. Although locally disastrous this Long Beach shock is not a general one and probably does not relieve the strain in the San Jacinto or San Andreas faults.

"The disaster emphasizes the need of earthquake resistant buildings under a reasonable building code recognizing earthquake hazards."

The San Andreas fault is the long cleavage in the earth's crust which runs from north of San Francisco along the coast to northwest of the Los Angeles region inland. Along this fault the great 1906 San Francisco earthquake occurred. The San Jacinto fault is to a certain extent an extension of the San Andreas fault southward of it.

Science News Letter, March 18, 1933



The Science Service radio address next week will be on the subject

APPLIED GEOGRAPHY

by

Dr. Isaiah Bowman

Director of the American Geographical Society

FRIDAY, MARCH 24

at 12:45 P. M. Eastern Standard Time

Over Stations of The Columbia Broadcasting System