

SEISMOLOGY

Tiny Grinding Noises Made In Earth May Warn of Quake

New Seismic Recorder Makes It Possible To Measure, Record and Classify Noises From Fault Line Movements

WITH a new instrument known as a seismic recorder, scientists can now tune in on an earthquake's "voice." Government seismologists in Oakland, Calif., have made the surprising discovery that the weird, rumbling sounds which precede certain kinds of earth shocks can be measured, and that they have frequencies very much like those heard in the commercial broadcast channels.

Even more important—the rumbling sounds can be classified, and after further study, doubtless will be useful in giving warning of approaching earthquakes.

What makes these noises? Most seismologists believe that extremely small movements, accompanied by barely recordable grinding noises, are taking place at various points along a fault line before a major earthquake occurs.

The seismic recorder was developed after many months of experimentation by scientists of the U. S. Coast & Geodetic Survey, the nation's official fact-finding body for earth shocks, with headquarters in Washington. It provides an automatic 14-day record. Changes in earth sounds from day to day are continuously and permanently recorded by a mechanical pen which makes marks on a moving roll of paper attached to a recording drum.

At the present time several of the recorders are in daily operation along the famous Hayward fault (large crack in the earth's surface caused by earthquakes), which is on the east side of San Francisco Bay. It runs through Oakland, all the way to the lower end of the Santa Clara Valley, and is at least 100 miles long.

This particular section of California was chosen to test the new instrument for two reasons, first, because it contains a number of wells, which provide ideal testing places for special microphones used with the recorders, and secondly because this is one of the nation's major earthquake centers.

During the past 60 years there have

been some four large quakes in the immediate vicinity. One in 1868 took place to the south of Oakland. It was highly destructive and several deaths occurred from falling bricks. Twenty years later another shock struck Oakland, resulting in moderate damage and no loss of life. In 1903 a less severe tremor shook the region but did very little property damage. Another minor quake took place at Niles Canyon, just south of Oakland, in 1933.

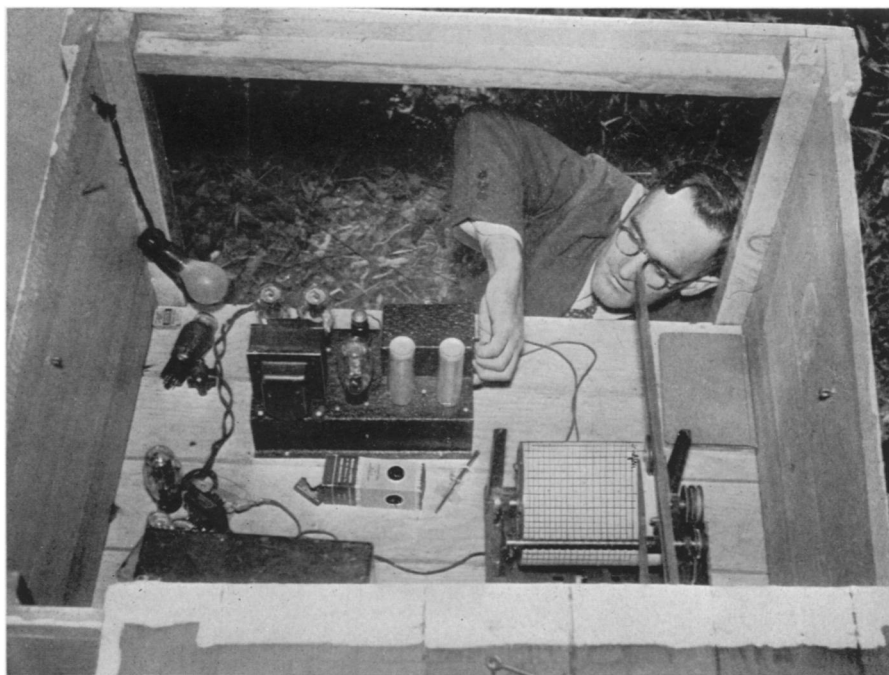
The seismic recorder was built by A. M. Vincent, radio technician of the Coast & Geodetic Survey. Lightweight and portable, it is readily transferable from one earthquake region to another. Just before an earthquake occurs the device works as follows: the characteristic warning sounds of the approaching tremor are picked up by two microphones placed in wells about 300 feet deep.

Permanent records of the sounds are made by a seismic recorder located at the surface of the ground near the top of the well. These sounds are then classified by the local seismologist and sent to Washington for further study. Within a few months it is hoped that a "musical library" of earthquake noises will be gathered together so that soon men may learn at least several days in advance of an impending quake.

Probably the next decade will develop more scientifically valuable information about earthquakes than has been evolved during past centuries, according to Captain N. H. Heck, in charge of seismological work for the U. S. Coast and Geodetic Survey. Doubtless, he says, there are many more thousands of quakes than are recorded on the seismographs of today. Approximately 10,000 earth tremors, major or minor, mostly of very slight intensity, are recorded yearly by the seismological stations now operating throughout the world.

With the help of the new recorder and with maps showing activity of earthquakes along the fault lines, it may be practicable, points out Captain Heck, to make predictions as to liability of occurrence of cataclysms in a given large area within a fixed but extended period of time.

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MAY WARN OF QUAKES

Dr. Dean S. Carder, seismologist of the U. S. Coast and Geodetic Survey, makes an adjustment of the new seismic recorder, which registers by a pen on the drum to the right the slight noises made in the ground by potential earth tremors.