Seismograph Faster Than Telegraph

Seismology

Sends News of Quake While Broken Wires Lag

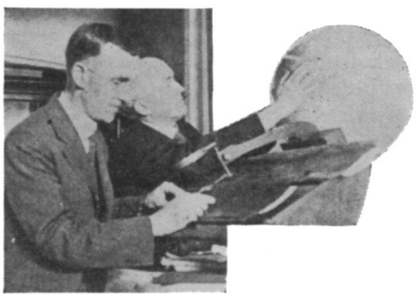
CABLE dispatches from Teheran, telling belatedly of a serious earthquake that killed 2,000 persons and caused widespread damage in the vicinity of Urumiya (Urumiah) Lake in northern Persia were anticipated by Science Service's announcement of the earthquake. The location of this disaster was determined a few hours after its occurrence through analysis of the telegraphed records of seismographs located in the United States, the Philippines, China and Canada.

The earthquake occurred Tuesday, May 6, at 5:34 p. m. Eastern Standard Time and sent its vibrations to all parts of the world. Within a few hours seismological observatories cooperating with Science Service had telegraphed, radioed or cabled their records. Experts of the U. S. Coast and Geodetic Survey utilized this data in locating the epicenter or place about which the earthquake centered.

Two days before interrupted communication brought direct cable news, Wednesday morning, Science Service announced to newspapers: "A violent earthquake occurred in northern Persia late yesterday. It is probable that many were killed and much damage was done."

Information from the region of the earthquake shows that the Persian disturbance is probably as serious as the Burma shock of May 5 about which more information has come to America.

According to the United Press dispatch the shock was most severe in an area west of the southern end of the Caspian Sea, some 400 miles northwestward of Teheran. The inhabitants are mostly Armenians.



Commander N. H. Heck, of the U. S. Coast and Geodetic Survey (right) and Frank Newman (left) determining the position of an earthquake from data furnished by Science Service. Commander Heck is in charge of earthquake investigations.

When the earth shakes severely, vibrations from the center of motion travel to all parts of the earth. They go in two principal ways, one through the center of the earth, the other along the surface. It is this fact that makes possible the determination of the quake's distance. The internal wave travels faster than the surface wave, and so is felt by distant seismograph stations first.

The seismograph, the instrument with which earthquakes are detected, consists essentially of a pendulum arranged to swing on the slighest motion of the earth under it. Greatly amplified, the motion is recorded on a moving strip of paper as a wavy line. Every minute a clock also makes a mark on the paper so that the exact time of a record can be obtained.

When an earthquake is not occurring, the line is straight. Then, as the first wave of a quake reaches the instrument, it starts to wave. A few minutes later, unless the quake is very close, another series of waves appears. These are the result of the vibration that travelled along the earth's surface.

Seismologists have studied many earthquakes and as a result they have compiled tables from which the distance of a quake from a seismograph can be determined from the difference in time of arrival of the two waves.

The record of a single station can only locate the earthquake on a circle at a certain distance from the station. Sometimes this circle may cross a region where earthquakes are frequent and then it would seem probable that the quake occurred there. However, when reports are received from several stations, circles can be swung on a globe around each of them. Where they intersect is the exact location of the quake.

By such a procedure Science Service, with the cooperation of the U. S. Coast and Geodetic Survey, the Jesuit Seismological Association and telegraphic reports from some 30 seismological stations throughout the world, locates many earthquakes.

Science News-Letter, May 24, 1930

What Happens To The Sun's Energy

Astro-Physics—Meteorology

WHAT becomes of radiant energy from the sun, which makes the earth livable, was reported by Dr. H. H. Kimball of the U. S. Weather Bureau, to the American Meteorological Society. Dr. Kimball was reporting information published recently by Sir Napier Shaw, noted former director of the Meterological office of London.

Only half the energy that enters the earth's atmosphere reaches the ground, he said. A large part is reflected back into the void and some warms the atmosphere directly.

That reaching the ground warms the earth and is reflected back into the atmosphere from which very little escapes directly to the void again, it was explained. The energy in the atmosphere divides, part going back to the earth and part to the void.

THE calm, assigned by popular belief to precede a storm, may also come in the middle of it, according to W. E. Hurd, of the Marine Division of the U. S. Weather Bureau.

An area of quiet still atmosphere from which blue sky or twinkling stars can be seen overhead while a few miles away hundred-mile-an-hour winds of the tropical hurricane rage, was described by Mr. Hurd.

"One cannot always see clear sky above the calm center," said Mr. Hurd. "This opening in the clouds, called the 'eye', usually occurs when the tropical cyclone is of great intensity—when it exhibits hurricane strength. But we have the instance of a tropical cyclone near the Society Islands of the South Pacific in 1928 which had a finely developed eye although the surrounding winds were of moderate strength only.

"The eye is not ordinarily associated with small local wind-whirls," Mr. Hurd continued, "but it has been observed in a whirlwind 200 feet in diameter off the west coast of Mexico in August, 1927. At the summit of this whirlwind angry clouds were seen revolving about a patch of clear sky."

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