Earthquakes Are Caused By Waves

There Earth Waves Originate Deep Down And Struggle

a quaking of the earth or a part of it; and theoretically any vibration at all fills the bill, from the tremor caused by a heavy truck passing along the street or a blast in a nearby quarry to the most violent convulsion that slides hills from their bases and opens yawning charms. bases and opens yawning chasms in

bases and opens yawning chasms in the earth.

Earth Waves Hold Secret

"But going beyond the superficial, there is more that needs to be said even by way of a bare definition of an earthquake. The quake in so far as man experiences it is the coming to the surface of waves in the earth. These waves cannot be compared simply to the up-and-down waves of rippled water nor to the back-and-forth waves in the air that make sound. Even the simplest wave motion is none too easy to understand; and the waves in the varying earth materials that make themselves known to man as earthquakes are probably the most complex waves that exist. They are at once motions 'up-and-down' like sea waves; crosswise like the waves in a flapping flag; back-and-forth like sound waves or the motion in a long coiled spring suspended with a weight bobbing at its end; and in addition may have twists about imaginary pivot lines in all of the three dition may have twists about imag-inary pivot lines in all of the three dimensions.

dimensions.

"The earth waves originate in some region down in the earth and start out in every direction. The waves from a pebble dropped into a pond form growing circles on the surface of the water. But the waves in the earth being in a solid, attempt to form spheres that constantly grow outward. Soon however, because of the difference in the rigidity of different rock materials, the form is not

outward. Soon however, hecause of the difference in the rigidity of different rock materials, the form is not a sphere at all but a very irregular curved solid instead, more nearly that of a potato, perhaps.

Two Kinds Of Waves

"The two principal types of earth waves, those that travel like the pulsations in a hobbing spring, straight out; and those that travel like ripples and the waves in a flag, with a sidewise motion, move at different speeds. The pulsing waves are the swifter, and of course the place where they make themselves felt first and most strongly is the surface area straight above their starting point. This is technically the 'epicentor' or 'epicentrum.' The pulsing waves around the epicenter alternately push up the surface of the earth and everything ont it, and let them fall back. This is done very rapidly, and though the actual rise and fall may be only a fraction of an inch on rocky surfaces or a very few inches on soft soil, the violence may be like that from innumerable tremendous blows, and sufficient to shake down buildings. that from innumerable tremends.
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"The 'sidewise' waves follow along simost immediately after the first pulsing waves, and the two, with perhaps 'twisting waves' as well, then operate together. The ground in the epicentral area, therefore, gets innumerable thrusts and falls and at the same time is jerked sidewise and back for tiny distances in every direction.

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"At points some distance from the epicenter the pulsing waves strike the surface at a slant and so accentuate the effects of the 'sidewise' waves and create new surface undulations. The shaking at the epicenter, too, throws the earth's surface there into undulatory waves like ripples on a pond, and these also travel outward in widening circles. These surface waves are those of greatest motion but least speed. They register the heaviest vibrations on the seismographs of the world.

How The Waves Start

"The second important question in regard to an earthquake is: what starts the waves?

"No one has ever seen an earthquake start outward from its center, and it is safe enough to say that no one ever will. But science has built certain hypotheses about the matter that seem to account satisfactorily for the happenings, and which are accepted pretty generally.

"Hold a dry stick as big as your thumb in your hands and bend it until it breaks. At the snap waves will travel to your hands and usually give you a quite painful sensation.

"Hold an Iron bar by one end and strike the other sharply with a hammer. Again the vibrations carried to your hands bay be violent enough to produce a stinging pain.

"And if you should strike a small explosive cap with the end of a long rod grasped by the other end, the ex-

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plosion would probably bring the same painful tingle to your fingers.

Breaks Most Important

"It is generally believed that earthquake waves flow from a point where one of the three forces illustrated is suddenly released—a break, a blow, or an explosion. Breaks are credited with the responsibility for ball practice at Lenoir college this most earthquakes. It is believed that occause of slow contraction or them in the elementary rudiments of shrinking which may result from the the same and collision which finally occurs is violent enough to shake down hills, open wide cracks and destroy cities."

WANT TO PLAY BALL.

Hickory, Sept. 18—Forty candidates reported for early season footomist for the practice at Lenoir college this week. Coach LaMotte is now drilling them in the elementary rudiments of To The Surface

Washington. Sept. 18 — Exactly what is an earthquake and what causes it?

These two questions very naturally pop into the minds of millions of persons when a catastrophe such as that which recently occurred in Japan overtakes some great city and causes thousands of deaths.

A bulletin from the Washington, D. C., headquarters of the National Geographic Society answers these fluestions:

"Superficially the name itself tells the story. It is no more nor less than quaking of the earth or a part of it; and theoretically any vibration at all fills the bill, from the tremor caused by a heavy truck passing

ten follows a break, the two acting

ten follows a break, the two acting together.

Volcanic Explosions

"Earthquakes in active volcanic regions may often result from explosions of gases far beneath the surface; but it is quite possible that even in the neighborhood of volcanoes the majority of the quakes may arise from sudden breaks in the rocks.

the game, and getting them in con-dition for their first game, which is scheduled for the early part of Oct-ober.

UNIVERSALISTS TO MEET

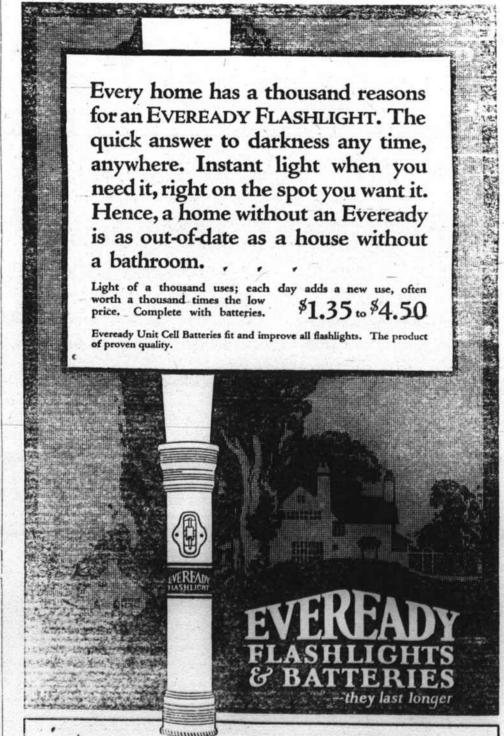
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