

## SEISMOLOGY

# Find New Earthquake Wave May Aid Detection of Enemy

A NEW type of earthquake wave, which is expected to alter radically now-accepted seismological theories and the allied concepts of building quake-proof structures, has been discovered by Dr. L. Don Leet, director of the Harvard University Seismograph Station.

In these warlike days the find is also expected to be of special military importance, since it will probably vitally affect the use of the seismograph in army artillery observation, which employs earth tremors as guides to the sites of heavy enemy guns. They are also used to check the accuracy of the army's own firing.

Both the discharge of a cannon and explosion of a shell start underground vibrations which can be traced on earthquake recording instruments.

The new wave-form was detected after a 10-year study of man-made earthquakes, touched off by high-power dynamite explosions.

Dr. Leet said the new type vibration, entirely unpredicted in earthquake theory, is the fifth fundamental type known to science.

The four forms previously known have been recognized for about 40 years, Dr. Leet said, and it was a bit surprising to find the new type, especially since in many types of explosion-shocks the new form is dominant, registering strongly on the instruments while the other four forms hardly leave their marks.

The new form is a sort of surface wave which travels through the upper 200 miles of the earth's crust, in contrast to the deeper waves which travel directly through the earth's core.

It is the third fastest of known earthquake waves. Those through the earth's center are the speediest and they impart a push-and-pull motion to particles in the path. Another internal wave, which shakes the particles from side to side of

the wave-path, is second-fastest.

Then comes the new wave, which drives particles at a diagonal to its path, followed by another surface wave, with a side-to-side motion, and finally, the slowest wave of all, a surface wave which drives the particles in a curious sort of elliptical rotation.

Dr. Leet has timed the new wave going about 2500 feet a second when set off by dynamite in sandy ground, but he pointed out that this speed might be considerably different under other conditions.

Thus far the new wave form has been observed only on dynamite-explosion records, not on natural quake-charts, but Dr. Leet said it is "almost certain" that it will eventually be found among natural tremors. In all other respects, he pointed out, natural and artificial quakes are similar.

An important problem arising from discovery of the new wave, and one which Dr. Leet is now investigating, is how much damage this new type of wave does. If it is mingled with the waves close to the sources of earthquakes, which cause heaviest damage, it may be necessary to change the design of quake-proof structures to withstand the ground conditions set up by the new wave.

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## PUBLIC HEALTH

# Influenza Epidemics Are Predicted For 1940 and 1941

A MAJOR epidemic of influenza is predicted for February, 1941, with a "Phase 2 outbreak of some severity" likely to occur in February, 1940.

The two-phase theory of influenza occurrence on which these predictions are based has been developed by an English physician, Dr. J. H. D. Webster. It is brought to the attention of American physicians and health authorities through an editorial in the *Journal of the American Medical Association*. (Oct. 7)

Analyzing 'flu epidemic history for the past 49 years, Dr. Webster finds that Phase 1, accounting for influenza outbreaks every 33 weeks, is the major phase in the influenza cycle. Phase 2, the intermediate, covers outbreaks occurring about 16 weeks after Phase 1. This phase has led to a number of serious outbreaks such as those in February-March, 1924, January-March, 1932, and the first and third world epidemics of 1918-1919.

The usefulness of the theory "as an instrument of prophecy will receive practical trial in connection with the predicted epidemics of February, 1940, or February, 1941" the editor of the *A.M.A. Journal* comments, pointing out also that more studies are needed to clear up many points about the periodicity of outbreaks.

Reports of influenza cases from the entire nation during the three weeks ending September 30 received at the U. S. Public Health Service showed a slight increase in number of cases over the median for this period. For the week ending September 30 there were 525 cases. Health authorities do not place much significance on a rise in cases when the total number for the nation is still counted in the hundreds, and point out that last year at this time there were 800 cases reported for the last week in September. The number dropped to 474 during the week ending October 7.

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