SEISMOLOGY

Woman Builds Own Instrument For Study of Earthquakes

Pipe, Needles, Silk Thread, Clock Frame and Smoked Paper Are Some of the Materials She Used

EARTHQUAKE study is the scientific avocation that has intrigued Mrs. M. M. Seeburger of Des Moines, Iowa. In the basement of her home she has installed a complete recording seismograph, which she built with her own hands on designs of her own invention. The instrument was put into operation recently, and now Mrs. Seeburger regularly reports earthquakes through the far-flung cooperative network of seismological observatories operated jointly by Science Service, the U. S. Coast and Geodetic Survey, the Jesuit Seismological Association and numerous university and governmental observatories in the United States, Canada, and overseas islands.

Mrs. Seeburger was interested first in the instruments used in measuring and recording the activities of volcanoes. She studied many such instruments in her travels. However, as she phrases it, "Volcanoes will not come to your door, here in Iowa, but earthquakes will. So I decided to concentrate on seismology, and spent two years working on the design and construction of our instruments and station."

The Uses of Inertia

Mrs. Seeburger's seismograph is based on the same principle as all other instruments of its type: what physicists call the inertia of a freely suspended mass. Inertia is what snaps your head back when a train starts abruptly, or makes you lurch forward when the four-wheel brakes on your car work too quickly. Basically, every seismograph consists of a suspended mass of metal that tries to stand still when the earth shifts under it, with a suitable apparatus for magnifying that relative motion and recording it on suitably prepared paper.

Mrs. Seeburger's instrument consists of two horizontal pendulums, one to record north-south movements of the earth, the other to record east-west movements. They are both built essentially alike.

For each, there is a mast-like steel upright, set firmly in a block of concrete embedded in the earth. Projecting from a pivot near the bottom is a long arm or boom, made of three-eighths inch pipe. Near the outer end of this boom is a heavy mass of lead, so arranged that it can be slid in or out, to reach the right adjustment. A length of piano wire to the top of the upright supports the weight.

From the end of the boom a lightly-built metal fork projects. Into its two ends Mrs. Seeburger set a pair of ordinary steel needles. These she threaded with one silk thread, running it around a delicately pivoted grooved steel wheel in a common clock frame. To the wheel is attached a light aluminum finger ending in a fine, lightly-balanced stylus, that bears on a piece of smoked paper stretched on a slowly turning drum moved by clockwork.

So long as the earth is quiet, the aluminum finger stands steady. But if a remote earthquake sends tiny tremors through the crust of the earth, the soil of distant Iowa responds with imperceptible motion. The inert lead weight balks at moving, and its differences with the earth under it, magnified fifteen times by the threaded wheel and the moving finger of aluminum, are registered by a wiggly line on the smoked paper drum. Mrs. Seeburger has learned to read this earthquake-shorthand, and she transmits its messages by coded wire to Washington, for correlation with other quake telegrams from the cooperating stations of the network.

Science News Letter, June 22, 1935

Coins of Emperor Nero's time have been found in north Jutland, showing that Scandinavia had connections with the Roman Empire earlier than was supposed.

WOMAN WATCHER OF EARTHQUAKES

Mrs. M. M. Seeburger of Des Moines with the seismograph she designed and built and which she operates herself. Materials used in construction range from heavy masses of concrete and lead to such housewifely items as sewing needles and silk thread.