

Seismographs

Chapter 7

Earthquakes generate seismic waves that travel all around the world and can be detected by sensitive instruments called seismographs. The earliest instrument to detect earthquakes was a seismoscope invented by Zhang Heng in 132. He called his instrument an earthquake weathercock.

Earthquake weathercock invented by Zhang Heng in 132

Zang Heng constructed a large brass urn with eight dragonheads on the outside that held a ball in their mouth. Inside the urn was a mechanism that would release the ball during an earthquake. The ball fell into the waiting mouth of a brass frog below the dragon's mouth making enough noise, so the Imperial Watchman would know an earthquake had occurred and let people know the direction of the earthquake. The earthquake weathercock was invented almost 2000 years ago and used by the Chinese for almost 400 years.



Seismographs recording activity on Kilauea Volcano at the Hawaii Volcano Observatory

19th century seismographs

European inventors had constructed several seismographs by the end of the 19th century. Most of the instruments suspended a pendulum or magnetic mass within an electric coil. A moving magnet, inside the coil, created an electric current during an earthquake. The electric current converted into an electrical signal

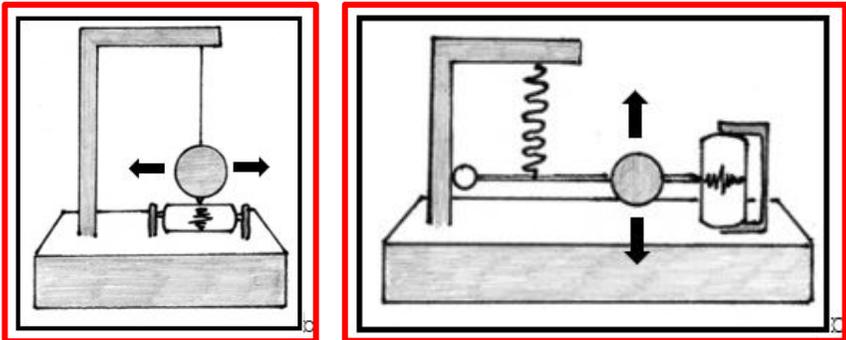
FS Earthquakes

that moved a needle across paper and would trace out the wiggles of the Earth's shaking.

The first time a seismograph recorded an earthquake that took place on the opposite side of the Earth was in 1889. The earthquake generated in Tokyo, Japan was recorded on a horizontal pendulum seismograph in Potsdam. Evon Rebleur Paschwitz reported his findings and his discovery that earthquake waves traveled through the Earth after a major earthquake.

Simplest seismographs

The simplest seismographs have a heavy pendulum with a pencil attached to record seismic waves on a paper. A manual seismograph that is a little more complicated is made with a drum that turns constantly with a piece of paper attached to it. A bar or spring with a hinge at one end holds a weight with a pen. The pen attaches to a pole or metal box that is bolted to the ground.



Seismograph stations have three different pendulums to record earthquake waves. The seismographs record north-south, east west, and vertical ground motions.

How simple seismographs work

The pen does not move because of inertia when an earthquake shakes the table and the drum. The drum vibrates during the earthquake. The unmoving pen records the distance the table moves during the earthquake on a seismogram, paper attached to the drum.

Tin Can Seismograph

Activity 7

Introduction

Seismologists use several different seismographs when they record earthquakes. They need one to record information about waves moving north and south, east and west, and up and down.

In this activity, you are going to make a simple seismograph tin can seismograph to record earthquake waves moving in one direction.



Tin can seismograph recording seismic waves.

Materials

- Large tin can
- Sand
- Rope
- Tape
- Pencil
- White paper

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