

When injected directly into the veins it is highly poisonous. But given by what the doctors call galvanic induction through the skin, its effects are more prolonged and hence more satisfactory, they found.

While the treatment is not a "cure" for rheumatism or chronic arthritis, it gives striking results, reducing the swelling, increasing the general activity of the joints without pain and making the patient more comfortable.

SEISMOLOGY

Better Knowledge of Earth From Better Instruments

RECENT improvements in the instruments which register earthquakes will greatly enhance our knowledge of the internal structure of the planet on which we live. These seismographs, as they are called, must be very sensitive in order to measure shocks thousands of times too weak to be felt. They must also be very reliable and always on the job, because there is no way of telling when an earthquake is to come.

The general principle of the operation of a seismometer is practically the same for all types and has been in use many years. Part of the instrument is suspended from a rigid frame attached to solid rock. The other end is free. Since the suspension is not rigid when the rock moves in an earthquake, the suspended part does not move in the same way. The relative motion between the fixed and suspended part can be detected and amplified electromagnetically just as it is in some types of telephone receivers. The current generated is measured in a galvanometer and the result recorded automatically on a sheet which also receives a record of the time. The accuracy of the time signals decides to a large extent the accuracy with which the origin of the quake can be determined.

An exceptionally accurate timing system has been developed by H. Benioff of the Seismological Laboratory in Pasadena. It depends on wireless signals given out regularly by the big broadcasting stations.

Mr. Benioff has also perfected a vertical seismograph which is so sensitive, especially to short-period shocks, that waves have been recorded after they had traveled two or three times through the

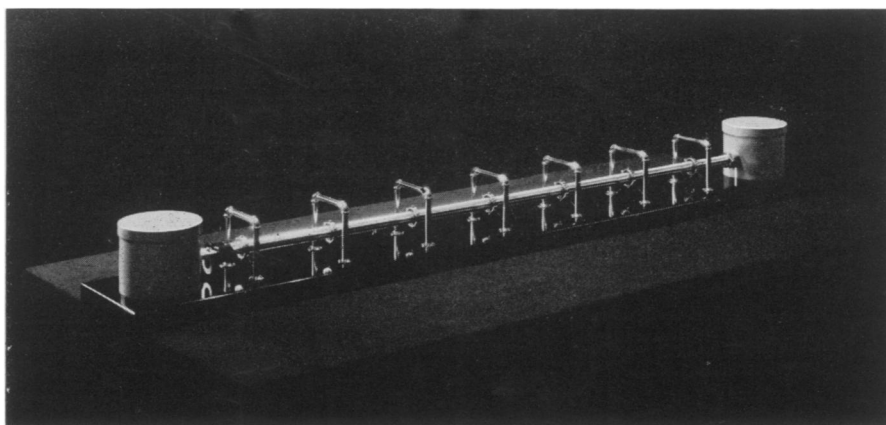
An asbestos bandage soaked in the medicine is wrapped around the affected limb or joint. Over this is placed a flexible metal plate which is connected to the positive pole of a galvanic generator. A moist pad electrode placed on the back is connected to the negative electrode and the current turned on and slowly increased. The electric current breaks the medicine down into ions which are carried into the skin.

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dense liquid core which exists in the center of the earth. Nearby quakes sometimes provide waves so short that the older instruments would not have responded at all.

The most novel and ingenious instrument which is due to Benioff is called the strain seismometer. This is simply a sixty-foot pipe attached to the earth at one end and extending horizontally to a fixed pier at the other. There is a small gap between the end of the pipe and the fixed pier. When a quake occurs the fixed foot of the pipe moves with respect to the fixed pier, and the gap changes. An electromagnetic pickup detects this change and records it amplified a million fold. Thus a quick earth movement of a hundredth of a wavelength of light will produce a half-centimeter deflection on the record.

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DETECTOR OF THE EARTH'S SHUDDERS

A model of the original strain seismometer, built by Hugo Benioff who also designed the original. Two reinforced concrete piers are embedded in solid rock sixty feet apart and move only when the rock moves. The pipe shown is fixed to the pier on the right but free at the other end. During an earthquake, the pipe moves with the right pier, varying a gap on the left end and generating a current in coils on the left pier.

PHYSICS

Large Currents Produced By Lightning Strokes

WHEN lightning strikes a lightning rod or the steel mast of a high tension line, it may produce a current as high as 60,000 amperes, enough to light 130,000 fifty-watt lamps at once.

This is the result of a research carried on since 1926 by Dr. Heinrich Gruenewald and his associates of the Berlin-Charlottenburg Society for the Study of High Tension Installations.

Currents of 30,000 amperes in lightning were found to be frequent, 50,000 to occur occasionally, and 60,000 was the highest measured.

The investigation was made by inserting in the path of the lightning short rods of a special substance that becomes magnetized on the passage of a current. The degree of magnetization showed the strength of the current, and the polarity of the magnetism showed its direction. It was found that the current usually passed upward from the ground instead of downward as is commonly supposed, showing that the base of a thunder cloud is usually negatively charged. This is in accord with the results of other recent investigations.

It was found also that the steel masts of high tension lines are excellent "catchers" of lightning, and are more frequently struck than is supposed. In many cases the only evidence that a mast had been struck was given by the magnetization of the special rods.

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