

in the southern Great Lakes region, you will most likely find little oaks. The second generation of trees, therefore, will be oaks and not pines.

However, oaks play the same selfish game toward their own offspring that the pines played in their day. Oak seedlings need more sun than can be found in the shelter of oak branches. So again we find the children of strangers coming in.

This time they are a mixed people: a good many beechlings, even more little maples, and a smaller but still goodly number of hemlocks. These three species can stand a great deal of shade in their infancy. They take full possession of the oak undergrowth, and when the oak generation dies out they inherit that portion of the earth.

But here the cycle of parental overdominance ends. For the shade of the grown beech-maple-hemlock forest is not too dense for young trees of its own kind. Once a forest has developed to this "climax" stage it remains there forever, replacing itself generation after generation, unless fire or the devastating ax of the human invader intervenes.

*Science News Letter, May 27, 1933*

SPECTROSCOPY

## New Spectra Are Explored By German

**S**PECTRA lying between the X-rays and the ultra-violet rays of 1200 Angstrom units, in which absorption spectra have hitherto been unknown, have been found by Dr. H. Beutler, Berlin physicist. The elements giving the newly discovered spectra are rubidium, caesium, cadmium and mercury.

Helium was exposed to a condensed discharge to produce light from 900 to 600 Angstrom units. The light source and the test vapor could not be separated from the vacuum spectrograph used by a window or other device because no material known allows these rays to pass through.

The new lines cannot be observed in emission but only in absorption. They are interpreted as arising from a change in the quantum numbers of an inner electron while the valence electrons remain unexcited and they thus represent a transition from optical to Roentgen spectra.

The experiments by Dr. Beutler are considered to be of fundamental importance in spectroscopy.

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OCEANOGRAPHY-SEISMOLOGY

# Prediction of Tidal Wave Forestalls Harbor Damage

**A** TIDAL WAVE that traveled on schedule was reported by E. P. Leavitt, Superintendent of the Hawaii National Park, following a recent earthquake in Japan.

The schedule was arranged by earthquake experts after the earthquake itself was registered on the seismographs at the Kilauea Volcano Observatory in the Hawaii National Park, and also at Hilo and Kona, about ten minutes after it occurred in Japan. The Kilauea Observatory is operated under the supervision of Dr. T. A. Jaggar, head of the Hawaiian Volcano Research Association.

Seismologists A. E. Jones at the Kilauea Observatory, and R. V. Woods at Kona, immediately realized that a tidal wave might occur in the Pacific, and figured that such a water wave, traveling 450 miles an hour, would reach Hawaii about eight and one half hours after the earthquake.

Mr. Jones therefore notified the harbor master at Hilo to look out for a wave about 3:30 p. m. that day, while Captain Woods in Kona informed officials at other ports that the tidal wave would reach them about nine hours after 7 a. m. The earthquake in Japan had occurred about 7 a. m., Hawaiian time.

With this information available, all of the Japanese sampans or fishing boats in the harbor at Hilo were moved out into the ocean to prevent wreckage in case of a large wave.

Intrigued by Mr. Jones' prediction, large crowds gathered at the seashore in Hilo as the hour of 3:30 approached. Mr. Leavitt reports that he and Mr. Jones, with policemen, patrolling cars and inspectors, went to the vicinity of the Wailoa River fish market to get a good view of the expected tidal wave as it came from the ocean. The wave struck within six minutes of the time estimated, and for about two hours rushed in and out through the Wailoa River. No damage was done at Hilo.

On the Kona side of the island, however, there was a maximum wave of about seventeen feet. A boat house belonging to Dr. Jaggar was moved about six feet by the waves and the water tank also was moved. Stone walls in

the vicinity were washed out and shipping pens damaged. Here sampans, a motorboat, and several canoes were washed ashore.

Those watching the recession saw the water drop below tide level, revealing the barrier reefs and the red rocks beneath. Neighbors walked around picking up fish in the yards along the beach.

Superintendent Leavitt states that because of the warning given by Dr. Jaggar and his staff, all sections of the Territory were prepared for the tidal wave and so little damage was done. Had it not been for the scientific research investigations carried on by the Hawaiian Volcano Research Association, with the cooperation of the United States Geological Survey, serious damage might have occurred.

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Nicotine gets its name from Jean Nicot, who introduced tobacco into France.

A rattlesnake gets a new ring on its rattle whenever it sheds its skin, and that happens several times a year, depending on how well the snake feeds.

Placing a chemically-treated band of paper around an apple tree may bring death to as many as a thousand codling moth caterpillars.

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