GEOPHYSICS

How Loud Is an Earthquake? Comparison Scale Proposed

Geophysicists Also Discuss New Device for Measuring Blueness of Sky; Tornado Frequency is Mapped

HOW loud is an earthquake?

This question was raised before the American Geophysical Union by Dr. H. Landsberg, seismologist at Pennsylvania State College.

The noises that accompany earthquakes, often terrifyingly loud and grinding, have never been adequately accounted for, said Dr. Landsberg. They do not always appear to originate at the point of maximum disturbance, the earthquake's epicenter. It is also difficult to figure the amount of earthquake energy diverted into the production of noise; calculations made by Dr. Landsberg indicate that only one ten-thousandth of the energy of the shock waves can pass into the air as sound waves.

It would be possible to record the energy of the earthquake noises in terms of decibels, the seismologist stated. However, the necessary sound-recording instruments are unlikely to be around when an earthquake happens. For this reason, Dr. Landsberg proposed a five-grade comparison scale for auditory comparison:

1. Whisper, or rustling of paper.
2. Conversation, quiet car moving at low speed, slight knocking.
3. Distant thunder, distant artillery fire, distant drums, church bells, rumbling inside slow-moving train.
4. Heavy thunder, noise in slow subway, train in tunnel, avalanche, artillery fire, waterfall.
5. Nearby explosion, quarry blast, noise in airplane, collapse of building.

Measure Sky's Blueness

How blue is the sky?

That is not a mere rhetorical question put by a poet for the purpose of dragging his lady's eyes into the discussion. The exact color of the sky is a matter of considerable scientific, commercial and even military importance, for it is a measure of air turbidity, dust content, haziness, etc., affecting visibility at a distance, intensity and color composition of sunlight, and a number of other intangible but important matters.

A new device for measuring the sky's blueness was described by Drs. H. Landsberg and H. Jobbins of Pennsylvania State College. It is considered an advance over the series of standard color cards hitherto employed, being more rapid and direct in use, and having no abrupt jumps from one degree of blueness to another.

The device consists of a wedge of clear blue glass of a standard hue, mounted so that sunlight is reflected through it from a mirror. Half of the opening of the frame in which it is mounted is open, so that the observer can look at the sky, and then slide the wedge along until the color matches. The deeper the blue, the thicker the part of the wedge needed to make a correct match.

In trial observations, Drs. Landsberg and Jobbins have found that the bluest part of the sky offers the best visibility; a pale sky means poor seeing. The part of the sky 90 degrees of arc away from the sun and on the opposite side of the sky is usually the deepest blue.

Where Tornadoes Rage

Has your county got the tornado habit?

A map shown before the meeting of the geophysicists by Drs. Charles W. Brown and Wyndham O. J. Roberts, of Brown University, could tell you.

Drs. Brown and Roberts have marked on every county on the map the number of its recorded tornadoes during a 50-year period, and have tried to trace "isotorns," or lines of equal tornado frequency, as isotherms indicate equal temperatures and isobars equal atmospheric pressures.

Isotorn tracing was not an easy task, they found, for some counties turned out to be tornadoless "islands" in the midst of areas of rather high tornado frequency.

Their map "debunks" one traditional notion: that all of Kansas and other western states are "cyclone country." The higher, drier parts of the Plains have relatively few tornadoes; only when one gets into regions of higher rainfall do the twisters begin to make a formidable showing.

Other regions of low tornado frequency are the northern border of the central region, the seaward margin of the coastal plain from Texas to New Jersey, and the Appalachians from hilly Georgia to New England.

Safer Aviation

Greater safety for planes, their pilots and their passengers, is sought in a program of research for high-flying little balloons proposed by Prof. Charles F. Brooks of Harvard University.

These small unmanned balloons are just passing out of early experimental stages at present. Carrying featherweight, ultra-shortwave radio sending sets, they will soon be ascending in scores and hundreds daily from weather observatories everywhere. They can gather and report weather data at altitudes of 20,000 feet or more, beyond the reach of human fliers except at unjustifiably great expense.

Prof. Brooks laid out a seven-point research program, which he recommended for the adoption of meteorologists interested in upper air phenomena, and which will have its applications in ground-level weather studies, too.

Among his points are: study of extent, heights, shapes of fogs and cloud masses, and their chances of clearing up; types and causes of "rough air;" fronts of contact between warm and cold air masses, with especial attention to lightning, and to winds that "go straight up"; ice conditions, their extent and height; high-altitude observations, with a view to better forecasts; hurricanes and typhoons; variations in ultra-shortwave radio transmission in relation to atmospheric stratification and fronts.

Prof. Brooks hailed as "a notable step" the action of the U. S. Weather Bureau in asking for bids on daily radio-meteorograph ascents at some pioneer station, to begin Sept. 1.

Ways of the Sea

As little unmanned aircraft are to be used to search the trackless ways of the air, so other little unmanned craft are being launched to follow the equally mysterious ways of the sea. Dr. H. U. Sverdrup, director of the Scripps Institution of Oceanography, reported a cooperative research program participated in by his institution and the California Fish and Game Commission, which includes the releasing of 6,000 drift bottles at sea. Each bottle contains a paper

stating where it was dropped overboard and requesting its return.

Quantitative measurement of the dim light that fish and seaweed live by is being undertaken with a new instrumental set-up devised by Dr. R. T. Young of Worcester Polytechnic Institute, Dr. Sverdrup continued. This consists of a watertight casing containing a photoelectric cell, which can be lowered into the water. At the same time a twin photoelectric cell in the boat registers the surface light. The differences between the two readings, after calibration, shows how much light the water absorbs.

Other lines of research being followed at the Scripps Institution include studies of ocean temperatures, currents, and salinity, identification and counting of the little known bacteria of the sea, collection and statistical studies of other marine microorganisms, and "applied" scientific work on such diverse problems as the fouling of ships' bottoms and the behavior of fishes.

Seismographs Aid Engineers

As you speed along the smooth, paved highway, you are all unconsciously indebted to benefactors who are equally unconscious of their contribution to your comfort.

Modern highway building owes much to seismologists, men devoted to the "pure" science of earthquake study, who know nothing of highway engineering.

The connection was pointed out at the meeting of the American Geophysical Union, by E. R. Shepard, research engineer of the Bureau of Public Roads, U. S. Department of Agriculture. Highway engineers are now making use of seismographs, invented by earthquake scientists, as oil geologists did before them, Mr. Shepard stated.

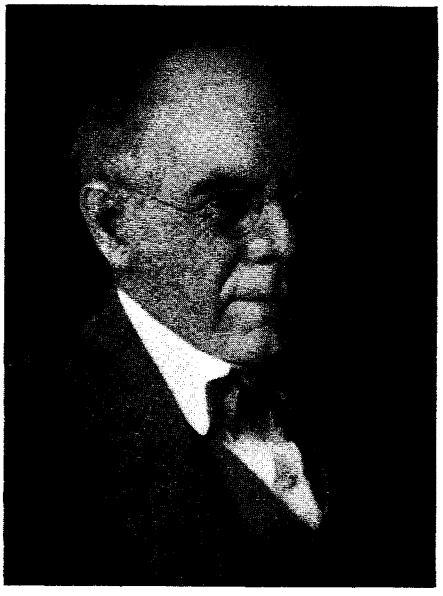
Highway engineers are using these instruments in the same way and for much the same purpose as the oil-seekers. That is, they start small artificial earthquakes with charges of dynamite, and then study the record of the waves as they come back to the seismographs, to see how far down it is to bedrock.

The thickness and nature of the loose soil above bedrock has much to do with the kind of foundations that have to be laid for the road. Knowledge of this kind makes for safer and longer-lived pavements, and frequently results in economies in construction.

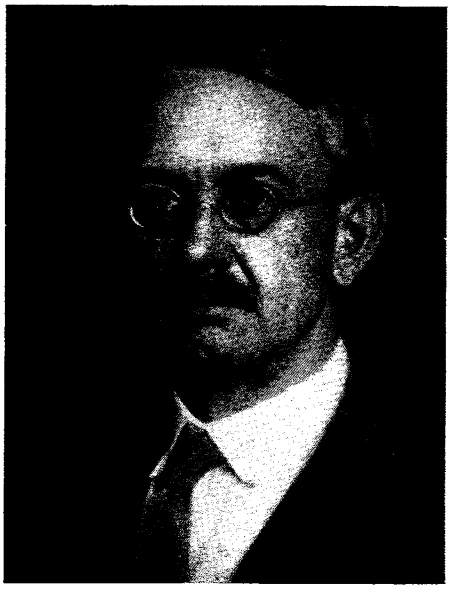
Science News Letter, May 8, 1937

Goldfish are mentioned in Chinese writings 12 centuries old.

Science Service Presidents



DR. J. McKEEN CATTELL



DR. EDWIN G. CONKLIN

DR. Edwin G. Conklin, noted Princeton biologist, was elected president of Science Service, the institution for the popularization of science, at its annual meeting just held.

Dr. J. McKeen Cattell, pioneer psychologist and also editor of *Science* and other journals, had made known his desire not to be reelected after nine years in the presidency. Dr. Cattell continues as a member of the board of trustees on which he has served continuously since Science Service was founded in 1921. The trustees and staff of Science Service joined in honoring Dr. Cattell at a dinner.

Dean Carl W. Ackerman of the Columbia University Graduate School of Journalism was added to the board of trustees to fill the vacancy caused by the death during the year of Marlen E. Pew, veteran newspaperman.

Dr. W. H. Howell, noted physiologist of Johns Hopkins University, was reelected vice-president and chairman of the executive committee, while Harry L. Smithton of Scripps-Howard Newspapers was reelected treasurer.

Science News Letter, May 8, 1937

AGRICULTURE

Pink-Hearted Cabbage From Imported Stock

A PINK-HEARTED type of cabbage has been grown from stock imported from Turkestan, at the experiment station of the U. S. Department of Agriculture, at Beltsville, Md., Dr. Roy Magruder reports. (*Science,* April 30.)

The heads are green outside. As the leaves are stripped off, the inner ones are first the usual cabbage-white or cream color. Then, varying from a half-inch to three inches in diameter, there is an inner heart of pale pink or magenta color.

Dr. Magruder is sending seed stock to Dr. C. H. Myers of Cornell University, who will continue breeding experiments.

Science News Letter, May 8, 1937

MEDICINE

Victims of Polio May Suffer Same Ill Again

INFANTILE paralysis, unlike proverbial lightning, can strike twice in the same place, Dr. Simon Flexner of the Rockefeller Institute for Medical Research reported to the National Academy of Sciences. He found that monkeys that had recovered from one attack could be given the disease a second time by infection with the same strain of virus, or with a different strain. Reinfection could take place after either a mild or a severe attack, "and in convalescent animals which have been subjected to hyperimmunization."

Science News Letter, May 8, 1937