

## Earthquakes and earth's rotation

Long-term fluctuations in the length of the day, the so-called Chandler wobble of the earth, global earthquake activity, changes in climate and periods of explosive volcanic activity all seem to show intriguing correlations. But can these five kinds of geophysical events actually be related by cause and effect? Seismologist Don L. Anderson of the California Institute of Technology thinks so.

In the Oct. 4 *SCIENCE*, he points out that a comparatively large deviation in the length of the day around the turn of the century correlates well with an increase in global seismicity at the time. Smaller peaks in length of day and seismic activity occur in the 1830's and 1940's. Correlations with volcanism and global climate are also good.

Anderson proposes this sequence of events: Dust spewed into the atmosphere by great outbursts of explosive volcanism (as happened in the 1830's and 1880's) alters the amount of solar radiation reaching the earth. This causes changes in zonal wind circulation patterns, which slightly alter the earth's rotation speed. Large amounts of elastic energy are stored in the crust and upper mantle due to rotational processes, so these small perturbations in rotation speed may cause the great crustal plates of the earth to decouple, triggering global seismic activity.

## Meteorite origin of basin in Canada?

The origin of the Sudbury Basin, a 60-kilometer-long by 27-kilometer-wide depression in the ancient rocks of the Canadian Shield, just north of Lake Huron, has long been a topic of debate. In 1964 geologist Robert S. Dietz proposed that it was formed by impact of a giant meteorite, and considerable evidence reported since then supports that view. Shatter cones have been found in the surrounding country rocks. Evidence of shock metamorphism has been found in rocks within the basin and north of it. Geologists who argue against the impact hypothesis emphasize, among other facts, that it is not circular.

Now two geologists from the Lamont-Doherty Geological Observatory, Stephen J. Brocoum and Ian W. D. Dalziel, have completed a study that deflates the noncircularity argument and supports the impact theory. Their study of the internal structure of the basin suggests that originally it was almost circular. After it was created, they report, the basin was squeezed into its present elongated shape at the same time as nearby rock provinces were undergoing major folding and flattening. 2.0 billion to 1.6 billion years ago. Their evidence, they conclude in the October *GEOLOGICAL SOCIETY OF AMERICA BULLETIN*, strengthens the hypothesis that the Sudbury Basin is a meteorite impact site.

## Stimulating snowfall

Project Skywater's Colorado River Basin Pilot Project, a test of the feasibility of increasing mountain snowpacks through winter cloudseeding in Colorado's high San Juan Mountains, will begin its fifth and probably final season in November.

The evaluation of the project will be completed by an independent investigator within a year following the project. An interim evaluation last year was inconclusive. The Interior Department's Bureau of Reclamation, in charge of the project, says data collected during the first three winter seasons, two of which were very dry, "were not sufficient to identify the effects of seeding with any degree of reliability."

October 12, 1974

# Advice to youth from a science fair judge:

**Winning a prize is more satisfying than not winning.**

**Judges favor projects they understand.**

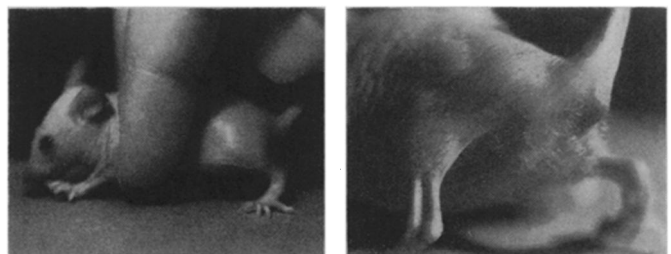
Even projects good enough to get all the way to the big International Science and Engineering Fair are not PhD theses. Those who judge a PhD thesis must be on top of all existing knowledge that directly locks into the missing piece the candidate offers. Not so for science fair judges. They may not be that sharply tuned to your topic and to your every word of written and spoken explanation. They have to move along to finish the judging.

Photography might get through to them. Not necessarily a dim little snapshot or two that mumbles in a dull tone, "The following apparatus was employed." That you may need anyway, but consider also a very short movie or a few stills that shout, "**HEY, LOOK! THIS IS WHAT YOU COULD HAVE SEEN!**" After that, the cold facts.

If you have some ideas of your own, our free package of photographic hints for science fair contestants may prove useful. Request it from Kodak, Dept. 841, Rochester, N.Y. 14650.



Any questions?



At the 1974 International Science and Engineering Fair, Theresa Tomilo of Comstock High, Kalamazoo, MI. showed with these pictures she had taken just how hairless a hairless mouse can be and what happened after injection with DNA extracted from embryonic cultures of haired strains. She walked off with prizes and honors from the U.S. Army, the U.S. Navy, and the American Dental Association, and a prize for photography from Eastman Kodak Company.

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