

## GEOPHYSICS

# Heating Rocks Gives Age

**Radioactivity, displayed in prehistoric objects as thermoluminescence, now dates civilizations up to about 100,000 years. This technique supplements the carbon 14 method.**

A METHOD of dating the age of past civilizations based on heating their rocks and pottery is now available to help the historian and archaeologist.

Thermoluminescence, caused by radioactivity in all sorts of materials and displayed when they are heated, is the basis of the new method.

Announced to the American Association for the Advancement of Science in Chicago by Drs. George C. Kennedy and Leon Knopoff of the University of California Institute of Geophysics at Los Angeles, the method is extremely simple and speedy.

The material, usually pottery or lava, is heated to below the point where it gives off light itself. This releases thermoluminescence, which is caused by electrons being freed from the solids in which they have been trapped for the many years.

All materials contain traces of radioactive elements. Over the years this radioactivity

decays, giving off alpha and beta particles which trap electrons in solid crystals. The older the material, the more electrons are trapped.

When the material is heated up to about 350 degrees centigrade or less, the electrons are given back and create a mild light that can be captured by a photomultiplier tube. The more light, the older the material is.

The method is good for about 100,000 years in the past and it therefore supplements beautifully the dating of ancient civilizations by carbon isotope 14 which has been so successful for samples up to 40,000 years old. Dr. Knopoff, in presenting the paper, told of dating 16 fragments of ancient Athenian pottery, dishes, lamps, cups, vases and wine jugs, which were known to have come down from the Ninth Century B.C.

The thermoluminescence method checked with the historical date. Lava rocks from

northern Arizona were dated back to 15,000 years ago.

It is expected that this new method will be particularly significant when used on Mayan and Mexican pottery, and it should solve the puzzle of the Mayan calendar. The method has been tied in with the dates in the Southwest determined by the study of tree rings and it will make possible a wide extension of the times at which early American civilization existed.

The new method is especially useful for civilizations which have left their records, not in wood and charcoal, containing carbon, but in their distinctive pottery.

Many of the past records have undoubtedly been lost because of the decay and rot of wood or the fact that later civilizations burned the records of the previous civilizations, which might otherwise have been dated from the tree rings or by the carbon-14 dating method.

Science News Letter, January 16, 1960

## GENERAL SCIENCE

## Study Urged for U. S. Science Council

THERE SHOULD BE careful consideration of the organization of science in the academic, industrial and Government areas of the nation, and a commission should be formed to study the problem, Dr. Wallace R. Brode declared at the Chicago meeting of the American Association for the Advancement of Science, speaking as retiring president. Dr. Brode is science adviser to the Secretary of State, but he stressed that the ideas presented were strictly personal ones.

Dr. Brode recommended study of the following concepts:

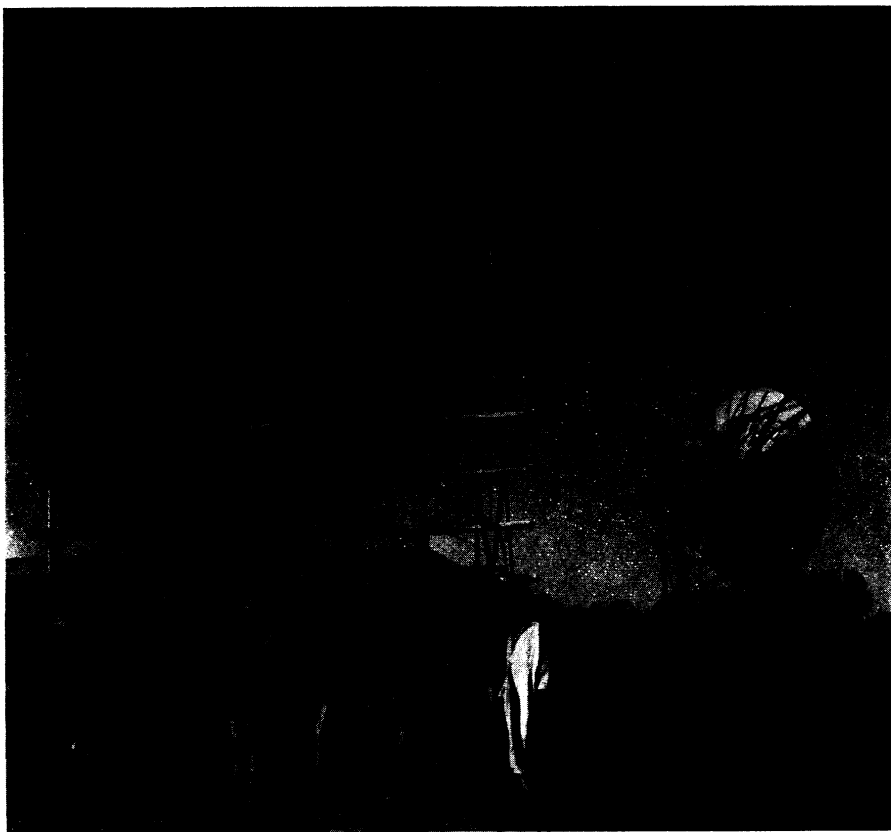
a. There should be a regrouping of some of the Government's scientific agencies or activities: a Department of Science, National Science Institute or other coordinated organization. A well-developed coordination must be established between the regrouped combination and those scientific agencies which remain separate so as to insure an efficient and comprehensive National Science Program.

b. There should be a realignment of the distribution methods and responsibility for support of basic research in our educational institutions with a movement toward university grants, administered largely by a basic Department rather than applied agencies. This may need to be coordinated with the growing problem of the support to our advanced education program in all areas.

c. There should be some separation of Governmentally-sponsored major research institutions from our educational and industrial system, especially those institutions which are essentially applied science. There should be a greater acceptance of operation of such institutions under an improved direct Government administration.

d. The liaison of Government scientists with the academic and industry scientists should be represented by a "National Science Council" in such a manner as to be compatible with the maintenance of our broad culture and balanced development.

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**TROPO SCATTER**—A multi-channel voice transmission system links three Libyan cities on the Mediterranean. Antennas beam voice signals from long distance telephone conversations to the troposphere six to 12 miles above the earth. The signals are then reflected back as far as hundreds of miles from their starting points. The tropo scatter system is easier to install and maintain than other transmission systems.