

PHYSICS

# Huge Burning Glass May Give Maximum Sun Heat on Earth

Temperatures as High as 10,000 Degrees Fahrenheit Are Hoped for Through Use of Multiple-Lens Instrument

A HUGE "burning glass" made of nineteen lenses each two feet in diameter, as well as nineteen smaller ones, will soon be in operation at Pasadena at the new Astrophysical Laboratory of the California Institute of Technology. With its aid, it is hoped, temperatures as high as those in the sun-spots, around 10,000 degrees Fahrenheit, will be attained, and astronomers will be able to study at close range how various substances behave when so heated.

The new instrument has been developed by Dr. John A. Anderson, of the Mt. Wilson Observatory, who originated the general design of the lenses, and Russell W. Porter, who worked out the practical details of a mounting for the instrument, so that it can follow the sun as it moves across the sky. The sun's light and heat fall first on the nineteen two-foot lenses, which by themselves would bring the rays to a focus at points twelve feet away. A set of eighteen mirrors reflects each beam to the center, where it meets the other beams. Before reaching the center, however, each beam passes through a smaller lens, seven inches in diameter, which concentrates it still further. The beam from the center two-foot lens passes directly into the second lens without reflection from a mirror.

## Size of Little Fingernail

At first, the large beam of sunlight which supplies the whole battery of lenses is ten feet in diameter, but at the final focus of the instrument it is reduced to an area the size of one's little fingernail, so that the energy is concentrated about 200,000 times. The material to be studied will be placed in an evacuated glass bulb, made large enough not to be melted by the intense heat. As the material vaporizes under the temperature—and no substance is known which will withstand it—it will give off light, which will pass into an adjacent dark room, where it can be analyzed by powerful spectrosopes.

The erection of the new astrophysical

laboratory, of which the solar furnace will be part, is one of the steps in a new program being undertaken at the California Institute of Technology, in studying the phenomena that occur in the heavens. The 200-inch telescope, double the size of any existing at present, which is now under construction, is part of the same program.

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ARCHAEOLOGY

# Prehistoric Cave Culture Proves Mystery to Scientists

BONES of twelve prehistoric Indians—and a dog—who lived in an Arkansas cave and were buried in a cave when they died, have been unearthed, and science finds itself faced by a new problem in American identities.

The cave dwellers do not appear to have been just like the prehistoric Pueblos of the Southwest, nor like the ancient Basket Makers who lived even before the Pueblos. Nor yet do the cave dwellers resemble the prehistoric Bluff Dwellers who took shelter under the overhanging bluffs of the Ozark hill country, nor are the cave dwellers like any other "type" of prehistoric Indian culture.

Winslow M. Walker of the Bureau of American Ethnology, who found the cave and its inhabitants in the Buffalo River region of Arkansas, says: "It seems to be simply an early cave culture. There is no way of dating it. It is prehistoric, that is all we can say now."

The twelve burials which Mr. Walker unearthed in the cave represent a strange assortment. There was an old man, a middle-aged man and woman, and the rest were babies. Some unknown agent of destruction, perhaps famine or disease, took heavy toll of the babies at one time. All of the skeletons were buried in a flexed position, knees close to



MODEL

*Of the instrument which it is hoped will concentrate the sun's power 200,000 times.*

chin, arms bent and held close to the body. Near one child lay the skeleton of a dog. The dog was accorded a proper burial, like his master, by having feet tied together and the head bent forward.

It is by studying the possessions of the people that Mr. Walker finds them "different." That is to say, the articles are so simple that they have little individuality. Everyday tools and weapons were of bone, stone, and shell. The crudity of the articles betokens a very low degree of culture. Many flint spearheads, arrowheads, and knives were buried in the cave. The pottery which the cave dwellers used for cooking and eating purposes was crudely fashioned. No basketry or any woven stuff was in evidence, and to the archaeologist this is one of the strangest features of the cave, for the Bluff Dwellers who lived nearest to these cave dwellers used many baskets.

The most puzzling object from the cave is a small piece of antler with a notch in it. This may be a piece of an atlatl, or dart thrower, one of the important weapons used by Southwestern tribes in early times. The Indian hunter would insert a dart in the atlatl notch. When he hurled the atlatl forward over his shoulder, the dart left the notch and