

gists found the round outlines of a group of huts, of the type built by early Iron Age inhabitants of Britain about 500 B.C. At one edge of the village group they came upon postholes and a ditch marking where a rectangular building, quite unlike the huts, had once stood.

Detailed examination showed that this structure, presumed to be the town tem-

ple, had consisted of an oblong inner room, 18 by 13 feet in size surrounded by a row of pillars. This is the basic design of a Greek temple. Apparently these early natives of Britain had built in wood a fair replica though in reduced size of what the Greeks of the time were erecting in stone at the far end of the Mediterranean.

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#### ELECTRONICS-PHYSICS

## Sound Detects Heat Waves

**New instrument is called an acoustical interferometer and may be used to detect invisible light signals or short radio waves used in radar.**

► **INVISIBLE** infra-red light, or heat waves, are detected by sound too high-pitched for the ear to hear by a new instrument revealed at the University of Illinois. It has practical as well as laboratory applications, such as the detection of invisible light signals, possibly in obtaining pictures not obtainable otherwise, and perhaps to detect the short radio waves used in radar.

The instrument is called an acoustical interferometer. It consists of two quartz crystals such as used in radio with a gas confined between them. A transmitter sets one crystal into vibration, and a receiver detects vibrations carried by the gas to the other crystal. When infra-red rays strike the gas they affect the vibration waves.

Certain types of quartz crystals have what scientists call piezo-electric properties. If a properly cut slice is pressed so as to flatten it slightly, opposite electric charges appear on the two surfaces. If the faces are pulled so as to thicken the slice, electrical charges appear in the reverse direction. In other words, vibration within the crystal sets up electrical energy. If electric charges are placed on the faces of the crystal, vibrations are set up within it which pass as sound waves

into the surrounding atmosphere.

In the new instrument, developed by Prof. W. J. Fry and his associates, the inaudible sound waves, called ultrasonic waves, are produced by connecting a radio transmitter to one quartz crystal and tuning the frequency to that at which the crystal vibrates naturally. The supersound waves set up travel through carbon dioxide containing water vapor or some other gas, to the other crystal, causing a vibration within it which produces tiny electrical impulses. These are amplified in a radio receiver and measured.

If invisible infra-red radiation is passing through the gas, it has an effect on the vibrations in it. Part of the light waves may be absorbed. The light that emerges may be examined to see how it has been changed by the gas in quantity and color.

A more important effect, however, is that of the light on the gas. The gas molecules are changed so that they absorb less of the sound waves passing between the two crystals. The infra-red modifies the sound so that the second crystal sends out changed electrical impulses to the radio receiver, and these may be instantly detected.

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#### BIOCHEMISTRY

## Antibiotic from Bee Killer

► A **GERM** that brings wholesale death to honeybees may provide a strong weapon for the defense of human and animal health, it has been discovered at the bee culture laboratories of the U. S. Department of Agriculture at Beltsville, Md., by Dr. Eugene C. Holst.

The germ is the one that produces the serious disease of infant bees known as American foulbrood; its scientific name is *Bacillus larvae*. From it can be produced, either by direct extraction of the "scale" which it causes or by culturing on a nutrient medium, an antibiotic, or

drug of the same family as penicillin and streptomycin. The new antibiotic has not yet been formally christened.

Among the bacteria against which the new substance has been found effective, in laboratory tests, are those that cause boils, blood poisoning, septic sore throat, undulant fever, spontaneous abortion in cattle, and both human and bovine tuberculosis. It has an unusually wide range of effectiveness, although some germ species do appear to be resistant to it. Much more work on experimental animals is considered necessary before clinical use can be undertaken.

On his discovery, Dr. Holst has been granted U. S. patent 2,442,006, which he has dedicated to the free use of the people of the United States.

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#### ENGINEERING

## New Thin Asbestos Paper Developed for Insulation

**See Front Cover**

► A **NEW** type of asbestos paper, thin as a human hair, has been developed by General Electric company of Schenectady, N. Y. It is for use as insulation in high-temperature electric equipment, and can easily withstand the flame of a blowtorch, as shown on the cover.

It is made of nearly pure asbestos and some mineral substance such as clay. It is free from any metallic matter which would lessen its value as an insulator. In an accelerated aging process equivalent to 100 years, this new insulator, which will be known as Terratex, retained its natural color and other physical properties.

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#### VETERINARY MEDICINE

## Fourth U. S. Scientist Joins Foot-Mouth Group Abroad

► **WHILE** the Department of Agriculture completes final arrangements for acquiring an island off the state of Rhode Island, as a research center for foot and mouth disease, another American scientist has gone to Europe to join the war on the cattle menace.

Dr. Stewart H. Madin of the University of California is sailing for Europe to join three U.S.D.A. scientists who are already at work on the disease in European laboratories. Foot and mouth disease is prevalent in Europe, and several governments there have had laboratories working on the disease for many years.