

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.

Science News Letter, June 5, 1948

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.

Science News Letter, June 5, 1948

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.

The new U. S. research center being planned for Prudence Island off Rhode Island will be the first of its kind for this country. Because there is no foot and mouth disease in this country, the law authorizing the laboratory required that it be located on an island not connected with the mainland.

Funds for the purchase of the site are available, but a new appropriation will be requested from Congress for construction of the laboratory, which is expected to cost more than \$25,000,000.

Meanwhile American scientists are continuing to help Mexico in beating back the disease which is now estimated to be some 300 miles south of the Rio Grande at its closest occurrence to the U. S.

Science News Letter, June 5, 1948

CHEMISTRY

2,4-D More Potent When Combined With Latex

➤ 2,4-D kills plants more quickly and surely when it has the help of a synthetic-plastic latex known by the trade name of Geon 31X.

This has been discovered in experiments at Michigan State College reported by Drs. C. L. Hamner and Kiang Chi-Kien.

Kidney-bean seedlings were treated with the sodium salt of 2,4-D by dipping leaves into solutions of various strengths, from five to five hundred parts per million. Some of the plants were subsequently sprayed with the latex, while the rest were left unsprayed, as controls.

All the plants treated with the strongest solution of 2,4-D died, but those treated with weaker solutions and left unsprayed with the latex recovered and continued growth, after greater or less evidence of poisoning. But mortality in the plants treated with both 2,4-D solution and the latex spray was very high.

Then the treatment was tried on oat seedlings, which normally are not affected by 2,4-D, since they belong to the grass family. However, while those that received only 2,4-D showed no ill effects, those that were afterwards sprayed with the latex died as the bean seedlings had done.

The two experimenters do not know what the latex spray does to make the 2,4-D more effective, but suggest that by forming a covering film it may insure greater penetration of the tissues.

Science News Letter, June 5, 1948



DECLINE OF THE BISON—In front is shown the skull of half-million-year-old *Superbison latifrons*, 80 inches from tip to tip of the horn cores, while at the left is an intermediate form, *Bison antiquus barbouri*, in the hands of Dr. C. Bertrand Schultz. The dwarfed specimen at the right is a modern bull bison's skull, held by W. D. Frankforter.

PALEONTOLOGY

Early Bison Were Giants

➤ IF BUFFALO BILL had gone a-hunting in the Wild West of a half-million years ago he would have had to carry an anti-tank gun for a rifle. He would have had to take along Paul Bunyan to be his skinner, using a bulldozer blade for a knife. That's how big the bison were in those days.

The first of these great shaggy beasts that roamed the Plains had a spread of 80 inches—nearly seven feet—from tip to tip of his horn cores. Those are the measurements of fossil skulls of that age, found in river gravels of early Ice Age date, as measured by Dr. C. Bertrand Schultz and W. D. Frankforter of the University of Nebraska State Museum.

Horn cores are the bone supports over which the hollow horns of animals of the cattle family fit. The horn substance has disappeared from all fossil skulls thus far collected, so the actual horn-spread of these ancient giants can only be inferred; but a ten-foot spread would not seem excessive. If the rest of the animal was built in proportion, this earliest "thundering herd" must have been of near-elephantine size. No wonder that zoologists have suggested a new name for the ancient genus: *Superbison*, instead of merely *Bison*.

This particular species has been given the full name of *Superbison latifrons*, which means "broad-faced super-bison"

—an eminently justified title.

This earliest of known bison was also the biggest. All later species (and there were some giants in later Ice Age times) were smaller than this great-granddaddy of the herd. This seems to be contrary to the evolutionary history of other large animals: horses, camels, elephants, rhinoceroses, all started small and became larger in the course of their development, as fossil records show.

This seeming contradiction may be due to the fact that we do not have nearly as complete a fossil history of the bison as we have of some of the other animals, notably horses and elephants. Despite their distinctively American character, bison did not originate on this continent. The giants studied by the Nebraska paleontologists were immigrants from Asia, arriving via the land bridge that existed across Bering Strait in Ice Age times and never blocked by the ice which had its greatest development farther towards the east. So the earlier, and possibly humbler, ancestors of the bison may still be buried deep beneath Siberia's perpetually frozen soil.

Be that as it may, the various species of bison that have existed between Old Broadface with his seven-foot horn cores and the present-day bull bison with a mere two-foot spread became smaller and smaller as time went on.

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