

## ● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by the U. S. Coast and Geodetic Survey of the following preliminary epicenter:

Saturday, March 15, 0:46.3 a.m., EST

In lower California. Latitude, near 28.1 degrees north. Longitude, 113.6 degrees west. Sharp shock.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see SNL, Feb. 22, 1941.

### PSYCHIATRY

## Health Service Advised To Attack Mental Disease

**D**ISEASES of the mind and nerves, which afflict more than half a million persons in the United States and consign at least that number to hospitals or other institutions, will be attacked on a nation-wide scale by the U. S. Public Health Service if plans drawn at the first meeting of the National Advisory Council on Nervous and Mental Diseases are carried out.

Establishment in or near Washington of a National Institute for Research on Nervous and Mental Diseases, similar to the National Cancer Institute and the National Institute of Health, was recommended. The proposed Institute would cooperate closely with the National Institute of Health and St. Elizabeths Hospital, federal institution for the care of the mentally ill. Besides the clinical and laboratory research to be undertaken at the Institute, grants-in-aid for other research projects looking to the cure or prevention of mental disease may be made to responsible institutions throughout the country, it was proposed.

Members of the Advisory Council on Nervous and Mental Diseases, appointed by Surgeon General Thomas Parran, are: Dr. Edward A. Strecker, Professor of Psychiatry, School of Medicine, University of Pennsylvania; Dr. Nolan D. C. Lewis, Director of the New York State Psychiatric Institute and Hospital in New York City; Dr. Lloyd H. Ziegler, Associate Medical Director, Milwaukee Sanitarium, Wauwatosa, Wis.; Dr. Abraham Myerson, Clinical Professor of Psychiatry, Harvard Medical School; Dr. Arthur H. Ruggles, Secretary of the American Psychiatric Association and Superintendent of Butler Hospital, Providence, R. I.; Dr. Henry W. Woltman, Consultant on Neurology, Mayo Clinic, Rochester, Minn., and Dr. Findlay Gale, Jr., Professor of Neuropsychiatry, Medical College of Virginia, Richmond, Va.

Science News Letter, March 29, 1941

### MILITARY SCIENCE

# Fortifications of Concrete Not Useless Despite "Failure"

## Army Engineer Approves Such Defensive Works When They Are Used in Conjunction With Troops in Open

**C**ONCRETE pillboxes, steel turrets and other field fortifications are far from being outmoded and useless, despite the alleged failure of the Maginot line, declares Capt. William Whipple, Jr., of the Army engineer corps. (*Military Engineer*, March-April.) They are not self-defending, but when such defensive works are skillfully employed in conjunction with troops in the open they still have great military value, he asserts.

Since the present war began, fortified lines have been successfully breached in three engagements, Capt. Whipple states. These were the Russian breakthrough of Finland's Mannerheim Line, the German capture of Fort Eben-Emael in Belgium, and the penetration of the Maginot Line in the later stages of the Battle of France.

However, the record shows that the Russians were able to break the Mannerheim Line primarily because of their overwhelming numbers and the possession of heavy artillery and large numbers of bombers, and that even with these advantages they paid a terrific price in lives for their gains. Fort Eben-Emael was not defended with nearly the same degree of skill with which it was attacked, primarily by a crack company of engineers, and the Maginot Line was

not even attempted by the Nazis until the mobile troops intended for its defense had been sucked into the struggle to the west after the break-through at Sedan.

Recently the Army has made studies of various techniques for attacking field fortifications, erected for "laboratory" purposes at Fort Belvoir in Virginia. Among other things, it was discovered that the very high-velocity, flat-trajectory shells of anti-tank and anti-aircraft guns were more effective than the much heavier projectiles of 155-millimeter field guns.

Well-directed small-arms fire, from rifles, automatic rifles and light machine guns, was found effective in driving defenders away from the gun ports. Hand-placed charges of high explosives and incendiary compounds, set by engineers who swarmed up to the fortifications under cover of darkness or smoke screens, proved able to disable the defenders' machine guns.

The only answer to such determined attack is not to depend altogether on the fortifications themselves, but to have mobile troops in reserve in the open, ready to meet attack with equally determined counter-attack.

Science News Letter, March 29, 1941

### ARCHAEOLOGY

# Hamath Wrecked to Terrify Small Opponents of Assyria

**U**NEARTHING the ruins of Hamath in Syria, Danish archaeologists have revealed the violence, fire and destruction wrought upon this Bible city that dared to stand up to steam-roller Assyria, conquering the world 2,600 years ago.

"The fate of Hamath was of course meant to terrify other states from pursuing a similar anti-Assyrian policy," Dr. Harald Ingholt, director of the excavations, declares. (*Asia*, April.) Dr.

Ingholt, now lecturing on Syrian archaeology in this country, probed into ruins of Hamath for the Carlsberg Foundation of Copenhagen, every year from 1931 to 1938.

Why the Bible writers Isaiah and Amos mentioned Hamath as a dark warning to independent but weak small states is clear today from the condition of the long-buried wreckage, Dr. Ingholt points out.

"Gates, doors, furniture, the woodwork of the houses were thrown together to be burned," he writes, "and the basalt sculptures were broken to pieces or mutilated, the surface of all stone objects and wall slabs suffering badly from the heat of the violent fire."

So fiercely were some mud-brick buildings burned that they were left hard as stone, requiring pick-ax blades to remove fallen sections.

Several hundred arrows found by the archaeologists in one building are relics of the battle, says Dr. Ingholt, in which Hamath lost her independence in 720 B.C.

Revealing elegance of the old city, are inlay pieces for decorating furniture, such as ivory plaques representing flowers, fighting sphinxes, and bulls, still carrying traces of decoration with gold leaf. It was against such luxuries in Syria and Palestine that Bible prophet Amos preached, denouncing those "that lie upon beds of ivory."

The excavations have brought to light the citadel and official buildings, and such devices as stone lions that guarded entrances—not for decoration, explains Dr. Ingholt, but because the people thought the lions had real magic power to stop or destroy an enemy.

While these ruins represent Hamath at the peak of its power, they are only one of 12 levels of civilization which the Danes have explored on the site. Probing deep into the mound filled with successive ruins, the archaeologists traced the ancient career of Hamath beyond 4000 B.C.

Following its terrible fate at the hands of Assyrian King Sargon, Hamath was rebuilt in a smaller way in the Hellenistic era, but mostly below the prominence of the mound. The historic mound today is on the edge of modern Hama, Syrian town of 40,000 people.

*Science News Letter, March 29, 1941*

## PHYSICS

# New Invention Will Detect Airplanes by Invisible Rays

## Radio Corporation Given Rights To Device for Making Visible Image From Heat of Plane's Exhaust

**L**AATEST addition to the long list of recent inventions for detecting airplanes by invisible waves is one which, the inventor claims, will even operate through fog.

Irving Wolff, of Merchantville, N. J., invented the new device, which was granted patent 2,234,328. He assigned his rights to the Radio Corporation of America, which holds the rights on most of the similar inventions patented in recent months.

Infra-red rays are emitted from the engine of a plane, as well as from its cloud of exhaust gases, or from the smokestacks of a ship. These are waves like those of light, but too long to affect the human eye.

"Instruments are now available, using photoelectric principles, for observing an invisible body radiating waves of a length slightly longer than light waves," declares Mr. Wolff in his patent specifications. "Such instruments will not operate where fog is interposed between the radiating body and the instrument, because the photoelectric means is not responsive to wave lengths which will penetrate fog."

With his new invention, he states, it is possible to detect "the existence of an invisible body radiating heat," and also "to produce a visible image of the original heat-radiating body." It may be used, he continues, "to detect the presence of an aircraft which is invisible to the eye because of fog." He suggests that it could be used for guiding aircraft

to a landing in fog "by visible indications from desired points which are produced by devices radiating heat." In such an application, the airplane would be equipped with the device, permitting the pilot to see the special infra-red beacons on the field which would outline the runways.

In operation of Mr. Wolff's invention, the heat rays fall on a diaphragm, which is one plate of an electrical condenser. The heat rays distort the diaphragm, and the capacity of the condenser is changed. In the condenser microphone, formerly widely used in broadcasting, a similar idea was used, only the sound vibrations in the air distorted the diaphragm.

A bank of such condenser units, at one end of a vacuum tube, is used. These are sprayed by a stream of electrons. An infra-red transmitting lens, not of glass, or a concave mirror, focusses the heat ray image on them. Adjustment is made so that, when the electron beam falls on the other end of a unit where infra-red rays are falling, still more electrons are given off.

In one form of his invention, these are directed to a fluorescent screen at the other end of the tube. Here the electrons are turned into light, and there appears a light picture of a heat ray image formed on the receiving end.

The individual condenser units correspond to the dots in a half-tone newspaper picture. The more there are, the greater is the detail with which the view is reproduced.

In another arrangement, the picture appears on a separate tube, just as with a television receiver. This viewing tube may be some distance away.

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## ● RADIO

Dr. Peter Debye, of Cornell University, will discuss "Probing Matter with Electrons" as guest scientist with Watson Davis, director of Science Service, on "Adventures in Science," over the coast to coast network of the Columbia Broadcasting System, Thursday, April 3, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.