

who at the time was sailing master of a yacht out of New York:

"We harpooned the fish shortly after sighting it, and put our fourteen-foot dory out with one man in it to bring the fish alongside the larger craft. I noticed he was having considerable trouble to get the fish alongside, so expected something like that to happen, and was standing by with my camera ready to get a picture.

"I saw the flash of the fish in the water as it approached the dory and pressed the trigger in time to get the picture as you see it. A few seconds after this picture was taken the fish made another savage lunge at the dory and ripped one plank entirely out, sinking the dory. We got the man all right, and shortly after landed the fish, weighing 350 pounds."

Science News Letter, April 25, 1936

SEISMOLOGY

Quakes Have Bad Reputation But Science Finds Their Uses

One Quake Killed 60,000 People, Another Moved Whole Mountains, But They Tell Scientists About the Earth

By **CAPT. N. H. HECK**, Chief, Division of Seismology, U. S. Coast and Geodetic Survey

EARTHQUAKES can move mountains—actually.

In China in 1920, in an earthquake at Kansu, whole mountains moved, and a stretch of roadway several hundred feet long was carried nearly half a mile.

Closing a railway tunnel is another Herculean feat of an earthquake. That happened in the Montana earthquake of 1925. A great rock slide was caused, and this closed a tunnel on a transcontinental railway. It narrowly missed burying a crack train.

Ability of earthquakes to kill large numbers of people is not to be despised. I believe, in the United States, some 36,000 persons lost their lives in traffic accidents last year. The 1923 Japanese earthquake took more lives than this. It killed 60,000 people by the fire caused by the quake.

In the United States, there have been comparatively few deaths from earthquakes, owing to the favorable hour at which most of our earthquakes have occurred.

In property loss, an earthquake can do forty million dollars worth of damage in a few minutes. This was the loss in the Long Beach earthquake. The property menace is particularly great where people have made no attempt to build for security against shocks.

Another menace is the psychological effect, especially damage to nerves, in cases when the quivering and rumbling of the earth is long continued.

But, so long as we have to have earthquakes, we may as well find some good in them. They do reveal facts about the structure of the earth which would otherwise be unknown or merely guessed by wild speculation. Just as the X-ray looks under the skin and brings out unsuspected facts about the human body, so the earthquake waves, properly interpreted, give us inside information about the earth.

The earth somewhat resembles an onion, though not a perfect one. The crust has been found to be made up of shells of varying thickness. The lowest of these shells ends apparently 30 to 50 miles beneath our feet. Since man, with the deepest mines and tunnels and drill holes, has never bored his way much deeper than two miles, you can see that the interior of the earth is not to be explored far by first-hand experience.

The core of this onion-like earth is probably metal, more than 4,300 miles in diameter. The core is probably, though not certainly, liquid metal, under tremendous temperature and pressure. And its surface is 1,800 miles beneath our feet.

What we call deep focus earthquakes are due to changes of pressure and other disturbing conditions as deep as 400 miles beneath us. Earthquake researches are now studying the mysteries of these deep focus quakes, for the results that we feel on top of the earth offer clues to the structural design. Our problem is to apply the rapidly accumulating knowledge of earth motions to this problem of the earth's inner plan and construction.

Earthquake science—the science of seismology—has given the factual basis for the so-called seismic method of prospecting for oil and minerals. By this method, artificial explosions create waves underground, and what is known about the performance of earthquake waves helps the mining geologist to interpret these waves, giving him a clue as to what forms of rock and mineral are hidden there.

Earthquake science is helpful, though earthquakes are not.

Science News Letter, April 25, 1936

ARCHAEOLOGY

War Tower in Bible Was "Old Fashioned" Even Then

See Front Cover

IMAGINE the same warfare tactics used for three thousand years!

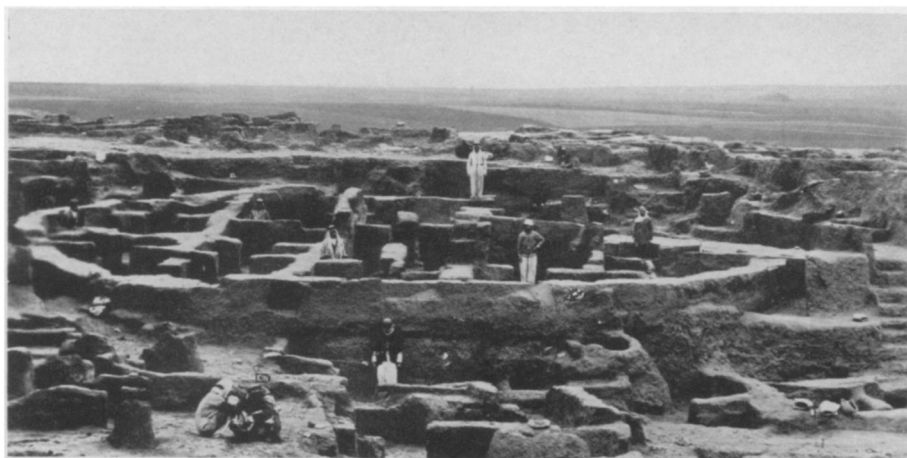
It is hard to believe in this age of inventive speed.

That time amazingly stood still in this way in ancient Bible lands is revealed by latest excavations at that famous site, "the oldest city in the



OLD-FASHIONED

When Abimelech met his death attacking this round temple-battle tower, it was then an ancient war device at least 3,000 years old. According to the story King Abimelech was mortally wounded by a rock hurled by a woman from the wall above. In this drawing by the artist Dore, he is begging his armor-bearer to kill him so that death might not come from the hand of a woman. The ancient prototype of the round battle-tower, as found at Tepe Gawra, is shown on the front cover.



ROUND HOUSE FOR BATTLE

Here, plain to be seen, are the outlines of a round battle tower built some 6,000 years ago. Three thousand years later the same type of fortification was used and recorded in Bible history.

world," Tepe Gawra in Mesopotamia.

A joint expedition of the University Museum, University of Pennsylvania, and the American School of Oriental Research at Baghdad, has found ruins of a big round temple-tower at Tepe Gawra. The sweep of an almost perfect circle of brick foundations 60 feet in diameter has been unearthed. Outlines of 17 rooms can be traced. This big round house was built about 4000 B.C.

The field director of the expedition, Charles Bache, identified this as a fortress because of thick walls, single entrance, and stone weapons still lying in some of the rooms. It has temple features, too, suggested by the plan of the central rooms with an inner sanctum.

The discovery turns archaeologists to Bible history, where King Abimelech's wild and warlike reign ended in a fight at just such a temple-tower. That happened in Palestine, a little over a thousand years before Christ.

Abimelech and his army had destroyed one such tower, by burning it and a thousand men and women inside, according to the Bible Book of Judges. Attacking another city, he found that the men and women had fled into a tall tower in the city, and he tried to burn it, too. But a woman hurled down a stone on the king's head, and the dying Abimelech forced his armor-bearer to kill him with a sword, that it might never be said he was killed by a woman.

That this type of round temple-tower was old fashioned in Old Testament days, already several thousand years old, had not been suspected.

Digging at Tepe Gawra has been pushed through 13 levels of occupation, revealing city life at the earliest stage yet found. But more antiquity is in store for the diggers. For there remain seven or eight deeper layers of civilization which are now to be explored.

Science News Letter, April 25, 1936

if they could not use the same surgical method to help his patient.

Arrangements were made whereby the patient became a "research project"—a human guinea pig—who let the scientists make important studies on him in return for the benefit he derived from the operation. This consisted in cutting the splanchnic nerves in the back of the chest. Following the operation the patient was able to get along on about half the amount of insulin he had been taking.

Science News Letter, April 25, 1936

CHEMISTRY

Chemical Yardstick Used To Classify Coal

A NEW chemical yardstick for determining the qualities of coal was reported to the American Chemical Society at its Kansas City meeting.

It allows scientists to go back through the millions of years in coal's prehistoric history and put their fingers on long past happenings that make one kind of coal differ from another.

Different kinds of coal, reported Prof. H. L. Olin of the State University of Iowa, have a strong attraction for oxygen and it is this affinity which is used as the basis for the new chemical test.

Coal, Prof. Olin recalled, is the fossil remains of ancient vegetation, and the various kinds of coal represent different ages of this fossilizing process.

Peat is a relatively young coal which has changed but little from the reeds and grasses of the bogs in which it was formed. Lignite has gone a step further in coal's life history. It has the appearance of coal but retains the woody structure of the long departed parent plants.

Going up the geological family tree of coal, the various bituminous grades and finally anthracite are reached. All the while the buried coal mass is changing chemically with a loss of hydrogen and oxygen and a concentration of carbon.

Using the chemical, potassium permanganate, as the oxidizing agent, Prof. Olin has made a study of various coals from the lignites of North Dakota to the semi-smokeless coals of West Virginia. The oxygen test, he declares, places these coals in their order of rank as determined by other less simple methods. The new development, the Iowa scientist believes, should prove useful in the work of establishing an official method of coal classification.

Science News Letter, April 25, 1936

SURGERY

Surgical Operation on Nerve For Severe Diabetes Reported

A SURGICAL operation to relieve severe diabetes was reported by Drs. Fred A. Hitchcock and George M. Curtis, of Ohio State University, at the meeting of the American Physiological Society.

The patient, one of the first to undergo this operation, which has only recently been developed through ani-

mal studies, was a young lad suffering from very severe diabetes. To control the condition he had to take one hundred units of insulin a day. This is a large dose and the cost of the treatment had become excessive for this patient. His physician had read reports of the operation performed on diabetic dogs and asked the Ohio investigators