

## MEDICINE

# Barrier to Virus Discovered; May Aid Paralysis Fight

**Structure Between Nerves and Muscles Stops Passage Of Disease Virus in Mice; Young Animals Without It**

**A** STRUCTURE between the nerves and muscles of the body which acts as a barrier to stop the passage of a disease causing virus was reported by Drs. Albert B. Sabin and Peter K. Olitsky, Rockefeller Institute for Medical Research, New York City, at the meeting in Boston of the American Association of Immunologists and the American Association of Pathologists and Bacteriologists.

Discovery of this barrier may shed light on resistance to infantile paralysis. The studies reported were made on mice, not men, and concerned another disease than infantile paralysis. Like infantile paralysis, however, this mouse disease is caused by a virus that attacks the brain and central nervous system.

The barrier that checks passage of the disease virus does not exist in young mice. When the virus gets into their muscles it easily reaches the nerves, travels along them to the brain, and causes disease and death. Older mice, however, have developed this protective barrier and seem to have another barrier

in the brain, so that even if the virus reaches the brain, its progress is blocked there and the rest of the nervous system is protected against it. In infantile paralysis, it has previously been reported, the lining membranes of the nose in some individuals seem to act as a barrier blocking the passage of the disease virus. What makes the nose lining an effective barrier in some persons and not in others is not yet known. Studies such as the Rockefeller scientists reported here on the mouse disease may in the future provide the explanation. In the mouse disease, the barrier is apparently built up in connection with the aging process. While more children than adults get infantile paralysis, it does not necessarily follow that development of the barrier to the passage of the infantile paralysis virus depends on age.

According to another infantile paralysis investigator, Dr. Lloyd Ayccock of Harvard Medical School, resistance to infantile paralysis depends on constitutional factors with which one is born.

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## PHYSIOLOGY

# Individual Muscle Fibers Repair Selves After Injury

**H**OW single fibers of muscle tissue heal themselves after injury was demonstrated by Prof. Carl Caskey Speidel of the University of Virginia, before the American Association of Anatomists meeting at Durham, N. C. Prof. Speidel has evolved a delicate technique whereby cellular details in the tail of a tadpole can be watched under a high power microscope—the tadpole being the while happily unconscious under anesthesia.

When the end of a muscle fiber is injured, as by an electric current or slight heat, it swells up and pulls back, immediately forming a hard, tough cap over itself. This cap persists for a time, but

then dissolves into the liquid-filled vacancy it leaves. Muscle cell nuclei migrate. Presently the normal cross-striated appearance of the fiber is restored, and all is normal once more. The same fiber, Prof. Speidel found, can thus recover several times from successive injuries.

Male animals can be made to perform the traditionally female function of producing milk, Dr. W. R. Lyons of the University of California showed at the same meeting. After injecting into young male rabbits heavy doses of two female sex gland extracts, or hormones, he was able to squeeze milk out of their nipples which in male animals ordinarily remain in an undeveloped condition.

A relic of the reptilian ancestry of mammals was described by Dr. G. W. D. Hammett of the U. S. Biological Survey. It consists in a stage in the development of the red blood cells of the opossum, at which these cells closely resemble those of reptiles. The opossum belongs to one of the most primitive, least evolved orders of the mammals. The same reptile-like stage has not been found in higher mammals, Dr. Hammett said.

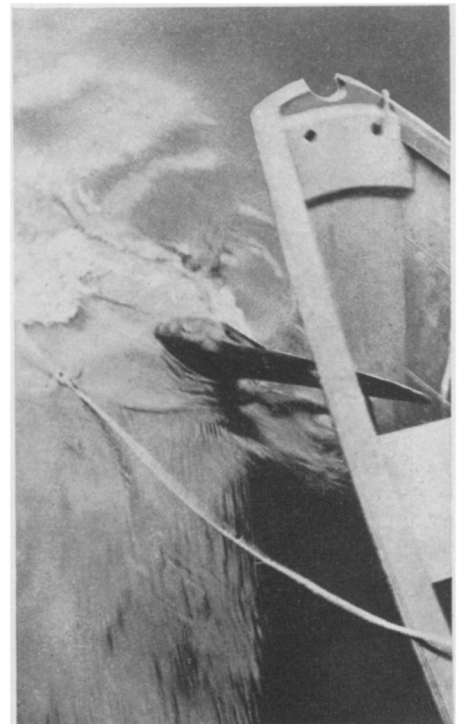
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## ICHTHYOLOGY

# First Known Photograph of Swordfish Stabbing a Boat

**A** SWORDFISH stabbing a boat with its powerful "sword" is shown in a remarkable and unique photograph now in the possession of the Academy of Natural Sciences in Philadelphia. So far as known, this is the only photograph of the kind ever made.

The attack took place in the Atlantic Ocean 120 miles southeast of Martha's Vineyard, Mass., and is thus recorded by Captain Ira Abbott, of Yarmouth, N. S.,

**NEWS!**

*When a fish scuttles a boat—that's news! This is an unusual photograph made of a swordfish in the very act of spearing a 14-foot boat.*

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."

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## 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

**E**ARTHQUAKES 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.

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## ARCHAEOLOGY

## War Tower in Bible Was "Old Fashioned" Even Then

See Front Cover

**I**MAGINE 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.