

## METEOROLOGY

**Tornadoes Occur When Invisible Wave Breaks**

► **TORNADOES USUALLY** occur when an invisible, but real wave in the atmosphere breaks, somewhat like a single wave of water toppling over as it hits the shore.

The breaking atmospheric wave, known as a pressure jump, is believed to be the trigger that sets off tornadoes and other severe storms. It does so, however, only if there is moisture in the air. If the air is dry, the pressure jump can occur, but no severe storms will follow, Dr. Morris Tepper, Weather Bureau meteorologist in charge of research in this field, states.

Hopes of more accurate tornado and severe storm warning service lie in pressure studies now being made by the Bureau in the Midwest, where tornadoes often hit this time of year. The research is aimed at learning more about the cause of tornadoes, how to predict their beginning and their paths.

The Weather Bureau is now publishing the results of the first pressure jump survey, made in 1951.

Science News Letter, May 1, 1954

## MEDICINE

**Quick, Economical Detection of Cancer**

► **FURTHER EVIDENCE** of the validity of the Penn-Serrofloculation test, a simple blood test to permit quick, economical detection of cancer, has been announced by doctors at the University of California at Los Angeles and the Los Angeles Veterans Administration Center.

The test is named after Dr. Harry Penn, associate clinical professor of radiology at U.C.L.A., who originated it.

Tried on more than 10,000 individuals during six years of research, the test can detect cancer in a majority of cases, help to distinguish between benign and malignant tumors, and indicate the response of cancer to treatment.

A solution of an inexpensive crystalline chemical is added to a blood sample. If the mixture remains murky, the test is considered negative. If small particles form and the solution clears, a positive test is indicated.

Ninety percent of the cancerous individuals tested have shown a positive result. The 10% missed included those in which cancer had not entered vital tissue, but was still in a microscopic stage. A negative result is considered to be a 10,000-to-1 assurance that the subject has no cancer.

Certain conditions such as arthritis and pregnancy give false positives. Further processing of blood samples will tell, in most cases, whether the positive test is the result of cancer or other diseases.

The accuracy of the Penn-Serrofloculation test is considerably higher than X-rays or any other clinical diagnostic approach.

Science News Letter, May 1, 1954



**POWER CHECK-UP**—Inventors of the Bell solar battery, G. L. Pearson, D. M. Chapin and C. S. Fuller, are shown checking sample devices for the amount of electricity derived from sunlight, here simulated by a lamp. The solar battery uses strips of silicon to convert the sun's energy directly and efficiently into electricity.

## PHYSICS

**Sun-Powered Battery**

Razor-sized silicon wafer that converts light directly into electricity was unveiled at the National Academy of Sciences meeting. Its efficiency is six percent.

**See Front Cover**

► **THE SOLAR** battery shown to the National Academy of Sciences meeting in Washington is a quite efficient, simple and direct converter of light into electricity. But it offers no threat to conventional or atomic power plants.

This little device is made of the common chemical element, silicon, in unusual metallic form. It is a cousin of the still novel junction transistor made of related germanium metal.

Just as transistors, replacing electron tubes, are miniaturizing hearing aids, radio sets and other electronic devices, the new silicon solar battery gives promise of first going to work electronically in the nation's telephone system.

The batteries will power mobile equipment such as small radio transmitters. Sun-powered battery chargers will be used at

amplifier stations along rural telephone systems of newer design.

Scientists are elated that the new semiconductor device has six percent efficiency in converting sunlight directly into electricity. Other photoelectric devices, such as selenium cells, do not rate more than one percent. The six percent figure compares favorably with steam and gasoline engine efficiency.

Advantages of the solar battery include: No cost of fuel, because it uses sunshine which is free. Nothing consumed or destroyed in the energy conversion process. No moving parts. No wearing out or obsolescence. The solar battery theoretically should last indefinitely.

The Bell Telephone Laboratories scientists who are credited with the development are G. L. Pearson, C. S. Fuller and D. M. Chapin. This team is part of a group, led by William Shockley, that has worked on