

## GENERAL SCIENCE

# Einstein and Gravitation

Before he died at age 76, the great scientist, whose theories revolutionized concept of the universe, was perfecting his work aimed at unifying atomic and stellar phenomena.

► PROF. ALBERT Einstein was working to perfect his generalized theory of gravitation, which aims at a complete description of the physical universe by a single theory, before his death at the age of 76 on April 18 in Princeton, N. J.

Einstein believed that his theory holds the key to the universe, unifying in one concept the tiny world of the atom and the vast reaches of star-filled space. Just as in 1905 his mathematical equations pointed out that light and mass were two different manifestations of energy, so he had tried mathematically to join gravitational and electromagnetic forces. These, he believed, are also simply two different manifestations of the unified cosmic field.

The equivalence of mass and energy has since been demonstrated many times in the blinding glare of atomic and hydrogen bomb explosions.

Mathematical difficulties have so far prevented checking the latest version of Einstein's generalized theory against known experimental facts. Einstein believed, however, that this unified field theory would eventually yield an explanation of the "atomistic character of energy."

As far as is known at this time, Einstein left no unpublished papers.

His first general theory of relativity was formulated in 1915. The first generalized theory of gravitation was published in 1950. Einstein revised it in 1953, and again in 1954.

Instead of the well-ordered universe that would follow from Einstein's field theory, most physicists today favor a particle theory, holding that the probability and uncertainty laws covering an electron's behavior must also apply to the universe.

Development of a single theory to explain both gravitational and electromagnetic forces has been a major goal of physicists since 1920. Although a vast store of knowledge about both atoms and galaxies has been built up since then, no single theory has previously been able to explain and describe it all.

In 1905 Einstein published his famous special theory of relativity, which set forth the equivalence of mass and energy and led to the well known equation,  $E = mc^2$ , or energy equals mass times the square of the velocity of light.

The world will have to wait to see if Einstein's generalized theory of gravitation will influence the present half century as profoundly as his theory of relativity did the first half.

Einstein was awarded the Nobel Prize in Physics in 1921. He came to the United

States in 1933 and had been a member of the Institute for Advanced Study since then.

Einstein's brain and other vital organs were removed for scientific study before his body was cremated on April 18, the day he died. Before his brain is dissected and its internal structure studied, it will be measured and observations of the outside will be made.

Scientists point out that it is difficult to find the distinctive signs of genius in a lifeless brain. The difference would appear to be a matter of how the brain functioned in life rather than its size, weight or structure.

Similarly, it is not the size of a man's head that is important, but what goes on inside it. The frontal lobes of the brain are generally thought to be more closely linked with higher intelligence than are other parts which control senses and movement.

Science News Letter, April 30, 1955



**MORE EFFICIENT BATTERY —**  
*The solar battery has reached an 11% efficiency in converting the sun's rays to electricity, double its original efficiency (See SNL, May 1, 1954, p. 278). Bell Telephone Laboratories scientist tests a modern version.*

## AERONAUTICS

## New 180-Mile Rocket

► A NEW research rocket designed to carry 150 pounds of scientific instruments 180 miles into the air at one shot was revealed by John W. Townsend Jr. of the Naval Research Laboratory, Washington, D. C. The 180-mile altitude is expected to set a record high for a single stage rocket.

Twenty-two of these Aerobee-Hi rockets will be fired at Fort Churchill, Canada, during the International Geophysical Year in 1957-58, Mr. Townsend told the American Rocket Society meeting in Baltimore. Their cost is only one-tenth that of large Viking rockets.

The Aerobee-Hi rockets will be pressure-sealed so that samples of air taken high in the atmosphere will not be contaminated by gases leaking out of the rocket. Such leakage, Mr. Townsend said, has spoiled all measurements of this kind from Viking rockets, since they were literally flying in a cloud of their own gas. Air escaping from instruments and gases from violently boiling liquids make the gas cloud around the rocket.

Besides the Aerobee-Hi and the Viking, Mr. Townsend also described the V-2, the Wac Corporal, the Aerobee and the Rocoon. The new research rocket is now under development.

R. B. Snodgrass, also of the Naval Research Laboratory, reported in-flight temperatures from the Viking 10 rocket measured slightly over 300 degrees Fahrenheit

at Mach number 5.8, or just under six times the speed of sound at that altitude. This temperature is about what would be expected, Mr. Snodgrass said.

Science News Letter, April 30, 1955

## MEDICINE

## Link Between Cancer And Virus Discovered

► THE STRONGEST link yet between viruses and human cancer has been reported by a pathologist in the University of California School of Medicine.

Dr. Warren Bostick has obtained from cancer tissue an infectious agent that causes a fatal virus disease in baby mice.

The cancer is Hodgkin's disease which has long been suspected to be of virus origin. This is the first time it has been possible, however, to cause infections in animals with Hodgkin's extracts.

Dr. Bostick probably succeeded in inducing infections in the animals because he used baby mice. Newborn animals are highly susceptible to infection and they gain resistance as they age. Failures in the past may have been due to use of adult animals.

The virus is now being grown in tissue culture and antibiotics, vaccines and antisera will be tested against it to see if the fatal infections of mice can be combated.

Science News Letter, April 30, 1955