

## PHYSICS

# Anti-Neutron Discovered

► THE ANTI-WORLD of atomic nucleons is now complete. Discovery of the anti-neutron as a companion of the anti-proton, made in the University of California's world's largest operating atom smasher, completes the strange opposite realm where everything physical is in reverse.

For many months, the discovery of the anti-neutron has been expected, particularly since creation of the opposite of the proton, basic particle of ordinary matter. (See SNL, Feb. 18, p. 107.)

There is no practical consequence foreseen. Scientists understand matter a little better. If there were available large supplies of anti-matter, consisting of anti-protons and the now discovered anti-neutrons, gigantic amounts of energy could be produced by merely bringing them into contact with ordinary matter.

Perhaps great galaxies of anti-matter stars do exist far away in the distant universe. That is astronomical speculation. (See SNL, Sept. 1, p. 131.)

As it is, just a few anti-neutrons have been

created with great difficulty in the giant bevatron. It is a great achievement, not unexpected and latest in a series that arose out of the research that gave man atomic energy and promises to explore matter and energy even further.

Discovery of the anti-neutron was made by four University of California scientists, Bruce Cork, Dr. Oreste Piccioni, Dr. W. A. Wenzel and Glen R. Lambertson, working under Dr. E. J. Lofgren, physicist in charge of the bevatron.

Annihilation of a neutron by an anti-neutron releases several hundred times as much energy per unit as does the fusion reaction in thermonuclear explosions.

To find the anti-neutron, the scientists stepped up the bevatron's anti-proton production. When an anti-proton brushes quite close to a normal proton, but not close enough for annihilation, then the anti-proton turns over its charge, becoming an anti-neutron.

Science News Letter, September 22, 1956

## ARCHAEOLOGY

# Explore Bible City

► THE ANCIENT ISRAELITE CITY of Gibeon where, the Bible reports, Joshua caused the sun to stand still has been explored and definitely identified by a party of American scientists.

Positive identification of the ancient Biblical city was made through inscriptions bearing in ancient Hebrew letters the name Gibeon.

Most important find at the site was the famous Pool of Gibeon where the servants of Abner battled the men of Joab. This pool, which was probably constructed before 1200 B.C., held over 200,000 gallons of water.

Although the scientists dug debris out of the pool for seven weeks, they were unable to reach the bottom, but they followed a circular, stone-cut stairway down to a depth of 35 feet—42 steps.

This stairway followed the circular edge of the pool. A guard rail was cut out of the solid rock.

Safe access to the pool from inside the city wall was provided by a 170-foot long tunnel, well lighted by oil lamps placed in niches cut into the walls at regular intervals.

The 96 steps inside the tunnel, well worn with much traffic, were carved out of solid rock.

Gibeon is a place where many battles have been fought over the years. The scientists encountered sling stones from the period of David, shrapnel from the First World War and, as they worked, they could smell the burning powder from an Israeli border incident just a few miles to the south.



**SAFE ACCESS**—This tunnel provided safe access from within the city wall of the Biblical city of Gibeon to a spring outside the wall.

The party was led by Dr. James B. Pritchard of the Church Divinity School of the Pacific. The expedition was sponsored by this school and the University Museum, Philadelphia.

Science News Letter, September 22, 1956

## PHYSIOLOGY

# Main Heart Pump Acts Like Two Separate Ones

► DISCOVERY that the human heart's main pump operates as if it were made of two separate pumps was announced by Dr. Simon Rodbard of the University of Buffalo Chronic Disease Institute at the American Physiological Society meeting in Rochester, N. Y.

The heart's main pump is the chamber called the ventricle. Studies on man and animals, Dr. Rodbard reported, show that the ventricle contracts to pump out blood in two stages.

The largest part of the ventricle contracts first and provides the major impetus to the flow of blood. After an appreciable delay, the part of the ventricle known as the bulbus, which is adjacent to the outlet valve, contracts.

In this way, the bulbus usually helps to propel the blood forward. The bulbus, Dr. Rodbard pointed out, may be an important mechanism for the regulation of the amount of blood pumped by the heart.

In disease, however, the action of the bulbus may obstruct the flow of blood from the heart. This happens in certain types of blue-baby disease. The obstruction to flow may sometimes lead to heart failure.

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## HEMATOLOGY

# No Blood Need Till 10 Days After A-Bomb

► BLOOD, especially fresh blood with living platelets, will be needed about ten days after an atomic bombing of a community.

Before that, however, considerably less blood will be needed than has been used for the care of the wounded in conventional warfare, Dr. William H. Crosby of Washington, D. C., told the International Society of Blood Transfusion at its meeting in Boston with the American Association of Blood Banks.

"Because of the enormous number of casualties many of the most severely wounded who have the greatest need for transfusion will die before they can be recovered," Dr. Crosby said.

"Others will be given a low priority for treatment in order to save larger numbers of good-risk and fair-risk casualties."

After the tenth day, blood will be needed to salvage those with radiation disease who develop severe lack of the important blood platelets.

During the first two days after an atom bombing, plasma and plasma substitutes can be used instead of blood for a majority of patients requiring such support during resuscitation and operations.

The amount of blood that could be provided in such a disaster, Dr. Crosby said, will probably be limited by the capacity of the blood bank teams and by competition with more essential materials for space in transportation to the bombed area.

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