

PHYSICS

Particles Get Greatest Energy From Whirligig Atomic-Gun

Fragments Fly From Explosion With More Energy Than That of Deuteron Bullets Which Tear Atoms Apart

ATOM smashing has revealed new secrets about the hidden energy of the building blocks of matter that may some day serve as power in a super-machine age civilization.

These new advances were disclosed by Dr. Ernest O. Lawrence, an American physicist, at the session of the Solvay International Institute of Physics being held in Brussels. Dr. Lawrence, with Drs. M. Stanley Livingston and Malcolm C. Henderson, his colleagues at the University of California, has also communicated his research results to the American journal, *The Physical Review*, to appear in a forthcoming issue.

The whirligig atom-gun invented by these modern alchemists has fired the most energetic atomic projectiles ever produced by artificial means. Dr. Lawrence and his collaborators forced the hearts or nuclei of heavy or double weight hydrogen, called deuterons, to whirl about in a vacuum. Twice during each circular trip these deuterons are fed more electrical energy. Finally they are stepped up to the almost unbelievable speed of 3,000,000 volts, the most energetic particles ever controlled by man.

Then these atomic bullets bombard targets of platinum, brass, wax and many other chemicals. Atomic disaster is the result of these collisions between the deuteron bullets and the target atom hearts. The fragments of these atomic explosions flying out are caught and measured. These measurements tell the physicists the story of the atomic disaster.

Fragments of one kind fly out with a speed of 5,400,000 volts. As this is 2,400,000 volts more than the deuteron bullet speed, small amounts of highly concentrated energy must have been released. These fragments, called protons, are the hearts of ordinary hydrogen atoms.

The companion fragment to the proton is called the neutron and has the same weight but no electrical charge.

This particle also flies out with an energy of 2,400,000 volts.

The California scientists have interpreted the results of the collisions from the disintegration fragments. They conclude that the deuteron bullet itself has been broken up and 4,800,000 volts of energy have been released as a result of this disaster. The deuteron has to be very close to the target atom's heart before this disintegration will occur.

Very seldom do the right conditions exist for the release of this enormous amount of energy. So seldom, in fact, that Dr. Lawrence states that the best targets gave only two disintegration protons for every 10,000,000 deuteron bullets bombarding the target. The process is so inefficient that it is only detected by very delicate scientific instruments and as yet cannot be thought of as a commercial source of power.

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ASTRONOMY

Second American Planetarium Opens in Philadelphia

AMERICA'S second planetarium, the first in the East, opened in Philadelphia on Wednesday afternoon, Nov. 1, as part of the astronomical section of the Benjamin Franklin Memorial and the Franklin Institute.

This device, a gift to the Franklin Institute by Samuel S. Fels, was made by the Carl Zeiss optical works, in Jena, Germany. It is an elaborate projection device, equipped with 119 lenses, by means of which images of all the naked-eye stars and planets are projected upon a sheet metal dome 65 feet in diameter.

For the audience seated below a realistic effect of the night sky is obtained, and the lecturer can change it at will. He may show the skies visible from any part of the earth at any time, and with



GENTLE HEADHUNTER

Not an Indian maiden, as you might think! This photograph taken by Matthew W. Stirling, chief of the Bureau of American Ethnology, shows a headhunter—a man—in thoughtful pose. This is one of the famous Jivaro headhunters of the Amazon jungle. He takes an enemy's head right off the shoulders and makes a trophy of it. But in everyday life, these warriors wear skirts and long hair, paint their faces like girls and speak softly. Yet, they are not "sissy." It is just Jivaro custom. Mr. Stirling made friends with the headhunters and learned much about them to replace the mystery and scariness that the public associate with that dread name Jivaro.

the motions speeded so that a year goes by in as little as seven seconds.

There are 18 planetaria in operation in Europe. The first in America opened in 1930 in Chicago, and during the past summer has been a popular feature of the World's Fair.

At the formal opening of the Fels Planetarium the inventor of the device, Dr. Walter Bauersfield, was presented with the Elliott Cresson Medal of the Franklin Institute. The award was made in absentia, the recipient being represented by Franz Fieseler, an official of the Zeiss firm. Dr. Heber D. Curtis, director of the University of Michigan Observatory, was the principal speaker, and a brief demonstration of the instrument concluded the exercises.

Beginning Monday, Nov. 6, the Fels