

made by this method have yielded a wealth of new facts regarding the way in which the minute elements of the body grow and behave in conditions of health, and enough preliminary observations also have been carried out to establish the value of the method in the study of diseased conditions.

The process employed in the "window" method was demonstrated to physicians from this country and abroad last week during the celebration of medical progress held in the University of Pennsylvania's School of Medicine.

*Science News Letter, October 18, 1930*

## ASTRONOMY

## Uranus and Neptune Without More Moons

**I**F THERE are any more satellites of the planets Uranus and Neptune, in addition to those already known, they are exceedingly faint. For many years four moons of Uranus have been known and one of Neptune. With the aid of photographs made with the 60-inch reflecting telescope of the Mt. Wilson Observatory, William H. Christie has made a search for additional satellites of these planets, giving time exposures of one to three hours' duration. However, no such object has been found, and so Mr. Christie concludes that if there are any additional satellites, those of Uranus are not brighter than the 19th magnitude and of Neptune not brighter than 18.5 magnitude.

*Science News Letter, October 18, 1930*

## PHYSICS

# Atomic Projectiles Sought to Release Energy of Atom

## California Physicists Find a Way to Speed Up Hydrogen Proton Without High Voltage Vacuum Tube Troubles

**T**HE PRODUCTION of atomic projectiles of tremendous speed, capable of smashing the hearts or nuclei of gold and other elements, perhaps transmuting them into other substances or releasing large quantities of atomic energy, is promised by a new experiment which has been reported to the National Academy of Sciences by a young University of California professor of physics, Dr. Ernest O. Lawrence, and his associate, Dr. N. E. Edlefsen.

It has long been the desire of scientists to have swiftly moving particles of high energy with which to bombard the compact and unknown center of atoms but the difficulties of producing high voltages of a million or more, necessary to generate such energies in an X-ray or vacuum tube, have stood in the way.

### Protons Given Kicks

Professor Lawrence has devised a method for speeding up the proton, or heart of the hydrogen atom, in such a way that the troubles of operating

vacuum tubes at such high potentials are avoided. Although he has not yet produced the high speed protons, with energies of million volt-electrons or so that are needed, his apparatus has operated successfully and he believes that it is merely a matter of time and effort before the desired high speed protons are produced.

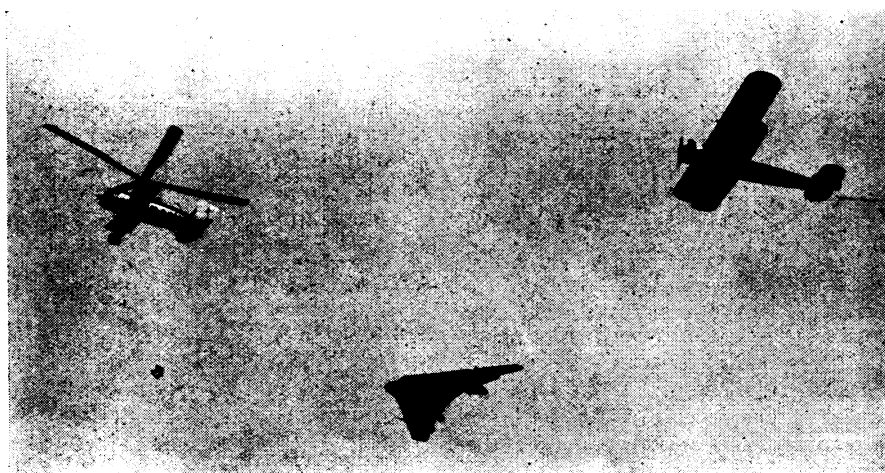
Protons are chased around electrically in such a way that they are given repeated kicks that constantly increase their speed and energy and finally they shoot out of the apparatus to attack the heart of another element.

Hydrogen is stripped of its electrons leaving the nucleus or proton. An electric current seizes the proton and jerks it across the space between semicircular hollow plates. As the proton goes to the other side it is bent in its path by a strong magnetic field acting perpendicularly and just at that time the electric current is reversed in direction and the proton is pulled back again. This happens over and over again in the vacuum in such a way that the proton is accelerated in a spiral path and finally is flung out with high energy. Oscillations of 10,000 volts and 20 meters wavelength, impressed on plates eight inches in diameter in a strong magnetic field are necessary and it is believed that these can be achieved without great difficulty.

### Eagerly Awaited By Scientists

Scientists eagerly await the day when they will be able to test the current speculation that quantities of energy are locked up in the heart of the atom. This idea, seriously advanced by leading physicists, has been the basis of fiction and drama that pictured successful bombardment as starting a progressive conversion of matter into energy that destroyed the world in a gigantic explosion. The idea that matter and energy are interchangeable is a consequence of the Einstein theory and the newer physics.

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### STRANGE PLANES IN FORMATION

Left to right—The windmill autogiro, which can be throttled down to 30 miles an hour; and the tailless pterodactyl and the slotted wing Handley-Page, both of which greatly reduce the stalling hazard. These are "freak" airplanes now, probably in the same way the Wright brothers' plane was a freak at Kitty Hawk a quarter of a century ago. They were photographed together at a display of the Royal Air Force in England.