

PHYSICS

# Practical Problems Planned For Atom-Smashing Device

## California Cyclotron Apparatus Now Being Enlarged To Make Possible Medical and Biological Research

**I**NTENSIVE research to turn the discoveries concerning the structures of atomic nuclei into immediate practical applications are under way at the laboratories of Prof. Ernest O. Lawrence at the University of California.

Prof. Lawrence's eighty-ton cyclotron apparatus, which whirls atomic particles round and round and finally flings them with terrific energy at specific targets, is being improved to increase further its capabilities in producing neutrons, the tiny atomic particles having no external electric charge. These neutrons are highly effective in penetrating through the electrical barriers which shield the nuclei of all atoms from bombardment.

A program of research to investigate practical uses for streams of neutron particles will start at once. Previous research has been concerned with highly technical work seeking to prove or disprove current theories of how atoms are put together which need experimental checking.

With the same apparatus, in its improved form, further work on artificial radioactivity will be undertaken to advance the problem of radiation therapy for such diseases as cancer.

Already synthetic radioactive sodium has been produced which gives off radiation comparable with that obtained from costly radium.

### To Provide Research Material

Laboratory production of the products of synthetic radioactive disintegration will be undertaken to supply material for use in problems of biology and medicine.

John H. Lawrence, brother of Prof. Lawrence, has already made studies on the comparable effects of neutron rays and X-rays as ionizing agents. He finds that an X-ray beam having an ionizing effect in air equal to that of a neutron stream has only one-tenth the ionizing effect of the neutrons on the blood of animals. Apparently the neutron rays are ten times as powerful.

The heart of the cyclotron device is a flat, airtight tank, in which deuterons or the skeletons of heavy hydrogen atoms are converted into bullets of exceedingly great energy to be used in bombarding

other atoms. At the present time Prof. Lawrence is building two new tanks for his atom gun, one of the same design as that now in use, the other of a new design which it is hoped will increase the output very greatly. The first of these new tanks will eliminate some obvious imperfections of the old tank and probably give an output 10 per cent. higher as well as more reliable. The second new tank which incorporates a more efficient method of putting electrical energy into it will, it is hoped, enable the California men to subject matter to bombardments far more devastating than any yet attempted. To carry this search for high energy projectiles with which to investigate the structure of matter still further, Prof. Lawrence plans later to enlarge the pole faces of the eighty-ton magnet which controls the movement of projectiles within the vacuum tanks. With larger pole faces on the magnet, he will be able to use larger tanks and again increase the energy of the bullets with which he is experimenting.

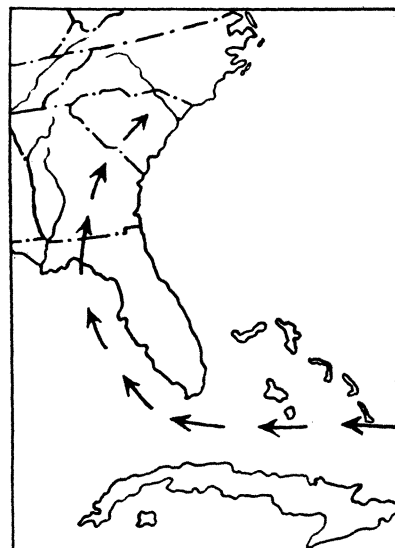
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METEOROLOGY

## Path of Hurricane Was Along Unusual Course

**L**IKE the course of a pirate ship sailing along the waterfront of a peaceful city and laying it waste with blasting broadsides, was the track of the recent hurricane's storm center.

Study of the official U. S. weather maps during and immediately after the nights of terror and destruction that brought manifold death to keys and coast shows that the center of the storm, the spot of lowest barometric pressure that sucks in wind at terrific velocities, first went directly over the "keys" or lowlying islands off the southern point of the peninsula, and then swung up along the Gulf coast as though steered by a malevolent intelligence. As it moved along this northerly course, the winds rushing in from surrounding areas of higher pressure tore squarely across the peninsula, so that practically the whole of the state was



PATH OF STORM

swept, though fortunately not all of it with the same devastating effect that made a shambles out of the "camps of the forgotten men."

Florida has been visited by hurricanes before, but the usual course of these tropical storms has been more directly westward into the Gulf, so that in previous visitations the track of principal destruction has lain athwart the peninsula, not parallel to it, with correspondingly more limited effects.

The violence of the storm is measured by the extremely low barometric pressure read on an instrument at Long Key, just two hundredths of an inch under 27 inches, the lowest ever recorded in the United States. Normal atmospheric pressure at sea level is 30 inches, and a gradient of an inch is ordinarily sufficient to account for a really considerable storm area.

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SEISMOLOGY

## Central Alaska Shaken By Moderate Earthquake

**C**ENTRAL Alaska was shaken by a moderate earthquake on Tuesday night, Sept. 3, the U. S. Coast and Geodetic Survey stated, after examining data transmitted through Science Service. The shocks began at 8:28 P. M., Eastern Standard Time.

Three seismograph stations reported: the Philippine Observatory at Manila, the private laboratory of Mrs. M. M. Seeburger at Des Moines, Iowa, and St. Louis University, St. Louis, Mo.

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