actual effective diameter of the pole faces is 42". The atomic beams can be led out into the air through thin platinum windows and their range amounts to several centimeters in air. A still larger cyclotron is now in the making.

When high speed deuteron streams are made to fall on berylium atoms, streams of neutrons are produced so powerful in their biological action that they are equivalent to the gamma radiations from 100 grams of radium. Accordingly, for the protection of the operator, the cyclotron is controlled from a distance of 40 feet from the apparatus with suitable intervening absorbing materials. With the deuteron streams, Lawrence has produced radioactive isotopes of many of the different elements known in the periodic table. In many cases the yields of the radio-active substances are quite large; as for example, a day's bombardment of sodium metal with 20 micro-amperes of 5 million volts deuterons produces more than 200 milligrams equivalent of radio-sodium, i.e. an amount of radio-sodium having a γ-ray activity equivalent to that of 200 milligrams of radium. That such large amounts of radio-active forms of many of the elements can be manufactured in the laboratory is of immense importance in opening up new avenues of research both in the physical and in the biological sciences. Many striking results have been obtained by Lawrence himself and his co-workers, while of course, similar work on nuclear transformations is being carried out in different physical laboratories of the world by other methods as well. But the cyclotron holds a unique position in that it can provide very large yields and possesses potentialities of even greater developments which stagger the imagination of the world.

Most of Lawrence's researches were encouraged by substantial public support. The Federal Telegraph Company donated the steel castings of the magnet. The Research Corporation and the Chemical Foundation provided funds for the construction and installation of the magnet and accessory apparatus, while the operating expenses were met by the University Research Board. But above all it was the genius and the single-minded devotion of Prof. Lawrence that overcame all the practical difficulties and brought to a very successful fruition an idea that must well nigh have looked fantastic when it was originally conceived; no wonder, the world applauds.

B. DASANNACHARYA
Benares Hindu University,
November 20, 1939.

SEDOV ARCTIC EXPEDITION*

THE Second Anniversary of the drift of the Soviet ice breaker 'Sedov' fell on the 23rd October. The drift of this breaker which bears the name of the celebrated arctic explorer, Georgi Sedov, began on October 27, 1937, in the Laptev Sea at 75° 19′ N lat. and 132° 25′ E long. The bearings on October 20 were 80° 36′ N lat. and 26° 12′ E long.

From the astronomical and meteorological data collected, it has now been established that the ice moves along isobars. This conclusion is of much practical significance, for from the data relating to the distribution of atmospheric pressures in the Arctic basin it would be possible to determine the shift of sections of ice in the central Arctic region. The hypothesis that ice moves from East to West under the influence of winds in a circular clockwise direction, with its centre near the 'pole of inaccessibility' situated between 83° and 85° N lat., first enunciated by the Russian Arctic Expedition, headed by Toll in 1900–03, has now been confirmed. The cause for such a remarkable phenomenon is the existence of more or less permanent stretches of open water or fissures in the region north of Greenland and north of the New Siberian Islands and Wrangal Island. The depth soundings taken by the Sedov showed that at 86° 26′ N lat. and 39° 85′ E long. the depth was greater than 5,180 meters.

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