PHYSICS

Nobel Physics Prize Honors Machine as Well as Its Maker

Professor Ernest O. Lawrence Receives Award For Invention of Cyclotron, Remarkable Research Tool

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THE 1939 Nobel Prize in Physics, won by youthful Prof. Ernest O. Lawrence of the University of California, is recognition to a most worthy recipient but it is also a tribute to a machine—the cyclotron—one of the most remarkable devices the human mind has yet produced and which has applications in investigations in many fields of science.

As a tool for smashing atoms the cyclotron—whirling charged atomic particles round and round at speeds approaching that of light—is unique. It delivers to these atomic "bullets" energies that enable them to pierce and change the very nuclei of other atoms and thus produce the transmutations of the elements that ancient alchemists talked about for centuries but never achieved.

Because it can easily create artificial radioactivity in nearly every element and make it give off rays like those coming from the naturally radioactive compounds, the cyclotron has a vital role to play in the treatment of cancer and other afflictions which yield to radiation therapy.

Moreover, cyclotrons (for the device of Prof. Lawrence has been and is being copied the world over in many laboratories) can, by making atoms radioactive, provide scientists in many fields with "tracer" atoms. These "tagged" atoms enable chemists, biologists, plant and human physiologists to follow through the transfer and utilization of chemical elements in plant, animal and human bodies. Each day they are finding explanations of how common-enough but little-understood processes occur.

While the cyclotron is not the only device for producing artificial radioactivity it is by far the best for a "mass production" of tracer elements so useful in other fields of science.

Honoring a machine, as well as a man, is no new thing for the Nobel Prize Award Committee.

The 1927 co-award of the Nobel Prize to Prof. C. T. R. Wilson of England was made for his invention of the Wilson cloud chamber, a device which makes it possible to see the tracks of atoms and atomic particles even though these minute entities are themselves invisible and probably always will be. The Wilson cloud chamber is a key piece of equipment in every first-rank physical laboratory the world over.

Young Prof. Carl D. Anderson of California Institute of Technology who won the Nobel Prize in 1936 for his discovery of the positron would be the first to thank the Wilson cloud chamber for making possible the identification of the positron.

The cyclotron's inventor, Prof. Lawrence, was only 38 years old last Aug. 8. Tall, blond and with rimless spectacles he could easily be mistaken—and has been—for one of his own students in the great Radiation Laboratory at California Institute which centers around his two cyclotrons; one weighing 85 tons and the new one, just finished, which weighs 200 tons.

Even as the newest cyclotron passed successfully its initial operation Prof. Lawrence was already at work seeking funds — something like $750,000—to build a still larger cyclotron that would weigh 2,000 tons and dwarf his present machines.

This cyclotron to end all cyclotrons is now only in men's minds, but as the usefulness of this type of apparatus is demonstrated anew each day the time draws nearer when it will become a reality.

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BEGINNING

Here Prof. Lawrence is holding the small model of the cyclotron. In 1931, this was its small beginning held in the palm of the inventor's hand. Now the latest cyclotron weighs 200 tons. And for the future one is promised weighing 2,000 tons.

CHEMISTRY

Young Men Gain Virility Through Nobel Prize Work

MANY young men cheated of their manhood by a mistake of Nature have been given virility as a result of the sex hormone research for which Prof. Adolph Butenandt, of Berlin, and Prof. Leopold Ruzicka, of Zurich, have just been given the 1939 Nobel Prize in chemistry.

The young men, probably several hundred of them by now, have been helped to develop into normal manhood by injections of the male sex hormone, or, more recently, by the aid of "hormone banks," tiny pills of the hormone which are injected under the skin and furnish several months' supply of the precious material at one time.

The hormone used in these treatments is testosterone. Normally this is formed in the male sex glands. Prof. Butenandt first obtained the male sex hormone in crystalline form from kidney excretions. This is called androsterone and is less active and slightly different in chemical structure from the testosterone formed by the glands. Both testosterone and androsterone have been synthesized in the laboratory from cholesterol. This part of the work, which has made the hormones available for medical use, was done by Prof. Ruzicka.

Before his research on the male sex hormone, Prof. Butenandt had worked on female sex hormone problems and discovered the chemical structure of one of these, progestin, the important chemical that prepares the mother's body for child-bearing.

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