



TAKING FORM

With the placing of the first upper horizontal piece of steel, the giant magnet for the University of California's new 100,000,000 volt cyclotron or "atom-smasher" begins to take form. When complete, there will be 1000 tons of steel in the upper member, and 3,700 tons in the entire magnet. So big are these parts that it is necessary to erect them in the open. Later a building will be constructed around them. The location is a hill in Berkeley, overlooking San Francisco Bay.

PHYSICS

200,000,000 Volt Energies Seen With New Cyclotron

Powerful New Instrument for Synthetic Radium-Like Materials Now Being Constructed in California

By WATSON DAVIS

ON THE top of a California hill opposite San Francisco there is building a giant machine that will manufacture synthetic radium-like substances that promise to usher in a new era of cancer treatment and industrial applications.

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The man behind that super-atom smasher is a tall, fair-haired physicist, not yet 40, who in a decade has brought about one of the outstanding developments in understanding how the universe is put together. He is Ernest Orlando Lawrence, Nobelist and University of California professor.

The other day he said that his \$1,500,000 atom machine, or cyclotron, will manufacture in one brief minute the equivalent of 350 grams, more than 10 ounces, of radium. This is more than all the radium in the world. Radium to do the same job would cost at least \$10,000,000 if it could be produced. It is true that the radiosodium, artificially radioactive element manufactured in the cyclotron by atomic bombardment, lasts only about 14 hours. But it can be produced daily or hourly as needed.

Only a little over ten years ago I talked with Lawrence in Berkeley when he was a young man with an untried idea. He

showed me then a model of his cyclotron, a glass apparatus that looked like a frying pan. As I heard him tell of the immense construction that will give forth energies of at least 100,000,000 volts, as much as the cosmic rays from the heavens themselves, I remembered those early days.

Cautiously Dr. Lawrence now hints that the giant cyclotron may even produce double the energy that it has been announced to deliver when it goes into service two or three years hence. It may actually be a 200,000,000 volt machine. There was high excitement only a few years ago when a million volt lightning generator was developed to imitate nature's electrical discharges smashing down upon electrical transmission lines. The largest cyclotron in operation, under the guidance of its inventor, Dr. Lawrence, generated deuterons (centers of heavy hydrogen atoms) at 16,000,000 volts.

Dr. Lawrence is the latest American to receive the Nobel prize awarded to him in 1939 after the war began. With the Scandinavian countries in the grasp of the Nazi, he may remain the most recent American Nobelist for years to come.

It is possible that the cyclotron in these days of military defense preparations may have more than mere scientific importance. It is known that there is an intensive drive on in scientific circles to explore the possibilities of power, practical useful power, from within the atom. This is secret research and how close science is to a real result can not now be told.

Dr. Lawrence hinted at what the new giant among the world's 30-odd cyclotrons may be able to do. He hopes that it may find new things that can not even be found in the cosmic rays. Just as a whole new world came to view when the power of man's machines was increased from hundreds of thousands of volts to millions of volts, so when hundreds of millions of volts are available new secrets may be unravelled.

Remember that dynamic Dr. Lawrence is not yet 40. He and dozens of other scientists in his laboratory and elsewhere are pioneering as eagerly in new fields as any '49er who crossed the plains.

A century ago Joseph Henry and other great scientists of those days spoke from rostrums of science. Today in a new age, there are scientific revolutionaries among us, remaking our world as Henry and his contemporaries changed the face of the earth on which they lived.

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