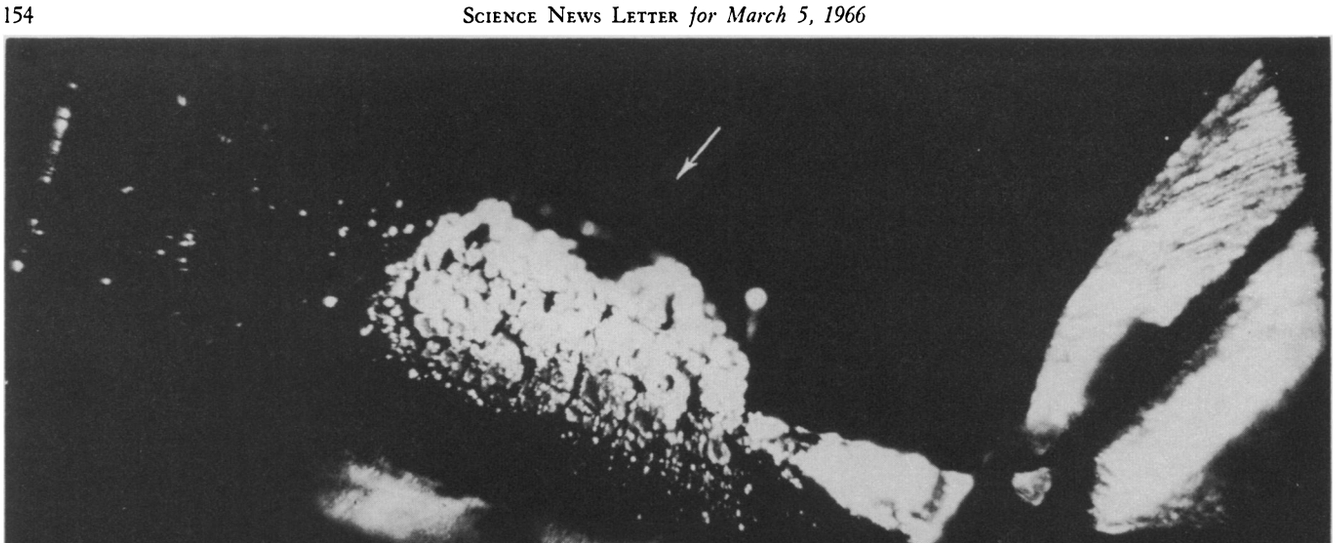

Lawrence Radiation Laboratory

FIRST PLUTONIUM DIOXIDE—The first weighable quantity of plutonium dioxide, indicated by the arrow, is shown in a tiny test tube under high magnification. This plutonium was made in cyclotrons during the first part of 1942, before the development of nuclear reactors in which it can be made in quantity.

PHYSICS

Plutonium's 25th Year

Plutonium, the highly radioactive metallic element emerging as the nuclear energy source of the future, was discovered 25 years ago in California.

➤ THE 25TH anniversary of the discovery of plutonium was celebrated in February.

A group of young scientists at the University of California in Berkeley on Feb. 23, 1941, isolated what was then a new chemical element, number 94, using a 60-inch cyclotron. The isotope synthesized was plutonium 238.

On Feb. 21, 1966, the small laboratory in Room 307 Gilman Hall in which the final identification was made was officially designated as a National Historic Landmark by Secretary of Interior Stewart Udall. One of the co-discoverers of plutonium was Dr. Glenn T. Seaborg, Nobelist and Chairman of the U.S. Atomic Energy Commission, who spoke at the ceremonies.

Plutonium, a highly radioactive metallic element, is made by bombarding uranium with neutrons and was first synthesized in a cyclotron. Huge atomic reactors were built at Oak Ridge National Laboratory in Tennessee and at Hanford in Washington State to produce from uranium the fissionable material, plutonium 239 needed for atomic bombs.

The nuclear energy released by the fissioning of one pound of plutonium is equal to the explosive effect of 20 million pounds of TNT. The element was produced in quantity because scientists and the U.S. Government feared that Adolph Hitler might be the first to use the German-discovered fission principle to build an atomic bomb.

Some of the events surrounding the discovery of plutonium will be discussed by Dr. Seaborg at the 25th annual Science Talent Search Awards Banquet on March 7, an activity of SCIENCE SERVICE. The dinner marks the 25th occasion at which outstanding young graduating high school scientists have been granted scholarships for their college education (see p. 149).

Plutonium is now emerging as the nuclear energy source of the future. It was the first and is still the only radioisotope producing power in space and is in use now on four satellites.

• Science News Letter, 89:154 March 5, 1966

TECHNOLOGY

New Kind of Pump Used to Power Laser

➤ A NEW KIND of pump to power lasers has been developed by scientists in Pittsburgh.

A laser pump furnishes the short brilliant bursts of light that stimulate a laser to produce narrow, coherent light beams millions of times brighter than the pumping light.

The new pump is called "coaxial." It consists of two quartz tubes of different diameters, one inside the other. A metal electrode holds the two tubes together at each end. The laser rod being pumped fits inside the transparent inner quartz tube.

This configuration permits efficient, shock-resistant operation in sizes large enough to power a laser rod three feet long. The pump was developed by Charles H. Church and James P. Lesnick of Westinghouse Research Laboratories, Pittsburgh.

One limit to the strength of a laser beam is the safe amount of electric power that can be dumped into the pump. The electrical pulses, typically lasting a few thousandths of a second or less, create shock waves that tend to shatter the flash tube.

To withstand this shock, the flash tube must be mechanically strong. It should also be efficient, in order to reduce the required amount of power and accompanying shock.

• Science News Letter, 89:154 March 5, 1966

BIOTECHNOLOGY

Plutonium Isotope May Fuel Cardiac Pacemaker

➤ NUCLEAR POWER may eventually be used for the treatment of "heart block."

The Atomic Energy Commission is initiating a program directed toward the production of a self-contained, radioisotope-powered pacemaker to stimulate rhythmical heartbeats. The nuclear-powered device is expected to operate at a very low power level of several hundred microwatts and would be fueled with plutonium 238.

Pacemakers in use at present are battery powered and must be replaced every three to five years. The nuclear-powered pacemaker, surgically implanted, would operate for at least 10 years.

Plutonium-238 was selected as the source of energy primarily because of its low shielding requirements and its relatively long half-life of 89.6 years.

The National Heart Institute of the National Institutes of Health, Bethesda, Md., and the Newark Beth Israel Hospital, Newark, N.J., will participate in the technical evaluation of the program.

• Science News Letter, 89:154 March 5, 1966