until 1962, perhaps 1963. The Pratt & Whitney power plant would require around 50,000 pounds less shielding than the GE plant.

The decision was made more difficult when John McCone, the outgoing chairman of the Atomic Energy Commission (it was a joint AEC-AF project) turned out, apparently much to the surprise of the Air Force, to favor the direct cycle: he doubted that Pratt & Whitney could solve, within a reasonably predictable time, the mechanical problems involved in pumping several thousand pounds of molten metal, under high pressure, through the network of 18 miles of tubing connecting the reactor with the radiating elements in the engines.

Eisenhower, in the budget presented just before Kennedy took office, recommended the program be cut to one engine approach, but without specifying which.

Kennedy's Decision

The new Defense Secretary told Kennedy that, in the light of advancing military technology, he didn't think even supporting the more promising indirect cycle approach could be justified, for he didn't believe that the operational planes that might be developed from the first prototype, now vaguely scheduled for 1965, would be valuable enough to justify the several billion dollars that would be required to produce and maintain even a small fleet.

There was a conflict of views on this, but Kennedy decided to support McNamara, cutting the program back to $25 million for reactor and materials research. But most of the money, it later became clear, would be used to support work relating to the indirect, rather than the direct, cycle. So although both approaches have been officially killed, the indirect cycle remains at least half alive, and there is a fair chance we will be hearing more of the atomic airplane within another year or two.

Meanwhile the most general reaction was this one, from a man who had as much reason as anyone to regret the outcome. He thought the decision was wrong, of course, but "we've had a lot of little empires building up in the Defense Department for 15 years, and someone had to step in and do something about it. This one hurt me, but I have to give Kennedy credit. We've finally got someone who's willing to make tough decisions."—H.M.

News Notes

Element 103 Created and Identified by Berkeley Research Group

A team of scientists at the Lawrence Radiation Laboratory, operated for the Atomic Energy Commission by the University of California, have created and identified a new element, number 103 on the periodic table.

The Berkeley researchers have suggested the name "lawrencium" (chemical symbol, Lw) for the new element, in honor of the late Ernest O. Lawrence, Nobel prize winner, inventor of the cyclotron, and founder of the laboratory which now bears his name.

The discovery was made by nuclear chemists Albert Ghiorso, Torbjorn Sikkeland, Almon E. Larsh, and Robert M. Latimer.

The scientists performed their experiments with the heavy-ion linear accelerator (HILAC), one of the major tools of nuclear research at the Lawrence laboratory.

The first evidence for the production of the element 103 isotope was achieved on 14 February 1961. Workers spent the next two months in confirming the February results. Attempts to produce element 103 span almost 3 years; the final 6 months were devoted to especially intensive experimentation.

The element 103 isotope is the first to be discovered solely by nuclear methods. No chemical techniques were used in its identification.

The new element was synthesized by bombarding a target consisting of three-millionths of a gram of californium (element 98) with boron-10 or boron-11 nuclei having energies of about 70 million electron volts.

The Berkeley scientists deposited californium over a circular area 0.1 inch in diameter on nickel foil 50 millionths of an inch thick. This target foil was enclosed in a container filled with helium and placed in front of the highly concentrated beam of the HILAC.

When a californium atom captured a nucleus from the beam, a new nucleus was instantaneously formed, several neutrons were lost, and the resulting nucleus flew out of the target. This nucleus was slowed down through collision with helium atoms and was attracted to a thin copper conveyor belt. The belt was periodically pulled a short distance, to place the collected atoms of element 103 in front of a series of silicon crystal detectors.

The silicon detectors recorded a maximum of five events per hour in which alpha particles of 8.6-Mev energy were emitted by atoms of element 103. No attempt was made to identify the resulting daughter atoms of mendelevium (element 101).

Final proof of the presence of element 103 was made through a series of experiments which ruled out the possibility that isotopes of element 102 or element 101 might have produced the 8.6-Mev alpha particles. The half-life of the isotope of element 103 was determined to be about 8 seconds.

The new isotope is thought by scientists to have a maximum atomic weight of 257, although further research will be required before this can be established conclusively.

The scientists pointed out that the actinide concept, elucidated by Glenn T. Seaborg (University of California), chairman of the U.S. Atomic Energy Commission, indicates that element 103 should be the last of the actinides to be discovered. The actinide series consists of 15 elements with atomic numbers 89 through 103; they all have similar properties. Element 104 should have chemical properties different from those of all the transuranium elements that precede it.

According to one scientific theory, element 103 is an element that was formed at the birth of the universe but decayed out of existence in a matter of weeks.

Scientists in the News

A number of scientists from overseas will be in the United States to participate in a symposium on the biology of the trachoma agent, to be held 26–27 May in New York, under the sponsorship of the New York Academy of Sciences. They include **H. Bernkopf**, Hadassah Medical School, Hebrew University, Jerusalem; **L. H. Collier**, Lister Institute of Preventive Medicine, London; **J. H. S. Gear**, South African Institute for Medical Research, Johannesburg; **N. Higashi**, Institute for Virus Research, Kyoto University, Kyoto; **E. W. Hurst**, Imperial Chemical Industries, Ltd., Macclesfield, England; **B. R. Jones**, Institute of Ophthalmology, University of London; **J. Litwin**, Statens Seruminstitut, Copenhagen; **Y. Mitsui**,

Department of Ophthalmology, Tokushima University School of Medicine, Tokushima, Japan; and **F. Maxwell-Lyons**, Division of Communicable Diseases, World Health Organization, Geneva.

Laurence L. Quill, head of the department of chemistry at Michigan State University since 1945, has resigned from that position to devote more time to writing and research and to his duties as head of the university's mathematical and physical sciences division. Max T. Rogers, professor of chemistry, is acting head of the chemistry department.

R. Gaurth Hansen, head of Michigan State University's former department of agricultural chemistry, has been named head of the university's new department of biochemistry, comprised of the department of agricultural chemistry and the biochemistry section of the chemistry department.

Edward J. Forrest, associate dean of the University of Illinois College of Dentistry, has been appointed dean of the University of Pittsburgh School of Dentistry, effective 1 September.

Randall T. Chew III has succeeded Thomas Clements as curator of mineralogy at the Los Angeles County Museum. For the past 4 years Chew has been assistant geologist and mining geologist with the Northern Pacific Railway, St. Paul, Minn.

Homer F. Marsh, dean of the University of Miami School of Medicine at Coral Gables since 1954, will succeed O. W. Hyman as vice-president of the University of Tennessee (Memphis) in charge of the medical units. Hyman will retire on 1 July; Marsh will assume his new position at a date to be set later.

Two new department chairmen at Rensselaer Polytechnic Institute have been appointed, effective 1 July.

E. C. W. A. Geuze, professor of soil mechanics and foundation engineering, will become chairman of the department of civil engineering. He succeeds Lewis B. Combs, who retired last year as professor emeritus.

Hillard B. Huntington, associate head of the department of physics since 1953, will become chairman of that department. He has been on a year's leave, as visiting professor of metallurgy and solid-state physics at Yale University. He succeeds G. Howard Carragan, who will retire 30 June.

Leo G. Horan, formerly chief of the cardiology section of the Veterans Administration Hospital in New Orleans and assistant professor of clinical medicine at Tulane University, has joined the staff of the University of Tennessee College of Medicine as an associate professor in medicine.

On 1 April, **Matthias Stelly**, former professor of soils at Louisiana State University, became executive secretary of the American Society of Agronomy, which has headquarters in Madison, Wis. He succeeds **L. G. Monthey**, who had held the post since 1948 and who is now extension resource development specialist with the University of Wisconsin.

In a recent ceremony at the University of California's Lawrence Radiation Laboratory, Livermore, Navy Distinguished Public Service Awards were presented to **Harold Brown**, director of the laboratory, and **Edward Teller**, professor of physics. In addition, the Livermore Laboratory earned a Navy Certificate of Merit. The awards were made for outstanding contributions by the laboratory and by Brown and Teller to the success of the Polaris missile program.

George Pheler, professor of solid-state physics at the University of California, La Jolla, has been awarded the 1960 American Physical Society Prize of $2500 for developing a method of examining the structure and behavior of atoms in semiconductor materials. The award is sponsored by Hughes Aircraft Company of Culver City, Calif.

Robert Shankland, Ambrose Swasey professor of physics at Case Institute of Technology, received the second Case Achievement Award at a recent convocation at the institute. He was cited for services to Case during the years since 1929, when he received his bachelor of science degree from the institution.

Hans E. Thalmann, of the department of geology at Stanford University, has returned from an 18-month teaching assignment for the International Cooperation Administration at the Escuela de Geologia of the University of Chile, Santiago.

Roy L. Whistler, Purdue University biochemist, has been appointed chairman of the university's newly created Institute for Agricultural Utilization Research. The institute will promote, develop, coordinate, and conduct basic scientific research leading to expanded industrial uses for agricultural products.

Robert S. Platt, professor emeritus and former chairman of the department of geography, University of Chicago, has joined the staff of the department of geography at Ohio State University as Mershon Distinguished Professor for the spring quarter. He will teach a course on the history of geography and a seminar on tropical development.

M. T. I. Cronin, former head of the department of pathology and toxicology at the Schering Corporation, Bloomfield, N.J., has joined Woodward Research Corporation, Herndon, Va., as pathologist.

Julian Donoso-Torres has also joined the Woodward staff. He was formerly soil chemist with the United Fruit Company's Division of Tropical Research in La Lima, Honduras.

Recent Deaths

Matthew A. Hunter, Troy, N.Y.; 72; metallurgist and dean emeritus of Rensselaer Polytechnic Institute, where he served for 41 years; retired in 1949; founded and headed the department of metallurgy engineering; 24 Mar.

Khachatur Koshtoyants, Moscow, U.S.S.R.; 60; internationally known physiologist at Moscow State University, where he was engaged in research for more than 30 years; author of *Comparative Physiology of the Nervous System*, a monograph that has been recommended for the 1961 Lenin Prize; 3 Apr.

Donald S. Rawson, Saskatoon, Saskatchewan; 56; professor and head of the biology department at the University of Saskatchewan; internationally known limnologist; 16 Feb.

Masao Tsuzuki, Tokyo, Japan; 68; an authority on radiation diseases and head of the Tokyo Red Cross Hospital; was Japan's representative on the United Nations scientific committee on the effects of atomic radiation in 1957 and 1958; was active in the World Health Organization and in the movement to ban nuclear tests; specialized in treating survivors of the Hiroshima and Nagasaki atom-bomb blasts; 5 Apr.