

CHEMISTRY

Dispute Discovery of 102

Research with the heavy ion linear accelerator (HILAC) at the University of California has confronted scientists with a puzzle concerning who has discovered the new element 102.

See Front Cover

► UNIVERSITY of California scientists have announced definite discovery of an isotope of element 102. Simultaneously they reported they had been unable to duplicate the work of an international team of scientists who said last year they had discovered element 102. (See SNL, July 20, 1957, p. 35.) An element is considered discovered whether it is first isolated as the element or as one of its isotopes.

The new research was reported at a conference in Gatlinburg, Tenn., on reactions between complex nuclei, by Albert Ghiorso, senior scientist at Berkeley, Torbjorn Sikkeland of the Joint Establishment for Nuclear Energy Research, Kjeller, Norway, John R. Walton, research chemist, and Dr. Glenn T. Seaborg, Nobel laureate and professor of chemistry.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the heavy ion linear accelerator (HILAC) built by the Atomic Energy Commission with which the discovery was made. Final identification occurred April 18 after three months' experimentation.

The new isotope was created by bombarding curium-246 with carbon-12 nuclei having energy of 68,000,000 electron volts (68 MEV) or carbon-13 nuclei of 75 MEV.

It has an atomic weight of 254 and a half life of three seconds.

The new isotope decays by emitting alpha particles and turns into fermium-250. As many as 40 atoms per experiment were observed. As yet the 102 isotope has not been observed directly, because of its short half life. Its existence was demonstrated by observing the fermium daughter with a half life of 30 minutes. Under the conditions of the experiment the scientists could deduce that the fermium atoms observed could arise only from element 102 decay.

The element's discovery was made by radical new techniques of research. After curium target atoms captured a carbon nucleus, it flew out of the target, boiling off four neutrons, and the resulting 102 atom was attracted electrically to a conveyor belt. As 102 atoms decayed they jumped off the belt and were attracted to the foil where they were analyzed. The half life was determined by the distance from the target at which the fermium atoms were found on the foil. Chemical separation of the dissolved foil also identified the fermium atoms and, indirectly, the atomic number of the 102 atoms.

Mr. Ghiorso said he and his colleagues searched carefully and repeatedly for evidence of an isotope of element 102 reported last year by scientists of Argonne National Laboratory, Lemont, Ill., Harwell, England,

and The Nobel Institute for Physics in Stockholm, Sweden.

This group reported observing directly an isotope of element 102 with a half life of 10 minutes and emitting alpha particles of 8.5 MEV. They bombarded curium-244 with carbon-13 nuclei in the Stockholm cyclotron.

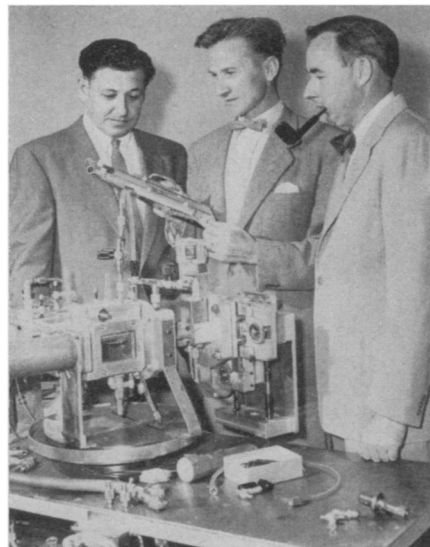
The California group attempted to duplicate this reaction with a curium target of the same composition. Their beam of carbon nuclei was about 10 times as intense, they reported. All their efforts were unsuccessful, Mr. Ghiorso said.

"An Open Question"

► THE PROJECT leader of the American section of the scientific team which reported the discovery of nobelium last year in Stockholm said he "is not discouraged" by the report of the California group.

Paul R. Fields, Argonne National Laboratory, Lemont, Ill., told SCIENCE SERVICE that the discovery of the element 102 isotope "still is very much an open question."

"We still are not sure whose report is correct," he said, "but I am sure scientists will come up with the right answer."



ISOTOPE DISCOVERERS — Albert Ghiorso, Torbjorn Sikkeland and John R. Walton, left to right, are three of the University of California Radiation Laboratory scientists who discovered an isotope of element 102, nobelium. Mr. Sikkeland holds a conveyor belt used to collect atoms of the element from the target. The target assembly is on the table.

Mr. Fields said he and his colleagues cannot understand why the California scientists have not been able to duplicate the Stockholm work, "although I have discussed it with Dr. Seaborg."

He said the original work will be repeated, probably next year, to find out if the results remain the same. The giant accelerator in Stockholm currently is being completely overhauled, Mr. Fields said.

"Dr. Seaborg saw our data in Sweden and talked with some of our team there," Mr. Fields said, adding that the international team was congratulated by the University of California scientist for their discovery of the isotope.

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● RADIO

Saturday, May 24, 1958, 1:30-1:45 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. William Cooper, attending orthopedic surgeon, Hospital for Special Surgery, New York, and assistant professor of orthopedic surgery, Cornell University Medical College, will discuss "Children with Cerebral Palsy."

GENERAL SCIENCE

Russia Captures Key Science Post in UNESCO

► RUSSIANS are playing a larger role in UNESCO (United Nations Educational, Scientific and Cultural Organization). There is some fear they will come to dominate phases of the far-flung program emanating from the Paris headquarters.

A Soviet scientist, Dr. Stanislav Shumovskiy, will become head of the UNESCO department of natural sciences on July 1, succeeding Dr. Pierre Auger, the French cosmic ray physicist, who becomes a consultant. Dr. Shumovskiy is well-acquainted with science in the United States, as he has spent several years in this country.

Not until 1954 did the U.S.S.R. join UNESCO. Their delegates walked out of the London organization meetings in 1945. Now Russians are being given important posts in UNESCO as they become available.

A logical answer to this form of Russian penetration could be for the United States to take a greater interest in UNESCO and send representatives of sound technical competence to assume a full share of responsibility in the UNESCO administration.

Dr. Luther Evans, formerly Librarian of Congress, who has served almost six years as the Director-General of UNESCO is being urged by the United States as a candidate for reelection. This is considered important for American prestige.

The new Soviet activity in UNESCO is viewed as a phase of the cultural competition that has become a Kremlin policy. The Soviets have a large mission to UNESCO, totaling about 11, compared with four in the U.S.A. mission.

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