How a 65-year-old Union Carbide booklet sparked interest in past and present stories

(As published in The Oak Ridger's Historically Speaking column the week of April 13, 2026)

This story came to me from David Keim, and I asked Carolyn Krause to conduct the interview. She has captured a most interesting story of nuclear energy education and a special booklet that has a special place in one family's memories. I am sure you will enjoy learning about "The Atom in Our Hands."

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Here's a story about the international circulation of information about Oak Ridge and nuclear energy in the last century, and about a great company that promoted nuclear energy and advanced it in Oak Ridge but no longer exists.

Eliam Hermann, a freshman at Oak Ridge High School, and his father, Raphael Hermann, and mother, Katrien Sevrin, all natives of Belgium, flew from Oak Ridge to the Namur province of Belgium last December.

On Christmas Eve, they had an interesting conversation at dinner with Christina Bastaens, whom they visit twice a year. She is Eliam's grandmother and the mother of Katrien, a teacher assistant for special education at Linden Elementary School and an Oriental dance teacher at the Dance Center of Oak Ridge in Jackson Square. Katrien was featured as a dancer in a photo on the front cover of the Feb. 23, 2023, edition of The Oak Ridger.

Raphael told Christina about a brand-new, two-semester course Eliam is taking at ORHS called the Nuclear Energy and Innovations pathway. The curriculum covers the fundamentals of nuclear energy, clean energy solutions, and the innovations driving the industry. The purpose of the course is to prepare students for the local workforce that will be supporting the advanced nuclear reactor and fuel fabrication facilities being built in Oak Ridge.

In an interview, Eliam and his father, a scientist who works at Oak Ridge National Laboratory in the Materials Science and Technology Division, where he uses neutrons to analyze materials, said that the course implementor and instructor is Kathy Foust, who serves as the work-based learning coordinator for Oak Ridge Schools.

"I mentioned to Christina that Eliam was engaged in a class on fundamentals of nuclear energy that he will take this semester," Raphael said. "She said, 'Wait a minute.'"

She left the dining room and returned with a pristine copy of the 1961 edition of "The Atom in Our Hands," a 40-page booklet produced by Union Carbide Corporation's office in New York City. (The first edition was printed in October 1955. The March 1961 edition of what might be called a brochure today was the sixth printing.)

She then told the family about her assignment to prepare a speech on any subject as a 16-year-old student in a Belgian high school in the mid-1960s. She said she chose nuclear energy as the topic.

"To learn about the topic, she wrote to a nuclear research center in Belgium," Raphael said. "We believe it's the research center in Mol. They sent her documentation, which was this booklet here. She gave the talk. And now that booklet is back here in Oak Ridge."

Some 60 years later, after working as a nurse, Christina gave to her family the glossy, two-color Carbide booklet (blue and black inks on white paper) that helped her with her talk. She said they are welcome to take it back to their home in Oak Ridge, which she learned about while reading the booklet as she drafted her speech.

Raphael and Eliam looked through the publication and noticed all the photos of historic Oak Ridge buildings and descriptions of nuclear production and research in Oak Ridge. The booklet is filled with solid, easy-to-read information that could provide Eliam with excellent background information for his fundamentals of nuclear energy class at ORHS.

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Raphael said that the family "might keep it as an heirloom for a while, and I'll make sure it does not disappear. It might be worth something someday." He did not rule out eventually donating it to an Oak Ridge museum if no other copies show up.

During the interview, Eliam was asked about the ORHS course and his interests. He said he enjoyed the first class, which focused on clean energy – solar, wind, biomass, fusion energy, and power from hydroelectric dams.

He said he likes science but is leaning toward becoming an engineer. He mentioned nuclear engineering, military engineering, and mechanical engineering.

Eliam said he was one of the students at Robertsville Middle School who participated in building RamSat, the first miniature satellite from a middle school to be selected for NASA's CubeSat Launch Initiative.

He is also in his fourth year as an active member of the Technology Student Association, a STEAM organization (science, technology, engineering, art, and mathematics). "I'm participating in a TSA project called website design," he said. "You code a website according to a prompt they give you."

After the family's return from Belgium, Raphael took the booklet to the lab and showed it to David Keim, Director of Communications and Community Engagement. Keim said that he had never seen this document before.

Union Carbide Nuclear Company (later called the Union Carbide Nuclear Division) managed ORNL for the U.S. Atomic Energy Commission from March 1948 until 1984. That's the year when the contract for ORNL and four other facilities (including the K-25 Gaseous Diffusion Plant, first operated by Union Carbide in 1943) was awarded to Martin Marietta Energy Systems.

Since 2000, ORNL has been managed by UT-Battelle for the U.S. Department of Energy. Along the way, copies of previous contractors' publications may or may not have been archived.

Keim liked the story Raphael told about Christina and asked that an interview be conducted with Raphael and Eliam. Raphael sent an electronic copy of the Carbide booklet to Ray Smith, editor of the Historically Speaking column of The Oak Ridger, and Carolyn Krause, volunteer journalist.

The booklet contains photos of three gaseous diffusion plants on the K-25 site in Oak Ridge and the X-10 Graphite Reactor at ORNL, the first continuously operated reactor in the world, and the source of many radioisotopes.

Union Carbide engineers were key to solving the immense technical challenges of the gaseous diffusion process for enriching uranium for use in the atomic bomb and later nuclear power plants, as well as nuclear weapons. They helped to develop a nickel-based barrier for separating uranium isotopes in a corrosive gas and to make materials that would not dissolve in contact with the gas.

The booklet provides simple explanations of how uranium enrichment works and how radioisotopes are made in the Oak Ridge reactor. It mentions the importance of two radioisotopes from ORNL –radioactive iodine for curing thyroid cancer and radioactive cobalt, which is used as a source of radiation for sterilizing potentially contaminated food and medicines.

"Cobalt-60 is a gamma emitter that's used around the world specifically for irradiating food," said Raphael. "I don't know if ORNL produced cobalt-60 and pioneered its use for sterilizing food."

According to Wikipedia, cobalt-60 was produced at the X-10 Graphite Reactor during the 1940s, but cobalt-60 from Oak Ridge was not used to irradiate food until 1953. That's when the U.S. Army launched a food irradiation program to sterilize rations for soldiers.

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Other photos and text in the booklet show and describe the Oak Ridge Research Reactor and other ORNL reactors, the lab's first cyclotron (compared to a "giant slingshot"), and adult students at the Oak Ridge School of Reactor Technology.

Booklet photos show hot cells, a mouse colony, and an early fusion machine in Oak Ridge. Also shown is the predecessor of the American Museum of Science and Energy – the American Museum of Atomic Energy, operated by the Oak Ridge Institute of Nuclear Studies, predecessor of Oak Ridge Associated Universities.

The publication served as an excellent vehicle for promoting Oak Ridge and nuclear energy. "I wish DOE would make booklets like this for the general public," Smith told Raphael after looking at the electronic copy of the Carbide document.

The booklet reflected well on the professionalism and quality of the employees and work at Union Carbide Corporation (UCC). For the most part its management of the federal government's Oak Ridge facilities met the government's expectations for 36 years.

UCC was once a titan among 20th-century American industries because of its innovations in the manufacture of chemicals and plastics and in nuclear technology. However, its reputation as a great company was badly damaged by a series of high-profile industrial disasters, ethical scandals and management failures. The reporter handed Raphael a printed summary of UCC's problems generated by Google Gemini.

Raphael recalled hearing about the Bhopal gas tragedy in 1984 when he was 11 years old. It was the single most damaging event in the company's history, and it remains the world's worst industrial accident. UCC was no longer an Oak Ridge contractor when Oak Ridgers heard about the Bhopal disaster.

On the night of December 2–3, 1984, in India, more than 40 tons of highly toxic methyl isocyanate gas leaked from a pesticide plant operated by a UCC subsidiary. At least 3,800 people died immediately. More than 15,000 to 20,000 people eventually died from the exposures.

At least 500,000 people in India suffered permanent respiratory, neurological, and vision damage from a tragic accident. UCC paid a $470 million settlement in 1989, which was widely criticized as inadequate.

UCC's long-lasting image as a responsible government partner in Oak Ridge was tarnished by the release of over two million pounds of mercury into East Fork Poplar Creek in Oak Ridge. The accident resulted from defense work by the Y-12 Plant, which used mercury to separate lithium isotopes (from 1955 to 1963) in support of the national project to develop the hydrogen bomb.

In the late 1950s, a fraction of the workers tested at the Y-12 Plant showed mercury levels in their urine far above safety limits. The extent of this contamination, which included toxic methylmercury in the creek's fish that was eaten by area residents, was kept secret from the public for decades. It was fully revealed in 1983 by a Department of Energy news release.

By the late 1990s, the combination of the Bhopal settlement, mounting asbestos lawsuits, and a lack of investor confidence made UCC a "toxic" asset. In 2001, the company was acquired by Dow Chemical for $7.3 billion.

"It's hard being a chemical company," Raphael said. "This is a sad story."

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Thanks, Carolyn, for undertaking this most interesting interview. The family's connection to nuclear energy is unique. The booklet that traveled from Belgium to Oak Ridge is a special artifact that will be

retained. I was able to locate one on eBay, which I purchased. I appreciate the electronic copy given to me by Raphael, but the paper hard copy is special as a historic artifact.

Eliam Hermann and his father, Raphael Hermann, show the special booklet given to them by Eliam's grandmother, Christina Bastaens (Courtesy of Raphael Hermann)

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Eliam's grandmother and Katrien Sevrin's mother, Christina Bastaens (Courtesy of Raphael Hermann)