

## Y-12 and Smithsonian video history interview, part 1

In 1987, Stanley Goldberg, consulting historian for the Smithsonian's National Museum of American History conducted interviews in the Kennedy Maxwell Productions Studio located at Louisville, Tennessee, and the Y-12 and K-25 sites in Oak Ridge, Tennessee. These interviews were intended to capture the history of the Manhattan Project with a focus on the engineering, physics, and culmination of the effort. In Oak Ridge he examined the research and technologies necessary to obtain the uranium 235.

One particular section of those interviews, conducted on March 4, 1987, gives some insight into Building 9731 and the motor generators used to power the calutron magnets. The interviewees were George M. Banic, Jr., John M. Googin, Chris P. Keim, Clarence Larson and Robert S. Livingston.

Before looking at the specific interviews let's learn a bit about the principles being interviewed. Banic, Googin, Keim, Larson and Livingston were all pioneers of Y-12's earliest days.

George Banic worked in the Stable Isotope program for years. I recently met his widow, Earline Banic. She was most interesting to talk to as she recalled her husband's deep devotion to Y-12 and how he loved working there for all those years. Others I have spoken with always mention George Banic when I ask about Building 9731. He was known as the most knowledgeable person about that building. You will see that in the interview transcript below.

Dr. John Googin was THE Y-12 Scientist and personally engaged himself over the years in every chemical operation at Y-12, designing most of them. He was a leader in engineering criticality safety into everything done at Y-12. One of the main operations that really was a second "Manhattan Project" type effort for Y-12 was the separation of Lithium 6 for use in the thermonuclear weapon just being developed in the late 1940's and 1950's. This was when the Cold War was just beginning.

Y-12 had a strong reputation as a leader in isotope separation technology as a result of the success of the electromagnetic separation of uranium and then the other elements being separated in Building 9731 and Building 9204-3. So, when the Atomic Energy Commission wanted a place to separate lithium, Y-12 was a logical choice. There were several empty buildings because the calutrons had been stripped out to reclaim the silver. But the primary reason for selecting Y-12 was the knowledge of isotope separation that was known to exist here. That knowledge was primarily held by John Googin who is credited with the design of the COLEX (column exchange) process that ultimately succeeded in separating the lithium.

Chris Keim received his Ph.D. in chemistry from the University of Nebraska in 1940. He then took a fellowship at the Mellon Institute where he stayed until coming to Oak Ridge. In 1944 he arrived at the Y-12 Plant and before very long was to become a research physicist working in Building 9731, the Pilot Plant, on improvements for the calutron operations. Immediately after the war ended in August 1945, Keim was a key to the formation of the stable isotope program at Y-12.

Keim was the individual who made the decision to separate the first isotope other than uranium. He had noted that often other materials (thought of as unwanted results) than uranium were being deposited at various locations inside the calutron vacuum chamber. This led him to consider if these stray materials that might have inadvertently gotten into the stream with the uranium through contamination of the feed material might not also be separated into their various isotopes.

So, late one night, he prepared a sample of copper and inserted it in one of the calutrons in Building 9731. With proper adjustments he soon was convinced separation was taking place. This proved to be the case and on November 16, 1945, the first isotope of copper (Cu 63) was separated in the Beta calutrons of Building 9731. Keim continued working at Oak Ridge until his retirement in 1971.

Clarence Larson was the Y-12 Plant Manager in 1948 and 1949, taking over from Nelson Rucker who went to manage the Oak Ridge National Laboratory when Monsanto left in 1948 and Carbon & Carbide Chemical Corporation took over that responsibility in addition to K-25 which had been taken over in 1946.

In 1950 Larson moved from Y-12 to manage the Oak Ridge National Laboratory until 1954 when Alvin Weinberg was named Director. He was named President of Union Carbide Nuclear Division in 1968 after Clark Center and was replaced in 1970 by Roger Hibbs.

Robert Livingston and Clarence Larson both received their Ph.D.'s from the University of California at Berkeley and continued their research at the Radiation Laboratory there until 1943. Livingston was in charge of Stone and Webster Engineering Corporation's design of the Y-12 Plant. He stayed on at Y-12 worked at Oak Ridge until his retirement in 1981.

These individuals were among those who were at the very heart of the Manhattan Project's electromagnetic separation efforts at Y-12. They were involved from the earliest designs, worked out the bugs in the operation and fully understood the nuances required to assure the effort's success.

In the interview segment in next week's article, you will see what I mean.