Grady Whitman: More Manhattan Project "War Stories"

(As published in *The Oak Ridger's Historically Speaking* column on April 22, 2013)

This Historically Speaking column is the second in a series featuring Grady Whitman and written by Carolyn Krause drawing on the oral histories found in the Center for Oak Ridge Oral History. …

Ohio-born Grady Whitman was an aspiring engineer who received training in the U.S. Army's Corps of Engineers. In March 1944 he ended up in Oak Ridge in an Army barracks with maid service. At first he thought he was on another Army reservation until he learned that the Secret City had many civilians.

A member of the Army's Special Engineer Detachment (which had 1250 people), Whitman worked with members of the 9218th Special Services Group at the Y-12 Plant in 1944-45. General Leslie Groves, director of the Manhattan Project (which developed the war-ending atomic bomb), and his deputy, Colonel Kenneth Nichols, created this group.

They were pressed to bring in more engineers, chemists, physicists, and other technically trained people to satisfy the contractors they selected – DuPont, Eastman, and Union Carbide. The recruited college-age men with technical expertise happily took these jobs in Oak Ridge and Los Alamos to avoid fighting in Europe, where many American combatants died.

Whitman saw General Groves a few times at the Y-12 Plant, where Whitman worked as a leader on the project to produce uranium enriched in fissionable U-235 using calutrons. "He used to come marching through the control rooms at least once every few months, with his entourage following him," Whitman told Steve Stow in an oral history interview at Oak Ridge National Laboratory, where Whitman later headed a program to study irradiated steel sections of reactor vessels subjected to realistic conditions.

" Groves was a portly man. He never smiled and he walked along, looking like so-and-so. He had no idea that I existed, even though I was in the Army."

Besides General Groves, Whitman saw Nobel Laureate Ernest O. Lawrence, director of the Radiation Laboratory at the University of California at Berkeley. "The calutron was Lawrence's baby," Whitman said.

"That's why he and his colleagues were interested in observing the operations of Y-12's calutrons. And, some of Lawrence's graduate students came here at special times and gave us instruction on advanced calutron design and operation." (Calutron is a shortened form of California University and cyclotron.)

Two of Lawrence's graduate students whom Whitman met were future Nobel Laureates Luis Alvarez and Edwin McMillan.

A key component of calutron technology is the electromagnet. Positively charged ion beams from a vaporized sample of uranium are accelerated and deflected by magnetic fields. The heavier U-238 beam is bent less than the U-235 beam, so the ions of different masses end up in separate collectors. Uranium-235 was the nuclear fuel for the first atomic bomb detonated during World War II.

The copper Y-12 possessed was never used for the electromagnets because there was not enough. Copper was in short supply in wartime America. "Groves decided that the amount of copper that would be required would have to come from South America, but the government was worried about submarine interception and the supply of ore," Whitman said.

Grady Whitman: More Manhattan Project "War Stories"

(As published in *The Oak Ridger's Historically Speaking* column on April 22, 2013)

To provide windings for the Y-12 electromagnets, massive amounts of silver were borrowed from the U.S. Treasury Department's storage facility at West Point, N.Y. A Treasury Department official there said, "We sell silver in Troy ounces. How much do you want?"

The answer: "We need about 15,000 tons of silver!" The metal was shipped to Allis Chalmers in Milwaukee, where it was rolled into ribbons and wound into coils for the Y-12 electromagnets.

"I knew one of the guys in charge of recovering the silver," Whitman said. "There were silver bus bars on top of each calutron unit. When workers drilled holes in the bus bars and put in the bolts, an armed guard picked up the shavings." All the silver was returned in the 1960s.

To fully exploit each large electromagnet, 96 calutrons were arranged around it in a large oval "racetrack." There were five Alpha racetracks; the Beta tracks each had 36 calutrons. "Was safety compromised?" Stow asked Whitman.

"Well, Y-12 was a pretty dangerous place with its high voltages and strong magnetic fields," Whitman said. "Although safeguards were there, you had to be very careful. There was a great urgency for production of nuclear fuel.

"Y-12 workers could cut some comers. And, there were accidents. One guy who worked for me had to go into calutron tanks between the magnetic poles for some reason, and he came out screaming. He had been in the Italian campaign and had been discharged from the Army."

The strong magnetic field tugged at the shrapnel in his right knee, causing considerable pain. The field could make wristwatches quit functioning, pull out women workers' bobby pins, and stop a maintenance man with a nail in his shoe from taking another step. Regular steel hand tools could not be used safely between the magnetic poles.

"We used beryllium and copper tools," Whitman said. "If you were to enter the magnetic field with a tool made of a ferrous material, it could chop your fingers off."

In spring 1945 a colonel told Whitman and his colleagues who had worked night and day for two years: "We're about to see the fruition of our work. We want you to make every effort to increase the output and we can reduce the quality a little bit." Whitman told Stow, "We ran like that for three months. I mean, just hammer and tong. And, that was the material that went into the Little Boy -- the Hiroshima bomb."

Whitman and his colleagues had produced enough enriched uranium for one bomb, but there was not enough left over for another one. Two additional bombs had been made of plutonium produced at the large Hanford reactors in Washington (based on pioneering work done in Oak Ridge).

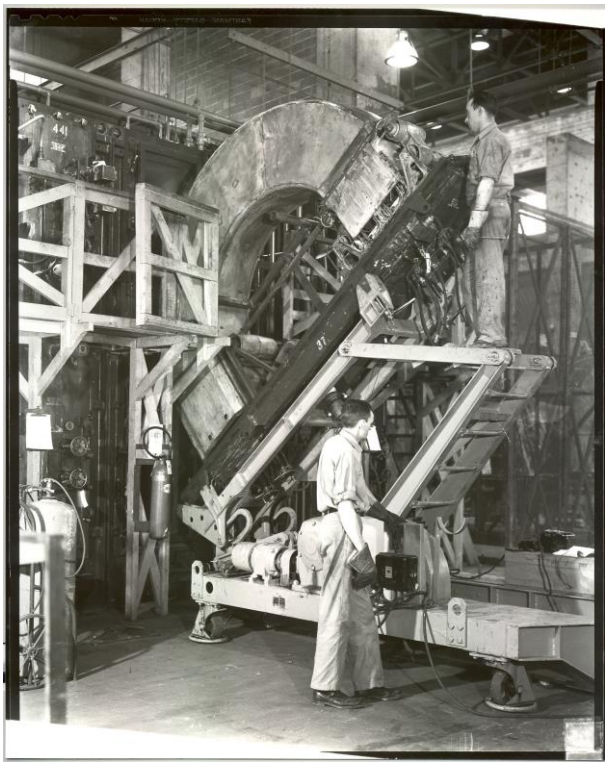
Whitman learned about the dropping of the atomic bomb on Hiroshima on Aug. 6, 1945, from Waldo England, his supervisor's boss, who may have heard about it on the radio. For Whitman this monumental event was the culmination of work he was involved in at Y-12. He told Stow he knew he had been a part of the process to produce the atomic weapon.

How did he feel? "I was very proud," he said. "I lost a lot of friends in the war."

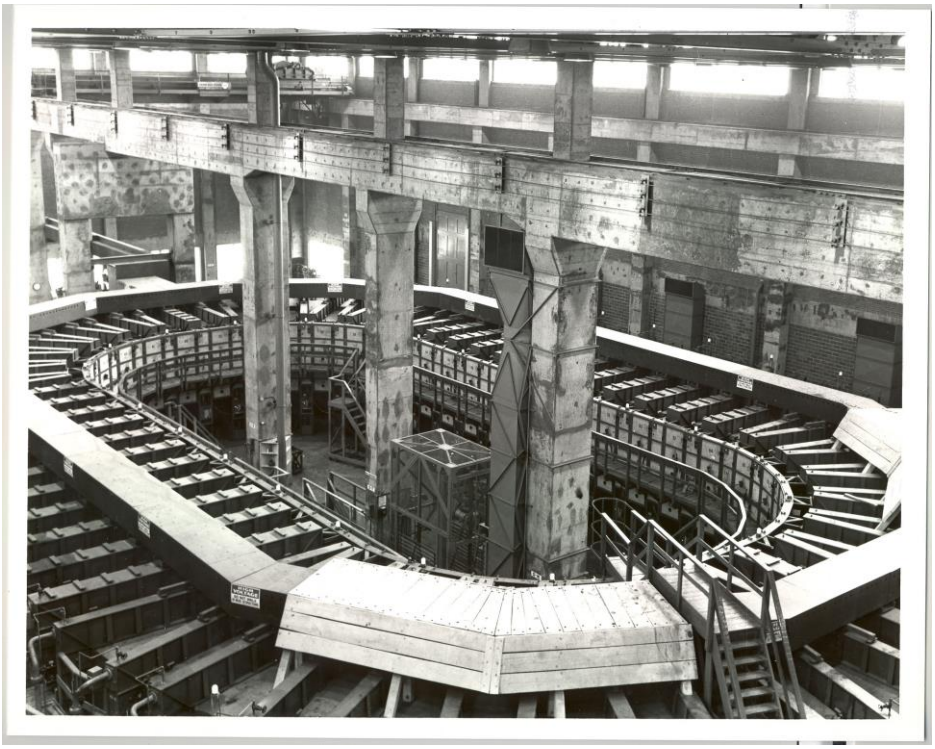
…

Thank you Carolyn for another great story from the oral history archives of the Center for Oak Ridge Oral History.

Grady Whitman



The vacuum chamber for the Alpha 1 Calutrons



Alpha 1 track of 96 calutrons