

# Oak Ridge's secret plutonium experiment, part 1

(As published in *The Oak Ridger's Historically Speaking* column on January 4, 2016)

This is part one of a two part series of *Historically Speaking* that will touch on sensitive and uncomfortable aspects of the past. The series will describe the first experimental injection of a human with plutonium. I know that sounds horrible...but it happened, right here...in Oak Ridge!

History is not always pretty. In fact, it can be downright disturbing especially without the context and mores of the time to help with perspective and understanding of the situation. Such is this story about Ebb Cade.

One of the members of the Manhattan Project National Historical Park Scholar's Roundtable is Kate Brown, author of *Plutopia*, and she has researched two of the primary locations where Plutonium has been produced, one in the United States and one in Russia. As a part of her research she uncovered actions in those locations where individuals were exposed to plutonium in ways that adversely affected them and she uncovered incidents that were covered up.

Kate brings keen insights into the discussion of potential interpretive themes the park will pursue. The importance of a balanced presentation of the whole history is a major effort of the National Park Service. I am proud to also be a member of the Manhattan Project National Historical Park Scholar's Roundtable helping assure that balance is struck!

Carolyn Krause has thoroughly researched the hard to accept facts surrounding this first recorded experimental injection of plutonium in a human. The details are available on the internet. Denise Kiernan, also among the members of the Manhattan Project National Historical Park Scholar's Roundtable, included this story of Ebb Cade in her book, *The Girls of Atomic City*.

Denise's account was the first full treatment I had seen of the situation that occurred in the Clinton Engineer Works in 1945 here in the Oak Ridge hospital. As with other aspects of her research, Denise captured this unpleasant experiment in detail and concisely placed it in her coverage of the history of Oak Ridge.

Here is the result of Carolyn's research from several sources of information:

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On March 24, 1945, well before sunrise, Ebb Cade, 53, undoubtedly expected this to be another routine day of labor. He and his two brothers, two others, and the driver rode in one car together every workday from Harriman to K-25. Later known as the Oak Ridge Gaseous Diffusion Plant, K-25 was being completed to produce enriched uranium that was used as feed material for the nearby Y-12 plant; after the war K-25 produced highly enriched uranium. Cade's job was to mix cement for J. A. Jones Construction Company at K-25.

The car's occupants had already shown their badges to the guard at the Blair Road gate at 6:30 a.m. The sun was rising over the horizon. The driver decided to pass a large, very slow vehicle on the road. The car crashed into a truck coming the other way. Perhaps the solar rays impaired the driver's vision, writes Denise Kiernan in "The Girls of Atomic City."

Cade reported severe pain in an arm and both legs. He was admitted to Oak Ridge Army Hospital. X-rays showed that the bones in his right forearm, left thigh and right knee were broken. "Some of the fractures were 'in poor position,' which meant an operation to properly set the bones would be necessary," wrote William Moss and Roger Eckhardt in "The Human Plutonium Injection Experiments" in the No. 23, 1995, issue of "Los Alamos Science," the research magazine of the Los Alamos, N.M., laboratory, where the uranium and plutonium atomic bombs were designed and built.

"Except for those injuries and 'a chronic urethral discharge which he has had for 10-15 years (his clinical record states this may have been due to chronic gonorrhea),' HP-12 had always been

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employed as a cement mixer and was generally in good health ('colored male, well developed, well nourished')." HP-12 (Human Product) was the code name given Cade.

The article was published in response to the Pulitzer-prize-winning series Eileen Welsome wrote in 1993 for The Albuquerque Tribune. As a result of the series, the 18 human plutonium injection experiments carried out during and after the Manhattan Project received tremendous notoriety in 1994, as did other human radiation experiments.

Two days after the Cade accident, health physicists meeting at Los Alamos approved a proposal to select hospital patients for plutonium injection experiments. They were concerned about possible health effects to workers exposed to plutonium at Clinton Labs in Oak Ridge, Hanford, Washington (which had three large plutonium-producing reactors) and Los Alamos, where at least two bombs were to be fueled with plutonium from Hanford. Health physicists at Los Alamos wished to know how much of a small dose of administered plutonium remained in the body and how much was excreted.

They were hoping to use the data to develop a diagnostic tool they considered "essential for the protection of workers who would produce and fashion plutonium metal for use in the early atomic bombs," Moss and Eckhardt wrote. "The idea was to remove a worker from the job if and when it was determined that he had received an internal dose that was close to or over the limit considered safe."

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Next we will conclude Carolyn Krause's research into this most uncomfortable yet historically accurate account of the first human plutonium experiment. An incident that took place right here in Oak Ridge and thus is a part, not a pretty nor a proud part, but a part of Oak Ridge's history just the same. It is necessary to include it in the overall history as will be told by the Manhattan Project National Historical Park – Oak Ridge.



Early color photo of Oak Ridge Hospital looking northeast showing Guest House, first high school and Jackson Square in background (Photo by Ed Westcott)

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View of Oak Ridge Hospital looking east with Castle on the Hill and steam plant across the Oak Ridge Turnpike and in the background (Photo by Ed Westcott)