

Herman Postma: Opportunist who bridged many gaps

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The Oak Ridge National Laboratory is the Department of Energy's largest and most diverse scientific research laboratory. It began during the Manhattan Project as the X-10 site where the Graphite Reactor was built, the world's first industrial size nuclear reactor.

At the end of World War II, the nation was creating national laboratories at a number of locations. However, an intense struggle was required to get the X-10 site designated as one of the national laboratories. The political climate was inclined to place national laboratories in or near large cities.

It took significant political maneuvering, a group of University of Tennessee professors and the collaboration of 14 southern universities to create what was first named the Clinton Laboratories, then the Clinton National Laboratory and finally in March, 1948, the Oak Ridge National Laboratory.

Over the years, the directors or acting directors have been Martin D. Whitaker, James H. Lum, Eugene P. Wigner, C. Nelson Rucker, Clarence E. Larson, Alvin M. Weinberg, Floyd L. Culler, Herman Postma, Alex Zucker, Alvin W. Trivelpiece, William Madia, Jeff Wadsworth and Thom Mason.

Carolyn Krause brings us yet another summary of an Oral History, this time giving insight into one of several turbulent times in the laboratory's history. Alvin Weinberg served as laboratory director from 1955 until 1973, the longest tenure of any of the directors. However, in the end he was forced out because he was not seen as following the direction desired by the Atomic Energy Commission.

Alvin had a vision of a Molten Salt Reactor that would revolutionize energy production. I find it most interesting to see what is being promoted TODAY by the Weinberg Foundation, a United Kingdom based organization established in September 2011, to advance research, development and deployment of safe, clean and affordable nuclear energy technologies.

One of the primary technologies being promoted by the Weinberg Foundation is the Thorium based Molten Salt Reactor. Here is their statement: "Molten Salt Reactors (MSRs), first designed, built and proven by Alvin Weinberg at the Oak Ridge National Laboratory, have the potential to revolutionise the world energy supply, allowing us to replace our fossil fuel-based energy system with clean, safe and economical nuclear energy."

The link to the foundation's web site is: <http://www.the-weinberg-foundation.org/>

Just this week I received a call from a person who had read a recent Historically Speaking column about Alvin Weinberg. He is seeking to bring additional recognition to Alvin Weinberg as a "Thorium Energy Pioneer" and a visionary.

The Weinberg Foundation goes even further saying that the Molten Salt Reactor was, "...first designed, built and proven by Alvin Weinberg at Oak Ridge National Laboratories in the 1960s. In 1974 Alvin's research into the huge advantages of thorium-fuelled MSRs was cut short by political considerations, robbing the world of a breakthrough in clean energy technology." Now that is a pretty strong statement. Wonder why we in Oak Ridge are not so strong in our support of Alvin Weinberg?

Enjoy Carolyn's oral history summary of this time of transition of the Oak Ridge National Laboratory after Alvin Weinberg was abruptly removed from his directorship.

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Herman Postma, son of Dutch farmers in North Carolina who became a plasma physicist with degrees from Duke and Harvard universities, was an opportunist who brought new opportunities

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to Oak Ridge National Laboratory. He was appointed director of ORNL just over 40 years ago, on Jan. 1, 1974, and retired from the position in 1988. His legacy included many changes still in place.

By traveling to the Soviet Union, learning about the Russian invention of the doughnut-shaped tokamak fusion device and convincing his management that Oak Ridge had the talent to design and build the tokamak-like ORMAK, Postma unknowingly saved ORNL's Fusion Energy Division. Although director of the division, he was unaware it had been on the list for closure – until later.

When he was appointed director of ORNL, he was not told that the lab was in bad shape. The main reason: the clash between Alvin Weinberg, the lab director Postma succeeded, and Milton Shaw, director of the Atomic Energy Commission's reactor division.

"Alvin got into trouble because he sequestered a lot of money for work on the Molten Salt Reactor," Postma told Steve Stow in an oral history interview in 2003. He explained that Weinberg also "got into trouble" by diversifying ORNL through increased research on non-nuclear energy sources and the formation of the environmental sciences division.

With the Arab oil embargos in the 1970s, the government emphasized non-nuclear energy research. "When there's change, there's opportunity," Postma said, noting that ORNL continued diversifying.

Postma's first problem was that many were upset by a congressional act that renamed ORNL the Holifield National Laboratory. The change was in honor of U.S. Rep. Chet Holifield, retired chair of the Joint Atomic Energy Committee (who hated ORNL and liked Shaw). After a year the lab's name was restored and the new tandem accelerator was called the Holifield Heavy Ion Research Facility.

In 1975 the Eugene P. Wigner Fellowships were established in honor of the Nobel Laureate who had served as a research director at ORNL in the 1940s and founded the lab's Civil Defense program in the 1960s. More than 70 Wigner Fellows, who represent the best and brightest among young people in science, have conducted research at the lab, sometimes for many years.

Other bright researchers were hired at ORNL in the mid-1970s because of ORNL's growing role in addressing energy and environmental challenges. Managing growth became a challenge for Postma.

"We hired almost a thousand people over a two-year span," Postma said. "We decided it was important to work on the new national energy policy called coconuke, which stands for coal, conservation and nuclear energy."

During his time as ORNL director, the reactor accidents at Three Mile Island in Pennsylvania (1979) and Chernobyl in the Soviet Union (1984) spelled the demise of nuclear reactor research at ORNL. "In fact," Postma said, "our conservation programs got to be much larger than our nuclear reactor programs."

Postma was responsible for the seed money program at ORNL, which became a model for other non-weapons national labs. "We were concerned that our weapons laboratory friends were able to spend a lot of money at their discretion," he said. "To do anything outside of what was programmed, we had to sequester a lot of money to take chances with."

Because this approach helped end Weinberg's ORNL career, Postma decided a seed money program had to be "legitimized." So, he took the initiative to the Department of Energy, and DOE managers in agreement ran it by Congress and won approval.

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As a result, ORNL established the seed money program and the Laboratory Directed Research and Development (LDRD) program. "We'd fund innovative research, like a venture capitalist, and then we'd go to the public fountain to get more money" if the ideas proved promising. A study that Postma requested showed that internally funded research resulted in more patents and papers than externally funded research and that the return on investment occurred faster.

"I noticed we had a lot of foreign investigators at the lab who would take ideas back home and do things with them we couldn't do here," he said. Even before the Stevenson-Wydler Technology Innovation Act of 1980 and Martin Marietta won the contract in 1984 to manage ORNL for DOE, Postma promoted the concepts of technology transfer and industrial interactions with national labs.

He and his fellow managers legitimized "user facilities" that enable industrial personnel to conduct research at ORNL for a fee and get patent rights to the technologies they develop in Oak Ridge. One such facility was the new High Temperature Materials Laboratory, which received financial support from industry, universities, and the federal government.

Later, other national labs were promised new research facilities to keep them viable, so Postma, Alex Zucker, and others pushed DOE for an Advanced Neutron Source reactor to advance materials research, a major ORNL strength. Congress later cancelled ANS over cost and nuclear proliferation concerns, but ORNL later got the accelerator-based Spallation Neutron Source as its new anchor facility.

Postma was the first DOE national lab director to encourage inventors to submit reports on their innovations to what became Research & Development magazine. Since that time ORNL has ranked first or second in the number of R&D 100 awards won, ahead of or after GE.

Working with his friend Jack Reese, chancellor of the University of Tennessee, Postma created the UT-ORNL Distinguished Scientist program, which brought brilliant scientists to both institutions for many years. In this way, Postma built a bridge between Oak Ridge and UT in Knoxville, opening up new opportunities for both cities.

After he died in 2004 in Hawaii from a rare form of muscular dystrophy, Postma was memorialized with the renaming of the Solway bridge over the Clinch River between Anderson and Knox counties. It is appropriately called the Dr. Herman Postma Memorial Bridge.

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Thank you Carolyn for yet another excellent summary from our many Oral Histories.

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Alvin Weinberg at the Molten Salt Reactor, 6000 full power hours, October 9, 1967



Herman Postma, Oak Ridge National Laboratory Director 1974 - 1988