

Charles Thomas and James Lum: the Clinton Labs' Monsanto men

(As published in The Oak Ridger's Historically Speaking column on May 30, 2016)

Carolyn Krause picks up her series documenting the directors of what is now Oak Ridge National Laboratory.

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At the end of World War II in late 1945, the University of Chicago withdrew from management of Clinton Laboratories for the Corps of Engineers. Martin Whitaker, the first director of Clinton Labs, had accepted a position as president of Lehigh University. So, General Leslie Groves, who had headed the Manhattan Project, selected a new contractor.

The Monsanto Chemical Company, headquartered in St. Louis, agreed to manage Clinton Labs. Charles Allen Thomas, then vice president of Monsanto, was appointed project director of Clinton Labs. As manager of the operating contractor, he selected James Lum and Eugene Wigner as co-directors of Clinton Labs and reorganized the Oak Ridge research facility's administration.

Thomas (1900-1982), son of a minister who died when Thomas was six months old, was a noted chemist and businessman. He rose to become president of Monsanto and of the American Chemical Society. He was elected to the National Academy of Sciences and the National Academy of Engineering. He had more than 100 patents.

After graduating from Transylvania University in Kentucky and earning an M.S. degree in chemistry from the Massachusetts Institute of Technology, he joined a General Motors team that, in its search for an effective anti-knocking agent for gasoline, developed tetraethyllead. Lead was used in gasoline for many decades until it was banned because of its toxicity.

Thomas co-founded the Thomas & Hochwalt Laboratories in Dayton, Ohio. They were acquired in 1936 by Monsanto, where Thomas spent the rest of his career. Recruited by General Groves, he played important roles in the Manhattan Project from 1943 to 1945.

First, he coordinated plutonium purification and production of pure plutonium at different sites. Unfortunately, no process could separate two plutonium isotopes, forcing a new bomb design different from the design for uranium fuel from Oak Ridge.

Then, Thomas was asked to lead at the Dayton labs the development of techniques to industrially extract and refine radioactive polonium-210 for use in the triggers of the atomic bombs that brought an end to World War II. The Dayton Project developed techniques for extracting polonium-210 from the lead dioxide ore in which it occurs naturally, and from bismuth targets that had been bombarded by neutrons in the Graphite Reactor and later the nuclear reactors in Hanford, Wash.

As an interesting aside, the neutron sources, or nuclear triggers, used to initiate chain reactions inside the two atomic bombs were of interest to the Soviet Union. George Abramovich Koval, the American son of Russian immigrants, was assigned by the U.S. Army to work as a health physics officer at Clinton Labs, where he had access to all buildings including the Graphite Reactor.

In 1945 Koval was transferred to the Dayton Project to perform the same job. As the secret Russian spy "Delmar," Koval passed off secrets to his handler at both locations. In 2007 Russian President Vladimir Putin posthumously awarded Koval a gold star, making him a hero of the Russian Federation for his work in "providing the recipe" for the initiator for the Joe-1 bomb.

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According to Wikipedia, the Dayton Project, in a search for more space, used a playhouse on property controlled by the wealthy family of Thomas' wife. The building became so contaminated with radioactivity that it was dismantled and buried in Oak Ridge in 1950.

In 1946 Thomas brought to Clinton Labs from the Monsanto facilities some 60 industrial chemists and chemical engineers with relevant expertise. Because of its remote backwater location, some Monsanto staff dubbed Oak Ridge "Dogpatch" in telegrams after the hillbilly community that the "Li'l Abner" comic strip parodied and popularized.

This allusion hurt the reputation of Monsanto and the Clinton Labs.

Thomas decided to establish a dual directorship at Clinton Labs. First, he convinced Eugene Wigner to take a year's leave of absence from Princeton University and assume a new position as research and development director of Clinton Labs.

Wigner was a chemical engineer and physicist from Budapest, Hungary. He designed the plutonium-producing reactors in Hanford for the Manhattan Project and won a Nobel Prize for physics in 1963. Wigner was attracted to Clinton Labs for several reasons (to be listed in a subsequent column), but agreed to take the job only on the condition that someone else deal with administrative details.

So Thomas assigned the administrative duties to James Henry Lum, who had assisted Thomas in managing the Dayton Project labs. Lum was appointed executive director of Clinton Labs. A chemical engineer born in Indiana, Lum graduated from Pennsylvania State University and earned a Ph.D. at Harvard University. During World War II he worked for the National Defense Research Council.

After leaving Oak Ridge in August 1947, he served as managing director of Monsanto Chemicals Ltd. in Australia, where he set up an aspirin factory, and then director of research and development for Monsanto's organic division in St. Louis. During his retirement, he lived in Sarasota, Fla., where he died at the age of 93 in 1996.

According to the 50th anniversary issue of the ORNL Review, Thomas and Lum formed new organizational units to study biology, metallurgy and health physics. They recruited replacements for Clinton Labs researchers who returned to universities after the war. New staff included Walter Jordan, P. R. Bell and Jack Buck (from the radar laboratory at MIT) and Ellison Taylor, Henry Zeldes, Harold Secoy and Frank Miles (from the closed wartime laboratory at Columbia University).

In 1946 Wigner asked Lum to merge the small machine shops scattered among several divisions to provide precisely formed components for scientific experiments. After some resistance, Lum organized the central research shops the next year.

"In 1947, under Monsanto's management, Clinton Labs employed 2141 workers, making building expansion imperative," stated the ORNL Review. "A moratorium on new construction during 1946 and 1947, while the facility's future was debated in Washington, caused personnel and equipment to be moved into empty buildings at the Y-12 Plant, which was shifting its focus from the electromagnetic separation of uranium-235 to precision machining of weapons components."

One problem Lum and Wigner faced was Colonel Walter Leber, the new Army representative for Clinton Labs starting in May 1946. He hired 54 people to closely monitor construction and administration, investigate security breaches and review planned science experiments. The group

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audited minor details, antagonizing the scientists and Monsanto executives. Lum strenuously objected to Leber's efforts to "interfere and assume responsibilities which are reserved only for Monsanto under the present contract."

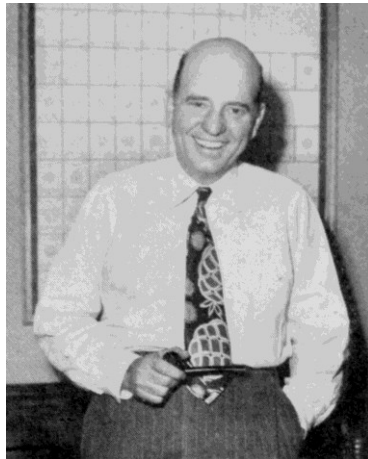
The accomplishments at Clinton Labs in 1946-47 included producing and shipping radioisotopes for use in medicine, research and industry; training future reactor engineers and designing a new reactor that provided neutrons at a record high intensity.

During negotiations on renewing the contract, Thomas had two requests that the AEC refused to grant. He wanted the Materials Testing Reactor designed at ORNL built near Monsanto's facilities, either in Dayton or St. Louis. He also requested that Monsanto be allowed to increase its maximum fee for services from \$65,000 to \$100,000 a month.

In May 1947, Thomas and Monsanto decided not to seek to renew the contract for operating Clinton Laboratories when the contract expired in June.

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Thanks Carolyn. Coming up is Carolyn's research into Eugene Wigner's contributions as research director of Clinton Labs.



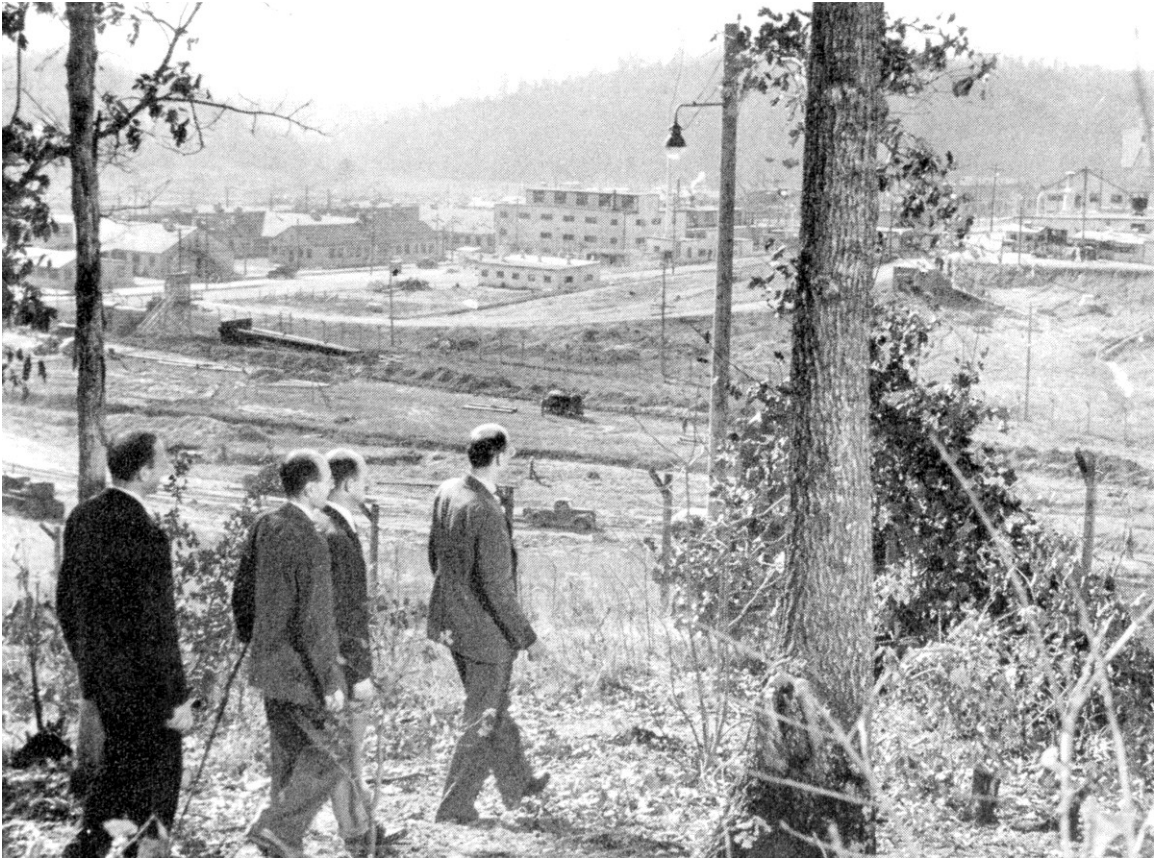
Charles Thomas



James H. Lum

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This is a Monsanto image that was used in the ORNL Review. *In the shadows of the Cumberland Gap*, the 1946 management team, program director Dr. Frederick Seitz, executive director of Clinton Laboratory Dr. James Lum, research director Dr. Eugene Wigner, and U.S. Public Health Services National Institute of Health Dr. Alexander Hollaender, look down on Clinton Laboratory in Oak Ridge, Tennessee, where the vanguard of a new expedition is forming.