

## Waldo Cohn: Conducted isotope research and the Oak Ridge Symphony

(As published in *The Oak Ridger's Historically Speaking* column on September 8, 2014)

One of the individuals in Oak Ridge's history that I have come to admire is Waldo Cohn. I have a copy of the handwritten letter he sent to Senator Howard Baker on February 1, 1954, regarding the "tempest-in-a-teapot here in Oak Ridge stirred up by the Council's school integration resolution of December 21, 1953..."

He was instrumental in achieving integration of Oak Ridge schools well before Clinton, TN, in 1956 and Little Rock, AK, in 1957. As you will see in Carolyn Krause's research below, integration was accomplished here in Oak Ridge in 1955! Waldo did not come through unscathed, however.

Read Carolyn's input to Historically Speaking below to see what happened to Dr. Waldo Cohn. You will see how a noted scientist AND a leader in our city government in the 1950's was treated by a small group of vocal individuals.

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If you've ever had a successful diagnosis or treatment involving radiation, if you have attended classical music concerts in Oak Ridge, and if you support nuclear power and equality for all regardless of skin color, you probably would appreciate Waldo Cohn.

The cello-playing Oak Ridge biochemist and nuclear chemist died 15 years ago in August 1999 at the age of 89, but his legacy touches many, as did his personality. He is remembered as handsome and charismatic with an air of distinction.

In 1946, when the future of the nuclear laboratory in Oak Ridge was uncertain, Cohn was the first to separate radioactive byproducts of the splitting of uranium nuclei exposed to neutrons in the Graphite Reactor. He applied ion-exchange chromatography to the separation and identification of these fission products.

He pioneered the production of radioisotopes, such as carbon-14 and phosphorus-32, by exposing the elements in their nonradioactive forms to neutrons from the reactor. Radioisotopes are used to detect tumors and parts of organs that are functioning poorly, to treat cancer, and to sterilize medical equipment.

According to Alvin Weinberg, director of Oak Ridge National Laboratory from 1955 to 1973, Cohn was the first to organize the production and distribution of radioisotopes from the world's first continuously running reactor—the Graphite Reactor. It was built to demonstrate that the plutonium explosive could be produced in and separated from uranium rods after bombardment with neutrons.

On June 14, 1946, before the Atomic Energy Commission began operation, Science magazine published Cohn's catalogue of reactor-produced isotopes that could be prepared in the Oak Ridge reactor and distributed for scientific and medical uses. The list included almost 20 isotopes produced by fission and about 60 neutron-bombarded elements available to qualified researchers.

On August 2, 1946, Research Director Eugene Wigner, standing in front of the Graphite Reactor, presented a small container of carbon-14 to the director of the Barnard Free Skin and Cancer Hospital of St. Louis. The event was hailed as the beginning of the peacetime uses of atomic energy.

In the first year of production, more than a thousand shipments of radioisotopes, mostly of iodine-131, phosphorus-32 and carbon-14, left the Graphite Reactor; by 1950 the number of shipments neared 20,000. In 1987 industry took over radioisotope production and sales, now mostly handled abroad.

Today tens of millions of nuclear medicine procedures are performed each year, and demand for radioisotopes is rising rapidly. It should be noted that radioisotopes are produced in linear accelerators and cyclotrons, as well as reactors (including the High Flux Isotope Reactor at ORNL).

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Cohn must have appreciated this famous quote by Weinberg: "If at some time a heavenly angel should ask what the Laboratory in the hills of East Tennessee did to enlarge man's life and make it better, I daresay the production of radioisotopes for scientific research and medical treatment will surely rate as a candidate for first place."

Paul Aebersold of the AEC took over as the isotope czar when Cohn became interested in applying ion-exchange chromatography to the identification of the components of the nucleic acids DNA and RNA.

Born in San Francisco, Cohn earned B.S., M.S., and Ph.D. degrees from the University of California at Berkeley. He moved to Harvard University to conduct postdoctoral research and then went to the University of Chicago in 1943 to work at the Metallurgical Laboratory for the Manhattan Project. He moved to Oak Ridge in 1944 and joined the staff at Clinton Laboratories.

Two months later he placed a small notice in the Oak Ridge Journal, a weekly newspaper, that announced a meeting for Oak Ridgers interested in playing in an orchestra. Two string players and seven woodwind players responded. In a 1983 interview he told the Knoxville News-Sentinel, "I didn't want to join an orchestra. I was just looking for someone to play duets."

The 19 musicians in an early group named him their conductor and gave the first concert as an orchestra in June 1944. Then, within weeks, the 65-member Oak Ridge Symphony Orchestra gave its first concerts on Nov. 3-4, 1944. This November, ORSO, the longest continuously running orchestra in Tennessee, will be 70 years old.

One of Cohn's contributions was to bring Isaac Stern, the famous violinist and his friend, to Oak Ridge to perform at the Grove Theater. According to the New York Times, Cohn's best known musical achievement may have been in 1952 when he conducted the premiere of the first serious musical composition inspired by the atomic age: "Overture to a Dedication of a Nuclear Reactor." Composed by Arthur Roberts, the piece was dedicated to Cohn.

After 11 years, Cohn stepped down as conductor of the Oak Ridge Symphony in 1955 when he received a Guggenheim Fellowship and Fulbright Research Scholarship for a year's study at Cambridge University in England. But he continued to play the cello in ORSO until two years before his death.

According to an obituary in The Oak Ridger: "Cohn was politically involved both nationally and locally. He was one of the organizers of a petition signed by a large number of scientists urging that a nuclear bomb first be detonated in a test blast before being used on human targets." After World War II, he urged control of nuclear weapons by the United Nations.

Cohn strongly advocated the development of nuclear power as a solution to global warming. He spoke out against what he considered exaggerated fears about the hazards of radioactive materials to the public. He declared the nuclear waste problem solvable.

"In 1953, Dr. Cohn was elected chairman of the town advisory council in Oak Ridge," stated the New York Times. "As chairman, he pushed through a resolution urging the Federal Government to include the town and its schools in an order desegregating military bases that had just been signed by President Dwight D. Eisenhower. Opponents, however, mounted a drive to remove Dr. Cohn, and in 1954 he stepped down from the post of chairman but served out his two-year term on the council." In 1955 Oak Ridge schools were peacefully integrated.

Where's Waldo? He "lives" in the memories of many friends, colleagues, scientists, musicians and advocates of social justice who appreciate what he did to help others.

NEXT: Highlights of the 1995 interview of Waldo Cohn by Thomas Fisher, Jr., and Michael Yuffee of the Office of Human Radiation Experiments, U. S. Department of Energy

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Thanks Carolyn for an exceptionally well done and thoroughly researched introduction to one of Oak Ridge's most effective leaders and great scientists! I know readers will anxiously await the next installment of the history of Waldo Cohn.



A young Dr. Waldo Cohn shown conducting the Oak Ridge Symphony Orchestra

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The entire Oak Ridge Symphony in the early days of its existence