

# Ernie Wollan: a son's perspective on a pioneering physicist

(As published in The Oak Ridger's Historically Speaking column on January 9, 2017)

Carolyn Krause has interviewed John Wollan, Ernest O. Wollan's son and he provides a personal perspective of his father. Enjoy Carolyn's fine conclusion to the series on Ernie Wollan!

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John Wollan, the third and youngest child of Ernest O. Wollan, who pioneered the fields of health physics (in Chicago) and neutron scattering (at Oak Ridge National Laboratory), said he felt "great disappointment that my father didn't win a Nobel Prize because he died too soon. What I have puzzled about is that I have absolutely no recollection of my father ever saying to me that the work he did was Nobel prize worthy."

According to a 2013 paper in the Acta Crystallographica Section A journal on the early development of neutron diffraction, Clifford Shull, who conducted neutron diffraction research with Wollan at ORNL and won the Nobel Prize in physics in 1994 for this research, "further honored his colleague by inviting members of Wollan's family to attend the Nobel Prize ceremony in Stockholm as his guests."

John Wollan, a physicist who once worked for Los Alamos National Laboratory developing superconducting magnets for the fusion energy program, said in an interview by email: "Unfortunately, that very kind and generous invitation from Cliff never got to my family. I have no idea why not. Once I learned about it, probably in the spring of 1995, I was very disappointed that it had not been received."

But then he looked upon the no-invitation incident as "one of those things that was not meant to happen." He explained that he "had just taken a program manager job at a small company in Denver several months before the Nobel announcement."

The funding secured for the program he led was so limited that going to Stockholm then would have been very risky for his career. "I have lived with the conflict of how much I would have wanted to go had the invitation been received, versus, did I want my career to quite possibly come to a sudden end at the age of 52!"

John-remembers his father as inquisitive, adventurous and "surprisingly fearless except for one thing, public speaking. In a foreign country he would eat the local cuisine. If we were vacationing in Minnesota, which we did almost every summer, he tried water skiing – when he was 50+ years old – and he could not really swim." His father also skied down a mountain in Switzerland in 1932-33, but John doesn't know where he learned this skill.

He and his father walked together in the woods (which John loved as he grew up in Oak Ridge). And his father taught him how to play golf. "Although he was only a modestly decent golfer, he loved the game,"

John said. "When my father was about twelve he accidentally stuck his finger in an open light socket. He had to have his middle finger amputated and his fourth and fifth fingers were permanently curled and frozen in place. That handicap certainly made it somewhat difficult for him to hold a golf club."

Ernie helped clear the brush and build the Oak Ridge Country Club, where he enjoyed the social scene and was "apparently a good dancer. He also loved to discuss or argue politics with some of my parents' close friends," according to John.

In 1959 Ernie's wife Addie died. John's older brother and sister had both graduated from college, and John left for college the following year.

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So Ernie spent almost 20 years as a widower in Oak Ridge, and John noted that these close friends became an even more important part of his life.

Unlike some scientists, Ernie was a devoted Christian and leader at Grace Lutheran Church in Oak Ridge. "I regret now that we never really discussed religion, even after I was an adult," John said. "I would very much like to have him here now so we could do that."

What John most remembers about his father's reminiscences on his work life is "the sense of awe he had for the amazing career he felt blessed to have, and the respect he had for the people he was privileged to have worked with – especially Arthur Compton, but also Enrico Fermi, Eugene Wigner and John Wheeler."

John described his parents as Minnesota Norwegians who both graduated from Concordia College, where his father was a mathematics professor. In 1923 Ernie was accepted into the University of Chicago's physics department and earned a master's degree there.

He took three years off, presumably to earn some money, and then returned to the university in 1927 to work on a Ph.D. degree in physics. He studied under Compton, who had just won a Nobel Prize in physics, and earned his Ph.D. in 1929.

"Dad stayed at the university until 1932 when he received a National Research Council fellowship," John said. "He was one of only three recipients that year who were allowed to do their fellowship work overseas."

"After carrying out some cosmic-ray studies within the Arctic Circle north of Norway, he spent the year at the Technische Hochschule in Zurich, Switzerland. While there he had the opportunity to meet a number of the leading European physicists."

"He returned to teach physics at Washington University in St. Louis, where Compton was the chancellor. Compton moved to the Chicago Tumor Institute in 1938, and my father went there with him." The institute tested the use of a radium source to treat cancerous tumors.

Then in 1942 Compton joined the Manhattan Project (to head the Metallurgical Laboratory in Chicago), and Ernie subsequently joined the program also. "He then came to Oak Ridge in 1944, although I have recently learned he apparently commuted between Chicago and Oak Ridge frequently in 1943 and early 1944," John said.

Wollan and Compton were both present when the first man-made self-sustaining nuclear chain reaction was achieved in the Chicago Pile experiment on Dec. 2, 1942, and when the first continuously operating reactor, the Clinton Pile, later known as the X-10 Graphite Reactor, first went critical on Nov. 4, 1943.

Although he didn't live long enough to win the Nobel, Ernie did receive other awards. Concordia College awarded him an honorary Doctor of Science in 1965. And the Franklin Institute in Philadelphia bestowed on him the John Price Wetherill Medal in 1967 "for his early work in developing the equipment and techniques for study in neutron diffraction, and for his many investigations which resulted in the elucidation of the magnetic structure of solids, especially the rare-earth metals."

It seems somewhat ironic that the ORNL scientist who started his career studying cosmic rays within the Arctic Circle should have an island named after him in the Antarctic. Wollan Island is "a dome-shaped, ice-capped island with conspicuous rock exposures on its northwest side," according to Wikipedia. The United Kingdom Antarctic Place-Names Committee named this

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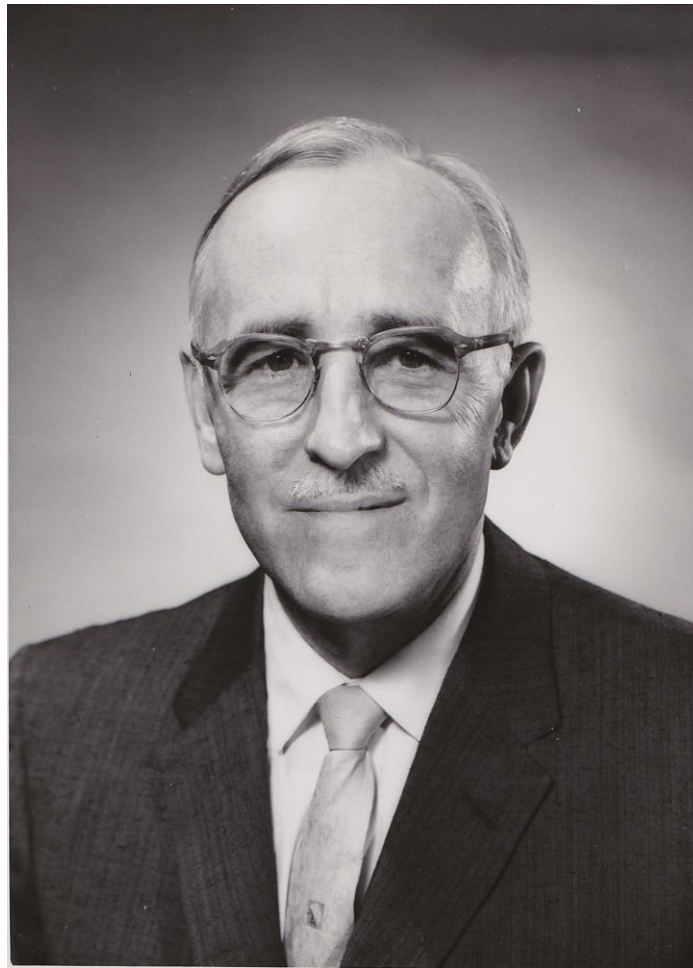
island in Crystal Sound “for Ernest O. Wollan, American physicist who used neutron diffraction to study the structure of ice.”

Clearly, Ernie Wollan was a world-class scientist – and a loving father.

(John Wollan can be contacted at [JohnJWollan@aol.com](mailto:JohnJWollan@aol.com)

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Thanks Carolyn! Great insight into a very personal perspective. Did you notice John's remark about wishing he had talked to his father about religion? We should each take a lesson here. Do not put off talking to your parents about ANYTHING! I have heard too many people say just as John did, that they sure wished they had taken the time to talk to their parents, but it is too late after our parents are gone!



Ernie Wollan pioneered neutron scattering and deserved a Nobel Prize in physics for his research but he died 10 years too early

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John Wollan was the third and youngest child of Ernie and Addie Wollan. He grew up in Oak Ridge and earned an undergraduate degree from St. Olaf's College and a doctoral degree in physics from the University of Iowa at Ames. He worked at Los Alamos National Laboratory for 10 years.

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In this family photo taken about 1947 in the backyard of the Wollan house at 107 Oneida Lane are son Tom, Ernie Wollan, daughter Kay, son John and Addie, Ernie's wife and the children's mother