

A brief history of the Biology Complex, part 2

As the transition of the buildings in what has come to be known as the “Y-12 Biology Complex” took place beginning in 1947, Buildings 9207, 9208, 9210, 9211 and others were occupied by a growing number of research scientists and engineers. Many of these individuals had been working on the Y-12 calutron process and were transitioning to the newly forming national laboratory developing at the X-10 Graphite Reactor site.

The restriction on constructing any new building at the X-10 site or Clinton Laboratories caused the large buildings being vacated at the Y-12 site to be a most attractive alternative. The scientists who were working hard to prove that they could compete with other national laboratories being formed around the country needed space and Y-12 had it.

However, the first use of Building 9211 after Y-12 chemical processing of uranium was no longer required was used as the full scale production facility for separating hafnium from zirconium to make pure zirconium. The Chemical Development Department of Y-12 in 1949 (within a year to become part of the Oak Ridge National Laboratory) was then located in Buildings 9733-1 and 9733-2 and was asked to join the nation-wide effort to find a method for freeing zirconium from its hafnium impurity.

Removing the hafnium was necessary to get the needed pure zirconium to be used for cladding of nuclear reactor fuels. The thiocyanate extraction with methyl isobutyl ether solvent process was developed within a year and turned over to chemical engineers for scale-up to be operated in Building 9211. The process was one where strong chemical and acids were required to the point that the actual structure of the building was damaged by corrosion.

In 1952, Building 9211 was converted from Hafnium-zirconium separation work as the technology had now been turned over to the private sector to supply the US Navy's nuclear fuels cladding needs. The operation had lasted just over a year and had proven to be highly successful. Repairs were made to the building resulting from the process created corrosion of the steel I-beams of the building.

Some unusual stories are told about the chemical processes required to separate the Hafnium from Zirconium to produce pure Zirconium. Such as, periodically they had to clean the roof of dead birds that had landed there and the exhaust gasses were so toxic that the birds would die from the fumes.

Another story is told in reference to the “he-man” status of some of the workers who thought it less than “manly” to wear a respirator while working around phosgene gas. They would just hold their breaths while quickly doing what needed to be done in the area where that gas was used and then run out at the last possible minute gasping for air. Sounds dumb, huh...stranger things have happened that in hindsight seem ridiculous!

The next phase of operation for Building 9211 was to serve as a major new salvage facility dedicated to chemical processing and recovery of slightly enriched uranium from various streams and wastes. One new facility was a very large furnace used for burning depleted uranium parts and recovering the values as uranium oxide.

Another large facility was a pulsed resin column about three feet in diameter and three stories tall. This unusually large pulsed system was used for the recovery and purification of uranium from low concentration waste streams or leached residues. Materials from the Fernald Plant and from the Niagara Falls facility were treated there as well as the Y-12 salvage materials.

In the 1960's Building 9211 was again surplus and began to be used by the growing Biology Division of ORNL. It was one of the facilities that supported the large number of experiments with mice.

As I have said in earlier discussion of the Biology Division, the team of William and Liane Russell, hired by Alexander Hollaender, were a key to the success of that organization over the years. Imagine my pleasure at getting an e-mail from Liane, even if she was politely correcting a mistake I made in an article published on the history of the Comparative Animal Research Laboratory.

Liane said, "I hope you won't mind my pointing out one little inaccuracy. Speaking about cows, you mentioned that scientists 'could even determine which embryonic systems were most susceptible during specific periods of development.' In fact, this research, using not cows but large numbers of genetically uniform mice, was performed at ORNL (not at CARL) in my laboratory in the Mammalian Genetics and Development Section of the Biology Division.

She went on to say of her research, "It identified critical periods during embryonic development for various types of abnormalities, and led to specific recommendations concerning medical irradiation. These included the so-called '14-day rule' that radiation for women of childbearing age should be scheduled to the two weeks following a menstrual period, when the probability of an unrecognized pregnancy was very low. Publication of a series of papers on this ORNL work began in 1950."

See the valuable research that was conducted at the Y-12 Biology Complex by the ORNL Biology Division. This is but one example of a very large and highly successful endeavor lasting over 50 years! Sad to see the structures go, but the benefits to humankind that have been created there over the years of their existence will live on indefinitely, thanks to great scientists like Liane Russell!

Some of the other Biology Complex buildings were constructed later. Building 9220 was constructed in 1965 and was built as a Virus Control Laboratory. The Oak Ridge National Laboratory operated the facility, but I am not sure it was ever used for the intended research.

Building 9224 was constructed in 1966 and was built as a Cell Fractionalization Laboratory. It too was operated by ORNL

Building 9769 was constructed along with the majority of the buildings in 1945 and was used originally as a Y-12 Plant Laboratory and Utilities. It has been upgraded, expanded and refurbished several times over the years and has been used for various functions. Radiological contamination found there caused planned demolition to be stopped in 2002.