

living cell nuclei and essential to normal cell functioning, are sensitive to ionizing radiation. Paper chromatography and ion-exchange methods used to separate compounds, Laboratory researchers reasoned, could help scientists and medical researchers measure and gauge this sensitivity.

After applying ion-exchange chromatography to separation of fission products and starting the Laboratory's radioisotopes program, Waldo Cohn used the same technique to separate and identify the constituents of nucleic acids. From this work came the discovery with Elliott Volkin that ribonucleic acid (RNA) has the same general structure as deoxyribonucleic acid (DNA), a concept that had a fundamental impact on molecular biology, virology, and genetics.

## Of Mice and Mammals

By 1949, 10,000 mice were housed in ORNL's renovated facilities at the Y-12 Plant. Research on mice, led by the Biology Division's William and Liane Russell, was designed to advance understanding of radiation effects on mammals.

According to William Russell, mice are used for genetic studies because they have few diseases, can be fed and maintained economically, reproduce rapidly, and have the same essential organs as humans. Liane Russell's 1950 survey of the gestation period of mice to examine their sensitivity to radiation yielded valuable information about critical periods during embryo development. She showed that radiation-induced changes of cells were more likely to occur during gestation. Largely because of her discovery of the greater radiation sensitivity of embryos, women have been cautioned about X-ray examinations during pregnancies.

The Russells, a cosmopolitan husband and wife team from England and Austria, came to Oak Ridge in 1948 from Bar Harbor, Maine. They expected Oak Ridge to be a backward community with minimal social and cultural opportunities. The Biology Division had an international clientele, however, and Liane Russell was surprised by the extent to which the world beat a path to Oak Ridge and the Laboratory. The Russells became renowned for taking their international guests on mountain hiking trails. They later played key roles in

the creation of the Big South Fork National River Recreation Area, a wilderness preserve just north of Oak Ridge.

## Technology School

Just as the Biology Division had an international reputation, the Oak Ridge School of Reactor Technology (ORSORT) established in 1950 enjoyed national prestige. ORSORT was the reestablished version of the original reactor training school of 1946-47. Because reactor technology was security-sensitive and could not be taught in universities, the AEC, with considerable support from Captain Rickover and the Navy, sponsored this school for outstanding engineers and scientists. Frederick VonderLage, the school's first director, was a former Navy officer who had taught physics at the Naval Academy. The faculty included Laboratory staff, and the school's text consultant was Samuel Glasstone, who published several overviews of nuclear reactor technology.

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John Swartout was an ORNL deputy director.