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including cancer, ORNL played a role in President Nixon's “war on cancer.” With additional support, researchers in the Laboratory's Biology Division focused on radiation and chemicals and later viruses and genes, including genes that promote tumors and those that suppress them. Consumer advocates who worried about the safety of hot dogs were especially interested in the findings of ORNL's Willie Lijinsky, who demonstrated that the nitrites widely used as food preservatives react with amines in food and drugs to form cancer-causing nitrosamines during digestion in the stomach.

Laboratory researchers were well positioned to attack the cancer problem because they had long sought to understand how organisms prevent or recover from the damaging effects of radiation and how to stimulate these self-protective mechanisms. They had discovered that cells can repair radiation-induced damage after radiation exposure ceases and that deficiencies in cellular repair mechanisms can predispose the organism to cancer.

Public and legal concerns about the environmental effects of nuclear power brought the Laboratory's studies of terrestrial and aquatic habitats to the forefront of its research agenda during the early 1970s. Using the “systems ecology” paradigm pioneered by Jerry Olson, Laboratory ecologists investigated radionuclide transport through the environment. Olson examined the migration of cesium-137 through forest ecosystems by inoculating tulip poplar trees behind the Health Physics Research Reactor with cesium-137, thereby establishing the first such experimental research center for forest ecosystem studies.

In 1968, the National Science Foundation placed Stan Auerbach in charge of a deciduous forest biome program in which the Laboratory contracted with universities for studies of photosynthesis, transpiration, soil decomposition, and nutrient cycling in forest systems in the eastern United States. That same year, David Reichle led a Laboratory forest research team that initiated large-scale forest ecosystem research. This work was a forerunner of subsequent Laboratory programs that investigated acidic deposition, biomass energy production, and global climatic change.

Environmental studies at the Laboratory received an unexpected boost in 1971 when a federal court,

in a decision on a planned nuclear plant at Calvert Cliffs, Maryland, ordered major revisions of AEC environmental impact statements as an essential part of reactor licensing procedures. Required to complete 92 environmental impact statements by 1972, the AEC asked for help from its Battelle Northwest, Argonne, and Oak Ridge national laboratories. Giving this effort the highest priority, Weinberg declared, “Nuclear energy, in fact any energy, in the United States simply must come to some terms with the environment.”

The Laboratory's skeleton staff for environmental impact statements, headed by Edward Struxness and Thomas Row, expanded in 1972 to include about 75 scientists and technicians. Staff working on these reports formed the nucleus of the Energy Division, established in 1974 under Samuel Beall's leadership.

The Calvert Cliffs decision required the AEC to consider the effects of nuclear plant discharges of heated water on the aquatic environment. Chuck Coutant led a Laboratory team assigned the task of developing federal water temperature criteria to protect aquatic life. For these and related studies, the Laboratory initiated construction of an Aquatic Ecology Laboratory, completed in 1973. Only the Pacific Northwest Laboratory had a similar laboratory. Its initial equipment consisted of 20 water tanks, each containing various fish species, and a computer-controlled heated-water system to supply water of proper temperature to the tanks; outside were six ponds for breeding fish and conducting field experiments. Early experiments at the aquatics laboratory investigated the survival rate of fish and fish eggs at elevated temperatures.

To determine the water temperature preferences of fish in streams, Coutant and Jim Rochelle of the Instrumentation and Controls Division developed a temperature-sensitive ultrasonic fish tag. The “electronic thermometer,” which can be surgically implanted into a fish, transmits temperature information as high-pitched sound waves of varying frequencies to a hydrophone in a boat or on shore. It has been used by private utilities and government agencies for fish studies.

An indirect result of the aquatic studies came during licensing hearings for Consolidated Edison's Indian Point-2 nuclear plant on the