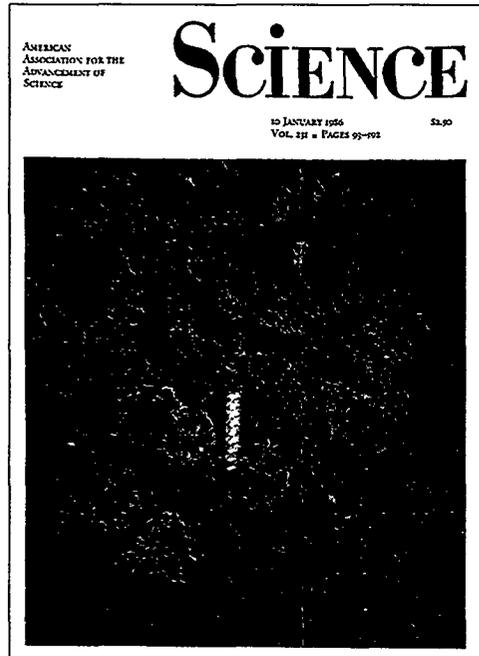


1977 An ERDA conference on CO₂ and climate change defined a multidisciplinary research agenda that would later be pursued by the multiagency U.S. Global Change Research Program.

1980 The DOE designated six additional National Environmental Research Parks at Fermilab, Hanford, the Idaho National Engineering Laboratory, Los Alamos, the Nevada Test Site, and Oak Ridge.

1980 A decade of research at the University of Texas on screwworm genetics, ecology, and radiation sensitivity, jointly sponsored by the DOE and the U.S. Department of Agriculture, concluded with the development of successful measures to control screwworm infestation in the U.S.



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A TOWERING SUCCESS Oak Ridge's Walker Branch Watershed project is one of the two longest-running forest ecosystem studies in the U.S. The aerial photo on this *Science* cover shows a meteorological tower above the forest canopy. Information on weather and atmospheric deposition is among the baseline data being used in an effort to understand the dynamics of forest ecosystems.

particular public worry, for example, was strontium-90, which can reach humans via cattle fodder and cow's milk and then accumulate at dangerous levels in bones. As a result of his pioneering field work, Auerbach would establish a reputation as one of the country's leading ecologists.

Auerbach and his colleagues pursued some of their first studies in the dry bed of White Oak Lake, where Oak Ridge once flushed low-level radioactive wastes. In the process of their studies, Oak Ridge ecologists introduced computer simulations to ecological science, a striking innovation in 1958. Products of this and other AEC research on radionuclide transport and bioaccumulation still provide the basis for models used to assess the impact of radioactive emissions on living organisms, including humans.

In the early sixties, attention at Oak Ridge shifted to the "cesium forest," a stand of radiolabeled tulip poplars, which produced some of the first research to document the extent to which an element is recycled within a forested ecosystem. Efforts then expanded in 1966 to include

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■ Based on experimental evidence that plant resistance to radiation is a function of cell nuclear volume (see page 37), it appeared likely that some tree species would be highly sensitive to gamma and neutron radiation. To assess the potential effects of nuclear warfare or a major reactor accident on forest ecosystems, the AEC thus began a broad program of forest radioecology. Beginning in 1963 and continuing into the seventies, the AEC funded a comprehensive study of the effects of gamma-rays (high-energy x-rays) on a tropical forest at El Verde in the Luquillo Mountains of Puerto Rico. Howard Odum, who would share the Crafoord Prize with his brother Eugene, headed the study. A 10-kilocurie cesium-137 gamma source was placed by helicopter at the center of a selected site. At the end of three months, it was removed and a large team of scientists began detailed comparative studies of the irradiated site and two nearly identical control sites. The study represented one of the most comprehensive and detailed experimental investigations of a terrestrial ecosystem ever conducted. The disordering stress of the radiation served as an especially illuminating experimental tool for studying the mechanisms that maintain order in ecosystems. ■

