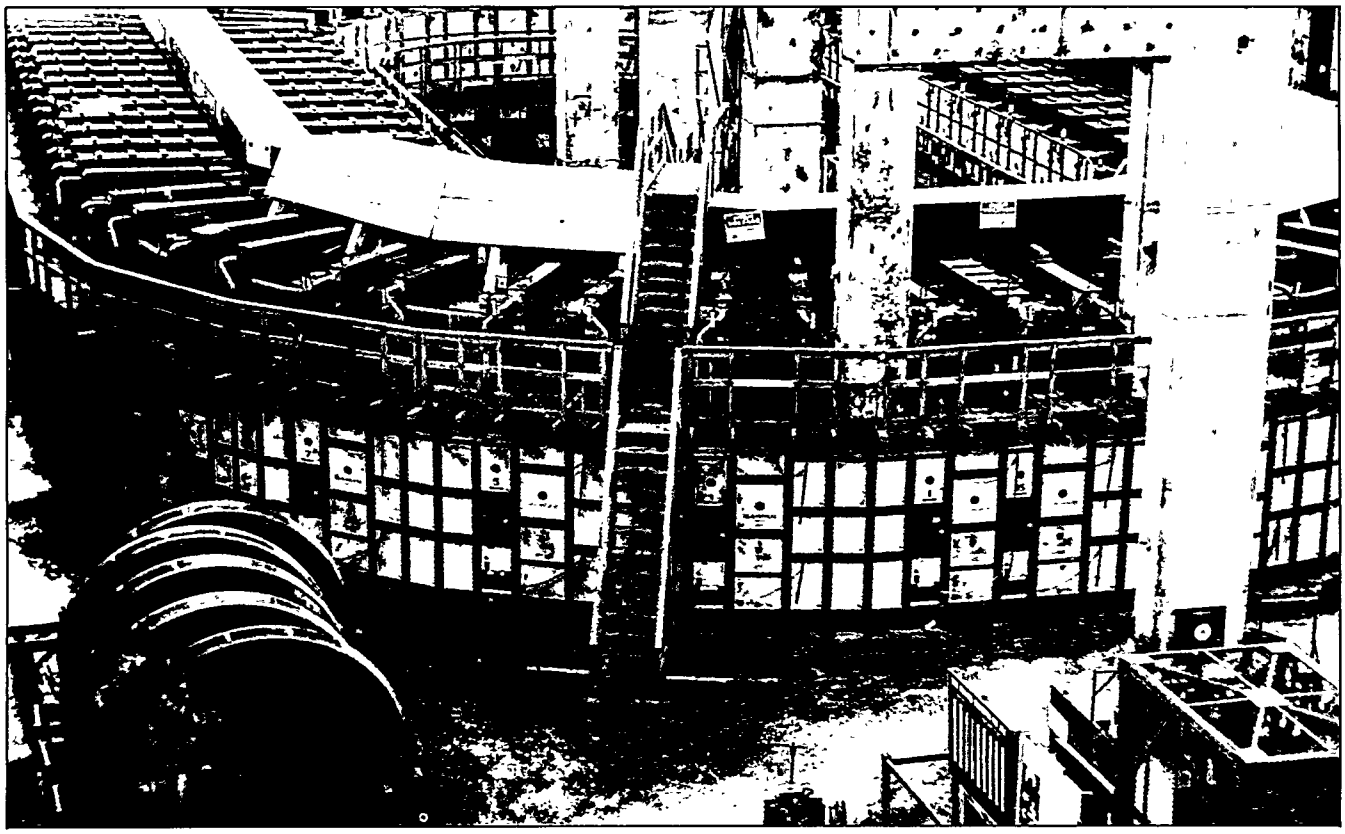
of two magnets with forty-eight gaps containing two vacuum tanks each per building, with ten buildings being necessary to provide the 2,000 sources and collectors needed to separate 100 grams of uranium-235 daily. It was hoped that improvements in calutron design, or placing multiple sources and collectors in each tank, might increase efficiency and reduce the number of tanks and buildings required, but experimental results were inconclusive even as Stone & Webster of Boston, the Y-12 contractor at Oak Ridge, prepared to break ground.

At a meeting of Groves, Lawrence, and John R. Lotz of Stone & Webster in Berkeley late in December 1942, Y-12 plans took shape. It was agreed that Stone & Webster would take over design and construction of a 500-tank facility, while Lawrence's laboratory would play a supporting role by supplying experimental data. By the time another summit conference on Y-12 took place in Berkeley on January 13 and 14, Groves had persuaded the Tennessee Eastman Corporation to sign on as plant operator and arranged for various parts of the electromagnetic equipment to be manufactured by the Westinghouse Electric and Manufacturing Company, the Allis-Chalmers Manufacturing Company, and the Chapman Valve Manufacturing Company. General Electric agreed to provide electrical equipment.

On January 14, after a day of presentations and a demonstration of the experimental tanks in the cyclotron building, Groves stunned the Y-12 contractors by insisting that the first racetrack of ninety-six tanks be in operation by July 1 and that 500 tanks be delivered by year's end. Given that each racetrack was 122 feet long, 77 feet wide and 15 feet high; that the completed plant was to be the size of three two-story buildings; that tank design was still in flux; and that chemical extraction facilities also would have to be built, Groves's demands were little less than shocking. Nonetheless, Groves maintained that his schedule could be met.[30]

For the next two months Lawrence, the contractors, and the Army negotiated over the final design. While all involved could see possible improvements, there simply was not enough time to incorporate every suggested modification. Y-12 design was finalized at a March 17 meeting in Boston, with one major modification—the inclusion of a second stage



Y-12 Alpha Racetrack at Clinton. Spare Magnets in Left Foreground. Reprinted from Richard G. Hewlett and Oscar E. Anderson, Jr., *The New World, 1939-1946,* Volume I of *A History of the United States Atomic Energy Commission* (University Park: Pennsylvania State University Press, 1962).