

Part IV:

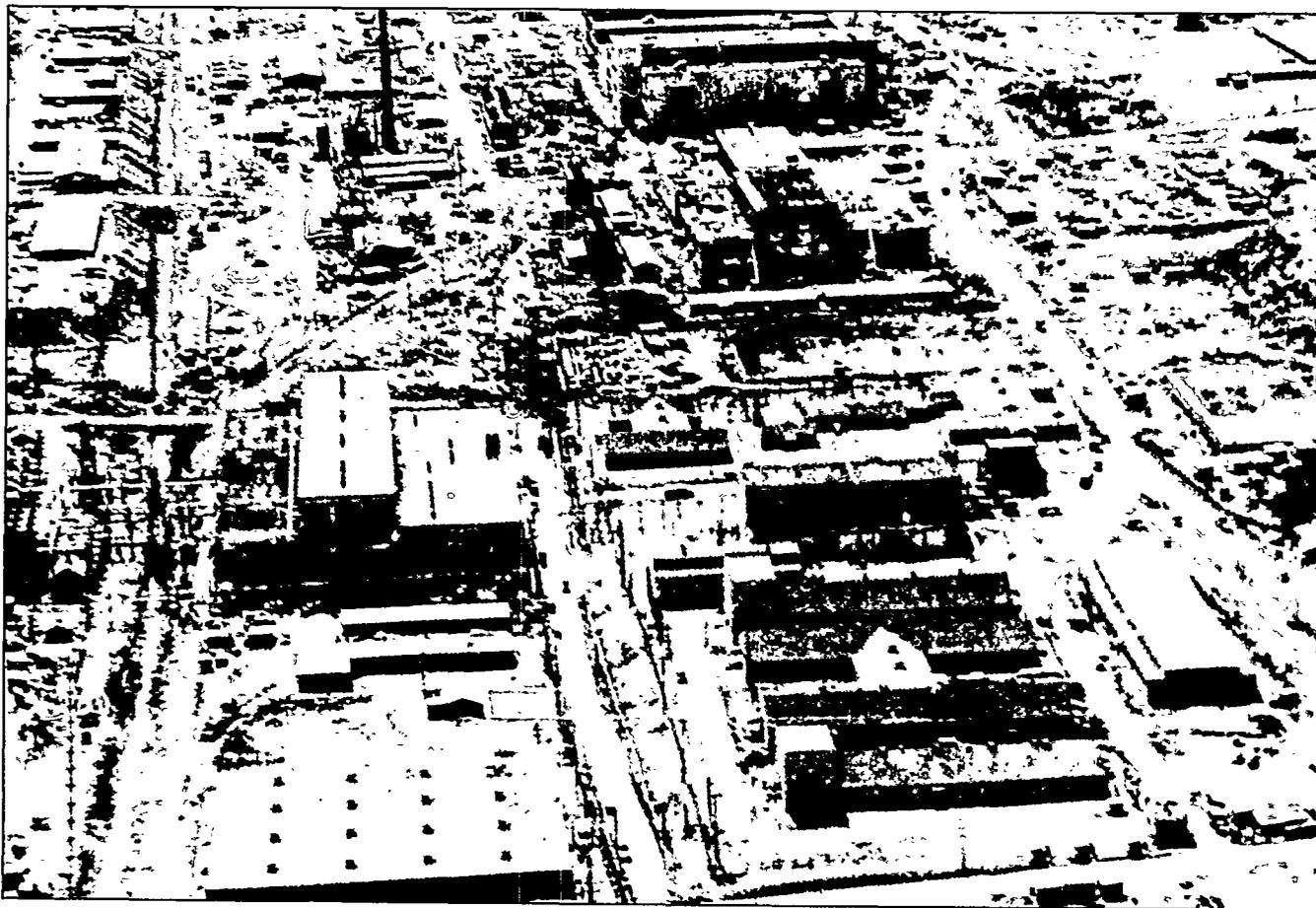
of the electromagnetic process. The purpose of this second stage was to take the enriched uranium-235 derived from several runs of the first stage and use it as the sole feed material for a second stage of racetracks containing tanks approximately half the size of those in the first. Groves approved this arrangement and work began on both the Alpha (first-stage) and Beta (second-stage) tracks.

Construction of Y-12

Groundbreaking for the Alpha plant took place on February 18, 1943. Soon blueprints could not be produced fast enough to keep up with construction as Stone & Webster labored to meet Groves's deadline. The Beta facility was actually begun before formal authorization. While laborers were aggressively recruited, there was always a shortage of workers skilled enough to perform jobs according to the rigid specifications. (A further complication was that some tasks could be performed only by workers

with special clearances). Huge amounts of material had to be obtained (38 million board feet of lumber, for instance), and the magnets needed so much copper for windings that the Army had to borrow almost 15,000 tons of silver bullion from the United States Treasury to fabricate into strips and wind on to coils as a substitute for copper.³¹ Treasury silver was also used to manufacture the busbars that ran around the top of the racetracks.

Replacing copper with silver solved the immediate problem of the magnets and busbars, but persistent shortages of electronic tubes, generators, regulators, and other equipment plagued the electromagnetic project and posed the most serious threat to Groves's deadline. Furthermore, last-minute design changes continued to frustrate equipment manufacturers. Nonetheless, when Lawrence toured with Y-12 contractors in May 1943, he was impressed by the scale of operations. Lawrence returned to Berkeley rededicated to the "awful job" of finishing the racetracks on time.³²



Y-12 Electromagnetic Plant Under Construction at Clinton. 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).