Robert S. "Stan" Norris, author of *Racing for the Bomb*, has graciously agreed for us to publish his lecture created for the 2020 Secret City Festival. When he was unable work the event into his schedule or even to travel because of the COVID-19 crisis, he sent the content of his prepared lecture for us to use. What follows is part one of the content of his lecture.

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### Choosing the site

Colonel Leslie Richard Groves was chosen to head the Manhattan Project on September 17, 1942. Two days later he ordered the purchase of 56,200 acres along the Clinch River in the hills of eastern Tennessee as the site for the uranium enrichment and plutonium factories.

I had always wondered how he could have made such a decision in so little time. In doing the research for my book (*Racing for the Bomb*) I discovered that Groves was not the first head of the Manhattan Project and that what came to be known as Site X and later Oak Ridge, and was initially known as the Clinton Engineer Works, had been under consideration as a site for at least four months.

When Vannevar Bush, FDR's science adviser, decided to hide the bomb project within the vast Army budget in early December 1941 it took some time for Chief of Staff General George C. Marshall and Secretary of War Henry L. Stimson to assign an officer to head the project. The task fell to officers of the Corps of Engineers and Col. James C. Marshall was selected on June 18, 1942.

Marshall, a West Point graduate (a class ahead of Groves) and a competent engineer was the Syracuse District Engineer at the time. He requested as his assistant a Lt. Col. Kenneth D. Nichols a figure who will play a prominent role in Oak Ridge's history. From the very first day James Marshall got the job he reported to Colonel Groves who at the time was deputy chief of construction for the Corps of Engineers.

So, for three months prior to getting the job himself Groves was aware of what Marshall was doing or not doing. High on James Marshall's list was whether to seize and purchase the Tennessee site. But even prior to Marshall's selection in June the Clinch River site was being considered.

Arthur H. Compton was mainly responsible for this. Compton, a Nobel Prize winner, was the head of a group of scientists based at the University of Chicago who were investigating enrichment technologies and plutonium production. The Tennessee site was first investigated in April 1942 and, as Compton recounts in his 1956 book *Atomic Quest*, he and several of his Chicago colleagues visited Tennessee in early May of 1942.

Clinch River was not the only site in East Tennessee or the only site under consideration. Compton informs us that his preference was in the Indiana dunes close to the shores of Lake Michigan. But by May Compton and the others had decided that, what came to be known as Oak Ridge, was the preferred site.

It was near the TVA for electricity, it was isolated yet near a labor pool in Knoxville, there was a source of water, there was rugged terrain, with hills and valleys that would isolate damage in the case of an explosion, and there was a mild climate to permit winter construction. A contractor was also under consideration mainly at the recommendation of Groves. Groves had used the Boston firm Stone & Webster on many army construction projects during the mobilization period and he urged Marshall to sign them up.

Throughout the summer of 1942 Vannevar Bush and his colleagues were becoming increasingly dissatisfied with Marshall's indecision and slow pace. If the bomb had a chance of being built and

playing a role in the war then things would have to move faster, much faster. Pressure by Vannevar Bush and James Conant was put on George Marshall, on Stimson and on the ranking officers of the Corps of Engineers to find a replacement.

Specifically, it was Lieutenant General Brehon B. Somervell (head of Army Service Forces) and Major General Wilhelm D. Styer (Somervell's Chief of Staff) that chose Colonel Leslie R. Groves on or about September 16th. Groves was informed by Somervell of his new assignment on the morning of September 17, in the hallway of what is now the Cannon House Office Building after testifying before the Military Affairs Committee. Groves was not pleased with the news.

Apparently, he had just been offered a position overseas where the war was going to be fought and where combat engineers were going to be needed. It was not to be.

While Oak Ridge had long been the top choice there was considerable difference over how much land should be seized. Compton mentions that he envisaged a site of two or three square miles, around 2,000 acres. After Groves assessed the situation, he decided that eighty square miles or more than 50,000 acres would be better.

### Building the atomic factories

Let us take a quick tour of Groves' involvement in the building of the major facilities at Oak Ridge. One of Groves' early decisions was to split the sites for uranium enrichment and plutonium production. The latter would go to Hanford, Washington, another piece of real estate, about ten times as large as Oak Ridge that was chosen by Groves. But it was decided to keep a small reactor at Oak Ridge to produce minute amounts of plutonium for experimental purposes. This would be X-10.

**X-10:** X-10 and the reprocessing facility that went with it were used by the Chicago and Du Pont scientists to help answer questions about the Hanford project and to supply plutonium samples to Los Alamos. Ground was broken in February 1943 and the air-cooled pile went critical nine months later on November 4, producing plutonium by the end of the month.

**Y-12:** Groves chose Stone & Webster to design and build the Y-12 electromagnetic isotope separation plant. The process was based on the ideas and concepts of Nobel Prize winner Ernest O. Lawrence and his Berkeley team. Groves had built Ordnance Works with Stone & Webster during the mobilization period and knew the president John Lotz and the chief engineer, August (Gus) Klein well.

To operate Y-12 Groves selected Tennessee Eastman. Groves knew its President James C. White and convinced him to take the job, though neither the purpose nor the location were discussed. If General Groves walked into your office and wanted something it was virtually impossible to say no.

One example of this was Groves' solution to the priorities problem. Groves had just spent the previous two years grappling with the priority system whereby resources (steel, copper, and dozens of other items) were allocated to projects on a graduated scale, with AAA the highest. The competition for resources was fierce and success or failure often depended on what rating your project received.

On September 19, the same day he bought Oak Ridge, Groves marched into Donald Nelson's office at the War Production Board with a letter in hand, to himself, only lacking Nelson's signature. The letter said that Director Nelson agreed to provide a AAA rating (or any lesser rating that Groves determined) to the Manhattan District. Nelson of course knew nothing about the Manhattan Project, had never laid eyes on Groves, and initially refused to sign.

At this point Groves applied a hammerlock on Nelson and told him he would recommend to Secretary Stimson that the Project be abandoned on the grounds that the Director of the War Production Board refused to carry out the wishes of President Roosevelt. At this point Nelson demanded to sign and there were no further problems concerning priorities for the remainder of the war. As I said, if General Groves walked into your office and wanted something it was virtually impossible to say no. He was a bureaucratic warrior of the first rank.

As for Tennessee Eastman, Groves and the Corps had just built the nearby Holston Ordnance Works to produce RDX, a more powerful explosive than TNT. I argue in the book, *Racing for the Bomb,* that the way that Groves went about building Holston would be a model for the Manhattan Project.

Other companies that were involved in Y-12 were Allis-Chalmers, General Electric and Westinghouse, all firms Groves had worked with before. Ground was broken on February 18, 1943 (for Building 9201-1, ground breaking for the entire site was on February 1, 1943 - Ray) and by early 1945 the first amounts of weapon-grade uranium were shipped to Los Alamos.

The complex eventually comprised some two hundred buildings spread over 825 acres with 22,500 employees. The cost to build and operate Y-12 during the Manhattan years was \$477 million, which is approximately \$10 billion in today's dollars.

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Thank you, Stan Norris, for such an insightful and concise document describing General Groves and his selection of Site X, Clinton Engineer Works or Oak Ridge. Next Stan will address the K-25 site.



Robert S. "Stan" Norris, author of Racing for the Bomb



General Leslie Groves who led the Manhattan Project



A view of the Y-12 electromagnetic separation plant during the Manhattan Project