

# From Cotton to Gunpowder

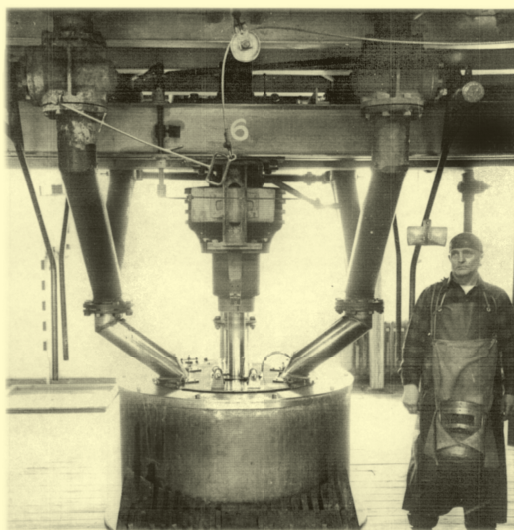
A large part of the Badger facility's operations was devoted to the production of smokeless powder. The starting product was cellulose, either in the form of cotton or wood pulp. This raw material was thoroughly cleaned and subjected to immersion in a nitric acid solution. The "nitrated" cellulose was sent via pipes to a centrifugal device that spun the cellulose, wringing out any excess acid which was reclaimed and sent back to the beginning, ready to be used on a new batch. The individuals operating the wringing machine had to be completely clothed in acid-resistant apparel. After wringing, the cellulose mixture was repeatedly heated (boiled), and washed off with vast quantities of water. The next step was removing the moisture from the material, after which it was cut into blocks and mixed with various chemicals, DNT—dinitrotoluene—being one of them. The nitrocellulose product, now in a semi-solid colloidal form, was sent through a number of other cutting, shaping, threading, and tumbling processes whereupon it ended up in the form of a highly refined smokeless powder.



Stainless Steel Holding Tanks- Photo from UW-Madison's CAE Website: [homepages.cae.wisc.edu/.../nov00/ammunition.html](http://homepages.cae.wisc.edu/.../nov00/ammunition.html)

## Nothing but the Highest Quality

The process of producing the smokeless powder for use as rocket or ammunition propellant was a painstaking process that including many redundant steps, to ensure the proper refinement. The goal of ultimate consistency was not taken lightly here, as every grain of powder had to be exactly the same. The attention to detail at home paid off on the warfront. American artillery was much feared by the Axis powers for its deadly accuracy and consistent detonation, due in large part to the efforts and quality control of workers in the ordnance facilities.



The worker in this photograph is wearing protective clothing which shielded him from the nitric acid, and various chemicals employed in the processing, and refinement of the propellant.

For more information, see *Powder, People and Place: Badger Ordnance Works and the Sauk Prairie* by Michael J. Goc

## The Ordnance Works on the Prairie: A short history



Citizens for Safe Water Around Badger

The Badger Army Ammunition Plant (BAAP), commonly referred to as the "Badger Ordnance Works" at the time of its construction, and early years of operation, imposed a dominating presence upon the Baraboo/Sauk City region. The plant, after operating throughout WWII, the Korean War, and the Vietnam War, is now in the process of being decommissioned/dismantled. The facility left a striking mark upon the landscape and people of the region during its 40 year operation, and many questions and conflicts arise in the wake of its passing.

# Origins of the Badger Army Ammunition Plant

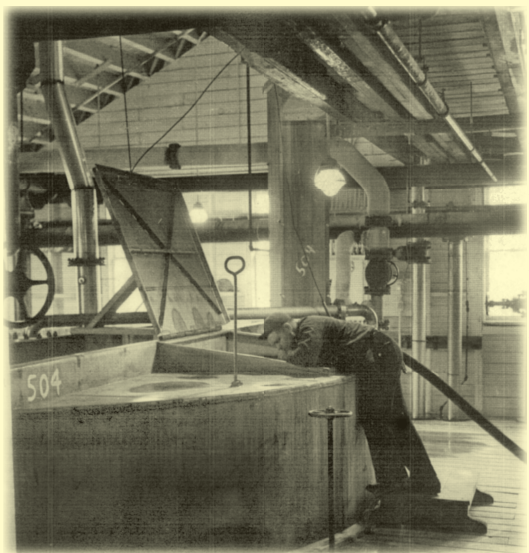
**C**hanges in the philosophy and doctrine of the War Department on the eve of WWII, and the potential threat of long-range Axis bombers, mandated a systematic shift of ordnance works and ammunition plants, from coastal areas to locations farther inland.

The Sauk Prairie is located at the southern base of the Baraboo Hills and bordered on the east and west by the Wisconsin River/Lake Wisconsin and U.S. Highway 12. This location was suitable for the War Department's new breed of ordnance works, which required a reliable source of water as well as an abundant labor pool.

The rail industry in Wisconsin was interested in reclaiming some of the Baraboo/Sauk City/Prairie du Sac regional market, which had faced decline following the greater reliance on truck transport. Bud Williams, President of Chicago and Northwestern, reportedly sought the assistance of Leo T. Crowley, an individual who had some pull in

Washington, D.C. in influencing the Army and War Departments' decision on the location of the new ordnance works. Business interests in the region also weighed in, as the economic prospects of having such a facility in the area proved tantalizing.

The result was the construction of a massive ordnance works on the Sauk Prairie, at the expense of approximately 80 farms and the families that depended upon them for their livelihood; their plight did not go completely unheeded, as strong arguments were made for alternative locations for the plant, including sites that were similar in certain attributes, but did not comprise of prime agricultural land. In the end, most likely because of the powerful business/political interests involved, the farm families were evicted (rather abruptly), and the area was prepared to receive massive planning and construction teams.



*A worker in one of the Badger Ordnance Works' facilities appears to be inspecting equipment likely used in the propellant production and refinement process*

# Construction of the Ordnance Works

**A**n "ordnance works" is distinguished from an "ammunition plant", by virtue of its function. An ordnance works manufactures the propellant (in Badger's case, ball powder), and performs reliability and performance tests, producing a form that can be utilized by ammunition plants where the actual assembly of bullets, rockets, and other armaments takes place.

In order to accommodate the production of volatile propellant, army engineers planned and constructed the plant according to strict measures of safety and practicality. Structures were spaced apart from one another, and reinforced with thick earthen sidewalls to ensure isolation of any potential explosion or fire. Ramps and chutes jutted out from the buildings, providing a hasty exit, in case things took a turn for the worst. A vast infrastructure of pipes was constructed for the purpose of conveying water, and any number of chemicals and acids that were needed for the production of the propellant.

# Running the Facility

**T**he ordnance works would be managed by a frequently rotating ensemble of military commanders beginning with Lt. Colonel George F. Griffith in January 1942, as well as a series of "resident managers." The plant's facilities produced propellant in the form of smokeless powder and rocket propellant, adding Ball powder to the line during the Korean War; Ball Powder was the essential propellant for use in 30 caliber and 7.62 mm ammunition in Korea and Vietnam, respectively.



*Citizens for Safe Water Around Badger*

*State Historical Society of Wisconsin*