

## **Episode 108: Confederate Chemists**

**<http://civilwar150.longwood.edu>**

Waging war requires more than a will to fight, it also requires abundant material resources. When the Civil War began, the disparity between the industrial infrastructures of the North and South was obvious to everyone. No one gave too much thought to this difference in the fervor of the war's beginning when most expected a short conflict. But after the first Battle of Manassas, it became obvious that both sides needed to plan for a longer conflict.

At the beginning of the war, the South was almost totally devoid of heavy industry. Exacerbating the situation was that blockade runners were more interested in the high profits that could be had by bringing luxury items in for civilians than in risking their lives to bring in industrial materials. This meant that Southerners would have to create from scratch an industrial base sufficient to keep their armies going.

Much of what needed doing was related to chemistry, a science still in its infancy at the time of the Civil War. Many scientists of the time still believed that matter was continuous as strong evidence for the existence of atoms had not yet been revealed. Several chemists around the world were working on crude versions of the periodic table but only about half of our current known elements were known at that time. The creation and production of new compounds was largely based on trial and error rather than on knowledge of the physical principles involved.

One of the most important products of the emerging chemical industry during the civil war was sulfuric acid, still the most important industrial reagent today. Demand for and production of this chemical has long been a measure of a nation's industrial health. In the North, established companies like du Pont were ready to supply most of the Union's needs. Lacking the

industrial might of their opponents, Southerners were forced to rely on ingenuity. At the beginning of the war, only 130 tons of sulfur was in the south, having been purchased for Louisiana sugar refineries. This was woefully inadequate to supply Confederate needs. Sulfur was a key component of gunpowder in addition to being needed throughout many industrial processes. John W. Mallett, head chemist of the Confederate Ordnance Bureau, was able to overcome this situation by locating large amounts of iron pyrite, sometimes known as fool's gold, and roasting this mineral to obtain the necessary sulfur.

Mallett also made a huge contribution later in the war. The percussion caps used in Confederate rifles and muskets required fulminate of mercury, a compound very difficult to procure after the war started. Mallett was able to come up with two substitutes for this mercury compound, essentially single-handedly keeping Southern troops firing at the enemy.

Mallett's contributions were just part of a large and concerted effort by the Confederate Ordnance Bureau to keep the Confederate armies supplied with that armaments they needed to fight. Headed by Josiah Gorgas, the bureau found ways to provide metals, chemicals and gunpowder in sufficient quantities that the Southern armies rarely lost a battle for lack of fighting weapons. The efforts to produce the required amounts of gunpowder required extreme amounts of creativity and will be detailed in a latter episode of this podcast series.