

Behind the Scenes of the **ALLEGHENY ARSENAL EXPLOSION**

by Tom Powers and James Wudarczyk

At the outbreak of the Civil War, America's industries were concentrated in the northeast. Pittsburgh, blessed with the natural resources of coal, oil, and water, and crisscrossed by rails, was becoming the continent's premier manufacturing center.¹ Amidst this industrial might, and contributing its own output, was the Allegheny Arsenal three miles upriver from Pittsburgh in the growing village of Lawrenceville.

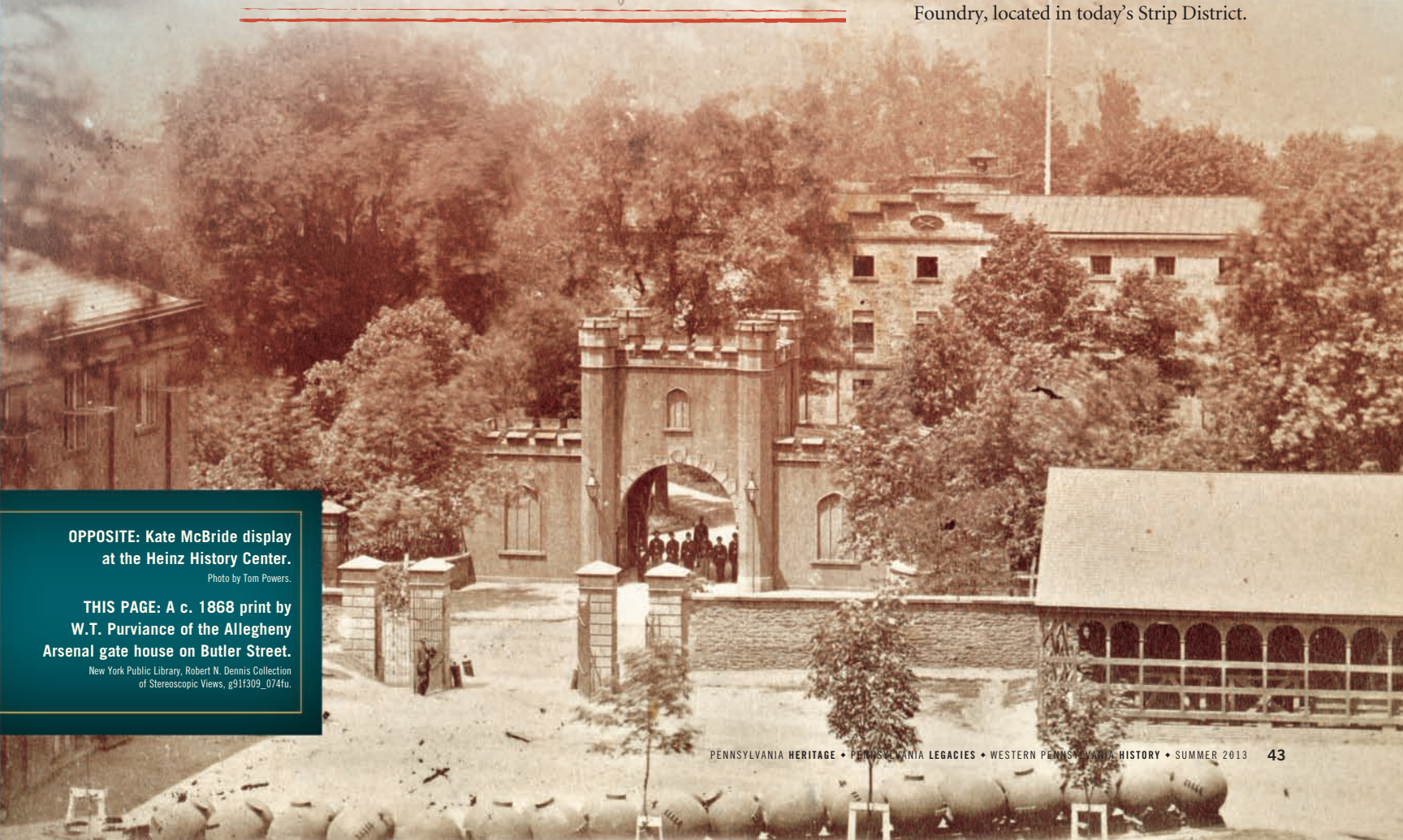
After construction of the Arsenal in 1814, manufacturers and suppliers multiplied in the area; by 1860, there were iron works to the west, oil refineries to the east, and a burgeoning tanning industry north across the Allegheny River along the cross-state Pennsylvania Canal. Lumber floating downriver from central Pennsylvania gave a steady supply of firewood for furnaces, not to mention bark for the tanneries. In the middle of the river, Herr's Island (now Washington's Landing) was a way station for livestock moving between Chicago and New York City, bringing animals for the tanneries and meat processors. This bounty of resources helped the Arsenal make ammunition of all types and sizes, and leather accoutrements for horse-driven vehicles. The Arsenal also stored artillery and contributed to technological advancements, most notably, experiments in casting techniques for large cannon by Major Thomas Rodman.² It was certainly advantageous for the Arsenal to be just two miles downriver from Fort Pitt Foundry, located in today's Strip District.

OPPOSITE: Kate McBride display
at the Heinz History Center.

Photo by Tom Powers.

THIS PAGE: A c. 1868 print by
W.T. Purviance of the Allegheny
Arsenal gate house on Butler Street.

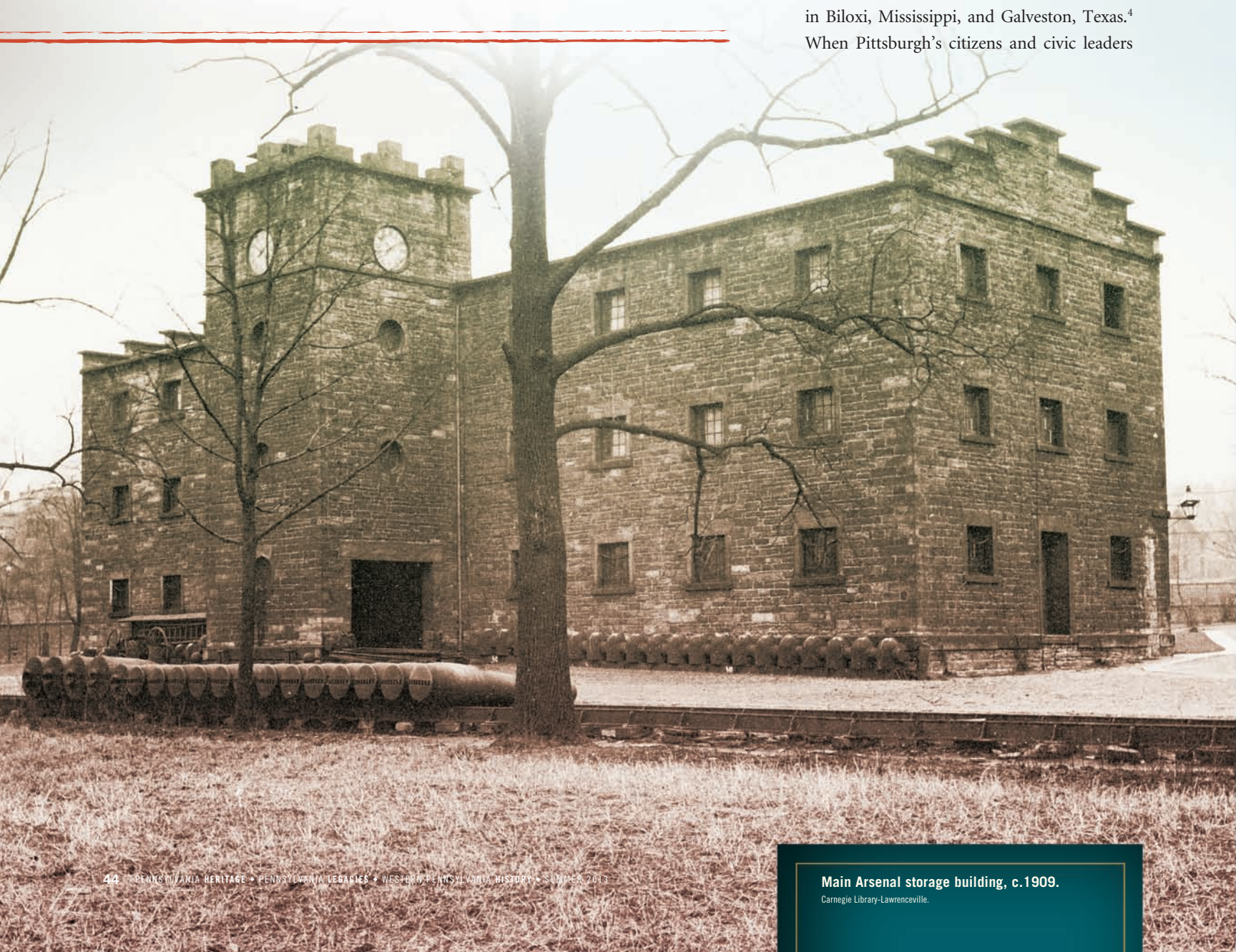
New York Public Library, Robert N. Dennis Collection
of Stereoscopic Views, g91f309_074fu.



On September 17, 1862, while the battlefield of Antietam was swallowing thousands of casualties from both sides of the bloody conflict, three disastrous explosions ripped through one of the Arsenal's laboratories where cartridges were being loaded, killing 78 persons, almost all of them teenage girls and women.

When tragedy struck the Arsenal in 1862, dozens were killed and the neighborhood was devastated, yet the citizens of Pittsburgh rallied to resume production of war materials for the Union Army. In the days and decades since, there has been no lack of theories and finger-pointing as to the cause and who was to blame. This study looks at the theories and explores which is the most likely scenario that sparked the largest loss of civilian lives during the Civil War.

By 1860, as sectional tensions flared, the Allegheny Arsenal was caught up in the escalation. That December,³ commander of the Arsenal, Major John Symington, received orders to ship 100 cannon to forts being built in Biloxi, Mississippi, and Galveston, Texas.⁴ When Pittsburgh's citizens and civic leaders



Main Arsenal storage building, c.1909.
Carnegie Library-Lawrenceville.

balked at the apparent collusion with Southern sympathizers, the order was rescinded.⁵ Though that shipment would certainly have been welcomed by the South, both sides would need far more ordnance than the amount involved in the controversial shipment once war broke out a few months later.

As the conflict escalated, the Arsenal struggled to meet munitions quotas. The recently promoted Colonel Symington also had personnel problems that would add to the disaster to come. He gave this account of the situation in an October 2, 1861, letter to his superior, General James W. Ripley:

Matches were discovered among the bundles of cartridges prepared to be packed, in one of the rooms. The strictest investigation failed to detect the offender. Stringent measures were then resorted to and the boys searched on going to work, and leaving, which still continues. The offense has, however, since repeated in the same room. And as the perpetrators could not be discovered, all the boys employed in the room, over twenty in number, were on each occasion, discharged, and have not been re-employed. It was hoped, as some two weeks passed since the last occurrence, that the malicious spirit has quelled, but yesterday, a similar attempt at mischief was discovered in the same room. That the offender did not belong to the room, is thus made evident and I have discharged all the boys at work in that portion of the laboratory, and will supply their places with females.⁶

A year later, the Arsenal employed approximately 950 workers to load cartridges and artillery shells, fill canisters with grapeshot, manufacture leather accouterments, and build gun carriages and caissons.⁷ Of those, 186 worked in the laboratory.⁸ The Borough of



1905 postcard of Arsenal Gate.

Collection of Tom Powers.

Lawrenceville (it would be annexed by the City of Pittsburgh in 1868) was a factory town, with rows of two- and three-story worker's houses within walking distance of the borough's "anchor" factory, the Allegheny Arsenal. In addition to the skilled jobs the Arsenal required, the many simple manual labor jobs it offered were ideal for untrained immigrants to get a start in this new country. Helping to augment the income of a skilled head of the household, it was not uncommon for several younger members from the same family to be employed at the Arsenal. This fact made the coming catastrophe all the more tragic.

On September 17, 1862, while the battlefield of Antietam was swallowing thousands of casualties from both sides of the bloody conflict, three disastrous explosions ripped through one of the Arsenal's laboratories where cartridges were being loaded, killing 78 persons, almost all of them teenage girls and women.⁹ Many of the Arsenal's employees

were of Scots-Irish descent and Gaelic names make up a large percentage of the explosion's casualty list.¹⁰ Also on that list are 11 pairings of surnames, attesting to the fact that many local families had multiple losses.

The most accepted theory is that a horse's hoof or the iron rim of a wagon wheel struck a hard stone that set off the deadly spark.¹¹ It could also be argued that a combination of negligence by the government, the workers, and Du Pont¹² (supplier of gunpowder to the Arsenal) all played some role in the deadly mishap. New investigation for this article allows us to piece together the likeliest chain of events. The isometric drawing on page 47 is based on information gleaned from the 1859 Ordnance Department Report.¹³ The illustration leaves off



the roof for clarity, especially since the report did not elaborate on the height of the roof or if it was peaked or flat, only that it was made of zinc. Given that most military buildings of the time had peaked roofs for air circulation, this was probably the case here.¹⁴

For the positioning of the rooms, we follow the drawing submitted by Arsenal laboratory superintendent Alexander McBride to the

Pittsburgh coroner's inquest into the explosion.¹⁵ McBride's original drawing is lost, but the September 20, 1862, issue of the *Pittsburgh Dispatch* reproduced it using the limited illustrating resources of letterpress movable type.¹⁶ Thus, the proportions of the buildings in the McBride plan do not quite match up with the dimensions given in the 1859 Ordnance Department Report.¹⁷ What the McBride plan gives us aside from a general footprint of the three structures involved are number and letter diagram key indications for the room descriptions and location of the first explosion. The isometric illustration uses McBride's diagram key to be consistent with the testimony given in both the Pittsburgh coroner's inquest and the U.S. Army inquest. All references in both investigations used McBride's key.

According to the 1859 secretary of war report, the L-shaped engine building (Room #13, #14, and #15) housed a force pump and boiler that provided heat to the main laboratory by two pipes containing steam. When the feed pipe entered the lab, the pipe was branched off into five pipes that radiated heat in each room in the building. This version of radiated heat predates the steam radiator still found in many buildings today.¹⁸ It is quite possible that the L-shaped engine house survived the explosion or was rebuilt. A similar footprint appears on an 1875 map¹⁹ and continues to appear on subsequent maps up until the 1914 property map.

There was no reference as to the exact dimensions of the shed "A" or the wardrobe "B." Both of those structures were probably built by Arsenal employees later from scratch, so for this illustration, their sizes are estimated. All structures shown were built of wood frame. The porches on both the laboratory and engine house were approximately three feet off the ground and had roofs.²⁰

The following timeline, keyed to the drawing, is based on testimony from the two trials and McBride's diagram key. The times are approximate.

2:00 p.m. — Joseph Frick is shown in his wagon on his way back from delivering ten 100-pound barrels of gunpowder. Three were first dropped off at Room #1. Next, five barrels were placed on the porch near Room #12, and the last two barrels were each placed by the L-shaped building at the entrances of Rooms #13 and #14.

Upon returning to Room #1, there is a strong possibility that a spark generated from Frick's front right, iron-rimmed wagon wheel or from one of his horse's iron shoes created a blaze from spilled gunpowder on the stone roadway. That would have transmitted to the porch and ignited the three barrels he had delivered earlier. At Room #1, attendant Robert Smith was killed instantly. Frick was blown from his wagon but survived; one of his two horses was badly burned.²¹

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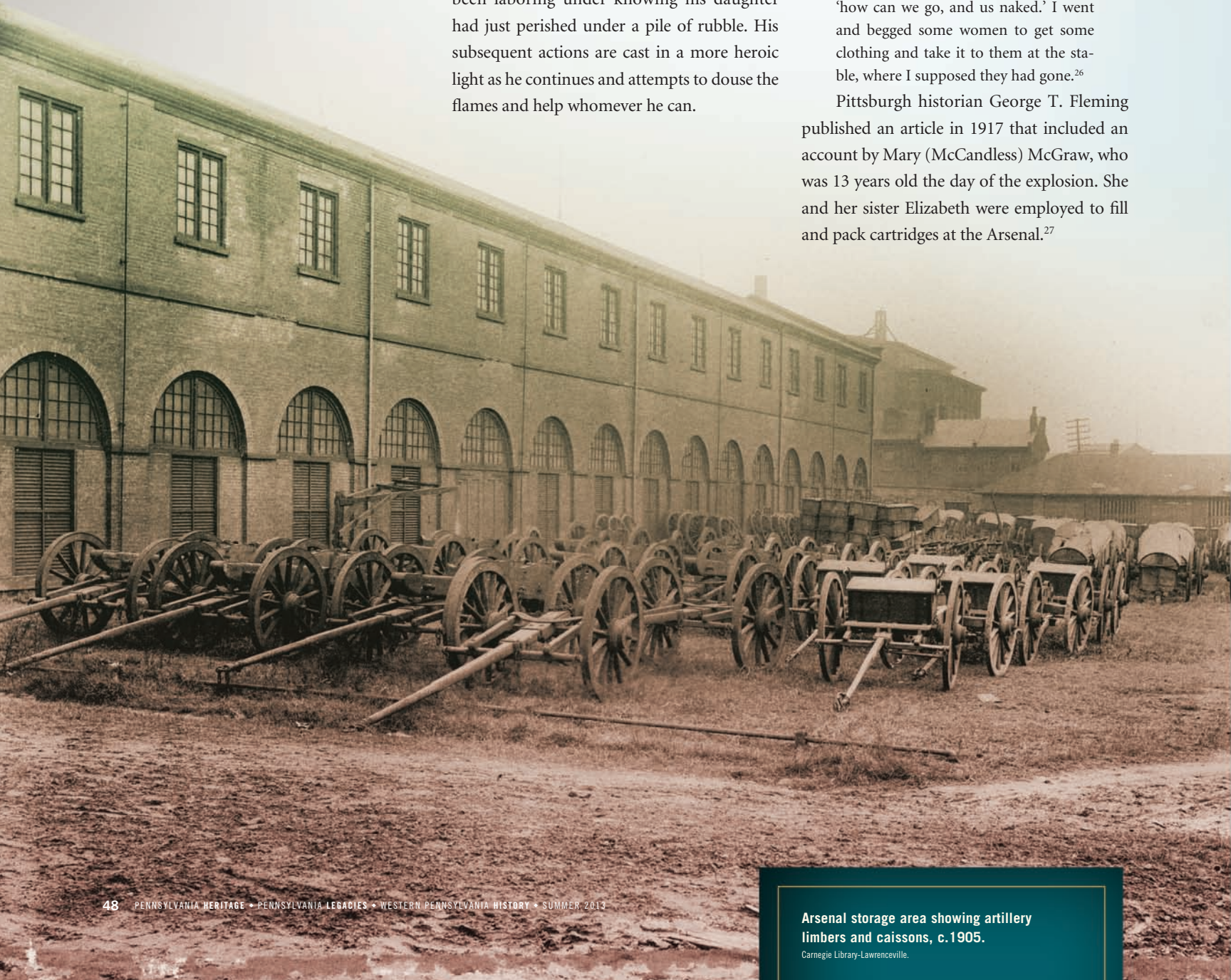
Superintendent McBride, who was in his office in Room #8 during the first explosion, performed heroically despite knowing his own daughter Kate had surely perished when the roof collapsed on Room #6. From his account given in the *Pittsburgh Daily Post* during the Pittsburgh coroner's inquest, McBride states that at the start, "I heard a noise apparently on the porch, and rose to ascertain the cause; I heard a scream a half minute afterwards; looking in the direction of the sound, I noticed the wall falling towards me into the room."²⁴ He continued:

I got on to the window at the end of the room; fell out, and having got out of the dust or flame, returned along the side of the laboratory to room #6, to seek my daughter; got on to the porch and met Joseph E. Bollman with a girl on his arm coming out. At the same time, I saw the ceiling of room #6, falling on the floor where the children were. The flames and dust forced me back. Mr. Bollman let down the child he had upon the porch, and near the fence I saw a girl bewildered, with her clothes burnt off.²⁵

What Superintendent McBride does not reveal in his matter-of-fact account at the inquest are the emotions he would have been laboring under knowing his daughter had just perished under a pile of rubble. His subsequent actions are cast in a more heroic light as he continues and attempts to douse the flames and help whomever he can.

I returned on to the porch, entered room #12 for a bucket, which was always there, but found no water in it. I saw Mr. Geary in room #14, and tried to get the windows and doors of #13 and #14 closed. I succeeded partly, and then went down to the pond with the bucket to get water, hardly knowing for what I wanted it. I got the water and returned through the fence. I met another girl in the same condition as the other, and threw the bucket of water upon her. I passed around a shanty near the pond where we kept empty boxes, and found Annie Shook and Annie Sibley, with their clothes burned, trying to crawl through the fence.... One of them said, 'how can we go, and us naked.' I went and begged some women to get some clothing and take it to them at the stable, where I supposed they had gone.²⁶

Pittsburgh historian George T. Fleming published an article in 1917 that included an account by Mary (McCandless) McGraw, who was 13 years old the day of the explosion. She and her sister Elizabeth were employed to fill and pack cartridges at the Arsenal.²⁷



There was a great hurry for ammunition on account of the battle of Antietam, then being fought, and orders from Washington were to rush ammunition with all possible speed to the front.

My sister and I walked to work from our home at Penn Avenue and Seventeenth Street that morning as usual. It was payday. I was a bundler in Room 13. The morning passed quickly. We did not stop for lunch at 12 o'clock on account of the rush. This proved a lucky circumstance. We were permitted to go to lunch at 1 o'clock and before returning to work were paid our wages. This deviation from the usual routine and the fact that it was payday saved many lives.

At 2 o'clock another girl and I were the only persons in Room 13. The other girls were in another building getting their pay and in the yard. Suddenly there was a terrific roar; the earth seemed to

split apart. The girl with me jumped through a window and I followed her, alighting on top of her in some grass behind the building. I lifted her to her feet and we started to run towards Butler Street. As we ran, there was a second explosion, and before we reached the street a third one.

Looking around we saw the building we had just left being torn to pieces. My sister escaped in some manner. She has never been able to tell just how. I was a nervous wreck for several weeks and so terribly shocked that night that I had to be held in bed by force.²⁸

The first explosion wrecked the laboratory; the second and third explosions wrecked the packing and shipping building. Forty-five of the dead could never be recognized, their bodies having been so terribly mutilated and burned.

Investigating the Tragedy

The first investigation into the incident was conducted by Coroner John McClung, who impaneled a jury on the very evening of the explosion. At nine o'clock the following morning, the jury assembled in the Lawrenceville borough council chamber, where they took testimony.²⁹ Witness Rachel Dunlap, who was taking a break on the porch of Room #12 when the gunpowder was sparked, confirmed wagon driver Joseph Frick's testimony that a flame shot up from between the wagon wheel and his one horse's rear hoof. Her position was such that she was the only person aside from the unfortunate Mr. Smith who could have witnessed the ignition.³⁰

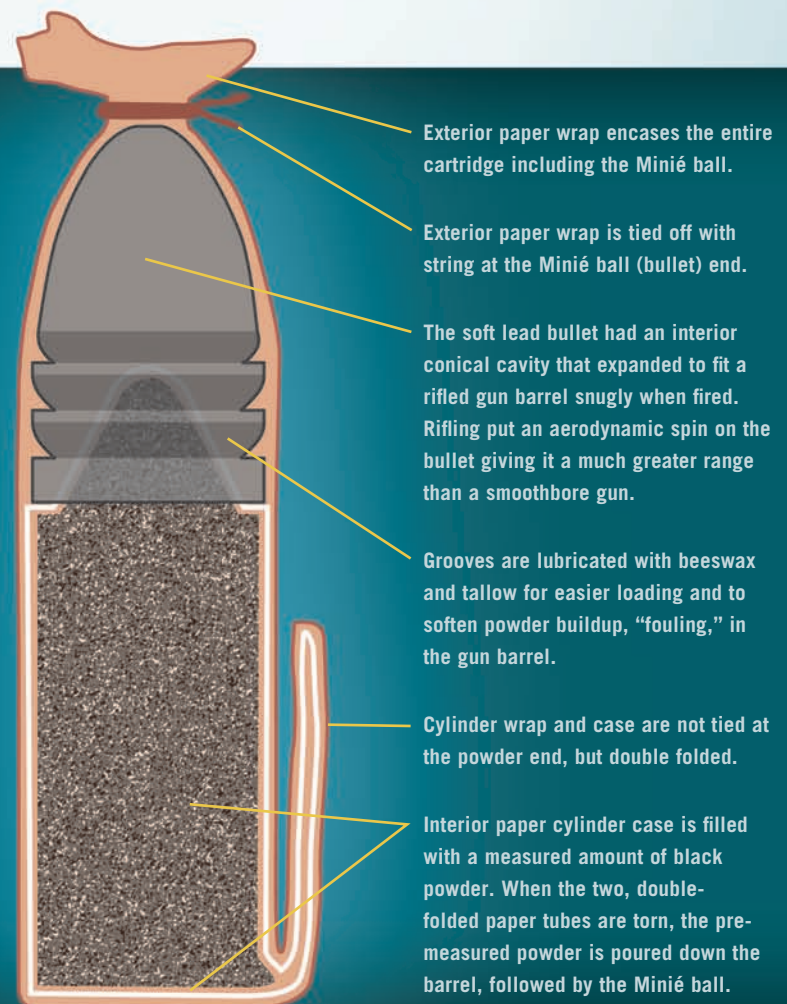
The Cartridge

Although brass-jacketed bullets were invented in 1808 and refined in the 1830s, the technology had not advanced by the Civil War to mass-produce the bullets or the weapons that used them. Civil War soldiers were more familiar with a cartridge that had a pre-measured powder charge of gunpowder and a Minié ball bullet wrapped in paper. It was this kind of cartridge that was assembled by hand at the Allegheny Arsenal. By the end of 1861, the Allegheny Arsenal had produced almost 10 million small arms cartridges.¹ Each cartridge was hand-packed with black powder and wrapped in paper, leaving a residue of black powder all over the buildings and grounds. The Arsenal explosion of September 17, 1862, in hindsight, seems inevitable. It was not until after the Civil War that breech-loading metallic cartridges became the norm.

¹ Dean Thomas, *From Round Ball to Rim Fire* (Gettysburg: Thomas Publications, 1997), 41.

Illustration of the makeup of a Minié ball cartridge.

Image by Tom Powers.





Furthermore, the majority believed the explosion to be caused by neglect on the part of Colonel John Symington, Lieutenants J. R. Edie and Jasper Myers, and the gross neglect of laboratory superintendent Alexander McBride and his assistant James Thorp.

Although the government posted safety rules, there is evidence that these standards were not adequately enforced. For example, Elias McClure, employed in the laboratory ammunition rooms, testified that Superintendent McBride preferred the gunpowder that spilled on the floor be gathered up and not swept out onto the roadway, but he never enforced that rule.³¹

As to the condition of the roadway, witness William Baxter testified, "I have quarried a good deal of stone. The stone on the roadway at the Arsenal grounds was as

dangerous for striking fire as any I know. It was a hard bastard stone, with a good deal of iron, taken out of the same quarry out of which I have worked."³²

At the conclusion of the inquest, the split jury resolved that the accumulation of vast quantities of gunpowder and other explosive materials in and near the United States magazine buildings as a great public wrong, unwarranted by any exigency of the service and fraught with imminent peril to the whole community. Furthermore, the majority believed the explosion to be caused

by neglect on the part of Colonel John Symington, Lieutenants J. R. Edie and Jasper Myers, and the gross neglect of laboratory superintendent Alexander McBride and his assistant James Thorp.³³

John W. Riddle, foreman of the coroner's jury, and James B. Hill were of another opinion on the matter. They wrote, "From so much of the foregoing finding as imputes negligence to Colonel Symington and Lieutenants Myers and Edie, we utterly and entirely dissent. The testimony, in our judgment, clearly discloses that the sad disaster is to be attributed to a disregard by the Superintendents of the wholesome and stringent orders of Colonel Symington, and we are unable to find anything in the evidence criminating either of his Lieutenants."³⁴

John Symington, a military officer, did not have to cooperate with a civilian inquest. But being eager to discover the cause of the great tragedy, he willingly agreed to assist and made his staff available for the proceedings.

The colonel was livid when he heard the findings of the coroner's inquest and immediately called for a military inquest.³⁵ Beginning October 15, 1862, and after extensive examination and testimony, its tribunal ruled that Symington had not acted improperly and no blame for the disaster could be laid upon him.³⁶ The tribunal concluded that "the cause of the explosion could not be satisfactorily ascertained, but that possibly it may have been produced by the young man Smith, (deceased) having jumped upon the

powder barrels which may have had powder dust upon the heads.”³⁷

By trying to place the blame on the deceased Mr. Smith, the tribunal discounted the testimony of wagon driver Frick (consistent with his testimony at the coroner’s inquest) and never called his corroborating witness, Rachel Dunlap. Colonel Symington, who acted as the court’s prosecutor, made a serious effort to discount Frick’s testimony, especially in calling witnesses to defame his character.³⁸

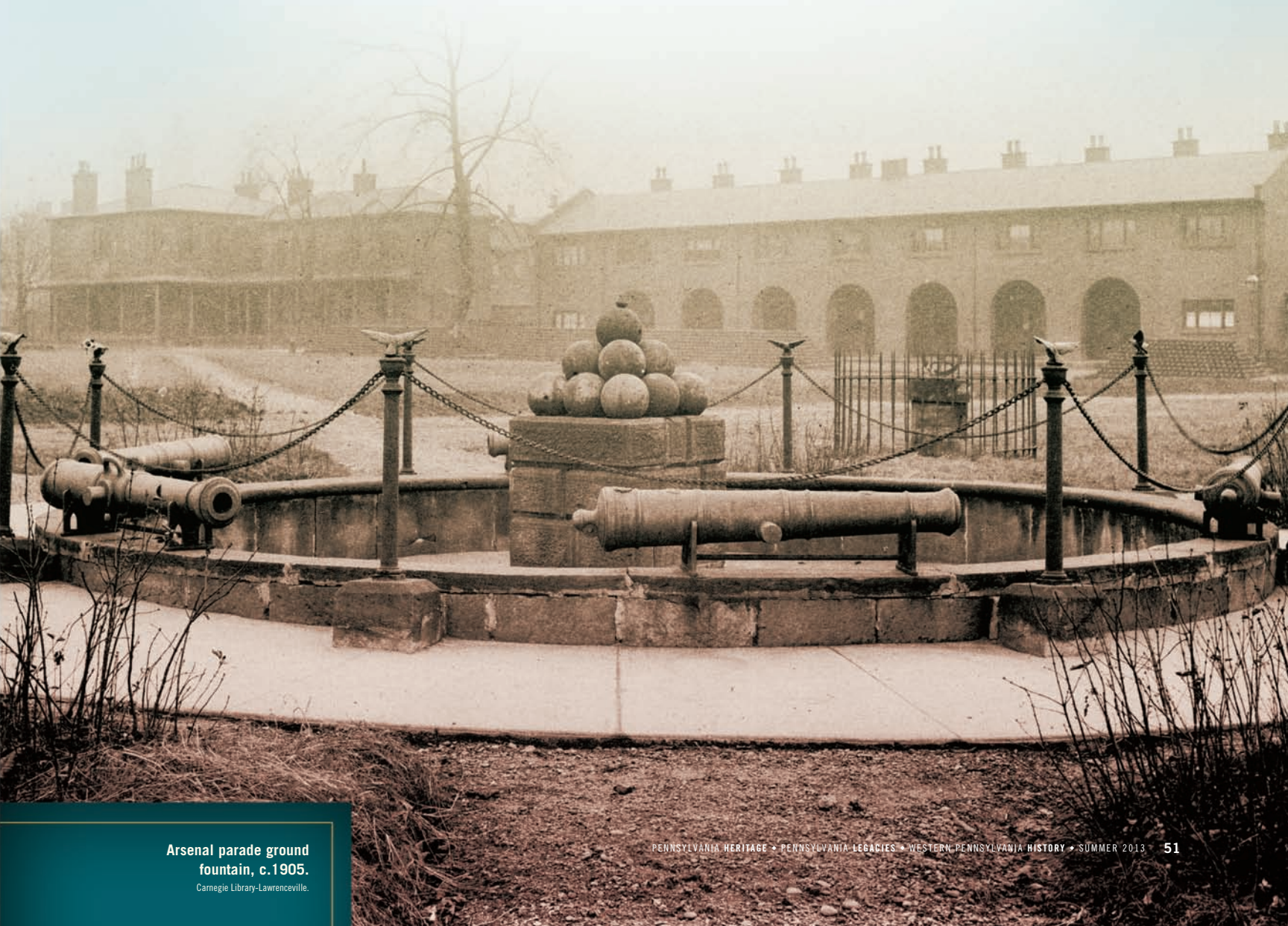
Additional information came from the colonel’s testimony at the Pittsburgh coroner’s investigation about the Du Pont Company, which required the recycling of empty barrels.³⁹ Superintendent Alexander McBride had previously reported on leaky barrels with loose lids that had resulted

from reusing them.⁴⁰ The testimony of both Symington and McBride seems to imply that defective barrels could have accounted for powder being shaken onto the roadway while in transit, thus making the road a fuse for the explosion. No further investigation was made, perhaps because Du Pont was the largest manufacturer of gunpowder for the Union, or simply because the military wanted to close the books on the tragedy so it could resume wartime production.

It is worth noting that this was not the only such explosion during the war. Du Pont suffered 11 separate blasts at its plant in Wilmington, Delaware, killing 43 men.⁴¹ At the Confederate States Laboratory in Richmond, Virginia, 31 women and two men were killed

on March 13, 1863.⁴² And 21 women were killed at the Washington, D.C., arsenal on June 17, 1864.⁴³

In the aftermath of the explosion, it is evident in a letter from Symington’s replacement, Major Robert H. K. Whiteley, that he worried about further incidents: “The capacity of two presses at this Arsenal is to produce 40,000 bullets per diem ... which is about one-fourth of the quantity consumed daily.” But he warned, “The manufacture of small arm cartridges must stop for want of storeroom shortly unless relieved by issue. I have eight million at this moment stored in a leaky frame shed, by no means safe from accident by fire.”⁴⁴



**Arsenal parade ground
fountain, c.1905.**
Carnegie Library-Lawrenceville.

List of Those Killed in the Arsenal Explosion

This list of names of the explosion victims from Arthur Fox's book, *Pittsburgh During the American Civil War*¹ was compiled from local newspapers, notes from the John Carnprobst collection, notes from Jean Morris (The Western Pennsylvania Genealogical Society), and notes from James Wudarczyk.

¹ Arthur B. Fox, *Pittsburgh During the American Civil War 1860-1865* (Chicora, Pa.: Mechling Bookbindery, 2002), 121-123.

| | | | | |
|-----------------|---------------------|--------------------|--------------------|--------------------|
| Ager, Elizabeth | Burkhart, Catherine | Donnell, Sarah | Hanlon, Sidney | Mahrer, Adaline |
| Algeo, Mary | Clare, Bridget | Donnelly, Mary | Heeney, Mary | Manchester, Ellen |
| Amarine, Mary | Clowes, Emma | Douglas, Magdalene | Heslip, Hester | Markle, Elizabeth |
| Baxter, Hannah | Collins, Mary | Dripps, Mary | Jeffrey, Mary | Maxwell, Elizabeth |
| Bishop, Barbara | Colston, Melinda | Dugan, Catherine | Johnson, Mary | Maxwell, Sarah |
| Bollman, Joseph | Cranan, Mary | Fleming, Nancy | Jones, Annie | McAfee, Ella |
| Bollman, Mary | Davison, Agnes | Foley, Catherine | Kaler, Catherine | McBride, Kate |
| Brady, Rose | Davison, Mary | Fritchley, Susan | Kelley, Margaret | McCarthy, Maria |
| Brown, Ella | Dillon, Ann | George, Sarah | Laughlin, Uraiah | McCreight, Susan |
| Burke, Alice | Dillon, Kate | Gilliland, David | Lindsay, Elizabeth | McKenna, Ellen |
| Burke, Sarah | Donahue, Kate | Hamill, Virginia | Lindsay, Harriet | McKenna, Susan |
| | | | | McMillan, Grace |
| | | | | McWhirter, Andrew |
| | | | | McWhirter, Mary A. |
| | | | | Miller, Catherine |
| | | | | Miller, Phillip |
| | | | | Murphy, Mary |
| | | | | Neckerman, Melinda |
| | | | | Nugent, Alice |
| | | | | O'Rourke, Margaret |
| | | | | Riordan, Mary |
| | | | | Robinson, Martha |
| | | | | Robinson, Mary |
| | | | | Robinson, Mary S. |
| | | | | Ross, Nancy |
| | | | | Rushton, Ella |
| | | | | Shepard, Eleanor |
| | | | | Shepard, Sarah |
| | | | | Shook, Elizabeth |
| | | | | Slattery, Ellen |
| | | | | Slattery, Mary |
| | | | | Smith, Robert |
| | | | | Truxall, Lucinda |
| | | | | Turney, Margaret |



Memorial monument in Allegheny Cemetery.

Photo by Tom Powers.



**The Arsenal's oldest
existing building.**

Photo by Tom Powers, 2013.

The Civil War was the heyday of the Allegheny Arsenal; within a few years, manufacturing ceased. By 1875, the Ordnance Department was decommissioning the Arsenal and recommended that it be sold and its contents relocated.⁴⁵ However, the recommendations were never acted upon and the Allegheny Arsenal served as a supply depot and infantry outpost until 1906, when it was designated the "Pittsburgh Storage and Supply Depot of the United States Army."⁴⁶

Two years later, the Arsenal grounds were home to a U.S. Bureau of Mines testing facility.⁴⁷ After a flurry of activity during World War I, the Arsenal was sold in 1926⁴⁸ at public auction to Howard and Clifford Heinz, who built warehouses on its parade grounds for their growing ketchup and condiments company.⁴⁹ A school was built there too, and today it is easy to miss the four buildings that remain of the original Allegheny Arsenal.

History buffs and the curious still visit the site, as they have from the start. Eleven days after the explosion, Reverend Richard Lea of the Lawrenceville Presbyterian Church preached about the tragedy. His church was

directly west of the laboratory, close enough that its windows were blown out. Lea's sermon, based on a verse from the Gospel of Matthew, "Watch, therefore: for ye know not what hour your Lord doth come,"⁵⁰ spoke about the Arsenal now receiving a steady stream of visitors.

Lea told of a woman, dressed in black, riding the horse-drawn trolley on Butler Street. When another woman in black boarded, a shriek of recognition was exchanged and both knew the other's destination. One took out a large daguerreotype and said, "There is my once happy group, all burned but that one."⁵¹ Everyone in the trolley gathered around to view the photo, even the conductor. At the gatehouse, the guard knew that the two disembarking women would be asking him the same questions that so many others were asking, most just curious, but some with the faint hope of hearing something about their lost ones. Day after day, the guards patiently answered as best they could, repeating stories that offered little hope, just tragedy and sadness. ★

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Jim Wudarczyk is a longtime member and former president of the Lawrenceville Historical Society. He has previously written about the Allegheny Arsenal in his book, *Pittsburgh's Forgotten Allegheny Arsenal* (Closson Press, 1999). Jim has a bachelor's degree in education from Edinboro University.



THE ARSENAL.

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¹ *Hammond's American History Atlas* (Maplewood, N.J.: C.S. Hammond & Co., 1958), A-21.

² Arthur B. Fox, *Pittsburgh During the American Civil War 1860-1865* (Chicora, Pa.: Mechling Bookbinding, 2002), 140-142.

³ *1860-1861 Orders for Supplies*, Allegheny Arsenal Logbook, December 22, 1860.

⁴ Arthur B. Fox and John Carnprobst, "The Allegheny Arsenal," *Pittsburgh Tribune Review*, February 1, 1998, Focus, 8.

⁵ *The War of the Rebellion, a Compilation of Official Records of the Union and Confederate Armies* (Washington, D. C.: Government Printing Office, 1899), Series 3, Vol. 1, 30.

⁶ Letter from Colonel John Symington to General James W. Ripley, Allegheny Arsenal Records, National Archives, Philadelphia, Pa., October 2, 1861, 275.

⁷ Fox, *Pittsburgh During the American Civil War*, 116.

⁸ *Ibid.*, 119.

⁹ "Appalling Disaster!," *The Pittsburgh Gazette*, September 18, 1862, 3.

¹⁰ Fox, *Pittsburgh During the American Civil War*, 121-123.

¹¹ "Pittsburgh Arsenal Explosion," Report No. 1434, 3.

¹² John Carnprobst, "A Federal Case: Part Two of Four Parts," *The Gun Report*, May 1964, 17.

¹³ Secretary of War John B. Floyd, *Annual Report of the Secretary of War for 1859*, submitted to the 36th Congress, 1st Session, Document No. 2 (Washington D.C.: George Bowman, 1860), 1120-1121.

¹⁴ United States Surgeon Generals Office, *The Medical and Surgical History of the War of the Rebellion (1861-1865)*, Part 3, Volume 1, Chapter 12, "On the General Hospitals," ventilation illustration (Washington D.C.: Government Printing Office, 1888), 945.

¹⁵ "The Arsenal Catastrophe—Investigation Before the Coroner's Jury—Testimony of the Witnesses, &c.," *The Pittsburgh Evening Chronicle*, September 19, 1862, 3.

¹⁶ "The Allegheny Arsenal Disaster," *The Pittsburgh Dispatch*, September 20, 1862, 3.

¹⁷ Secretary of War John B. Floyd, 1120.

¹⁸ *Ibid.*

¹⁹ United States House of Representatives, *Executive Documents Printed by Order of the House of Representatives*, 45th Congress, 2nd Session, Volume 5, Report of the Chief of Ordnance, No. 1, Part 2, Volume 3, Appendix M, Map of Allegheny Arsenal (Washington D.C.: Government Printing Office, 1878), Map No. 16.

²⁰ *Transcript of the Proceedings of a Court of Inquiry to Investigate an Explosion at the Allegheny Arsenal Lab on September 17, 1862, Convened on October 15, 1862 under Order 288 of the Adjutants Generals Office*, Record Group 153, Courtmartial Records, National Archives, Mid Atlantic Region, Philadelphia, Pa., 93.

²¹ *The Pittsburgh Dispatch*, September 20, 1862, 3.

²² "A Direful Calamity," *The Pittsburgh Daily Post*, September 18, 1862, 3.

²³ *Ibid.*

²⁴ "The Arsenal Catastrophe — Coroner's Investigation," *The Pittsburgh Daily Post*, September 20, 1862, 3.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ *Ibid.*

²⁸ George T. Fleming, "Arsenal Blowup Recalled by Big Blast — Eddystone Disaster Rivalled by Holocaust Here — September 17, 1862," *The Pittsburgh Gazette Times*, April 22, 1917, sec. 5, 2. Mrs. McGraw gave the account to Fleming on the occasion of a memorial unveiling at Arsenal Park on September 24, 1913.

²⁹ *The Pittsburgh Daily Post*, issues of September 20, 23, 25, and 29, 1862.

³⁰ John Carnprobst, "A Federal Case: Part Two of Four Parts," 16.

³¹ Carnprobst, "A Federal Case: Part Three of Four Parts," *The Gun Report*, June 1964, 14. It should be noted that during the Military Inquest, Elias McClure's veracity was called into question. He had been dismissed from the field ammunition room (rooms 9 and 11) for disorderly conduct and sent to another area in the Arsenal. *Transcript of the Proceedings of a Court of Inquiry*, 90-92.

³² *Ibid.*, 13.

³³ "Pittsburgh Arsenal Explosion," *Reports of Committees for the House of Representatives for the First Session of the Forty-Seventh Congress, 1881-1882*, Report No. 1434, 1-3.

³⁴ *Ibid.*, 2.

³⁵ John Carnprobst, "A Federal Case: Part One of Four Parts," *The Gun Report*, April 1964, 9; National Archives, Record Group 156, Ordnance Department, Allegheny Arsenal, Letter Book, October 1, 1958, to February 28, 1863.

³⁶ *Transcript of the Proceedings of a Court of Inquiry to Investigate an Explosion at the Allegheny Arsenal Lab on September 17, 1862, Convened on October 15, 1862 under Order 288 of the Adjutants Generals Office*, Record Group 153, Courtmartial Records, National Archives, Mid Atlantic Region, Philadelphia, Pa.

³⁷ *Ibid.*, 102.

³⁸ *Ibid.*, 47-61.

³⁹ Carnprobst, "A Federal Case: Part Two of Four Parts," 19.

⁴⁰ *Ibid.*, 17.

⁴¹ Jack Kelly, *Gunpowder: Alchemy, Bombards, and Pyrotechnics: The History of the Explosive that Changed the World* (New York: Basic Books, 2004), 199.

⁴² "Terrible Explosion," *The Richmond Enquirer*, March 14, 1863.

⁴³ "Further particulars of the terrible explosion at the arsenal," *The Washington Star*, June 17, 1864.

⁴⁴ Dean Thomas, *From Round Ball to Rim Fire* (Gettysburg: Thomas Publications, 1997), 41.

⁴⁵ *Executive Documents Printed by Order of the House of Representatives*, 45th Congress, 2nd Session, Volume 5, Report of the Chief of Ordnance, No. 1, Part 2, Volume 3, Appendix M (Washington D.C.: Government Printing Office, 1878), 597.

⁴⁶ "The Allegheny Arsenal No Longer Post for United States Infantry," *The Pittsburgh Press*, August 17, 1906, 11.

⁴⁷ "Wonderful Experiments Are Being Performed on Old Arsenal Grounds," *The Pittsburgh Press*, December 14, 1908.

⁴⁸ "Army Supply Depot to Be Sold by United States," *Pittsburgh Sun*, August 16, 1926.

⁴⁹ "Picturesque Gateway of Arsenal to be Preserved as Memorial," *The Pittsburgh Post-Gazette*, December 11, 1935, Second Section, 1.

⁵⁰ Matt. 24:42 (King James Version).

⁵¹ Reverend Richard Lea, *Sermon Commemorative of the Great Explosion at the Allegheny Arsenal at Lawrenceville, Penna., on September 17th, 1862, Preached by Rev. R. Lea, Pastor of the Lawrenceville Presbyterian Church, September 28th, 1862* (Pittsburgh, PA: W.S. Haven, 1862). Reprinted in a 15-page program for the May 27, 1928, dedication of the new monument to the Arsenal victims in Allegheny Cemetery. Reprinted by John Carnprobst in "A Federal Case: Part Four (Conclusion)," *The Gun Report*, July 1964, 22.