"INFERNAL MACHINES"

MINE WARFARE IN THE CIVIL WAR

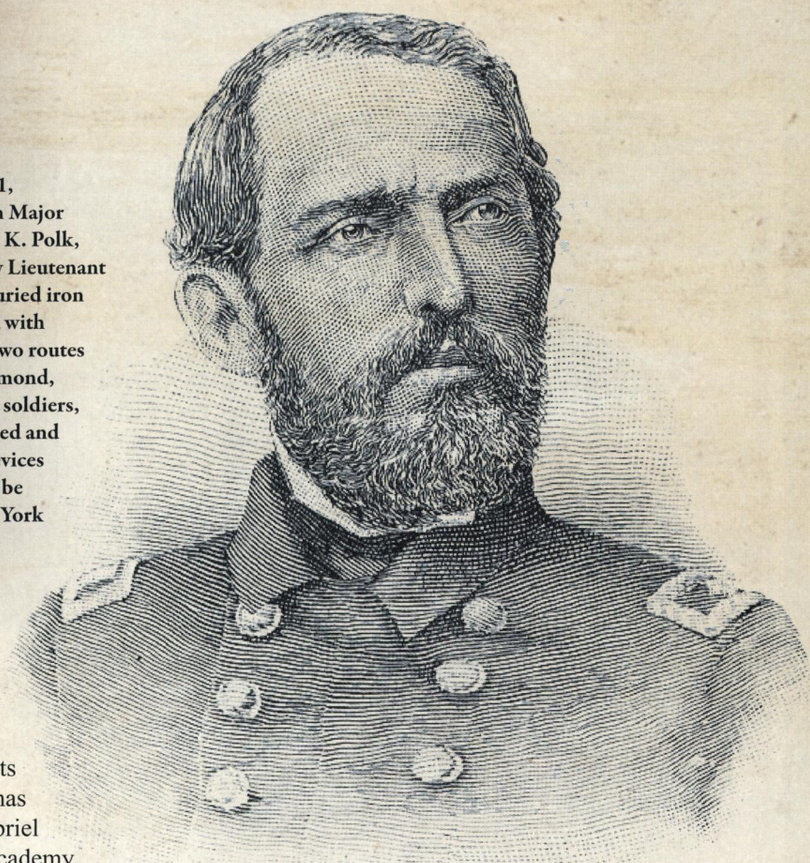
By John Grady

The Civil War marked the first large-scale use of torpedoes, better known today as mines, in American military history. This photograph shows a cache of Confederate torpedoes seized by Union forces when they captured Charleston, South Carolina, in February 1865. (Library of Congress)

EARLY IN THE CIVIL WAR, hard-pressed Confederate Army officers in the West, like Major General Leonidas K. Polk, knew they were particularly exposed to the Union Army and Navy. Less than a day's cavalry ride from Polk's headquarters at Columbus, Kentucky, the Union was building a fleet of gunboats up the Mississippi River above Cairo, Illinois. At the same time, Brigadier General Ulysses S. Grant had moved more Union soldiers into Cairo at the confluence of the Mississippi and Ohio Rivers. He was poised either to move down the Mississippi toward Belmont, Missouri, to remove the heavy chain the Confederates were using to block the river, or he could fall upon Paducah, Kentucky, on the Ohio and threaten Nashville and interior Tennessee.

Polk realized that he needed assistance to prevent Union forces from driving unimpeded into the South. A longtime acquaintance of Matthew Fontaine Maury, former superintendent of the Naval Observatory and now head of Confederate coastal defense, Polk, who had taken off his robes as an Episcopal bishop to fight for the South, wrote, "I feel constrained to urge upon you the necessity of at once furnishing me an officer familiar with the subject of submarine batteries and capable of a practicable application of this species of defense to the Mississippi River."

Torpedoes, weapons better known as mines today, form a little-known albeit important part of Civil War history. When this irregular style of warfare is written about with regards to the Civil War, it usually is confined to small books about the Confederate Secret Service or the Confederate Navy, emphasizing men like Maury, one

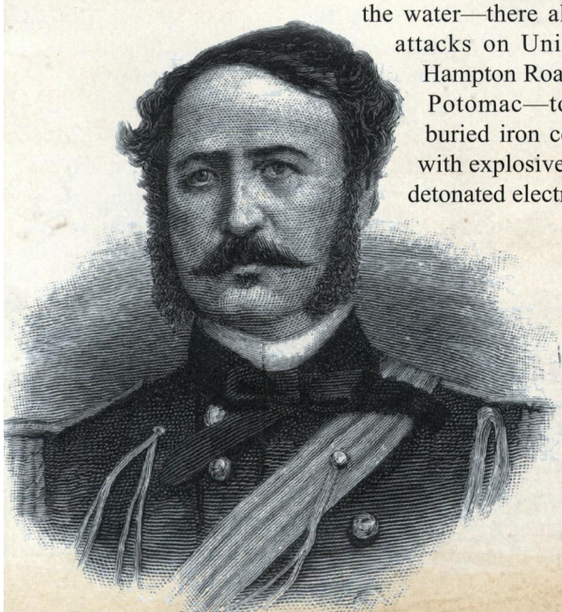


In December 1861, under orders from Major General Leonidas K. Polk, Confederate Navy Lieutenant Isaac N. Brown buried iron containers loaded with explosives along two routes leading into Richmond, Kentucky. Union soldiers, however, discovered and dismantled the devices before they could be detonated. (New York Public Library)

of the era's leading scientists, and his protégés Lieutenants Hunter Davidson and Isaac Brown. Eclipsed over time has been the work of John Bankhead Magruder, brothers Gabriel J. and George Washington Rains (all three U.S. Military Academy graduates and former U.S. Army officers) and Thomas Courtenay, in transforming mine warfare from defensive to offensive ashore and afloat.

By pushing the limits of nineteenth century technology against a backdrop of a deteriorating military situation, they set off explosive debates inside the Confederate government and Army over the ethics of using "weapons that wait," or "infernal machines," as Union Major General William Tecumseh Sherman called them. These debates over the ethics of mine warfare did not end in 1865.

In December 1861, Polk received help in mine warfare, not from Maury, but rather from Brown, who took mine warfare from the water—there already had been attacks on Union warships in Hampton Roads and along the Potomac—to land. Brown buried iron containers loaded with explosives that were to be detonated electrically along two routes leading into Columbus, but Union soldiers discovered the torpedoes and dismantled them before they could be detonated.

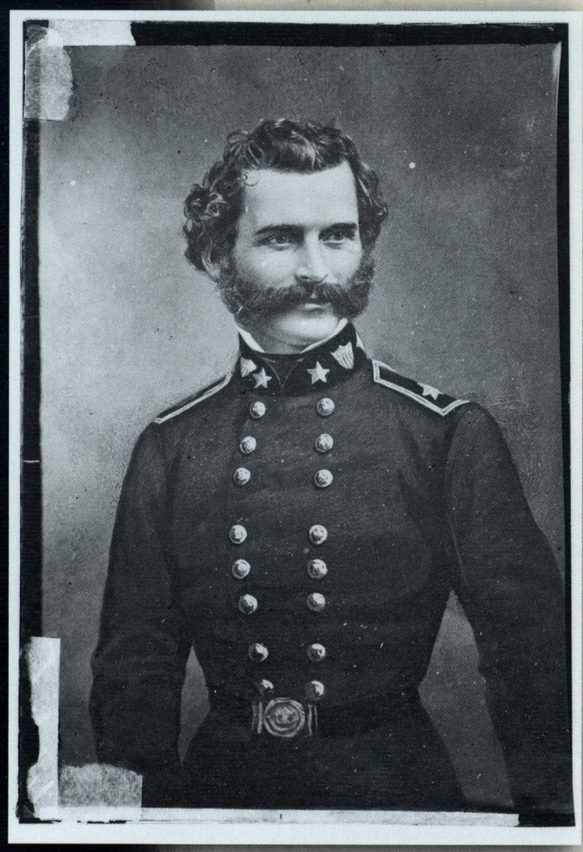


As an observer during the Crimean War in the 1850s, Major General John B. Magruder had witnessed the use of mines in the defense of Sebastopol and Kronstadt. His observations in the Crimea led him to employ similar weapons against the Union Army of the Potomac during the early stages of the Peninsula campaign in the spring of 1862 in Virginia. (New York Public Library)

Back in the Eastern Theater in Virginia, Major General Magruder commanded Confederate forces on the peninsula between the York and James Rivers. In the 1850s, he had witnessed how the Russians effectively used mines defending Sebastopol and Kronstadt as an observer in the Crimean War. His interest in mine warfare increased when he was posted to Washington, where his brother George served as chief of the Navy's Ordnance Bureau. He also established a strong friendship with Maury. On Navy organization charts, Maury answered to Magruder's brother; the reality for almost two decades was bureau chiefs like Navy Secretaries came and went, but the superintendent remained at the observatory.

Magruder, an amateur actor who earned the nicknamed "Prince John," is best remembered for deceiving Major General George B. McClellan and his Army of the Potomac during the early part of the Peninsula campaign in 1862. He marched and counter-marched his troops, moved his few cannon from place to place during the day, and felled pine trees and painted them black to look like artillery along a 13-mile defensive line around Yorktown, all designed to make his force appear larger than the 33,000 men he commanded.

What is not as well known is that Magruder was the first commander to employ mines on a large scale during the Civil War. With orders from Magruder and guidance from Brigadier General Gabriel Rains, Confederate soldiers began hiding crude explosive devices (early versions of improvised explosive devices, or IEDs) made from artillery shells or other materiel in the sandy soil



Confederate Brigadier General Gabriel J. Rains's first experience with landmines came during the Seminole Wars in Florida, where he had experimented with early examples of the weapons. Rains's younger brother, Lieutenant Colonel George Washington Rains, was an eager disciple in mine warfare, and the two became known as the "Bomb Brothers." (Library of Congress)

around Yorktown, along the town's streets and roads, inside houses, and around telegraph poles. After Yorktown was abandoned in early May 1862, Union forces reported several serious injuries and a few deaths from these "booby traps." While ignoring his own superiors' concerns about using "deceptive devices" in land warfare, Rains was conflicted about using buried shells on the roads leading from Fortress Monroe to Yorktown. With so many civilians on the few roads fleeing the Union advance, Rains decided against indiscriminately burying the mines. Mining the fortifications and the town was a different story.

Rains had considerably more experience with mines than Magruder. In the long-running Seminole Wars (1817-1858) in Florida, he had experimented with the use of mines against the Seminole warriors. Shortly before the Peninsula campaign, Rains, a North Carolinian, was engaged in mining efforts in the James and the York Rivers to disrupt the Union Navy. He was well suited for this unusual mission, having patented a specialized torpedo effective in the water and on land. Rains's younger brother, George Washington Rains, a lieutenant colonel in the Confederate Army, was an eager disciple in mine warfare. Together, the two became known as the "Bomb Brothers."

Following the Battle of Williamsburg on 5 May, Rains suppressed his earlier qualms about mining roads to cover the retreat of his wounded. He had his soldiers bury four artillery shells on the main road leading to Richmond. A lawyer watching a Union cavalry advance come to a standstill when the shells exploded on contact with the horses' hooves noted, "They never moved a peg after hearing the report." Years later, Rains boasted "these four shells checkmated the advance of 115,000 men under General McClellan and turned them from their line of march."

In his official report on Yorktown and Williamsburg, Union Brigadier General William F. Barry angrily denounced the Rains brothers' actions. He had particular scorn for Gabriel "for disgracing the uniform of the American Army during the Seminole war in Florida" and doing it again against his former comrades in arms.

In response to the mines, Major General George B. McClellan, who also had been an American observer of the Crimean War, vowed to "make the prisoners remove [the mines] at their own peril," and soon began ordering Confederate prisoners to clear mines at Yorktown. This threat was repeated by Major General Sherman and Read Admiral David Dixon Porter later in the war.

Magruder's and the Rains brothers' successes with landmines set off new debates over using "weapons that wait" to maim or kill soldiers, rather than against boats and ships. General Joseph E. Johnston, the Confederate commander on the Peninsula, was hesitant to condone their use. Brigadier General James Longstreet, however, openly condemned Gabriel Rains's actions at Yorktown and Williamsburg. Confederate Secretary of War George W. Randolph finally stepped in to end the increasingly heated argument between the two. Randolph, who was Thomas Jefferson's grandson, drafted a series of "do's and don'ts" that may have eased some consciences in what

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was now becoming total war. He wrote, "It is admissible to plant shells in a parapet to repel assault, or in a road to check pursuit," but added, "It is not admissible to plant shells merely to destroy life and without other design than that of depriving the enemy of a few men."

Gabriel Rains, a former West Point classmate of Polk, was named commander of the "submarine defenses of the James and Appomattox Rivers" and later chief of the Conscription Bureau, seemingly dead-end positions for an ambitious but aging Army officer. However, he caught the attention of President Jefferson Davis, who graduated from West Point the year after Rains. He was then named commander of the newly created Torpedo Bureau inside the War Department. Davis quickly dispatched him to Johnston in Mississippi in a vain effort to break the siege of Vicksburg. All of Johnston's reservations about torpedoes resurfaced as soon as Rains arrived. Known for his deliberate approach to warfare, Johnston uncharacteristically hustled Rains out of sight, sending him to Mobile to defend the Gulf Coast port. Before departing Vicksburg, Rains left behind a few shells buried in the river bank that were found and disabled when the Confederate forces surrendered the city in July 1863. Other mines placed along two roads leading out of the town slowed the Union approach to Jackson, the state capital.

Davis, who had been at odds with Johnston over strategy and tactics almost from the day after the Rebel victory at First Manassas in July 1861, countermanded Johnston's orders. The president instead ordered Rains to Charleston, South Carolina. Forts and batteries around the city were under attack by monitors on the water, with a blockading fleet behind them ably supported from Port Royal about sixty miles away. In addition, the Union Army occupied some of the barrier islands around the city's harbor.

At Charleston, Rains found a superior officer, General P.G.T. Beauregard, consumed with the defense of Charleston and open to new ideas. Beauregard, who first drew notice during the bombardment of Fort Sumter in April 1861, saw the addition of Rains as invaluable to holding the forts on the barrier islands, closing the coastal rivers to Union gunboats, and blocking the shipping channels to any would-be attacker. In large measure, Rains succeeded—Charleston did not fall until the Union Army captured it on 18 February 1865.

When ordered to Mobile the second time in mid-February 1864, Rains worked with Victor von Scheliha, Confederate Corps of Engineers, in layering the defenses of the port with mines, various obstructions, artillery

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> Confederate Secretary of War George W. Randolph

The use of mines was condemned by Union officers, including Major General George B. McClellan, commander of the Army of the Potomac during the Peninsula campaign. McClellan ordered that Confederate prisoners be made to "remove [the mines] at their own peril." (Library of Congress)

emplacements, and improved forts. When Union Rear Admiral David Glasgow Farragut's fleet sailed into Mobile Bay on 5 August 1864, his force, while eventually victorious, paid a heavy price in ships and men.

Outside Mobile, Union soldiers advancing on Spanish Fort in April 1865, months after Farragut closed off the escape routes to the Gulf of Mexico, found hundreds of Rains's landmines still in place. No federal soldiers, however, were killed or wounded because the safety caps to prevent them for detonating prematurely had not been removed.

As technology advanced, in part through George Rains's tenure as commander of the Confederate arsenal at Augusta, Georgia, and more officers employed torpedoes, new political and ethical questions surfaced. Davis rejected schemes to launch mine attacks from Canada on canal locks along the Great Lakes as he was hesitant to destroy civilian targets.

Despite Davis's qualms, many in the Confederate Army continued to question how far the South should go in taking mine warfare to Northern civilian life and commerce. Since the war began, Missouri Confederates had been sabotaging Union shipping on the Mississippi and Missouri Rivers by placing explosives in the firewood used for fuel on steamboats. For them, the next logical step was to find a way to disguise explosives in other fuels, and they were spurred on by a new law authorizing bounties for inventors of devices that could sink Union warships.

What triggered significant debate was the "coal torpedo," an explosive device set in a block of cast iron "dipped in beeswax and pitch and covered with coal dust." The coal torpedo was developed by Belfast-born Thomas Courtenay, who was authorized to employ up to twenty-five volunteers to cast and distribute these devices, with their pay coming from the bounties authorized by the Confederate War Department.

James A. Seddon, Randolph's successor as Confederate Secretary of War, now had to devise new rules of engagement. He ordered "passenger vessels of citizens of the United States on the high seas and private property in the water and [on] railroads or within the territory of the United States…not to be subject of operations" using Courtenay's devices. "But the public property of the enemy may be destroyed wherever it may be found," he added.

As the war neared its end, the Confederates also added timers to the torpedoes to better sabotage barges, transports, warehouses, and armories in North America—all "public property of the enemy." No attack was more deadly than the Confederate strike at City Point, Virginia, the site of Lieutenant General Grant's headquarters and the Union Army's primary logistics center during the siege of Petersburg.

Located at present-day Hopewell where the Appomattox River joins the James, City Point included landings, a huge warehouse divided into offices and sections for ammunition, commissary stores, and other supplies, and rail tracks to move replacements, equip-

As commander of the defenses of Charleston, General P.G.T. Beauregard welcomed Brigadier General Rains to his command and used his experience in mine warfare to defend the barrier islands and shipping channels around the port city. (Library of Congress)

While usually used as weapons against ships, keg torpedoes, such as the one shown here, could also be used as landmines. Several of these were used in the defense of Fort Wagner, South Carolina. (West Point Museum)

ment, ammunition, provisions, and livestock from transport vessels to Union soldiers in the trenches. At the foot of a hill leading away from the piers were a post office, express office, the quartermaster's office, the U.S. Sanitary Commission post at the edge of the water, and sutlers' establishments. A *New York Tribune* correspondent reported in the summer of 1864 that the hill itself was "a city of tents" with a dozen or so large frame residences on it, all being used by the Union Army.

There was also a huge depot hospital—originally 1,200 tents and later ninety wooden buildings and 452 tents—and a U.S. Colored Hospital with physicians and surgeons, accompanied by volunteer nurses, from the Union Army and the Sanitary Commission in both facilities.

In early August 1864, under orders from Rains, Captain John Maxwell of the Confederate Secret Service left Richmond for Isle of Wight County, Virginia, with a special box loaded with twelve pounds of explosives and a timer. After meeting up with R.K. Dillard, another agent of the Confederate Secret Service who knew the lay of the land between eastern Tidewater and City Point, they traveled mostly by night "and

Working for the Confederate Secret Service, Belfast-born Thomas Courtenay developed a coal torpedo, or coal shell, to destroy Union ships. (Library of Congress)

Courtenay's coal torpedoes, cast iron blocks disguised as chunks of coal and packed with black powder, were tossed into fuel piles for Union ships. While they did not have enough explosive power to sink a ship outright, they could damage a ship's boiler, leading to a massive secondary detonation. (Library of Congress)

crawled upon our knees to pass the east picket line" closest to the wharf, warehouse, tents, and hastily-constructed buildings for the huge depot.

Once inside Union lines on 9 August, Maxwell told Dillard to stay put about a half mile from the wharf. The cautious Maxwell continued the mission and found out that the captain of an explosives-laden barge at the wharf had left his vessel. When a sentinel stopped him on the wharf, Maxwell bluffed his way forward by saying that the captain had ordered him to take a box containing "candles" aboard the barge. Then, as Maxwell later said, "Hailing a man from the barge I put the machine in motion and gave it in his charge," who took it aboard. With the clock ticking, Maxwell found Dillard and they headed toward high ground and presumed safety.

About an hour later, the ammunition barge carrying between 20,000 and 30,000 artillery shells exploded along the wharf extending a third of a mile into the water. The *Tribune* correspondent compared the detonation to the eruption of Mount Vesuvius, destroying Pompeii and Herculaneum, writing, "Instead of lava and dust and ashes, it rained over the circle of a mile, in whole packages and by piece-meal, everything you can imagine at a military depot."

In his report, Maxwell said that the explosion also destroyed another barge and most of the warehouse. "The scene was terrific, and the effect deafened my companion to an extent which he has not recovered," he said. Maxwell also described himself as being "severely shocked" but that he had quickly recovered from the blast.

From the scene, African American war correspondent Thomas Morris Chester wrote, "Fragments of humanity were scattered around," adding, "Those loudest in their grief were the contrabands who mourned their relatives and comrades. Being employed in great numbers where the accident occurred, more of them were killed and wounded than any other class of individuals."

At City Point, the estimates of those killed ranged from more than fifty to 300. The estimates of wounded ranged from 126 by Union officials to a number that "greatly exceeded that" in Maxwell's view.

The following day, the *Tribune* correspondent reported the suspected causes of the explosion, which ranged from careless handling of explosives by the contrabands to an "old-time torpedo." Some surmised a Rebel spy or a random shot.

The explosion required the efforts of 1,000 laborers to clear away the debris, rebuild the warehouse, and replace the wharf. Nine days after the attack that caused between $2 million and $4 million in damages, Union supply depot at City Point was back in business.

On 27 November 1864, the Confederates found more "public property of the enemy," the troop transport *Greyhound* steaming down the James River about five miles from Bermuda Hundred. *Greyhound* also served as Major General Benjamin Butler's floating command post. Aboard the unarmed steamer with Butler were his staff, Major General Godfrey Weitzel, and Rear Admiral David Dixon Porter, now commanding the North Atlantic Blockading Squadron. Meeting in the ship's upper deck salon, they were discussing the pending attack on Fort Fisher and closing Wilmington, North Carolina, the last Confederate port on the Atlantic open to blockade runners. *Greyhound* was, in the words of today's military terminology, an especially "high value target."

From the start, Porter was uneasy being on an unarmed vessel with the Army of Northern Virginia occupying the northern banks of the James River. He was especially suspicious of the men he saw

In one of the most famous uses of mines during the Civil War, the Union monitor USS *Tecumseh* struck a floating mine during the Battle of Mobile Bay, 5 August 1864, and sank with most of her crew. In addition to floating mines, the Confederates incorporated hundreds of landmines in defenses around Mobile Bay. (Library of Congress)

loading coal aboard the ship. As the ship headed downstream, a huge explosion rocked the engine room. Smoke filled the *Greyhound*, but the quick-thinking engineer "closed the throttle-valve, stopping the vessel, and opened the safety-valve," letting the steam escape.

Porter knew instantly what had happened and was convinced it had to be one of the "coal torpedoes" that he had been told about during his time on the western rivers. Porter later wrote, "When the torpedo was thrown into the furnace with the coal, it soon burst, blowing the furnace-doors open and throwing the burning mass into the fire-room, where it communicated with the wood-work."

Some men were blown overboard; others jumped into the water to escape the fire. All were pulled safely from the river, and those who were still on board *Greyhound* were transferred to other ships that came to its rescue. The last to leave was Butler's aide who had been scurrying about recovering the general's papers. No people were killed in the explosion, but several of Butler's horses died in the blast and subsequent fire and sinking.

In late March 1865, George Shepley, a judge in civilian life but now serving as Weitzel's chief of staff, prepared his mix of white New Englanders, New Yorkers, and African American troops for an assault on Longstreet's lines, south of Richmond. Despite Lieutenant General Longstreet's earlier objections to the use of mines, Confederate engineers buried mines around the Confederate lines defending Petersburg.

As the Union soldiers spent a restless and sleepless Sunday night on 2 April expecting to attack the Rebel defenses in the morning, a continuing rumbling noise from the north could be heard. From a seventy-foot signal tower, one of Weitzel's aides could see flames lighting up the night sky. Richmond was ablaze. The rumble was from the explosives used to fire the tobacco warehouses, as the Confederate government raced to leave the city.

Early on 3 April, Weitzel ordered a company to grab a Confederate picket to find out if Longstreet was still there. The soldier quickly told his captors that he did not know where the general was or his artillery unit. A black man driving a buggy through the Union lines shouted, "Dey am running from Richmun! Glory! Glory!" Other Confederate deserters confirmed the story that the capital was an "open city."

In the early morning light, Shepley rode carefully forward toward the abandoned Confederate fortifications. He noticed "small squares of red cloth inserted in split sticks in the ground." There was about an eighteen-inch separation between the two lines of *abatis*,

each marking the placement of a torpedo, directly in front of Weitzel's lines. Neither horse nor rider was injured as they passed through the Confederate fortifications.

Historians say that mines, or torpedoes, claimed thirty-five Union ships and one Confederate vessel during the Civil War. Gabriel Rains claimed fifty-eight in his postwar memoir, although he does not make clear whether he counted vessels of any size sunk by water-borne mines, nor does he offer any estimates of how many sailors were killed or wounded by mines.

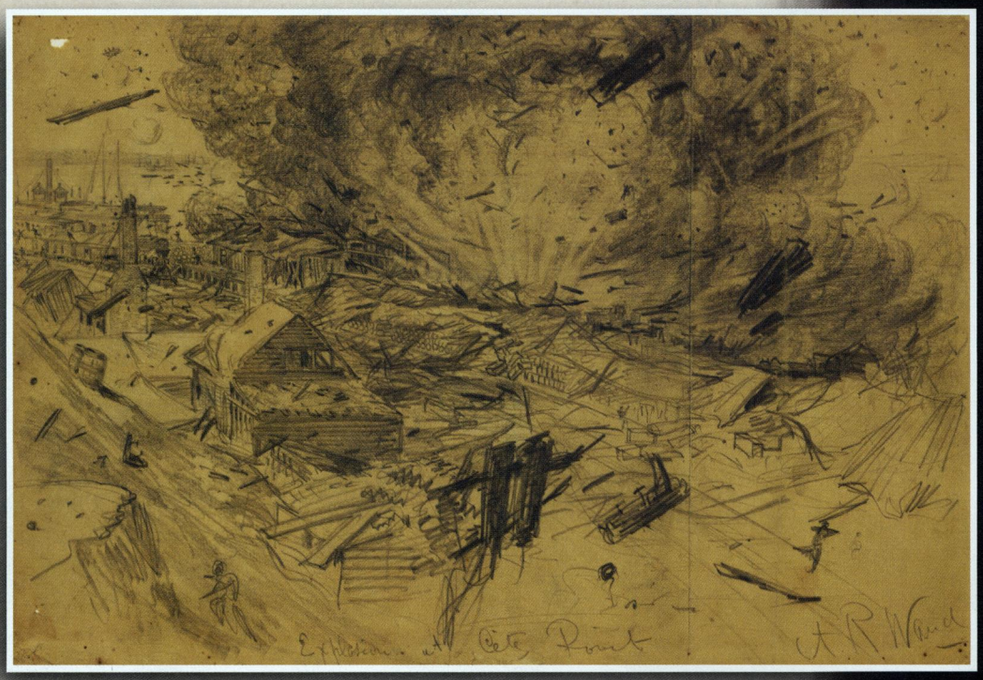
Furthermore, there are no accurate figures on how many soldiers and civilians were maimed or killed by "subterra" explosives planted to defend Yorktown, Williamsburg, Richmond, Jackson, Charleston, Savannah, Fort Fisher, and City Point, or the explosives used by the Union at the "Crater" outside Petersburg.

The practical Porter wrote, "In devices for blowing up vessels the Confederates were far ahead of us, putting Yankee ingenuity to shame." He added in a touch of irony the Union inventor of a similar device approached him wanting to know how many "coal torpedoes" the Navy had used during the war "probably with the idea of claiming a royalty."

The unnamed inventor was not the only one trying to exploit his skills in irregular warfare in the late 1860s. Maury, Davidson, Courtenay, and Gabriel Rains all tried to play upon their names and reputations to make a living from their expertise, but none truly accomplished these goals.

The reasons for their lack of success were twofold. Technology moved too quickly for them. For example, Great Britain successfully fired an "automotive" torpedo on a moving ship in 1866, and France soon followed. There were by the late 1860s too many others in North America and Europe who had the same expertise and were willing to sell it at a discount in a buyer's market.

Soon, a torpedo "arms race" commenced. The ethics questions proliferated as fast as the weapons were being used in battle. In the end, Rains best captured the moral dilemma of mine warfare, stating, "Each new invention of war has been assailed and denounced as barbarous and anti-Christian, yet each in its turn notwithstanding has taken its position by the universal consent of nations according to its efficiency in human slaughter."



On 9 August 1864, Confederate agent Captain John Maxwell infiltrated the Union supply depot at City Point, Virginia, with an "horological torpedo"—an explosive device with a timing mechanism. Maxwell's mine triggered a massive explosion that destroyed hundreds of tons of ammunition and supplies and killed dozens of soldiers and laborers. (Sketch by Alfred R. Waud, Library of Congress)

This photograph, taken after the explosion at City Point, shows some of the damage wrought by Maxwell's horological topedo. (National Archives)

ABOUT THE AUTHOR

John Grady, a former managing editor of* Navy Times *and a retired director of communications at the Association of the United States Army, is completing a biography of Matthew Fontaine Maury. He is also a contributor to the Navy's Civil War Sesquicentennial blog.