

# THE CHARGER

April 2014

505th Meeting

Vol. 35, #8

*Tonight's Program:*

## Materials and Processes in the Manufacture of Civil War Small Arms

The Civil War witnessed a technological revolution in weaponry. This was highlighted by a changeover in shoulder-fired weapons from smoothbore firearms that had to be loaded through the muzzle each time a shot was fired to rifled-barrel firearms, some of which loaded at the breech. Most of these new rifle-muskets still had to be loaded between each shot, but repeating weapons such as 7-shot Spencer and 16-shot Henry rifles and carbines were developed as well. Unfortunately for the common soldier, tactics did not advance as quickly as technology. Napoleonic linear tactics from earlier in the century now combined with more accurate, faster-firing weapons to result in catastrophic casualty figures throughout the War.



*Tonight's Speaker:*

## John Harkness

John Harkness holds BS and MS Degrees in Metallurgy from Case Institute of Technology and Case Western Reserve University, respectively, and is a Fellow of the American Society for Metals International (ASMI). He retired in 2011 from the position of Principal Scientist, Alloy Research and Development, at Brush Wellman Inc. (now Materion). He is co-inventor on several US and foreign patents for lean, low cost, high performance Cu-Be alloys; has written extensively on the performance attributes of Be-containing alloys and has contributed to articles on Cu-Be and other Cu alloys in the ASM Handbook series. He is a Past Chairman of the Cleveland Chapter, ASM International. Mr. Harkness is a lifelong student of military history and the development of military technology. He is Past President of the Cleveland Civil War Roundtable (1982), a member of the Company of Military Historians and the Ohio Gun Collectors' Association, a former Civil War and Revolutionary War re-enactor and has shot original Civil War small arms with live ammunition extensively in target competition in the North-South Skirmish Association.

*Date:* **Wednesday, April 9, 2014**

*Place:* **Judson Manor  
1890 E. 107th Street  
Cleveland, Ohio**

*Time:* **Drinks 6 pm  
Dinner 6:45 pm**

*Reservations:* **Please send an email to [ccwrt1956@yahoo.com](mailto:ccwrt1956@yahoo.com) with your reservation, or call Dan Zeiser at (440) 449-9311 by 9 pm the Sunday before the meeting.**

*Meal:* **Entree, vegetable, salad, and dessert.**

**CLEVELAND  
CIVIL WAR ROUNDTABLE  
FOUNDED 1957**

*President:* **Jim Heflich** (216) 381-8833  
*Vice President:* **Patrick Bray** (216) 407-7878  
*Treasurer:* **Chris Fortunato** learnedhand@live.com  
*Secretary:* **Jean Rhodes** (440) 739-0579

**Directors:**

Paul Burkholder                      Mike Wells  
C. Ellen Connally                  Howard Besser

**Historian - Dave Carrino**

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## Cleveland Civil War Roundtable Past Presidents

2013 **Mike Wells**  
2012 **Paul Burkholder**  
2011 **Lisa Kempfer**  
2010 **Dennis Keating**  
2009 **Jon Thompson**  
2008 **Terry Koozer**  
2007 **John Fazio**  
2006 **Dave Carrino**  
2005 **Mel Maurer**  
2004 **Warren McClelland**  
2003 **Maynard Bauer**  
2002 **Bill McGrath**  
2001 **William Vodrey**  
2000 **Bob Boyda**  
1999 **Dick Crews**  
1998 **John Moore**  
1997 **Dan Zeiser**  
1996 **John Sutula**  
1995 **Norton London**  
1994 **Robert Battisti**  
1993 **Kevin Callahan**  
1992 **Bob Baucher**  
1991 **Joe Tirpak**  
1990 **Ken Callahan Jr.**  
1989 **Neil Glaser**  
1988 **Martin Graham**  
1987 **George Vourlojianis**  
1986 **Tim Beatty**  
1985 **Brian Kowell**

1984 **Neil Evans**  
1983 **William Victory**  
1982 **John Harkness**  
1981 **Thomas Geschke**  
1980 **Charles Spiegle**  
1979 **William Bates**  
1978 **Richard McCrae**  
1977 **James Chapman**  
1976 **Milton Holmes**  
1975 **Thomas Gretter**  
1974 **Nolan Heidelbaugh**  
1973 **Arthur Jordan**  
1972 **Bernard Drews**  
1971 **Kenneth Callahan**  
1970 **Frank Schuhle**  
1969 **Donald Heckaman**  
1968 **Frank Moran**  
1967 **William Schlesinger**  
1966 **Donald Hamill**  
1965 **Lester Swift**  
1964 **Guy DiCarlo Jr.**  
1963 **Paul Guenther**  
1962 **Edward Downer**  
1961 **Charles Clarke**  
1960 **Howard Preston**  
1959 **John Cullen Jr.**  
1958 **George Farr Jr.**  
1957 **Kenneth Grant**

## President's Message

Here it is April already, and just two exciting meetings left in our program year that I get to preside over as Roundtable President, and I have a bit of a confession to make - I've never been to Gettysburg! Well, I did stop there once on a drive east to Philadelphia. But it was years ago, long before I became consumed with interest in the Civil War. I do not remember anything of the visit except seeing vultures circling very close from the summit of Little Round Top. Once a birder, always a birder...

But this June my wife and I are signed up for a 3-day/4-night Gettysburg tour under the auspices of her college alumni association. Morning classroom sessions with an expert historian and afternoons walking the battlefield. Nights at one of Gettysburg's historic inns. I will be thrilled every minute of the tour - I hope Patty has enough moments of interest to make it all worthwhile to her.

My request to fellow Roundtable members - most of whom have been to Gettysburg multiple times - what special places should I be sure not to miss? A special monument? A unique vista from atop one of the ridges? Barlow's Knoll? The Codori Farm? I have been reading a great deal in preparation for the tour, but would really appreciate your unique recommendations.

See you at Judson Wednesday the 9th for John Harkness's talk on Civil War armaments. John is an expert metallurgist and past Roundtable President. It should be a very informative evening. And please disregard my maladroitness suggestion a few months ago to bring any Civil War weapons you might own to the meeting. As was very correctly pointed out to me privately, that violates common sense safe practices. John will have a few properly secured armaments to display.

Respectfully,  
Jim Heflich  
[laureldoc@gmail.com](mailto:laureldoc@gmail.com)

# CLEVELAND CIVIL WAR ROUNDTABLE

## 2013-2014 SCHEDULE

September 11, 2013



*A Species of Legal Fiction:  
The Wheeling  
Conventions and the  
Creation of West Virginia*

**Dr. David T.  
Javersak**

October 9, 2013

*Slaves to Contradictions:  
Patrick Cleburne's  
Emancipation  
Proposal*

**Wilson R. Huhn**



November 13, 2013

*Zouaves:  
America's Forgotten  
Soldiers*  
**Patrick Schroeder**



December 11, 2013



*"It was a terribly grand  
scene..."  
The Slaughter Pen and  
Prospect Hill  
at Fredericksburg*

**Kristopher White**

January 8, 2014

*The Dick Crews Annual Debate  
What Was the Most Important Battle  
of the Civil War?*

**Moderator: William F. B. Vodrey**

February 12, 2014

*The U.S. Navy  
and the  
Naval Battles of  
Charleston 1863*

**Syd Overall**



March 12, 2014

*The Battle of  
Kennesaw  
Mountain*

**Dan Vermilya**



April 9, 2014

*Materials and  
Processes in the  
Manufacture of Civil  
War Small Arms*

**John Harkness**



May 14, 2014

*Soldiers and the Homefront:  
A Northern Community  
Confronts the Civil War*

**Nicole Etcheson**



# Civil War Weapons

Many Weapons were used in the [The Civil War](#) from knives to swords along with a variety of firearms, including rifles, pistols, muskets, and repeating weapons. Also widely used was artillery including cannons. Some of the new weapon technologies used in the civil war include rifled gun barrels, the Minie ball and repeating rifles.

## Civil War Cannons

Cannons played a major role in the [the civil war](#). Some of the cannon used by union and confederate forces include the 12 pound Howitzer, the 10 pound Parrot rifle, and the 3 inch ordnance rifle. Learn more about [Civil War Cannon](#)

## Civil War Guns

The civil war brought many advancements in gun technology, most notably the widespread use of rifled barrels. Popular rifles used in the civil war include the Springfield rifle, the Lorenz rifle, the Colt revolving rifle. Learn more about [Civil War Guns](#)

## Civil War Swords and Sabers

Swords were still used widely in the civil war. Popular swords include the Model 1832 Foot Artillery Sword, Model 1832 Dragoon Saber, Model 1840 Light Artillery Saber, and the Model 1840 Army Non-commissioned Officers' Sword. Learn more about [Civil War Swords](#)

## The Minie Ball

The Minié Ball (aka Minie Ball) was a type of bullet that was used throughout the Civil War. Designed to expand while traveling along the rifle barrel, it increased muzzle velocity as well as providing spin to the bullet, expanding its accuracy and range. This advance in weaponry, along with outdated military tactics devised in an era of older firearms, are often cited as a reason for the large numbers of casualties of the Civil War. Learn more about the [Minie Ball](#)

Taken from [www.historynet.com/civil-war-weapons](http://www.historynet.com/civil-war-weapons)



# Rifles

## Springfield Rifle Musket



This was a single shot, muzzle-loading gun that used the percussion cap firing mechanism. It had a rifled barrel, and fired the .58 caliber [Minié ball](#). The first rifled muskets had used a larger .69 caliber Minié ball, since they had simply taken .69 caliber smooth bore muskets and rifled their barrels. Tests conducted by the U.S. Army indicated that the .58 caliber was more accurate at a distance. After experimenting with the failed Maynard primer system on the [Model 1855 musket](#), the [Model 1861](#) reverted to the more reliable percussion lock. The first Model 1861 Springfields were delivered late in that year and during 1862 gradually became the most common weapon carried by Union infantry in the eastern theater. Western armies were slower to obtain Springfield rifles, and they were not widely used there until the middle of 1863.

Rifles were more accurate than smooth bore muskets, and could have been made using shorter barrels. However, the military was still using tactics such as firing by ranks, and feared that shorter barrels would result in soldiers in the back ranks accidentally shooting front rank soldiers in the back of the head. Bayonet fighting was also important at this time, which also made militaries reluctant to shorten the barrels. The Springfield Model 1861 therefore used a three-band barrel, making it just as long as the smoothbore muskets that it had replaced. The 38-inch-long rifled barrel made it a very accurate weapon, and it was possible to hit a man sized target with a Minié ball as far away as 500 yards (460 m). To reflect this longer range, the Springfield was fitted with two flip up sights, one set for 300 yards (270 m) and the other for 500. Along with a revised [1863 model](#), it was the last muzzle-loading weapon ever adopted by the US Army.

By the end of the war, approximately 1.5 million Springfield rifle muskets had been produced by the [Springfield Armory](#) and 20 subcontractors. Since the South lacked sufficient manufacturing capability, most of the Springfields in Southern hands were captured on the battlefields during the war.

Many older Springfield rifle muskets, such as the Model 1855 and 1842, were brought out of storage and used due to arms shortages. Many smooth bore muskets dating all the way back to the Springfield Model 1812 were brought out of storage for similar reasons. These old and obsolete weapons were replaced by newer weapons as they became available.

## Enfield Rifle Musket



The second most widely used weapon of the Civil War, and the most widely used weapon by the Confederates, was the British [Pattern 1853 Enfield](#).

Like the Springfield, this was a three-band, single-shot, muzzle-loading rifle musket. It was the standard weapon for the [British Army](#) between 1853–1867. American soldiers liked it because its .577 cal. barrel allowed the use of .58 cal. ammunition used by both Union and Confederate armies. Originally produced at the [Royal Small Arms Factory](#) at [Enfield](#), England, approximately 900,000 of these muskets were imported during 1861–1865, seeing use in every major battle from [Shiloh](#) onward. Many officers, however, preferred the Springfield muskets over the Enfield muskets—largely due to the interchangeability of parts that the machine-made Springfields offered.

The Enfield had a stepped flip up sight, which was adjustable from 100–900 yards (91–823 m) (1,200 yards (1,100 m) in later models) in 100 yard increments. Realistically, though, hitting anything beyond 500 yards was mostly a matter of luck.

## Lorenz Rifle



The third most widely used weapon of the Civil War was the [Lorenz Rifle](#). This rifle was invented in 1854 by Austrian lieutenant [Joseph Lorenz](#). This rifle had first seen action in the [Second Italian War of Independence](#).

The Lorenz rifle was similar in design to the Enfield rifle-musket. It used a percussion lock, was similar in length, and had three barrel bands, like the Springfield and Enfield. The Lorenz rifle was originally .54 caliber. A large number were bored out to .58 caliber so that they could use the same ammunition as the Springfield and Enfield rifle-muskets.

The quality of Lorenz rifles during the Civil War was not consistent. Some were considered to be of the finest quality, and were sometimes praised as being superior to the Enfield. Others, especially those in later purchases, were described as horrible in both design and condition. The bored out versions were not consistent in caliber, ranging from .57 to .59. Many of these poorer quality weapons were swapped out on the battlefield for Enfield rifle-muskets whenever one became available.

The Union purchased 226,924 Lorenz rifles, and the Confederacy bought as many as 100,000.

## Whitworth Rifle



The [Whitworth rifle](#) was designed by Sir [Joseph Whitworth](#), and was manufactured in [Manchester, England](#). The Whitworth rifle featured a unique hexagonal shaped bullet (with a matching hexagonal barrel) that gave it superior accuracy. This rifle was mostly used by Confederate snipers. The accuracy of the Whitworth was often exaggerated, but it was capable of hitting a man sized target beyond 1,000 yards.

Whitworth rifles were equipped with either Enfield style sights or telescopic sights. The telescopic sights were more accurate, but had a reputation for bruising the user's eye due to the rifle's recoil.

## Other rifles used

Other rifles used during the Civil War were the [British P-1841-Bored Brunswick Rifle](#) (not common), [Burnside carbine](#) (used only by cavalry), [Henry rifle](#) (Very limited issue; many brought privately by individuals), and the [Spencer rifle](#) (used almost exclusively by cavalry). There was also the Model 1859 Sharps rifle, a single-shot breechloader. They were expensive to manufacture and only 11,000 were produced, most of which were unissued or went to sharpshooters. However, the Sharps carbine was very common, with over 90,000 produced. The rifles differed from each other mainly in the different "actions" they had. Almost all rifles were made with iron barrels, while only some, like the Burnside, used steel, which then was expensive.

Model 1855 rifles were fairly common. Most of the regular army was equipped with them in 1861, and the Confederates had a few thousand that had been stored in Southern arsenals. They acquired more through

battlefield pickups and would use them throughout the war (although the 1855 rifle was eventually replaced in the Union ranks by 1861 Springfields).

The [Model 1841 Mississippi Rifle](#), the progenitor of the Model 1855 and 1861 Springfield, was still used in the Civil War to a fair degree, especially by Confederate [non-commissioned officers](#) (NCOs) and sharpshooters.

The Confederacy also produced a variety of weapons itself, standardizing on .58 caliber in 1862. These were usually clones of existing designs and tended to be poor quality due to shortages of raw material and skilled labor. Some such weapons included clones of the Sharps carbine, the [Richmond/Fayetteville rifles](#) (a Springfield clone) and imitations of Enfield rifles and muskets.

The only breechloading rifle (not built as a carbine like the Burnside) firing a primed-metallic cartridge (a .50 cal. rimfire) made by the Federal Government (at Springfield Armory) and actually designed for issue to infantrymen was the Model 1865 Springfield Joslyn Rifle, of which only 3,007 were made. In fact, this rifle was the first breechloader ever made in any national armory that fired a primed metallic cartridge. It was basically a Joslyn Carbine action fitted to an 1863 Springfield barrel and stock (though heavily modified). It was issued to disabled soldiers of the Veteran Reserve Corps very late in the war (April 1865) and likely was never used in action. However, it established the single-shot metallic cartridge breechloader as a standard infantry weapon, which eventually all modern armies adopted in one form or another. The US adopted the breechloading [1866 Springfield "Trapdoor" infantry rifle](#) built from surplus rifle-musket parts after the war.

The new repeater rifles would see fairly limited use in the Civil War. The first such weapon adopted by the US Army was the Model 1855 Colt Revolving Rifle (and a companion carbine), but it had a serious defect in that the gun would often discharge several chambers at once, the extra rounds flying straight into the hand that was holding the barrel up. Some soldiers tried to get around this dangerous problem by loading only one chamber, however this defeated the purpose of having a repeater rifle. Most Colt Revolving Rifles were eventually sold off by the War Department for 55 cents just to get rid of them. The unfortunate experience the army had had with these led to a stigma against repeating rifles, combined with the old fear that they (and single-shot breech loaders) would encourage men to waste ammunition.

[Spencer rifles](#) were the first successful repeater used in the United States. After attending a demonstration firing, President Lincoln was impressed enough to give it his approval. The seven-shot Spencer was produced in rifle and carbine versions, although the latter was more common. By 1864, some Union companies were armed with them, although rarely whole regiments. A few fell into Confederate hands, but proved largely unusable due to a lack of ammunition (the Confederacy had insufficient supplies of copper to manufacture the Spencer's rimfire cartridges).



The Henry rifle had a copper or brass cartridge that effectively sealed the breech of the gun so that the hot propellant gases would be held inside of the gun. The ignition source was a folded rim on the inside of the gun. The inventor of the gun was able to mass-produce a cartridge that had a powerful powder charge. The power of a Henry Rifle was comparable in power to military pistols, but that was not enough to be used as a shoulder fired rifle for the military. While most shoulder fired rifles during the time fired a bullet between 350 and 500 grains propelled by 40 to 60 grains of powder the Henry rifle shot a small .44 bullet of only 200 grains and 26 to 28 grains of black powder, giving it a quite short range. While the Henry was carried and used by men in the Civil War it was not widely accepted or popular by the military. Nonetheless, Henry and Spencer rifles were used at the December 1864 [Battle of Nashville](#) to quite devastating effect.



## For More Information

[http://www.cincinnatiwrt.org/data/ccwrt\\_history/talks\\_text/holt\\_shoulder\\_arms.html](http://www.cincinnatiwrt.org/data/ccwrt_history/talks_text/holt_shoulder_arms.html)

<http://www.civilwar.org/education/history/warfare-and-logistics/warfare/smallarms.html>

<http://www.militaryfactory.com/smallarms/civil-war-guns.asp>

<http://militaryhistory.about.com/od/smallarms/ig/Civil-War-Weapons-Gallery/>

[http://www.army.mil/gettysburg/weaponry/small\\_arms.html](http://www.army.mil/gettysburg/weaponry/small_arms.html)

<http://civilwarstory.nstemp.com/links/small-arms.html>

[http://www.civilwar.si.edu/weapons\\_intro.html](http://www.civilwar.si.edu/weapons_intro.html)

## MARK YOUR CALENDAR!

**2014 Field Trip, September 18-21**

**Thursday, travel to Franklin, Tennessee**

**Friday and Saturday, tour of Franklin and other sites TBA**

**Sunday, Return to Cleveland**



## NEXT MONTH

***Soldiers and the Homefront:  
A Northern Community  
Confronts the Civil War***

**Nicole Etcheson**





<http://www.civilwar.org/battlefields/franklin/maps/franklin-animated-map/>

