

(6 June). Additional Confederate forces in the theater included Major General John C. Breckinridge's small army in the Shenandoah Valley and General P.G.T. Beauregard's forces protecting Richmond, southern Virginia, and northern North Carolina. In the course of the campaign, Lee received some reinforcements from both Breckinridge and Beauregard. The Army of Northern Virginia (including Longstreet's I Corps) began the campaign with about 64,000 soldiers.

Although plagued by an overall shortage in numbers, Lee had fewer worries about the organization and quality of his manpower. Most of his soldiers had enlisted for the duration of the war, thus his army lost few regiments due to expired terms of service. Also, thanks to its better replacement system, Confederate regiments were usually closer to a consistent strength of 350 to 600 men instead of the wild disparity of their Union counterparts (as low as 150 soldiers in the decimated veteran regiments and as much as 1,200 in the heavy artillery regiments). Overall, Lee could count on the quality and consistency of his units, and he did not have to endure the turmoil of troop turnover and organizational changes that hindered Grant's forces.

As for staffs, on the Union side Grant maintained a surprisingly small staff for a commander in chief. His personal chief of staff was Major General John A. Rawlins, a capable officer who generally produced concise and well-crafted orders. In addition, he was Grant's alter ego, a trusted friend who took it upon himself to keep Grant sober. In fact, recent scholarship indicates that Grant's drinking was far less of a problem than formerly indicated, and there were certainly no drinking difficulties during the Overland Campaign. The rest of Grant's small staff consisted of a coterie of friends who had earned Grant's trust from their common service in the western theater campaigns. In general, this staff performed well, although a few glaring mistakes would come back to haunt the Union effort. Of course, one of the major reasons Grant could afford to keep such a small staff in the field was that the chief of staff for the Union armies, Major General Henry W. Halleck, remained in Washington with a large staff that handled Grant's administrative duties as general in chief. In fact, Halleck was a superb staff officer who tactfully navigated the political seas of Washington and gave Grant the freedom to accompany the Army of the Potomac in the field.

In contrast to Grant's field staff, Meade had a huge staff that Grant once jokingly described as fitting for an Imperial Roman Emperor. Meade's chief of staff was Major General Andrew A. Humphreys, an extremely capable officer who only reluctantly agreed to leave field command to

serve on the army's staff. Humphreys has received some criticism for not pushing the Army of the Potomac through the Wilderness on 4 May; but for most of the campaign, his orders were solid and his movement plan for the crossing of the James River was outstanding. Another excellent officer on the army staff was the chief of artillery, Major General Henry J. Hunt. Recognized as one of the war's foremost experts on artillery, Hunt had a more active role in operational matters than most artillery chiefs who usually just performed administrative duties. The rest of Meade's staff was of mixed quality. In addition, the poor caliber of Union maps coupled with some mediocre young officers who were used as guides repeatedly led to misdirected movements and lost time.

Compared to Meade's large headquarters, Lee maintained a smaller group of trusted subordinates for his staff. Lee did not have a chief of staff, thus much of the responsibility for writing his orders fell on the shoulders of a few personal aides and secretaries, especially Lieutenant Colonel Charles Marshall. Lee employed several young officers, such as Lieutenant Colonel Walter Taylor and Colonel Charles S. Venable, as aides, and had great faith in these men to transmit his orders to subordinates. However, the lack of a true staff to ease his workload probably took its toll on Lee who was ill and physically exhausted by the time of the North Anna battles at the end of May. Other than his young aides, Lee had several other staff officers of mixed quality. His chief of artillery, Brigadier General William N. Pendleton, was mediocre at best, and the Army commander usually relegated his chief of artillery to strictly administrative duties. On the other hand, Major General Martin Luther (M.L.) Smith, Lee's chief engineer, played an active and generally positive role throughout the campaign.

Weapons

Infantry

During the 1850's, in a technological revolution of major proportions, the rifle musket began to replace the relatively inaccurate smoothbore musket in ever-increasing numbers, both in Europe and America. This process, accelerated by the Civil War, ensured that the rifled shoulder weapon would be the basic weapon used by infantrymen in both the Federal and Confederate armies.

The standard and most common shoulder weapon used in the American Civil War was the Springfield .58-caliber rifle musket, models 1855, 1861, and 1863. In 1855, the US Army adopted this weapon to replace the .69-caliber smoothbore musket and the .54-caliber rifle. In appearance, the rifle musket was similar to the smoothbore musket. Both were single-shot

muzzleloaders, but the rifled bore of the new weapon substantially increased its range and accuracy. The rifling system chosen by the United States was designed by Claude Minié, a French Army officer. Whereas earlier rifles fired a round nonexpanding ball, the Minié system used a hollow-based cylindro-conoidal projectile slightly smaller than the bore that dropped easily into the barrel. When the powder charge was ignited by a fulminate of mercury percussion cap, the released powder gases expanded the base of the bullet into the rifled grooves, giving the projectile a ballistic spin.

The model 1855 Springfield rifle musket was the first regulation arm to use the hollow-base .58-caliber minie bullet. The slightly modified model 1861 was the principal infantry weapon of the Civil War, although two subsequent models in 1863 were produced in about equal quantities. The model 1861 was 56 inches long overall, had a 40-inch barrel, and weighed 9 pounds 2 ounces with its bayonet. The 21-inch socket bayonet consisted of an 18-inch triangular blade and 3-inch socket. The Springfield had a rear sight graduated to 500 yards. The maximum effective range of this weapon was approximately 500 yards, although it had killing power at 1,000 yards. The round could penetrate 11 inches of white-pine board at 200 yards and 3¼ inches at 1,000 yards, with a penetration of 1 inch considered the equivalent of disabling a human being. Although the new weapons had increased accuracy and effectiveness, the soldiers' vision was still obscured by the clouds of smoke produced by the rifle musket's black powder propellant.

To load a muzzle-loading rifle, the soldier took a paper cartridge in hand and tore the end of the paper with his teeth. Next, he poured the powder down the barrel and placed the bullet in the muzzle. Then, using a metal ramrod, he pushed the bullet firmly down the barrel until seated. He then cocked the hammer and placed the percussion cap on the cone or nipple, which, when struck by the hammer, ignited the gunpowder. The average rate of fire was three rounds per minute. A well-trained soldier could possibly load and fire four times per minute, but in the confusion of battle, the rate of fire was probably slower, two to three rounds per minute.

In addition to the Springfield, over 100 types of muskets, rifles, rifle muskets, and rifled muskets—ranging up to .79 caliber—were used during the American Civil War. The numerous American-made weapons were supplemented early in the conflict by a wide variety of imported models. The best, most popular, and most common of the foreign weapons was the British .577-caliber Enfield rifle, model 1853, which was 54 inches long (with a 39-inch barrel), weighed 8.7 pounds (9.2 with the bayonet), could be fitted with a socket bayonet with an 18-inch blade, and had a rear sight graduated

to 800 yards. The Enfield design was produced in a variety of forms, both long and short barreled, by several British manufacturers and at least one American company. Of all the foreign designs, the Enfield most closely resembled the Springfield in characteristics and capabilities. The United States purchased over 436,000 Enfield-pattern weapons during the war. Statistics on Confederate purchases are more difficult to ascertain, but a report dated February 1863 indicated that 70,980 long Enfields and 9,715 short Enfields had been delivered by that time, with another 23,000 awaiting delivery.

While the quality of imported weapons varied, experts considered the Enfields and the Austrian Lorenz rifle muskets to be very good. However, some foreign governments and manufacturers took advantage of the huge initial demand for weapons by dumping their obsolete weapons on the American market. This practice was especially prevalent with some of the older smoothbore muskets and converted flintlocks. The greatest challenge, however, lay in maintaining these weapons and supplying ammunition and replacement parts for calibers ranging from .44 to .79. The quality of the imported weapons eventually improved as the procedures, standards, and astuteness of the purchasers improved. For the most part, the European suppliers provided needed weapons, and the newer foreign weapons were highly regarded.

Breechloaders and repeating rifles were available by 1861 and were initially purchased in limited quantities, often by individual soldiers. Generally, however, these types of rifles were not issued to troops in large numbers because of technical problems (poor breech seals, faulty ammunition), fear by the Ordnance Department that the troops would waste ammunition, and the cost of rifle production. The most famous of the breechloaders was the single-shot Sharps, produced in both carbine and rifle models. The model 1859 rifle was .52-caliber, 47½ inches long, and weighed 8¾ pounds, while the carbine was .52-caliber, 39½ inches long, and weighed 7¾ pounds. Both weapons used a linen cartridge and a pellet primer feed mechanism. Most Sharps carbines were issued to Federal cavalry units.

The best known of the repeaters was probably the seven-shot .52-caliber Spencer, which came in both rifle and carbine models. The rifle was 47-inches long and weighed 10 pounds, while the carbine was 39-inches long and weighed 8¼ pounds. The Spencer was also the first weapon adopted by the US Army that fired a metallic rim-fire, self-contained cartridge. Soldiers loaded rounds through an opening in the butt of the stock, which fed into the chamber through a tubular magazine by the action of the trigger guard. The hammer still had to be cocked manually before each shot.

Field Artillery

In 1841, the US Army selected bronze as the standard material for fieldpieces and at the same time adopted a new system of field artillery. The 1841 field artillery system consisted entirely of smoothbore muzzleloaders: 6- and 12-pound guns; 12-, 24-, and 32-pound howitzers; and 12-pound mountain howitzers. A pre-Civil War battery usually consisted of six fieldpieces—four guns and two howitzers. A 6-pound battery contained four 6-pound guns and two 12-pound howitzers, while a 12-pound battery had four 12-pound guns and two 24-pound howitzers. The guns fired solid shot, shell, spherical case, grapeshot, and canister rounds, while howitzers fired shell, spherical case, grapeshot, and canister rounds, while artillery ammunition is described below).

The 6-pound gun (effective range 1,523 yards) was the primary fieldpiece used from the time of the Mexican War until the Civil War. By 1861, however, the 1841 artillery system based on the 6-pounder was obsolete. In 1857, a new and more versatile fieldpiece, the 12-pound gun-howitzer (Napoleon), model 1857, appeared on the scene. Designed as a multipurpose piece to replace existing guns and howitzers, the Napoleon fired canister and shell, like the 12-pound howitzer, and solid shot comparable in range to the 12-pound gun. The Napoleon was a bronze, muzzle-loading smoothbore with an effective range of 1,619 yards (see table 3 for a comparison of artillery data). Served by a nine-man crew, the piece could fire at a sustained rate of two aimed shots per minute. Like almost all smoothbore artillery, the Napoleon fired "fixed" ammunition—the projectile and powder were bound together with metal bands.

Another new development in field artillery was the introduction of rifling. Although rifled guns provided greater range and accuracy, smoothbores were generally more reliable and faster to load. Rifled ammunition was semifixed, so the charge and the projectile had to be loaded separately. In addition, the canister load of the rifle did not perform as well as that of the smoothbore. Initially, some smoothbores were rifled on the James pattern, but they soon proved unsatisfactory because the bronze rifling eroded too easily. Therefore, most rifled artillery was either wrought iron or cast iron with a wrought-iron reinforcing band.

The most commonly used rifled guns were the 10-pound Parrott and the Rodman, or 3-inch ordnance rifle. The Parrott rifle was a cast-iron piece, easily identified by the wrought-iron band reinforcing the breech. The 10-pound Parrott was made in two models: model 1861 had a 2.9-inch rifled bore with three lands and grooves and a slight muzzle swell, while model 1863 had a 3-inch bore and no muzzle swell. The Rodman or

The Henry rifle was, in some ways, even better than either the Sharps or the Spencer. Although never adopted by the US Army in any quantity, it was purchased privately by soldiers during the war. The Henry was a 16-shot, .44-caliber rimfire cartridge repeater. It was 43½ inches long and weighed 9¼ pounds. The tubular magazine located directly beneath the barrel had a 15-round capacity with an additional round in the chamber. Of the approximately 13,500 Henrys produced, probably 10,000 saw limited service. The government purchased only 1,731.

The Colt repeating rifle, model 1855 (or revolving carbine), also was available to Civil War soldiers in limited numbers. The weapon was produced in several lengths and calibers, the lengths varying from 32 to 42½ inches, while its calibers were .36, .44, and .56. The .36 and .44 calibers were made to chamber six shots, while the .56-caliber was made to chamber five shots. The Colt Firearms Company was also the primary supplier of revolvers (the standard sidearm for cavalry troops and officers), the .44-caliber Army revolver and the .36-caliber Navy revolver being the most popular (over 146,000 purchased). This was because they were simple, relatively sturdy, and reliable.

Cavalry

Initially armed with sabers and pistols (and in one case, lances), Federal cavalry troops quickly added the breech-loading carbine to their inventory of weapons. Troops preferred the easier-handling carbines to rifles and the breechloaders to awkward muzzleloaders. Of the single-shot breech-loading carbines that saw extensive use during the Civil War, the Hall .52-caliber accounted for approximately 20,000 in 1861. The Hall was quickly replaced by a variety of more state-of-the-art carbines, including the Merrill .54-caliber (14,495), Maynard .52-caliber (20,002), Gallagher .53-caliber (22,728), Smith .52-caliber (30,062), Burnside .56-caliber (55,567), and Sharps .54-caliber (80,512). The next step in the evolutionary process was the repeating carbine, the favorite by 1864 (and commonly distributed by 1865) being the Spencer .52-caliber seven-shot repeater (94,194).

Because of the South's limited industrial capacity, Confederate cavalrymen had a more difficult time arming themselves. Nevertheless, they too embraced the firepower revolution, choosing shotguns and muzzle-loading carbines as well as multiple sets of revolvers as their primary weapons. In addition, Confederate cavalrymen made extensive use of battlefield salvage by recovering Federal weapons. However, the South's difficulties in producing the metallic-rimmed cartridges required by many of these recovered weapons limited their usefulness.

ordnance rifle was a long-tubed, wrought-iron piece that had a 3-inch bore with seven lands and grooves. Ordnance rifles were sturdier and considered superior in accuracy and reliability to the 10-pound Parrott.

A new weapon that made its first appearance in the war during the Overland Campaign was the 24-pound Coehorn mortar. Used exclusively by the North, the Coehorn fired a projectile in a high arcing trajectory and was ideal for lobbing shells into trenches in siege warfare. The Coehorn was used briefly during the fighting at the "bloody angle" at Spotsylvania and later in the trench lines at Cold Harbor.

By 1860, the ammunition for field artillery consisted of four general types for both smoothbores and rifles: solid shot, shell, case, and canister. Solid shot was a round cast-iron projectile for smoothbores and an elongated projectile, known as a bolt, for rifled guns. Solid shot, with its smashing or battering effect, was used in a counterbattery role or against buildings and massed formations. The conical-shaped bolt lacked the effectiveness of the cannonball because it tended to bury itself on impact instead of bounding along the ground like a bowling ball.

Shell, also known as common or explosive shell, whether spherical or conical, was a hollow projectile filled with an explosive charge of black powder that was detonated by a fuse. Shell was designed to break into jagged pieces, producing an antipersonnel effect, but the low-order detonation seldom produced more than three to five fragments. In addition to its casualty-producing effects, shell had a psychological impact when it exploded over the heads of troops. It was also used against field fortifications and in a counterbattery role. Case or case shot for both smoothbore and rifled guns was a hollow projectile with thinner walls than shell. The projectile was filled with round lead or iron balls set in a matrix of sulfur that surrounded a small bursting charge. Case was primarily used in an antipersonnel role. This type of round had been invented by Henry Shrapnel, a British artillery officer, hence the term "shrapnel."

Last, there was canister, probably the most effective round and the round of choice at close range (400 yards or less) against massed troops. Canister was essentially a tin can filled with iron balls packed in sawdust with no internal bursting charge. When fired, the can disintegrated, and the balls followed their own paths to the target. The canister round for the 12-pound Napoleon consisted of 27 1½-inch iron balls packed inside an elongated tin cylinder. At extremely close ranges, men often loaded double charges of canister. By 1861, canister had replaced grapeshot in the ammunition chests of field batteries (grapeshot balls were larger than canister, and thus fewer could be fired per round).

Weapons in the Overland Campaign

The variety of weapons available to both armies during the Civil War is reflected in the battles of the Overland Campaign. To a limited extent, the Army of Northern Virginia's infantry had more uniformity in its small arms than the Army of the Potomac. In fact, some regiments of the famous Pennsylvania Reserves Brigade were still equipped with smoothbore muskets. In any case, both armies relied heavily on the Springfield and Enfield, which were the most common weapons used (although almost every other type of Civil War small arms could be found in the campaign).

The variety of weapons and calibers of ammunition required on the battlefield by each army presented sustainment challenges that ranged from production and procurement to supplying soldiers in the field. Amazingly, operations were not often affected by the need to resupply a diverse mixture of ammunition types.

The Army of the Potomac (including the IX Corps) started the campaign with 58 batteries of artillery. Of these, 42 were six-gun batteries, while the other 16 batteries were of the four-gun type. The Federals went to a four-gun battery system after the battle of Spotsylvania. Also at this time, the Army of the Potomac's Artillery Reserve was disbanded except for the ammunition train. The Reserve's batteries went to the corps-level reserve artillery brigades. The Army of Northern Virginia totaled 56 artillery batteries. The vast majority of these (42) were four-gun batteries. The rest of the mix included one six-gun battery, three five-gun, five three-gun, four two-gun, and a lone one-gun battery. (Refer to table 3 for the major types of artillery available to the two armies at the start of the campaign.)

The effectiveness of artillery during the campaign was mixed. In the Wilderness, the rugged terrain and the dense vegetation reduced the effectiveness of artillery fire. Specifically, the Federals' advantage in numbers of longer-range rifled guns was negated by the lack of good fields of fire. The more open ground at Spotsylvania and Cold Harbor allowed for better use of artillery. However, the increasing use of entrenchments on both sides tended to relegate artillery to a defensive role.

The Confederates tended to keep their batteries decentralized, usually attached to the infantry brigades within the divisions to which they were assigned. Lee's army did not have an artillery reserve. The Union tended to centralize their artillery, even after disbanding the army-level reserve. This often meant keeping reserve batteries at corps-level, other batteries in division reserves, and occasionally assigning batteries to brigades as needed.