Between mid-July 1863 and late December 1864, Federal command-
ers concerned with southwestern Virginia launched four major attacks
on the strategic mineral operations in the region and on the railroad over
which these and other vital materials moved. The two mineral industries
targeted were the lead and salt operations in the Valley and Ridge coun-
try west of the Blue Ridge. The lead mines at Austinville and the enor-
mous salt works at Saltville were, in fact, essential to the Confederate
war effort, particularly in the last two years of the conflict. Thus, Union
forces were sent at various times from West Virginia, Kentucky, and
finally eastern Tennessee over some of the most rugged terrain in eastern
North America to attack and destroy the mineral industries and rail-
road in far southwestern Virginia. These little-known campaigns, laden
with instances of hardship, suffering, and courage, provide a fascinating
glimpse into the connections between the topography, mineral deposits,
and Civil War history of this region.

Virginia’s Mineral Contributions to the Confederacy

In order to feed the huge Northern and Southern war machines that
developed in the 1860s, certain mined materials were absolutely funda-
mental. These included lead, salt, iron, niter (saltpeter), and coal.¹ Lead,
of course, was needed to make bullets, which at that time were cast-lead
projectiles of varying sizes, but typically around 50 caliber or even larger.
Salt was essential to pack and preserve meat and other foodstuffs, to
provide nutrition for soldiers and animals, and to make medications. Iron
was necessary for railroads, armaments, and implements, and niter was
the main ingredient in gunpowder. Even coal, just then beginning to
replace wood as a major fuel, was required for certain heavy industries
such as the giant Tredegar Iron Works at Richmond.

Of all the Confederate states, Virginia ranked first in the production
of each of these strategic materials save iron, where it was a close second
to Alabama. Perhaps even more interesting is the fact that, except for the coal which came principally from the mines around Richmond, nearly all of the production of the other mined resources was located west of the Blue Ridge. Iron, for example, was manufactured primarily at furnaces and forges in the Valley and Ridge of western Virginia. Niter-rich organic deposits in the limestone caves of many western Virginia counties provided most of the Old Dominion's saltpeter production.

But no Virginia mineral operations rivaled the importance to the Confederate war effort of the Wythe County lead works or the salt operations at Saltville (Fig. 1). The lead mines and smelting facilities at Austinville eventually produced approximately one-third of all the lead consumed by the South during the war years. Particularly in the last two years of the conflict, as pre-war stockpiles and smuggled quantities of lead became increasingly scarce, the Confederacy came to rely almost exclusively on the one significant lead-mining operation within its borders — Austinville. Nearby Saltville in adjacent Smyth County was just as crucial as Austinville, eventually providing an estimated two-thirds of all the salt required by the Confederacy. No wonder, then, that as the war wore on, Northern military activities in southwestern Virginia focused more and more on the irreplaceable lead and salt production centers and the region’s greatest transportation system, the Virginia and Tennessee Railroad.

Geology and Geography of Southwestern Virginia

Virginia has five distinct geologic and physiographic provinces — the Coastal Plain, Piedmont, Blue Ridge, Valley and Ridge, and Plateau, from east to west. Most of the major battles of the Civil War in Virginia were fought in the low-relief Coastal Plain (“Tidewater”) and Piedmont provinces, where Washington and Richmond lay and where large armies could be handled and supplied much more effectively than in the mountainous provinces to the west. Beyond the Blue Ridge, especially in the Great Valley at the western foot of the mountains, important military activity did occur, as evidenced by Stonewall Jackson’s brilliant Valley campaign in 1862. And in southwestern Virginia’s Valley and Ridge were Saltville, Austinville, and the railroad, the three great military targets of the region.

The formation of the rocks exposed in the Valley and Ridge began approximately 550 million years ago, long before the Appalachian Mountains arose. At that time, the area that would become western Virginia was part of a low-lying continental margin covered by a shallow sea
under tropical conditions. Thick masses of carbonate-rich rocks (limestone and dolomite) formed much as they do now in the present-day Bahamas area. After deposition of the carbonates, extensive layers of sediment composed of mud, sand, and gravel accumulated as the tectonic plates shifted about and produced elevated land masses. Eventually, climaxing around 250 million years ago, the continental margin was compressed in a major mountain-building event caused by the collision of North America and Africa. The sediments along the edge of the continent were folded, faulted, and uplifted to form the Appalachian Mountains. After the tectonic plates separated, the Atlantic Ocean formed, erosion of the newly-formed Appalachians began, and the present-day landforms of eastern North America started to take shape.

These geologic events have had a profound impact on the human history of southwestern Virginia. The Wythe County lead ores were emplaced into the ancient carbonate rocks during this time, perhaps when metal-rich fluids were generated in an episode of mountain build-
ing. The salt and gypsum deposits were formed at Saltville when the young Appalachians arose and blocked moisture-bearing winds from reaching the western side of the range. There, under warm, dry conditions, sea water evaporated and precipitated salt and gypsum, much like modern-day occurrences in the Persian Gulf region.

But not only mineral gifts constitute the geological heritage of southwestern Virginia. The very shape of the land itself has exerted tremendous influence over the human history of the area. The Great Valley subregion immediately west of the Blue Ridge exists because of the relatively "soft" (to the processes of erosion) carbonate rocks underlying this area. The Great Valley offered fertile bottom land and an easy transportation corridor for travelers wishing to journey northeast or southwest. This area then, which regionally extends from Alabama to Pennsylvania, drew many early settlers and ultimately determined the principal road and railroad routes. In the 1850s, the Virginia and Tennessee Railroad was constructed from Lynchburg to Bristol (and beyond); most of its length in Virginia — Big Lick (Roanoke) to Bristol — lay in the Great Valley. During most of the Civil War, Southern commanders had control of southwestern Virginia's Great Valley and used it to shift their forces either north or south quickly. Northern forces, until very near the end of the war, had to launch their attacks on southwestern Virginia from West Virginia or Kentucky, which meant moving slowly through the treacherous, deeply dissected Plateaus country and across the rugged mountains of the western Valley and Ridge. Hence, the terrain of southwestern Virginia was very definitely not "neutral" during the Civil War, but greatly favored the defending Rebel forces.

History and Technology of the Lead and Salt Operations

The Wythe County lead mines (Fig. 2), which later came to be known variously as the mines on Cripple Creek, the Austinville mines, or the Wytheville mines (as they were commonly called during the Civil War), were opened in the mid-1700s by Colonel John Chiswell, a British officer who was a native of Wales and an early adventurer in southwestern Virginia. By the time of the Revolutionary War, Colonel Chiswell had died and the mines were taken over by the state of Virginia. Of particular historical interest is the writing in 1775 of the "Fincastle Resolutions," which were drawn up at the Lead Mines (as the little mining community was then known), the Fincastle County Seat. These resolutions were addressed to the Virginia Delegate to the Continental Congress and helped
frame the Declaration of Independence of July 4, 1776, fame. During the Revolution, the lead mines produced significant amounts of lead for George Washington’s Colonial Army.

After the Revolutionary War, the lead works came into the hands of two Austin brothers, Moses and Stephen. In 1798, by which time the community of Lead Mines had become Austinville and Moses’ son Stephen F. Austin (later to become the “Father of Texas”) had been born, Moses Austin and his family left Virginia for Missouri. The mines changed hands once again; in 1806, Thomas Jackson, an English immigrant who had worked at the mines previously, and two other partners acquired the lead mines from the state for $19,000. Soon thereafter (1807-12), Jackson had the Shot Tower built on a dolomite bluff along the New River about three miles northeast of the lead operations. This fascinating structure, one of the few historic shot towers still standing in the United States, was constructed to produce lead shot for hunting purposes. The then-current method of pouring molten lead through sieves and letting the droplets fall through the air to cool into nearly perfect little spheres is still used today to produce lead shot.
Following Jackson's death in 1824, activities at the lead mines continued on a very limited scale. Eventually, a new operator, the Wythe Lead Mines Company, was organized in 1838; the company name was changed to the Wythe Union Lead Mine Company in 1848. On March 8, 1860, the Union Lead Mining Company was incorporated for the express purpose of mining and manufacturing lead and shot. Ironically, then, by the eve of the Civil War and throughout the conflict, the South's only substantial domestic lead source was operated as the Union Mines!

Shortly after the war began, Confederate officials told the mines management either to work the mines to "their utmost capacity," or surrender them for operation by the government. The company directors chose the former, and thus full-time war production commenced. The mines ran day and night and the mined ore was "reduced" (smelted) on site. Lead pigs were cast and hauled by wagons to Max Meadows, an important trans-shipment point on the railroad about ten miles north of the mines. Here, the lead was loaded onto railroad cars and shipped to the Richmond-Petersburg area or Knoxville and Chattanooga. Production records are incomplete, but reports after the war by Confederate ordnance officers indicate that around 3,300,000 pounds of lead were produced at the Wythe County mines during the war (Table 1). This amount constitutes fully one-third of the estimated 10,000,000 pounds of lead consumed by the entire Confederacy in the manufacture of 150,000,000 cartridges used by its armies.6

The history of salt-making in the Saltville Valley is as fascinating as the development of the Wythe County lead mines.7 Extraction of salt from the brine ponds in the Saltville Valley must have begun thousands of years ago when native Americans evaporated the brines for salt acquisition. By the 1750s, Charles Campbell had acquired most of the saline

| Table 1. Wythe County Union Lead Mines Production, 1861–64 (from Donnelly, 1959) |
|-------------------------------|-----------------|
| May 1, 1861 – February 28, 1862 | 1,232,254       |
| February 28, 1862 – February 28, 1863 | 842,378       |
| February 28, 1863 – April 1, 1864 | 623,113        |
| April 1, 1864 – December 17, 1864 | 585,571        |
| Total                          | 3,283,316       |
springs and ponds; his relatives began the first commercial salt operations in 1782. By the late 1700s, the original Campbell works had passed by marriage into the hands of the Preston family. At about the same time, William King began competing salt production on land adjoining the Preston operations. For the next 60 years, these two salt operations grew and intertwined, being known generally as the Preston’s and King’s salt works.

During the first half of the nineteenth century, a burgeoning mineral industry developed in southwestern Virginia. Just a few miles southwest of Saltville at Plasterco, gypsum or “plaster” was prospected for and mined as early as 1815 from the same geologic strata containing the salt. Originally used mostly to “sweeten” or condition the soil for farmers, gypsum found new uses, such as plaster products\(^8\), and production increased. Iron furnaces and forges sprang up in a number of southwestern Virginia counties west of the Blue Ridge (especially, Wythe, Smyth, and Washington) and, of course, lead production continued at Austinville. By the 1850s, southwestern Virginia produced an abundance of salt, plaster, shot, pig iron, and lead for the area between the Cumberlands and Smokies. The completion of the Virginia and Tennessee Railroad in 1856 greatly aided economic development in this region. Of particular interest to the salt works was the construction of a railroad spur from Glade Spring on the main line to Saltville in 1856.

The technological aspects of the salt manufacture at Saltville is an interesting story. In the 1750s, Charles Campbell, original owner of the salt ponds and springs, followed the Native American practice of simply boiling down the salt from the surface brine sources to meet his own needs. By 1800, William King was producing 200 bushels a day by using open-shed furnaces to evaporate water bucketed from his wells. (Surprisingly, brine evaporation by boiling in kettles continued as the basic salt production technique until 1892, when salt production ceased. No salt was ever obtained by pick-and-shovel mining).

In 1857, a fascinating sketch of salt manufacture at Saltville appeared in Harper’s Magazine (Fig. 3). The article described the salt wells from which brine was pumped into large reservoirs on the ground surface. Wooden pipes conducted the briny solutions from the reservoirs to the kettles in the open-shed furnaces, some of which were up to 150 feet long. Two rows of kettles, shaped like shallow bowls, were a common arrangement; in the largest furnaces, 80 to 100 kettles might be present. Workmen made their rounds at regular intervals and ladled out the crystallized salt, which was then drained, dried, and stored in salt sheds (or “magazines”) for shipment.
This was the technology that produced the Saltville salt during the Civil War. Stuart, Buchanan, and Co. operated the Saltville works for most of the war years and a few years thereafter. (Partner William A. Stuart was the older brother of famed Rebel cavalryman J.E.B. Stuart, whose wife and children spent much of the war in Saltville under William’s care.) Shortly after fighting began, the salt works contracted with the Confederate government to provide salt “to and for the uses of the Confederate State armies.” By the fall of 1862, the Saltville output had become so important that nearly every Confederate state had negotiated contracts to purchase salt or erect their own operations. Thus, numerous state-owned operations sprang up in the valley. In the peak production year of 1864, the salt operations combined included 38 furnaces with 2,600 kettles that produced a total of four million bushels (200 million pounds) of salt. The enormous salt output during the war years commonly exceeded the ability of the Virginia and Tennessee Railroad to carry it. According to contemporary accounts, it was “a common thing to see as many as a thousand salt wagons at one time” lining the roads for miles waiting their turn for salt. Each wagon would bring a load of wood, needed to feed the voracious furnaces, as part payment for the salt; the rest was paid in Confederate currency.
Mineral Fights — Battles for the Lead and Salt

The first two years of the Civil War saw little significant military action in southwestern Virginia. This region was far removed from the major battles raging in other theaters. Indeed, for many people, those times were not only relatively peaceful but prosperous, thanks in part to the mineral-based war industries located in the area. But in the summer of 1863, things changed dramatically as the Confederacy suffered the twin disasters of Lee’s defeat at Gettysburg (July 1-3) and the fall of Vicksburg (July 4). Almost immediately, Federal commanders began devoting resources to the destruction of the enormously important salt and lead operations and the railroad in Virginia’s far southwest.

On July 13, 1863, Union Colonel John Toland left Charleston, West Virginia, with about 1,000 cavalry and mounted infantry, intending to attack the salt works at Saltville. Coming into Virginia through the Abbs Valley lowland, Toland met and defeated a small Rebel outpost there. Fearing that Saltville and its considerable defensive forces would be forewarned, Toland switched his plans to an assault on Wytheville, hoping to demolish the railroad “High Bridge” west of town over the Reed Creek. He also anticipated mounting an attack on the lead mines.

By late afternoon on July 18, Toland was within sight of Wytheville. A small group of defenders had been hastily assembled; these consisted of local armed citizens and about 130 troops from the Confederate Department of Southwest Virginia, sent down from department headquarters at Dublin by train. A sharp fight broke out along the streets of downtown Wytheville and Toland was killed. In about 45 minutes, the Union forces overpowered the Southern defenders and the Battle of Wytheville was over. But the Union command was decimated and the surviving ranking officer gathered his troops and retreated to West Virginia.

The results of all this were negligible. Parts of Wytheville were burned, and some railroad track was damaged; it took only about an hour to make repairs. The High Bridge was untouched and the crucial lead mines never attacked. Indeed, the lead mines’ home guard, consisting of two companies of miners, was called out to help defend Wytheville, but arrived too late to be of any consequence. They simply turned around and went back home.

The next major action involving the mineral operations and railroad occurred in spring 1864. By May, Union Commander-in-Chief General Ulysses S. Grant had Federal forces on the march throughout Virginia. In particular, General Benjamin Butler was coming up the James toward Richmond, General Franz Sigel was advancing southward in the
Shenandoah Valley, and Grant himself was moving down from Washing-
ton to confront Lee in the Wilderness area.

As part of this grand strategy, a Union force based in West Virginia
under General George Crook left Charleston with 6,155 troops on April
29, determined to destroy the salt works at Saltville and cut the Virginia
and Tennessee Railroad by burning the "Long Bridge" over the New
River at Central (now the City of Radford). Crook detached General
William Averell's cavalry to attack Saltville, but, once in Virginia, Averell
learned that Saltville was defended by the ferocious General John Hunt
Morgan and his terrible men. Averell switched his plans to an assault on
Wytheville and the nearby lead mines; however, Morgan caught Averell
just outside Wytheville in the Crockett's Cove area. The result was the
Battle of the Cove on May 10, 1864, a running cavalry battle in which
Morgan eventually drubbed Averell smartly and drove him northeastward
toward Crook. Shortly thereafter, Averell and Crook returned to West
Virginia without getting anywhere near the lead or salt works or inflict-
ing serious permanent damage on the railroad.

A very important battle occurred at Saltville in October 1864. Union
General Stephen Burbridge left his base in Kentucky on September 20
with about 5,200 mounted troopers.11 Burbridge chose a particularly
difficult invasion route into southwestern Virginia, moving along the Levisa
Fork of the Big Sandy River through the rugged, deeply dissected Plate-
taus country. One noteworthy incident illustrates the ordeal endured by
the Federal soldiers: crossing a high mountain on September 28 at night
during a thunderstorm, perhaps as many as eight men and their mounts
fell to their deaths from the precipitous trail. Others had to be rescued
with ropes.

Meanwhile, on the Confederate side, Saltville's defense was the re-
sponsibility of the newly reorganized Department of Southwest Virginia
and East Tennessee. The Department's commander, General John
Breckinridge (like Burbridge, a Kentuckian), had been campaigning in
the Shenandoah Valley but was hastening back to southwestern Virginia.
As Burbridge approached Saltville, Breckinridge's chief lieutenant, Gen-
eral John Échols, was working miracles, pulling together scattered forces
for the defense of the salt works. On the very day of the battle, the last
Rebel troops, about 1,700 strong under the command of General John
Williams, arrived a bare hour and one-half before fighting broke out.

The battle of Saltville began around 11a.m. Sunday, October 2. Gen-
eral Williams commanded Saltville's 2,500 defenders, who were dug in
on the high ground guarding the approaches to the town, during the
fighting. Williams and the other Southern field commanders handled their
troops well for the six hours of battle; conversely, Burbridge led his men rather poorly. The Federal commander sent his soldiers repeatedly up steep slopes in the face of withering fire from the entrenched Confederates. By 5 p.m., Burbridge was beaten and withdrew. The Battle of Saltville was a clear Southern victory that kept the salt works safe for a few more months. The Rebel success at Saltville might have led to more significant things, but the Confederacy was simply too weak to exploit the victory.

By December 1864, the rapidly weakening Confederacy was tottering toward defeat and final oblivion. Sherman was tearing through the heart of the deep South and Grant was inexorably closing the ring around the Richmond-Petersburg complex and Lee's trapped Army of Northern Virginia. In southwestern Virginia, Union scouting parties sometimes roamed at will. The citizens of the region, besides facing Federal troops, were equally terrorized by outlaw bands of bushwhackers, murderers, and deserters from the Confederate army. But, incredibly, even at this late stage of the war, the three great military targets of the region — the lead mines, the salt works, and the Virginia and Tennessee Railroad — remained intact and operational.

General George Stoneman, an ambitious Union commander in eastern Tennessee, was determined to change all this. Stoneman left Knoxville, by now in Union hands, on December 10 with 5,500 men plus artillery pieces. Stoneman's troops entered Virginia at Bristol; from here he continued his movement up the Great Valley, driving the weakened Confederate forces before him. Railroad trestles, rolling stock, and depots were eventually destroyed from Bristol to ten miles north of Wytheville. On December 16, Wytheville itself was taken and partly burned.

Next day, Stoneman sent two regiments of troopers to attack the lead mines. Facing virtually no opposition, the Yankee soldiers crossed the frigid New River at Austinville and demolished the lead works. In only two hours, the mine offices, storehouses, stables, crushing machine, bellows, furnaces, and even the sawmill and gristmill, went up in flames. (Surprisingly, even with this much devastation, resourceful Confederates had the mines back in production on March 22, 1865). His work at Wytheville and Austinville accomplished, Stoneman turned back toward Marion and defeated Confederate troops led by Breckinridge on December 17 and 18. At last, the way to the great salt works lay open.

Stoneman's forces arrived at Saltville on December 20 and overwhelmed its few hundred defenders, mostly young boys and old men. There followed an "orgy of destruction" described as follows:
Sledge hammers rang against salt kettles and masonry kilns; artillery shells and railroad iron rattled down the wooden well casings; soldiers broadcast sacks of salt like Romans at Carthage; everywhere sheds, stables, and offices crumbled in flames.¹⁴

Stoneman's troops left Saltville and withdrew from southwestern Virginia. But, like the lead mines, the salt works had not been permanently disabled. A report to General Breckinridge a few days after the Saltville raid said that fewer than two-thirds of the sheds and less than one-third of the kettles had been destroyed; some of the sheds and furnaces were left untouched. Several weeks later, the furnaces were going once more and salt was again being furnished to the various states; this continued until the end of the war.

Stoneman returned to Knoxville in late December, his devastation of southwestern Virginia temporarily ended. Next March, as the Confederacy collapsed, he returned to complete his destruction of the region. By then, no amount of lead or salt or any other mineral resource could save the exhausted South; Lee surrendered at Appomattox on April 9, 1865. The war was finally over and with it ended the struggle for the great mineral-producing centers of southwestern Virginia.

Epilogue

After the Civil War, the Austinville mines continued to be a significant mineral production center. Lead manufacture resumed in October 1865, but gradually declined as zinc became the major metal extracted. Approximately 13,000 pounds of zinc ore had been shipped in March 1864 to Petersburg for trial smelting.) Substantial reserves of zinc ores were discovered in 1866 in the Bertha territory near Austinville and large-scale zinc operations soon developed throughout the mining district. Eventually, New Jersey Zinc Company acquired the Austinville district operations and continued zinc production (with lead as a minor by-product) until December 31, 1981. On that date, all work in the Austinville district ceased when the mines and production facilities were permanently closed by New Jersey Zinc, thus ending the approximately 225-year-long history of the oldest continuously operating mines in the entire United States.

At Saltville, mineral production also continued for many years after 1865. Before the Civil War ended, a joint stock company — the Holston Salt and Plaster Company — had been formed in 1864 that united the King and Preston estates under single ownership. This company sur-
vived the conflict and operated until 1892, when it was purchased by the Mathieson Alkali Works. Mathieson soon ended salt manufacture and switched to the production of numerous sodium and chlorine compounds (ultimately ranging from baking soda to rocket fuel) made from the briny solutions extracted from the Saltville subsurface. These operations flourished, and high-pressure injection wells were introduced into the area in 1929. In 1954, Mathieson merged with Olin Industries, after which Olin-Mathieson operated the brine fields and chemical industries until 1971. In that year, confronted by rising public concern about stream pollution and enforcement of state and federal regulations, Olin-Mathieson ceased operations and the long history of human use of the Saltville Valley’s briny waters ended.

A symbolic footnote to the story of the historic mineral operations in southwestern Virginia occurred in 1969 when rockets powered by hydrazine fuel made at Saltville helped put the first humans on the moon. Therefore, little more than a century after soldiers of a divided nation fought and died for control of the Smyth County salt operations, these very same mineral resources ensured that the first footprints in the lunar dust would be those of Americans.

Endnotes
2. R.W. Donnelly, 1959, “The Confederate lead mines of Wythe County, Va.,” Civil War History (1959), pp. 402-14. This is a key reference for much of the material in the present article.
4. K.W. Noe, Southwest Virginia’s Railroad (Urbana and Chicago: University of Illinois Press, 1994). This remarkable work offers much insight not only into the history of the Virginia and Tennessee Railroad but also into the many connections between the physiography and culture of southwestern Virginia.


9. Toland’s raid is well described in Donnelly (1959; see note 2); Marvel (1992; see note 7); and Kegley (1989; see note 5).


13. D. Evans, "Stoneman’s raids," Encyclopedia of the Confederacy, ed. R.N. Current (New York: Simon and Schuster, 1993), pp. 1546-47, is a good overview of Stoneman’s two raids in southwestern Virginia. More detailed information on the destruction of the lead mines is from Donnelly (1959; see note 2); and on the ruin of the salt works is from Marvel (1992; see note 7).