

STEEL DRIVIN' MAN

**JOHN HENRY, THE UNTOLD STORY
OF AN AMERICAN LEGEND**

SCOTT REYNOLDS NELSON

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To my grandfather, David George Brown.
A big man who died too young.

As blasting became more powerful, that part of the process speeded up considerably. The use of railway cars to clear away blasted rock shortened the time between blasts. Soon, hand-drilling the blast holes became the bottleneck in the process. One civil engineer in 1867 called hand drilling the "the most difficult portion of the labor and that which consumes the most time."¹ On the major tunnels of the late nineteenth century—the Mount Cenis and the Hoosac—miners would drill for hours at a time, while the blasting crew worked perhaps an hour. Speeding up the drilling process became critical. Huntington cared not just about efficiency but about time. At least three tunnels had to be made through the Appalachian Mountains to finish the C&O in the six years he had been allotted.

That was where convicts and steam drills came in.

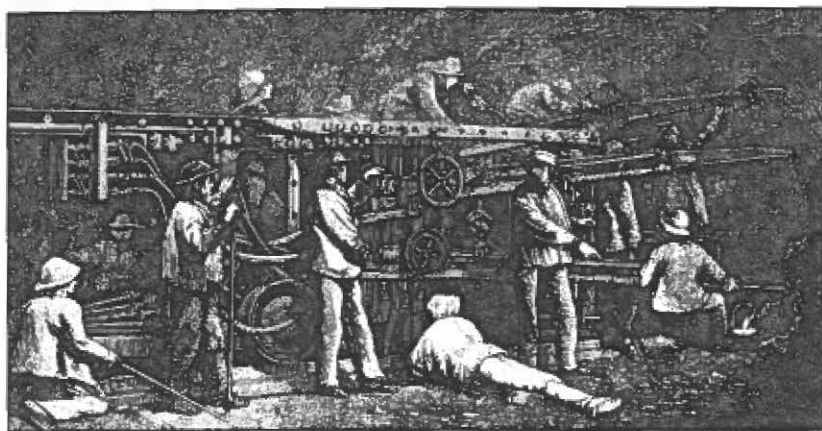
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MAN VERSUS MOUNTAIN

HOW DID JOHN HENRY DIE? A barrel-chested Yankee from California dreamed of steam drills, machines that would make instant holes for nitroglycerin charges, allowing a railroad to puncture the Allegheny Mountains. When free workers balked at the danger and the pay, Huntington turned to John Henry and hundreds of other prisoners in the hands of Virginia. John Henry hammered, as he and dozens of other men in chains learned to drill alongside new steam drills. As the drills kept failing, the convicts did wonders. But soon dozens died, then more.

Once Collis Potter Huntington had nitroglycerin to blast holes into mountains, he recognized that making the pilot holes would become the bottleneck, just as it had been on the Central Pacific Railroad. Huntington's solution to that bottleneck was the steam drill. The power of steam engines had been the marvel of the last two centuries, but it was difficult to transfer that power to something other than a piston or wheel. A steam engine typically consisted of two parts: a boiler that heated water and an engine that acted as a piston. The two devices, boiler and engine, had to be side by side for the boiler steam to move the engine's piston. While the piston might act as a drill, miners found it difficult to push both boiler and engine into man-sized tunnels and then pull them both away for a blast.

In an age before the practical transmission of electricity, engineers and mechanics discovered that one way to transfer steam power over a distance was to transfer *pressure* over a distance. In what came to be called the pneumatic system, engineers connected powerful steam engines to long



Steel engraving of the steam drill used on the Mount Ceniz Tunnel. Tubes on the left and in the middle transferred power to percussive drills on the right. As many as five drills worked simultaneously. (Swem Library, College of William and Mary)

vacuum pipes. An automatic valve at the rock face could then release pressure four times a minute or so. Whether the drill was directly harnessed to the boiler or operated over a distance using compressed air, the mechanical force from a boiler pushed a steel chisel into rock, emulating the hand labor of miners.¹

A competing steam drill, sometimes called a Leschot or diamond drill, was also in development. This drill had been developed in Switzerland, as a by-product of watchmaking. In the nineteenth century when a watchmaker received a packet of white and yellow diamonds for decorating watches, it always included many valueless black diamonds. Georges-Auguste Leschot, the son of a Swiss watchmaker, had collected these black diamonds and forged them around a steam-powered drill. The drill was the engine, driven by the steam of the boiler. The diamonds mounted around the rotating drill burned their way inside a small pilot hole, pushing rapidly into the most difficult rock. This rotating motion worked best in softer rock or rock that was crumbly. It was simple, elegant, and clean. In fact, modern oil drilling still relies on the rotating force of a diamond-tipped drill.

In 1868, both drills were experimental. Huntington contacted both percussive and rotating drill manufacturers and had them contact his contractors to run tests on the tunnels. With dynamite and steam drills Huntington was confident that he could tunnel through the Alleghenies by 1872.²



Image of Leschot's rotary diamond drill, 1870. (Western Reserve Historical Society)

Both steam drills, however, were what engineers today would call kluges—fiendishly complex devices designed to solve a basic problem.³ In the years that John Henry spent in the Allegheny Mountains, contractors tried both drills, and neither worked consistently. The pipes for the steam drill broke down frequently, and the diamond drill often broke at the sharp end.

Both kinds of drills lacked the flexibility found in the skilled two-man hammer teams that had been tunneling through mountains for centuries. The hammer man swung a sledgehammer down onto the chisel. The shaker shifted the drill between blows to improve the drill's bite. A good shaker had a supple wrist and could adjust the drill in the two or three seconds before the next blow came. Rocking, rolling, and feeding, as a mechanical engineer described the process in 1867, were the actions that steam drills mimicked. In rocking, the shaker rocked the drill back and forth to clear away bits of broken rock. In rolling, he twisted the drill to improve the bite. In feeding, he pushed the drill farther into where the hole was progressing.⁴

Song coordinated the movements. White observers in the 1840s noted the presence of singing deep underground in the Chesterfield mines, though they declared black miners tuneless.⁵ The descendants of these singing miners became the skilled men on the C&O tunneling sites, men who would have supervised the unskilled workers, free and convict. They would have taught the unskilled workers how to use song to manage drilling.⁶ Tunnelers sang humorous songs, sad songs, religious songs, all rhythm and meter and intonation but without an obvious melody—phrases, really. A driller learned to sing them all day, and every day they were slightly

different, changing with the condition of the rocks. Like the rocks, these little songs were chipped down by regular use, repeated with tiny variations, until they took the shape of black America's folk poetry.

Hikin' Jerry,
Hikin' on the main line Southern
Dead on time, lord lord
dead on time.

Look yonder,
standin' in the head of a tunnel,
Standin' in the head of a tunnel,
with a head rag on.

Here comes the walker,
comin' down the line,
With a forty-five, lord lord
with a forty-five.

The walker
hit my woman this mornin'
And now she's gone, lord lord,
now she's gone.⁷

The breaks between the lines of these hammer songs coordinated the complex movements of drilling. The hammer came down at the end of the line, forming what would decades later be called a backbeat. Sometimes it was the hammer man who sang, telling his partner with his rhythm and lyrics when the next blow would come. Other times a third man would sing for hammer man and shaker. Between blows the shaker would work his magic, either rocking or rolling. Many hammer songs echoed the work process, describing the rolling that the partner, or "buddy," did with the drill:

Roll on buddy, don't you roll so slow,
Baby how can I roll when my wheel won't go?

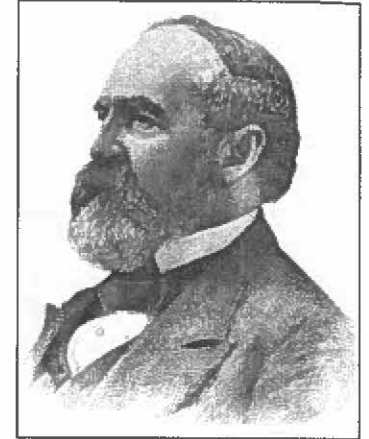
Here in the mines and work camps of Southern railroads the phrase "rock and roll" was born.⁸ A group of men swinging hammers, twisting

drills, moving to the beat of a terrible, rhythmic song, formed out of their own bodies a complex machine. Theirs was a finely tuned instrument that a manufactured steam drill could not match. Huntington imagined that a steam drill could replace the skilled labor of miners, that he could work without their rock and roll. He was wrong.

John Henry and the dozens of others shipped to the mountains would have begun as unskilled laborers for the C&O. They worked as "muckers," loading the broken rock and muck onto railway cars. They dumped the rock and muck down the mile-deep ravines between the mountains. They pulled scrapers along the ground to make the roadbed flat. Problems with the construction would gradually draw them into the mouth of the Lewis Tunnel.

Prisoners' contracts dictated very little about the work they would do. When Virginia's Governor Wells and prison superintendent Wardwell designed contracts for the lease of these men, Wardwell would have had in mind his visit to Joseph Shultz and his father the previous year. On that visit the convicts had "bunks, straw, and blankets," Mr. Shultz had agreed that prisoners were convicted of trivial crimes, and Wardwell and the Shultzes had a dinner prepared by prisoners that was "good and well cooked."⁹ But the men who received the convicts were not Shultz and his son. Instead Wardwell gave the men to Claiborne R. Mason, who was much more closely tied to the future of the C&O Railroad and would drive more than a hundred men to their deaths as he finished the tunnels.

Mason's connection to the railroad went back to the 1840s, when it was mostly state owned. He was a self-taught railroad contractor who had first bossed slaves and free blacks in his coal mines in Chesterfield County, just south of Richmond. As railroads first came to Virginia, he had used slaves and convicts to grade and lay track, earning himself stock in the railroad. He also had a long connection to the penitentiary. In the winter season, when coal prices increased, he leased black convicts from the penitentiary to work in his coal mines. A reporter described him as "a short, stout,



Collis Potter Huntington.
(Library of Congress)

firmly built man, with a head like a Senator's, plain of dress, direct and brief of speech, with that undeniable air of ease that comes to a man who has acquired all he knows from experience."¹⁰

During the war Mason controlled thousands of drafted slaves, rebuilding bridges for Stonewall Jackson. Many Southerners hated and feared Mason for what he did to stop Confederate desertion. In the last two years of the Civil War, General Robert E. Lee had given Mason broad orders to hunt deserters in Albemarle County in western Virginia near Charlottesville. Mason had dutifully captured dozens of soldiers absent without leave, as well as those who had given them aid. He then brought them to the nearest town, posted notice of their execution, and hanged them. In the mountains, bitterness against Claiborne Mason lasted for decades. This resourceful but hard-hearted man oversaw most of the prisoners who worked on the Chesapeake & Ohio.¹¹

Claiborne Mason was an insider, and when he saw the C&O created under Huntington's control he had almost exclusive access to the penitentiary's convicts. On December 1, 1868, when W. C. Wickham took over the state's railroads in order to turn them over to Huntington, John Henry was loaded, along with fourteen other men, onto cars at the Richmond penitentiary. Dozens of other convicts were already at work on the line, signed over to Claiborne Mason or one of his men.¹² As Mason picked up contracts to lay track leading to the tunnels on the West Virginia border, he brought the free black coal miners who had worked for him in prewar days, along with dozens of black men with closely shaved heads and chains on their ankles.

A peculiar wrinkle added to the contract on December 1 ensured that John Henry and the other convicts hired by Mason would be forever tied to the city of Richmond. Months earlier, some convicts on long-term lease escaped from custody, leading Governor Wells to worry about further escapes.¹³ Thus just before John Henry departed the prison walls, Governor Wells added a new provision to the contract between the state and the C&O. Contractors like Mason would have to post a bond that guaranteed the safe return of prisoners and pay all the expenses for the state's attempts at recapture, should it be necessary. Governor Wells wrote that contracts have "stipulated damages of one hundred dollars for each *prisoner not returned*."¹⁴ This way Mason and other contractors could not claim that a prisoner had died when he had escaped.

To avoid the hundred-dollar fee, Mason and his lieutenant would have to send the corpses of the many prisoners who died in the coming years

back to Richmond. One hundred dollars was a small fortune in 1868, more than a year's labor by a convict. This contract was the reason John Henry's body would be shipped back to the white house and buried in the sand. His resting place would be the grounds of the Richmond penitentiary.

The frenzied construction of the mountain sections of the C&O line started in December 1868, after C. P. Huntington acquired the company. Engineers inspected the site while the contractors tunneled, bridged, graded, and tracked. The engineers dutifully gathered the gossip that traveled up and down the line. They reported monthly on the contractors who got drunk, those who abandoned their contracts, and those who seemed to be failing—a common occurrence. As contractors faced problems with supplies or labor, they quickly went bankrupt. In less than a month, county sheriffs would arrive to seize contractors' mules, scrapers, and shanties. Every bankruptcy pushed the C&O further and further toward the use of convict labor.



The roadbed for a new railway, circa 1900–1905. (Library of Congress)

When it came to tunneling, black men with experience in the Chesterfield County mines seemed the perfect candidates. Claiborne Mason had grown up there and had bossed slaves, free blacks, and convicts in his coal beds, most of which were less than ten miles from the Richmond market. Mason's convicts from the penitentiary would have only acted as muckers at first, taking out rock generated by gunpowder and nitroglycerin blasts. In the everyday course of work, convicts would have combined songs they had learned on plantations with songs sung by

black miners whose grandfathers had mined coal beside the muddy waters of the James River.¹⁵

Miners also brought a strong tradition of whiskey drinking, though the tracklayers, brick masons, and day laborers may have been able to meet them cup for cup. All the line's workers drank their liquor and had their fights in the ordinaries and public houses that cropped up weeks after tracklaying began. Shanties popped up everywhere, and county sheriffs hardly knew where to find them. A division engineer named Wildman may have privately established the first of these "whiskey shops" on the top of nearby Tunnel Hill. For every legitimate and licensed establishment, like Claiborne Mason's own grogshop at the foot of the Lewis Tunnel, there were two or three crossroads shanties run by Irishmen with names like Finn and Fox. Sheriffs hauled them to court for selling ardent spirits without a license, but apparently with little effect.¹⁶

The whiskey shops were places where music would have been shared between the black colliers of Chesterfield County, the Irish American brick masons from up the Ohio River, and the black carpenters and blacksmiths who hailed from plantations downstate. The convicts from Richmond would have bought liquor with the extra money they received for skilled work. Contractors called the coins or scrip paid to convicts an "overstint," or pay for the work they did beyond the stint of a common laborer. But convicts would have been sharply restricted in their movements and could have only spent their dimes in Claiborne Mason's grogshop.¹⁷

Between 1868 and 1872, the Lewis Tunnel and the Big Bend Tunnel consumed the attention of President Huntington and his chief engineer, a former Unionist spy named Henry D. Whitcomb. Henry Whitcomb had come to Richmond before the Civil War as a young man, a graduate of Maine's prestigious Bowdoin College. He acted first as a construction engineer for the C&O's predecessor in the Shenandoah Valley. The war stopped all railway construction, forcing Whitcomb to make temporary quarters in Richmond and act as the railroad's general superintendent. His temporary position allowed him frequent travel outside of Richmond and gave him the opportunity to spy for the Union's Army of the Potomac.¹⁸ Whitcomb emerged from the war a wealthy man with good connections. In July 1869, he and others from the C&O Railway accompanied Huntington on a survey of the entire line. Shortly afterward Huntington came to rely entirely on the former spy as his official mouthpiece at the company, appointing him chief engineer of construction.¹⁹

The central obstacle for Whitcomb, his division engineers, and more than two dozen contractors was the eastern edge of the Allegheny Mountains. Lewis Mountain stood most prominently in their way, blocking access to West Virginia. With a proposed length of 4,300 feet, the Lewis Tunnel on the Virginia–West Virginia border would be the second-longest tunnel of the route. That mountain would also be the hardest. Forty-two and a half miles west, the Big Bend Tunnel promised to burrow a mile into the Big Bend Mountain. That tunnel would eliminate the need for track along the snake-like bend that the Greenbrier River had etched around Big Bend Mountain. In piercing this mountain, the railroad would head straight through to the Ohio River. As division engineer C. A. Sharp put it to Whitcomb, "If you want a monument, let this Big Bend Tunnel serve to carry your name down to posterity."²⁰ But no one remembers Henry D. Whitcomb. The Big Bend Tunnel carried only John Henry's name down to posterity.

The Big Bend Tunnel, however, never used steam drills. The contractor in charge of the Big Bend was Captain William R. Johnson Jr., who used mostly free workers to build his tunnel, though he took thirty Virginia prisoners from Wardwell in 1868 and another fourteen in 1869. Johnson, like Mason, had gotten his start bossing slaves in the Confederacy's engineering corps.²¹ Johnson distrusted steam drills. He contracted to dig three shafts the old-fashioned way, with hammer men, after which he would tunnel laterally from the shafts and the ends. Despite its length, work on the Big Bend Tunnel was much easier than on the Lewis Tunnel. Steam engines did provide support for the operation at Big Bend, but only for ventilation, lifting, and pumping water.²²

The Lewis Tunnel proved more difficult. Huntington had contractors grade and lay track to Lewis Mountain. Temporary track ran over the mountain while construction was in progress. Concerned about the harder rock, Huntington immediately sought out steam drills. He had Whitcomb contact John Tilsby, an agent for Burleigh rock drills, who outlined how the Burleigh drills worked. While hand labor made about fifty feet per month, he bragged that in the Hoosac Tunnel in Massachusetts his drill made "as much as 7 feet per day" and allowed blasts that made tunnels wider and taller than could be made by human hands.²³ By October 1869, Tilsby's associate had brought in a man who had superintended "tunnels through the Sierra Nevada on the CPRR."²⁴ This must have reassured Huntington, since he made his first fortune when the Central Pacific passed through the Sierra Nevada Mountains near the California border. Everything seemed to be falling into place.

By March 1870, contracts went out for drilling, and contractor C. P. Durham received the bid for the Lewis Tunnel. "We expect to use the Burleigh drills," Durham wrote Whitcomb. His hope was not to drill shafts down from the top of the mountain at all. Hand tunneling required multiple shafts; otherwise the work would take too long. But Durham felt that the miraculous speed of the steam drill would allow him to drill straight across and "progress with more rapidity than by going down the shafts and doing the work by hand."²⁵ The Burleigh drills would require a boiler to produce steam that would be forced through a pipe the size of a drainspout. The chamber that received the steam had a metal drill inside. A valve action pushed the drill forward into the rock with a percussive force that, it was hoped, would far exceed that of a man with a hammer.

Through most of 1870, free workers apparently tunneled while convicts did support tasks. In March, for example, Mason's convicts dug out pits east of the Lewis Tunnel. There they mined the rock that would be used for bridges. Convicts also built shanties in nearby Millboro as the initial drilling proceeded.²⁶

But the percussive drills were failing. Boilers to generate air pressure could not be easily transported to the site, and the agents bickered with the contractors about prices. Initial demonstrations in New York and Richmond were not as promising as Whitcomb had hoped, and just a week later he sought out agents for Leschot's rotating diamond drill.²⁷ The Severance & Holt Diamond Drilling Company sent its diamond drills out to the site after a brief demonstration in Richmond. With the same technological exuberance as the Burleigh agent, William Holt gushed about his diamond drills.

Our firm would make very liberal arrangements with your co. to furnish all the drilling apparatus for the *entire work* and wd. *guarantee* its entire success, enabling yr. contractors to do their work far more *quickly & cheaply* than they can possibly do it with any other machine. Our machines are especially adapted to *through cuts* and *tunnels*—boring in the latter 3 to 5 holes simultaneously at steady rate of eight to ten feet *per hour* in *each hole*. The extreme simplicity of our drilling apparatus enables it to be operated by cheap labor, and renders repairing unnecessary.²⁸

Durham declared that he would try his best to use these new drills but that he lacked iron to lay track to the tunnel. By the summer of 1870, things

had progressed from bad to worse. Water flooded the tunnel's western end, making steam drilling impossible, and more steam engines were required to pump it out. Moreover, five of Mason's convicts had escaped from nearby Millboro and were at large in the mountains. Neither steam drill was working reliably. Huntington determined that Durham and company had not really made a fair test of the drills and that Durham's contract should be dropped. The C&O kept the drills on lease, however, for a fairer test.²⁹

Labor troubles proliferated along the line. The assistant engineer issued a circular requiring contractors to pay no more than "one dollar and board per day for ordinary laborers." He also set the hours of labor at "six o'clock AM till sunset allowing one hour for dinner."³⁰ Tunnel workers balked about the pay. In response, Huntington threatened to bring impoverished Irishmen from the slums of New York. Though some Irish workers were brought in to work on the western end of the line, most of the men who dug out the tunnels were former slaves.³¹

Then, on the Big Bend Tunnel, the men went on strike in the spring. Miners, black and white, declared that the tunnels had "bad air" and marched out, demanding two dollars a day and a resolution of the problem.³² On the Lewis Tunnel, Durham had proved unable to get enough laborers at the prescribed rate of a dollar a day.³³ More ominously, the division engineer noted that the Lewis Tunnel appeared to be composed not of shale but of "slate or shaly sandstone."³⁴

The workers were right: Drilling in sandstone produced deadly clouds of tiny silica particles. Less than sixty years later and seventy miles away, Union Carbide contracted to build a tunnel in West Virginia that would divert the New River under Gauley Mountain. Black workers by the hundreds volunteered for the work, attracted to cash wages there, but experienced miners stayed away. Drills deep underground produced clouds of silica dust that, over the space of three years, killed more than three hundred, with perhaps seven hundred total dead within five years. It has been called America's worst industrial disaster.³⁵ Had anyone heard the truth about what happened to the convicts at the Lewis Tunnel between 1870 and 1871, the Hawk's Nest Disaster of 1927 might never have occurred.

By 1870, Huntington was upset about the delays at the Lewis Tunnel. He proposed turning over the contract to an old associate, J. J. Gordon, who offered to "bring Chinese laborers from California immediately." Back in 1862, Irish workers on the Central Pacific had refused to work near nitroglycerin and had struck for higher pay numerous times. Chinese

brought two hundred convicts directly to the site.⁴⁴ Gordon built up a whole town to support his drills. Unlike his predecessor, C. P. Durham, he knew that both vertical and horizontal shafts would be necessary to complete the tunnel. No opportunity to drill was ignored, and Durham had teams of convicts drilling alongside his steam drills, whether they liked it or not. A correspondent described the Lewis Tunnel and the temporary track that ran over it, adding that Gordon had assembled entire "machine-shops . . . at which a locomotive might be built." To a man who traveled over the tunnel, the activity that transpired beneath him was remarkable:

150 feet beneath him are nearly 200 toilers boring through the earth, and showing by patient and persevering labor the triumphs of man over seemingly insurmountable obstacles. Besides the approaches to the tunnel, there are three shafts, measuring in depth 70, 125 and 145 feet respectively. One hundred and twenty men are at work inside constantly, night and day. The difficulty in working Lewis tunnel, as is doubtless known, is the almost unprecedented hardness of the material through which it has been worked. It has the appearance of blue granite, and is so hard that it almost resists the ordinary drill.⁴⁵

Convicts who worked alongside the drill were housed near the tunnel itself and occasionally escaped.⁴⁶

In May 1871, the C&O invited fifty-eight reporters from New York, New Jersey and Pennsylvania on an excursion along the line as the tunneling was well under way. They stopped the train briefly to explore the Lewis Tunnel.⁴⁷ They were drawn to what they called "the magnitude of the work and the modus operandi of blasting the hard rock." They described the tunnel construction in some detail: "Shafts were sunk at three different points, and the drilling machines were worked by steam power. A large body of men, mostly convicts from the State penitentiary, were at work in the various shafts and at both ends of the tunnel, in blasting the rock and removing the debris to neighboring ravines."⁴⁸

If it is true that John Henry drove fourteen feet and the steam drill only made nine, then John Henry and the steam drill would probably have been drilling on a shaft working downward from the top of the Lewis Mountain. For blasting at either end of the tunnel, pilot holes needed to be only five to six feet into the rock. When blasting downward, however, holes had to be ten feet deep or more.⁴⁹ In the race to the bottom, John

Henry's hole would have been deep enough at the end, but the steam drill's would have required more drilling to make a blast.

John Henry went upon a mountain
And came down on the side
The mountain was so tall, John Henry was so small,
That he laid down hammah and he cried, "O lord."

John Henry told his captain,
"Captain, go to town
And bring me back two twenty pound hammers,
And I'll sure beat your steam drill down."

John Henry told the people,
"You know that I am a man.
I can beat all the traps that have ever been laid,
Or I'll die with my hammer in my hand,
Die with a hammer in my hand."⁵⁰

Neither the steam drills nor the convicts worked as planned. Gordon's partner told a correspondent for the *Richmond Dispatch* that he was happy enough with the convict laborers, "despite many drawbacks."⁵¹ One of the principal drawbacks was price. Gordon was paid by the cubic foot, but he would have paid Mason and his partner for the convicts by the day. If no drilling got done, Gordon would have to pay for an entire crew of workers anyway.

While he liked his steam drill well enough, Gordon could not meet his contract. Though Gordon gave them a fair test, the steam drills failed again and again. He had thought that the Sierra Nevada Mountains near the California border were remote, but he had never been to the edge of the Alleghenies. Gordon continually faced engine problems, probably from the dust generated by the drills themselves. He found he could not get replacement boilers to compress the air to drive them. "I am very anxious to get that boiler to run Burleigh Drill in East approach," he wrote Whitcomb in October 1871. "If you have done anything in regards the furnishing it please inform me, if not I will have to double on it with hammers."⁵²

The phrase "double on it with hammers" is telling. Gordon would have been drilling two sets of holes on the rock face of the east approach, one

with convicts, one with the Burleigh drill. If the steam drill failed that day, he would have to do the work with two teams of hammer men. Before the boiler failed, Gordon would have run a steam drill on one side and a hammer team on the other.

The last time a steam drill was used on the Lewis Tunnel would have been the summer of 1871, when the boiler failed on the eastern approach. Until then, possibly at many of the approaches, men and drills worked side by side.

The steam drill set on the right hand side,
John Henry was on the left.
He said, "I will beat that steam drill down
Or hammer my fool self to death."

The men that made that steam drill,
Thought it was mighty fine;
John Henry sunk a fourteen-foot hole
And the steam drill only made nine.⁵³

By October, Gordon had run out of steam. The western tunneling expert who "thought his drill was mighty fine" was hemorrhaging money by hiring workers from Mason. Gordon asked to be excused from the contract by the middle of the month.⁵⁴

Once Gordon abandoned his contract, Mason and his partner, Mr. Gooch, did the work entirely with convicts, for whom they paid just twenty-five cents a day. Because Mason and his partner had not bid on the price of drilling, the convict owners and C&O officials haggled over prices. As Peyton Randolph told the chief engineer in October, "The rock is hard but drills and blasts well and I consider \$4 [per foot] an outside price for it. Yesterday Gooch talked about \$5 but I laughed at him."⁵⁵ Randolph knew that Mason and Gooch got their convicts for twenty-five cents a day, and had hundreds of them to spare.

It was sometime during or immediately after Gordon's trials that John Henry died, for he disappears from prison records after 1873, presumably when his corpse arrived at the penitentiary.⁵⁶

John Henry, O, John Henry!
Blood am runnin' red!

Falls right down with his hammah to th' groun',
Says, "I've beat him to th' bottom but I'm dead, -
Lawd, - Lawd, -
I've beat him to th' bottom but I'm dead."

John Henry kissed his hammah;
Kissed it with a groan;
Sighed a sigh and closed his weary eyes,
Now po' Lucy has no man to call huh own, -
Lawd, - Lawd, -
Po' Lucy has no man to call huh own.⁵⁷

Despite the seemingly heroic tale of John Henry's death, he was just one of many convicts who died with their hammers in their hands. The Virginia Penitentiary workers died at the rate of approximately 10 percent per year through the entire decade of the 1870s. Even after the survivors were transferred back to the relatively safer work of constructing the James River and Kanawha Canal near Richmond, they continued to die, their lungs still filled with the silica dust they had inhaled in the tunnel. As early as 1880 most of the convicts who worked on the tunnel would have been gone and unable to tell the story of what happened to John Henry underneath Lewis Mountain.⁵⁸

Few would have lived to tell their story. It was up to free workers on the nearby Big Bend Tunnel to report what had happened. One man, an African American roundhouse cook named Cal Evans, traveled from the Lewis Tunnel to the Big Bend Tunnel in 1875. As he cooked for workers at the Big Bend, he told many stories of the exploits of John Henry. When the story of John Henry became popular in the 1920s, interviewers passed Evans by, believing that since he had not been at the Big Bend Tunnel between 1870 and 1872, "he got no opportunity, therefore, to see John Henry drive steel." Yet the interviewer noted something peculiar. Cal Evans had many stories about John Henry, "and his practice of telling them is a matter of general knowledge in the community."⁵⁹ He and others immortalized John Henry in an old-fashioned ballad, one that miners and railway workers alike sang as they tunneled and laid track for C. P. Huntington, Henry D. Whitcomb, and Claiborne Mason, the men who killed John Henry.

In retrospect, no one can say exactly how John Henry and over one hundred other convicts died building the Lewis Tunnel. The surgeon's report

for the penitentiary listed the names of the men who died in prison but only gave the total number of men who died on the C&O Railroad. The Virginia Penitentiary's board of directors reported that from 1871 to 1873 death rates were increasing rapidly, but that their penitentiary was not to blame. "Less than half of the deaths during the year were caused by disease contracted in the building," the surgeon reported. "All the cases of scurvy we have had in this institution were contracted while the men were at work on the Chesapeake & Ohio railroad. They were returned on account of the disease." Scurvy, what we know now is vitamin C deficiency, was understood then to be the result of malnutrition. The surgeon also noted three cases of "dropsy," the swelling of organ tissue because of excess fluid. This, he felt sure was also "the result of scurvy." The single greatest cause of death the prison surgeon saw was "consumption," the nineteenth-century shorthand for death that originated in a wasting away of the lungs. The prison surgeon marked half of the prisoners who died in the penitentiary in 1872 as "Died of dis.[ease] con[tracte]'d while at w'k on R. R."⁶⁰ Others returned to the penitentiary as corpses.

The fact that the Lewis Tunnel was composed of "slate or shaly sandstone" may be the key. While many cases of consumption can be attributed to the tuberculosis bacterium (discovered in 1882), miners knew that in certain kinds of rock, the mines themselves could destroy men's lungs. Agricola, the founder of geology, noted in *De Re Metallica* (1555) that "there were women in the Carpathian mountains who had married seven husbands, all of whom had died from consumption."⁶¹ Miners' consumption was not caused by bacteria or close confinement but by the silica loosed by blasting rock, particularly sandstone. The men who went on strike at the Big Bend Tunnel understood that "bad air" put dust in your lungs that could kill you. These miners demanded that tunnels be washed down or ventilated before workers entered them. But convicts could not strike.

The use of steam drills on the sandstone in the Lewis Tunnel, mentioned repeatedly by division engineers and observers, probably killed every worker in the tunnel in the space of a few years. The "bad air" that Big Bend workers noticed would have been generated in much larger quantities by the combination of hand drills and steam drills in the Lewis Tunnel. This was in part because steam drills worked both faster and less efficiently than hand drillers. A drilling team could make a hole cleanly with relatively little dust; a steam drill jabbered crazily on rock, spitting crystalline dust in every direction.⁶² Contractor Durham had the drillers

work right next to the steam drills. As Claiborne Mason pushed the convicts harder and harder in the last year of tunneling, he would have driven them back into the tunnels immediately after the nitroglycerin blasts, to meet his schedule. And because no one knew about the Lewis Tunnel disaster, a similar tragedy followed less than sixty years after it, at the New River under Gauley Mountain. Union Carbide kept workers near the drills without wetting them down and pushed workers back into the tunnel right after nitroglycerin blasts.⁶³

What was in those clouds of sand, generated by drill and dynamite? Freshly ground silica between five and ten microns wide, silica that floated through men's nostrils and directly into their lungs. While Big Bend workers left their site when they saw dust, convicts at the Lewis Tunnel could not. Even a single day's exposure to freshly ground silica can cause acute silicosis and early death. In a process that is still not well understood, these microscopic particles of silica get caught in the alveoli, or air sacs. The lungs have microphages, white blood cells that ordinarily ingest bacteria. When these microphages ingest freshly ground silica, they die. Other microphages rush to the site, also dying. Pus fills the air sacs, providing a breeding ground for tuberculosis and pneumonia, as well as constricting air supply. Those not killed by tuberculosis and pneumonia will die anyway, because acute silicosis is almost always fatal within a year or two. In 1969, nearly one hundred years after John Henry and his fellow workers died, the Coal Act mandated that powered drills have collars to prevent silica from shooting out, that workers wear masks near them, and that drills be wet.⁶⁴

The Lewis Tunnel steam drills left the tunnel by the end of October 1871. The race was over. Nearly two hundred men, mostly convicts, now finished the tunnel for C. P. Huntington. Thousands of free laborers graded, laid track, and finished the surfacing of the other tunnels. Men had triumphed over machines, but at a terrible cost. For two years, between the last month of steam drill operation and the completion of the tunnel—in September 1873—close to one hundred convicts died from a variety of diseases, most of them associated with lung impairments. Forensic anthropologists at the Smithsonian Institution, who received the corpses buried at the penitentiary, noted that approximately 80 percent of the corpses they examined were black men in their early twenties. One anthropologist wrote me that of the skeletons she examined, "several had evidence of rib lesions indicative of some sort of chronic disease infecting the lungs."⁶⁵

Some prisoners escaped, and some were killed by guards for what the railroad labeled "mutiny," but the remainder entered tunnels where tiny bits of microscopic rock floated in the air, entered their lungs, and over a period of six months to three years, strangled them. These prisoners died gasping for air.⁶⁶ By contract, they had to be returned to the Virginia Penitentiary in Richmond, "the white house." If they were not sent back, the C&O faced a one-hundred-dollar fine per man. Nearly one hundred men came back between 1871 and 1873, most of them dead. More than two dozen more died in the next year.⁶⁷

John Henry did not die inside the Virginia prison, because his name is not listed in the surgeon's report. He does, however, disappear from prison records by 1874, with no mention of pardon, parole, or release. Along with nearly one hundred other prisoners, he is marked transferred, in pencil. His corpse, then, was one of the counted but unnamed bodies shipped back to the penitentiary by rail. Other men returned from the Lewis Tunnel to the penitentiary with advanced cases of consumption and died in the hospital ward. John Henry, if he lived past the contest, might have died on the way back to the penitentiary. Otherwise, he would have died in a prison shanty outside the Lewis Tunnel, asking for a cool drink of water before he died.

John Henry hammered in the mountains
Till the hammer caught on fire.
Very last words I heard him say,
"Cool drink of water 'fore I die,
Cool drink of water 'fore I die."⁶⁸

John Wm. Henry, prisoner and railroad man, raced a steam drill at the Lewis Tunnel in the late summer of 1871. He beat the steam drill, but he and dozens of other railroad men died doing it. And so the harsh sentences meted out by Virginia's Reconstruction courts became death sentences in the Appalachian Mountains. The biggest problem, as the superintendent saw it, was what to do with the bodies. They were taken to the white house that lay along the track of the Richmond, Fredericksburg & Potomac Railroad and buried in the sand, and no one was the wiser. Only a song, stubbornly sung by railroad men, convicts, and miners, kept the story alive.

6

THE SOUTHERN RAILWAY OCTOPUS

FOR ABOUT THIRTY-FIVE YEARS, from the early 1870s until 1909, the story of John Henry was transmitted orally, apparently without written record. It traveled along the route of the railway system that John Henry's hammer had made possible. Reconstruction ended as railroad corporations effectively took control over much of the modern South. The embarrassing story of a man killed by a railroad company was effectively buried at the time, but through this period at least three distinct versions of the song emerged, sung in different contexts, all by the men whose labor made the railroads' fortune. Coal miners framed it in a familiar ballad tradition, convicts made it an early blues song, and trackliners turned it into a bragging song, while carrying the legend everywhere in the South. After 1909, when folklorists discovered the song, they reunited the different versions into a single coherent tune with many variations. They also turned John Henry's story from a cautionary tale into a legend in the mold of Homeric myth.

John Henry was not exactly a hero who single-handedly built a railroad tunnel to the west. But by 1873, his hammer had nonetheless changed the shape of the South. His labor proved Huntington's boast that a private corporation could penetrate the Allegheny Mountains. A man, a drill, and nitroglycerin had erased the barrier that separated Kentucky, Tennessee, and West Virginia from Virginia and the Carolinas. He had joined East and West.