

Chapter 3

Assembly Required

As far as the readers of *Architectural Record* knew, Theodore Starrett really needed only one word to describe Union Station. The magazine's editors had asked Starrett, president of the building's lead contractor, to explain his assignment, and his response filled eleven pages of the December 1905 issue. His first sentence introduced "the great Terminal Station," and his second argued that Daniel Burnham had "grown greater with the years." Because of the skill of this "great organizer," Starrett wrote, the capital was about to enjoy one of the three "great railway stations that are to be built in the United States." (The others were New York's Pennsylvania and Grand Central Stations.) He concluded by pointing out that the terminal's significance extended past transportation: it would be the "first of the series of great buildings which is to make Washington a White City that will indeed be the wonder of the world."

“Great” was not, however, a word Starrett used when he discussed the station privately. Its construction had almost immediately fallen behind schedule and run over budget, problems that put him in the middle of a constant debate among the railroads, the architects, and the contractors over who was at fault and what the solutions were. More than a year before his article came out, he claimed that the rights of his company, Thompson-Starrett, were being “transgressed” by the B&O; during the summer of 1905, he announced to Burnham that continuing was probably “a waste of time.”

Starrett’s comments illustrated the contrasts in the rebuilding of the capital’s railroad facilities. The terminal and the associated work offered much to admire: the best technology and materials, a nationwide reach, an enormous reshaping of the capital. Yet its difficulties were just as big, including ballooning costs, internal disputes, community complaints, and labor trouble. In its simultaneous production of excitement and frustration, the Washington improvement provided a detailed example of how they really used to build them.

I

The two hundred men walking north of the Capitol on this steamy morning in August 1903 were on a last-chance-to-see tour of Swampoodle. That was not their reason for going up and down the streets of this working class community: they simply wanted to buy used construction materials on the cheap. Yet every time auctioneer James Ratcliffe stopped the sweating group to sell a brick rowhouse for \$60 or a wooden shanty for \$6, Swampoodle’s disappearance moved a little closer. The land beneath the buildings had become property of the B&O and the PRR, and each successful bidder had just thirty days to remove his purchase so the railroads could begin creating the new

gateway to the capital.

The half-dozen auctions Ratcliffe conducted between April and September were among the early signs of the Washington improvement. Work had initially appeared a year earlier, when the Pennsylvania, knowing it would replace the Long Bridge under any plan for new terminals, brought 150 men, tugboat, dredge, caisson, and derricks to the Potomac. By the time Swampoodle went up for sale, construction was appearing elsewhere in Southwest. Five hundred feet upstream from the Long Bridge, a separate set of workers, these hired by the District, were creating the crossing for carriages, pedestrians, and trolleys. Inland, the PRR was creating new freight yards at 7th and 14th Streets SW and its new grade-separated right-of-way just north of the current tracks.

In Southeast, most construction lay below ground level. One large steam shovel and hundreds of workers were extending the Virginia Avenue freight tunnel: the machine excavated a trench thirty feet deep; masons built a two-track tube of stone, brick, and cement; and laborers finished the job by backfilling the open area with dirt. This method, known as cut-and-cover, was also used for the First Street tunnel. The Pennsylvania began that project by establishing, through the purchase and demolition of a dozen homes, a right-of-way from its current line to the intersection of New Jersey Avenue and C Street, SE. It assigned the northernmost section of this path to its contractor, the elaborately named Continental-Jewell Filtration Company, who used it to establish a staging area.

The Union Station Act had its biggest impact in Northeast. Contractors for the Pennsylvania started its new route out of the city, building a trestle across the Anacostia River and flattening the land that would carry to its passenger trains to Maryland. On the site of the

future roundhouse, laborers cut down trees and converted them into railroad ties; nearby, a half-dozen steam shovels were reducing the area's hills into the terminal's yards. A little farther south, firms hired by the B&O worked along Florida Avenue, creating its new freight yard to the north and new coal yards to the south. This two-mile stretch was easy to spot from throughout the city: the constant digging kicked up so much dirt that the area developed an almost permanent yellow haze.

Changes were most dramatic at the station site. Day laborers put into storage government property like curbing, catch basins, and the public trough that had watered horses at the intersection of Massachusetts and Delaware. Utility workers relocated the sewer and gas lines that ran where the building would stand. The winners of Ratcliffe's auctions took away three hundred buildings: In the middle of this process, one observer noted, each block looked like a mouthful of broken teeth. Thompson-Starrett soon put new ones in their place: two plants along G Street sent carload after carload of concrete to the men pouring the station's foundations; a dozen steel derricks, some sixty feet tall, swung building materials into place; and a cabin near the intersection of Delaware and Massachusetts became the project field office.

These changes left local reporters breathless. "An earthquake or a cyclone could not have created greater havoc," the *Evening Star* gasped in October 1903. "But for the presence of hundreds of busy workmen and puffing steam engines, the appearance of the long stretch of debris-covered territory would lead the visitor to believe that some great natural convulsion was responsible for the conditions that now exist." Each of the capital's newspapers would publish dozens of similar, if somewhat calmer, stories about construction over the subsequent months, some containing thousands of words. The *Evening Star* ran

so many, for example, that its editors decided that its files, normally organized under broad categories like "District Affairs" or "Business," needed an entry for "New Terminal."

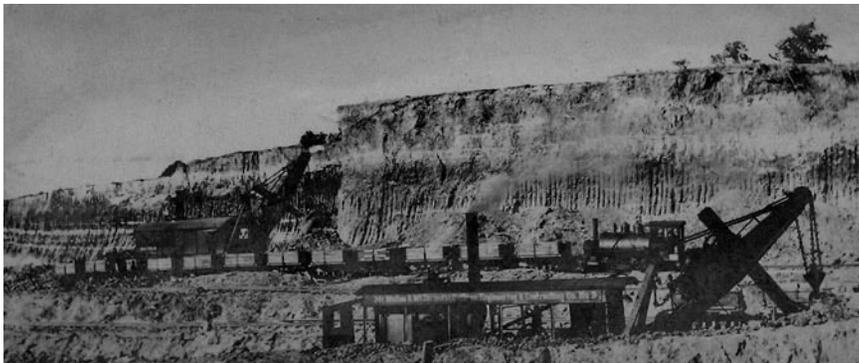
It was possible to dismiss this excitement as evidence that Washington remained a small town eager to prove it was a city. Each of New York's two stations was significantly more elaborate, particularly with the inclusion of associated work like the PRR's mile-long tunnel under the Hudson River. In turn, both of those projects seemed rather limited compared to what was happening in Panama, where construction of the canal was becoming the biggest public works project ever.

But the interest in what was happening in Washington extended far beyond the District. The *New York Times* thought the station's platforms were important enough to print a letter to the editor criticizing their design. The *Atlanta Constitution* ran two separate stories on the project within its first six months, both of which featured "magnificent" in their titles. *Scientific American*, which at the time appealed to a general audience with stories like "More Facts About Tea," devoted a page of text and three photos just to the station's foundations. Representative Babcock would even claim that he lost his race for re-election because his opponent fooled voters back in Wisconsin into thinking that he had given the Pennsylvania Railroad millions of dollars for the project.

Professionals followed the work even more closely. The *Engineering Record* wrote seven stories about various parts of the improvement, while *Engineering News* devoted six full pages to a single progress report. *Railway Age*, the industry's leading journal, printed three articles about the work between 1902 and 1906; *The Railway and Engineering Review* ran two others, including one that filled nine of its legal-size pages. *The Journal of the Brotherhood of Locomotive Engineers* even described the station for the men in the cab.

The station's owners encouraged this attention. The Pennsylvania distributed press releases that showed up in papers along its route. The B&O provided the trade journals drawings and photographs and gave W.F. Strouse, the B&O engineer supervising construction of the station, time to work on the text of articles. The most substantial promotional piece appeared at the 1904 World's Fair in St. Louis, where the B&O's exhibit included a one-twelfth size model of the station—so large that an adult could stand up inside the waiting room.

But what really brought attention to the Washington improvement was the project itself. Part of what made it remarkable was its size. The terminal and its yards covered 160 acres, and the B&O's and PRR's new freight facilities occupied an additional xx acres. There were also the tracks: the Pennsylvania's two miles of rebuilding in Southwest, the shared three-quarter-mile tunnel under Capitol Hill, seven miles of new right-of-way—six for the PRR, one for the B&O—through Northeast. The scale of the work was also clear from what disappeared, with Ratcliffe's auctions led to so many demolitions that the city's market in used brick collapsed from oversupply.



Digging the Ivy City yards. Steam shovels like the one in the foreground deposited material in hopper cars (background) so it could be used as fill at the station. (*Library of Congress*)

Construction demanded enormous amounts of material. In Ivy City, the steam shovels creating the coach and engine yards were in the middle of removing more than 2.5 million cubic yards of earth, enough to cover three acres of the Mall to the top of the 550-foot Washington Monument. Most of this dirt would be reused, with 900,000 cubic yards going under the terminal and another 1 million building up the plaza and surrounding streets. The northern approach to the station required 6,000 tons of rail, which laid as a single track would extend 50 miles. The numbers for the building itself were just as impressive, including 2,600 tons of steel, 50,000 barrels of cement, and seven million bricks.

Appropriately, given that this work was producing the gateway to the national capital, its effects extended far beyond Washington. Since the 1850s, better transportation and communication had enabled architects and contractors to obtain resources from a wide area. On Union Station, the firms responsible for cement work, plastering, ornamental iron, and roofing came from Chicago; those handling terra cotta and plumbing, from New York; those providing the furniture and the wiring, from Cincinnati. These companies in turn hired a range of subcontractors: the plasterers used a Philadelphia firm to decorate interior columns, while the cement company had a District business lay asphalt.

Supplies followed a similar pattern. The portico used terra cotta from a plant a few miles east of the capital, the concrete plants mixed in crushed stone from a quarry in West Virginia, and the office furniture came from a factory in Tennessee. While many contractors bought their materials from other companies, those handling specialized machinery typically made their own equipment. Some of the latter group were unfamiliar to the general public, such as the Philip Carey Company

of Cincinnati, which insulated miles of water and steam pipe, but others were famous names like Westinghouse of Pittsburgh, which provided ventilation fans for the waiting room and generators for the powerhouse.

Nowhere outside of Washington was the station's influence greater than in central Vermont. Like much of hill country New England, Northfield had struggled after the Civil War, with small farms wearing out marginal land and talented young people leaving to find better opportunities. Its economy was so bad during this period, remembered the local paper, that a sure way to condemn a neighboring community was to say that it was "as dead as Northfield." But conditions began to change in the 1890s, when the town's first "sheds" began hiring workers to cut granite slabs taken from quarries in nearby Barre. By the turn of the century, Northfield had nearly a dozen stone manufacturers arrayed near the Central Vermont Railroad depot in the center of town, and that growth was a main reason the village's population was ??, ?? percent higher than just ten years before.

Locals hoped that supplying 440,000 cubic feet of granite for Washington promised bigger changes in the future. The District engineer who examined the quarries in 1903 noticed that "rumor of so large a contract...has excited much interest," and the subsequent announcement that the E.B. Ellis Company had won the job—"The Largest Single Stone Cutting Contract for a Building Ever Awarded," according to an impossible-to-verify claim that made its way into the *Northfield News* and the *Boston Globe*—led to celebration and anticipation. Not only did locals expect the purchase of \$900,000 of granite to double the number of stonecutters in the village, but they also believed that Union Station's prominence would lead other architects to make a similar choice, leading to "demand...that has never had a

parallel."

Life in Northfield changed quickly. A major investment from Thompson-Starrett allowed the Ellis Company to expand one of its two existing sheds and to add a third. By 1904, filling the buildings were more than 300 stonecutters, many of whom moved to the area to work on this project. While some were native-born, others were Italians, Spaniards, and Scots, making Northfield a far more diverse place than outsiders would have imagined. This influx created a housing shortage that drove up costs for everyone, even after E.B. Ellis built a 100-man boarding house west of the depot. Locals benefited indirectly from Industrial rowth, since it encouraged the electric company to expand its plant, making residential service easier to obtain.

The terminal had a similar effect on Bethel. Workers began moving here as well, and because of the remoteness of the site and the area's poor roads, many of the quarrymen settled in another Ellis-owned boarding house. Granite production spun off other jobs, particularly for the laborers building the railway that would carry stone down to the main line of the Central Vermont.

That new spur was one illustration of how important transportation was for the Washington improvement. Save for the airplane, which the Wright Brothers demonstrated six months after construction had started, virtually every method of travel contributed to the work. Laborers walked to the site, horse-drawn wagons moved smaller quantities of materials, and the architects and engineers occasionally traveled in one of the few hundred cars now in the capital. Barges brought in certain items, most notably the superstructure for the approach to the new Long Bridge, which had previously carried the PRR over a river in New Jersey. Dominating transportation was the railroad. The country's permanent network of tracks delivered supplies

to Washington at a rate of ten carloads every single day, and the contractors laid miles of temporary rails to shift material, particularly fill, around the site.

The assembly of these building blocks highlighted another reason construction generated so much attention. While many jobs used centuries-old techniques, others took advantage of the latest technology. Workers driving the tunnel under First Street powered their tools with compressed air, saving them from breathing the gases a steam engine produced. Cement mixing relied on electricity, even though at the time only eight percent of Americans had it in their homes. A series of skyscrapers had shown the advantages of a steel framework—strength, flexibility, light weight—and commercial architects had quickly adopted this system for other structures. Though the station, the express building, and the power house would have traditional exteriors, anyone passing by could see that underneath their skins were the riveted I-beams that would characterize large-scale 20th century construction.

Contractors were eager adapters of machinery because it saved time and accelerated progress. A man with a standard wheelbarrow could move one-quarter of a cubic yard of dirt per trip; each of the twenty brand-new narrow-gauge “dinky” train sets—a locomotive and six hopper cars—carried 200 times that much during each trip from the yards to the station. Steam-powered derricks rose above every task that needed heavy lifting, some moving as much as fifteen tons in a single swing. Serving the terminal and the tunnels were seven concrete mixers, including one with grades built into its tracks so that each carload ran downhill to its destinations.

While most articles described what was happening at the station, Starrett’s piece for the *Architectural Record* focused on how, why and so

what. The author was himself part of a great story, one of five brothers from suburban Chicago, all of whom became prominent in American construction. Theodore, the eldest, began his career in Burnham’s office, where he helped build the Rookery; Paul (second oldest) and Goldwin (fourth) would also later work for Burnham. Paul subsequently became a partner at the George A. Fuller Company, the country’s largest general contractor,

By the turn of the century, Theodore had moved to New York and founded, along with local investor Henry S. Thompson, the firm that bore their names. Thompson soon sold his interest to corporate lawyer Albert Boardman, who in 1903 brought in new investors to increase Thompson-Starrett’s capitalization from \$100,000 to \$1,000,000. This new money reduced Theodore’s ownership share from one-half to one-third, but it enabled the company to pursue more jobs. Even then, Thompson-Starrett remained a family business: during the work on Union Station, its employees included middle brother Ralph, Goldwin, and youngest brother William, as well as a brother-in-law. Goldwin and William would later be the first half of Starrett Brothers and Ekin, the structural engineers for the Empire State Building.

Theodore’s article in *Architectural Record* emphasized two themes. He began by arguing for the station’s importance to the city’s and the country’s artistic development. “It is the first of the series of great buildings,” he wrote, “which is to make Washington a White City that will indeed be a wonder of the world.” Its example would help save America from any more Victorian-style “monstrosities” like the Sixth Street Station; now, structures based on the 1893 World’s Fair would “be an inspiration to every one of us.” Starrett then turned to his second theme, the successful production of such uplifting buildings. To succeed, “[p]lan your work as a general would plan his campaign. It

must all be mapped out in the imagination, just as battles are fought on paper beforehand.” As a result, the public would associate Beaux-Arts design with modern efficiency, bringing further credit to the style.

Since contractors coordinate men and machinery to reach a specific goal, just like the military does, Starrett’s analogy seemed appropriate. But his account—in fact, virtually every article about construction—avoided a key aspect of this campaign. Almost from the beginning, conditions all along the line suggested a word that would later make its way from the army to general use: *snafu*.

II

Work on the Washington improvement had started along the Potomac, and it was there that the first serious trouble appeared. At the end of 1903, engineers for the PRR discovered that the central draw for the new Long Bridge was three feet too high: the American Bridge Company, the fabricators and installers of this 280-foot, 300-ton piece of steel, had never received the final plans. Because the draw was so big, the bridge contractors decided their best solution was to raise the approaches to it, which they did by adding new stone caps to the remaining piers. This revision cost only a little time and money, and trains began running across the new bridge just a year later.

There were, unfortunately, many other problems, and most would not be so easy to fix. Improving railroad facilities was always difficult, since regular operations had to continue during construction. Expansion and modernization was even harder in an urban area, where there was little room for temporary structures and where local officials wanted life to remain as normal as possible. Working in Washington meant additional challenges, since the city had a disproportionate number of people who, regardless of their actual knowledge, might

have the power to affect progress.

The builders expected to handle these challenges well. Thompson-Starrett had supervised dozens of large projects, and Theodore’s previous firm had built Burnham’s union station in Columbus. D.H. Burnham & Co. had recently finished the PRR terminal in downtown Pittsburgh and had sent one of its experienced superintendents, Edward Willman, to Washington. Part of the Pennsylvania’s claim to be the “Standard Railway of the World” came from its skillful engineering, and the Baltimore & Ohio had studied the area for years.

The chain of command seemed logical. At its top was the PRR’s chief engineer, William Brown, whose authority to resolve disputes was defined clearly in each contract. The railroads had divided responsibility for shared facilities geographically, with the B&O, led by D. D. Carothers, its chief engineer, supervising all construction north of Massachusetts Avenue, the PRR and Brown everything south. The two companies had also decided that the station was so important it needed its own manager, a position to which they appointed Strouse, who for the last ten years had been the B&O’s chief draftsman. Reporting to him were the architects, who had responsibility for supervising the contractors.

In practice, however, the hierarchy was not nearly so clear. Burnham was, in the words of Paul Starrett, “accustomed to being Czar on his buildings.” His faith in his own judgment, combined with his connections to Cassatt and Brown from previous assignments, meant he was not reluctant to go directly to either when he thought it would benefit the project. This situation would have been difficult even for an experienced manager, something Strouse was not. “I did not,” he later admitted, “have very much construction work until 1903.” Starrett’s partner Albert Boardman presented a further complication.

Not only was he president of Thompson-Starrett, but he advised top executives at both the B&O and the PRR, including helping Cassatt prepare to testify before New York City's hearings on the Pennsylvania's Manhattan construction.

Trouble at the station began at the bottom. D.H. Burnham & Co. had designed the building's foundations as a series of square concrete piers, two to six feet on a side. To ensure that the pillars rested on ground stable enough to carry the terminal's weight of 75,000 tons, Thompson-Starrett used a steam shovel to remove the top six to eight feet of soil, much of which was decayed plant matter from when the area was swampy. Digging exposed a layer of gravel, on which concrete



Conditions at the station in May 1905. The wall in the right center is the foundation for the wall to run between the headhouse and the concourse. Hopper cars dumped their dirt from the tracks running through the foreground, leading to the damage Thompson-Starrett protested. The building in the upper left is the Government Printing Office. (*Library of Congress*)

workers placed their wooden forms. Pillars were not anchored to the ground but would be held in place by dirt dumped around them as they rose.

This work proceeded with less than military efficiency. By the summer of 1904, when the foundations were supposed to be completed, barely twenty-five percent of the pillars were up to final height. “Union Station is nothing like ready,” the secretary of the local steelworkers union noted in August, advising members from other cities that there was little for them to do in Washington. Within the next couple of months, employees of the Baltimore & Ohio admitted that the station would not be ready for the next inauguration.

Part of the trouble was the B&O's main line. When construction started, it still ran down Delaware Avenue—in other words, through what would become the center of the building. As soon as they could, the project managers wanted to shift trains onto temporary tracks just past the western edge of the terminal. However, this route collided with the trestles serving the B&O's coal yards between First and North Capitol Streets. Because Washingtonians were among the great majority of Americans who depended on coal to heat their homes and fuel their stoves, the yards had to remain in service until the company finished the new ones it was building near M Street.

The main line exposed some of the problems with project management. Strouse was never explicit with Thompson-Starrett about the conditions under which it would initially work, an oversight that the contractors, when they fell behind schedule, used to blame the B&O. “Our rights...[have been] palpably transgressed,” Theodore told Burnham in October. “We expected to have free swing on the premises to complete our contract without delay and without interruption.” Strouse's failure made it impossible for Carothers to contradict that

argument directly, leaving him only to say, “It must have been very apparent to the contractors, at the time the contract was made, that they could not get a clear space until the coal yard...had been removed.”

Time was now turning into money. Thompson-Starrett advertised itself as the firm for those “who wish to be insured against the unexpected increase of finished cost over preliminary estimates,” but it now demanded an additional \$100,000 to compensate for the Baltimore & Ohio’s failure to clear the site. Theodore implied that his company would stop work if they did not receive this supplement or a new contract under which their fee would be ten percent of the project’s expenses. Carothers scoffed at this announcement, pointing out that Thompson-Starrett had already received extra payments when it became clear the site needed more elaborate foundations. Nor would the railroads change to a cost-plus contract, since that arrangement removed the contractors’ incentive to save money. Burnham’s office agreed with Carothers, particularly after one of its staff showed that Thompson-Starrett had never produced concrete at the rate necessary to stay on schedule.

The B&O’s new coal yards opened during the fall of 1904, but work did not race ahead. Winter limited progress, since storms slowed or even stopped activity and cold retarded the setting of the concrete. It would be months before the B&O’s monthly construction summary reported substantial progress.

Spring brought embarrassing reminders of what should have been. March started with the inauguration of Teddy Roosevelt, during which more than 100,000 visitors again had to jam themselves through the city’s old depots. The PRR and B&O may have been even more ashamed two months later, when 1,000 delegates to the International Railway Conference came to the capital. While each of the professionals

attending did receive a stylish pamphlet promising completion in the fall of 1906, it was a poor substitute for entering Washington through its new gateway.

Relocating the tracks had not ended the shifting of blame over the foundations. The B&O had hired two closely related firms from Philadelphia, McMullen & McDermott and Hoffman Engineering & Contracting, to handle grading north of Massachusetts Avenue. Their responsibilities included filling between the pillars, which they did by dumping hopper cars of dirt from the six trestles they had built around the site. Thompson-Starrett saw this method was another example of how its work suffered because of the railroad, since after the material fell thirty feet, as it often did, it could have enough momentum to crack or shift a pier. Though the B&O had already given Thompson-Starrett an extra \$60,000 to fix damaged pillars, in May 1905 the builders made another request for additional compensation.

The handling of this claim illustrated just how tangled the project’s lines of authority were. Though Theodore favored following procedure and going first to Burnham, his board of directors ordered Boardman to talk directly to Cassatt. The PRR’s president responded by having Burnham—not Brown or someone else at the railroad—investigate the situation. The architect reported that, while the damage was not as bad as the contractors claimed, the railroads should pay for another \$10,000 of repairs. Burnham then told Theodore to have Thompson-Starrett’s men “do everything in their power to facilitate the work of Mr. Strouse and his contractors,” instructions appropriate for him to give to someone he supervised. But Burnham also asked Brown, two levels above him, to order Strouse to coordinate more closely with Starretts. Burnham even gave Cassatt some gratuitous analysis of the root of the trouble: “As you know the final authority was not placed

in our hands as has always been done by our other clients...[but] rests with the engineer of the Terminal Company (Strouse), which deprives us of power to compel both parties to do what we say.”

It was about this time that a second big problem became clear. Thompson-Starrett and the E.B. Ellis Company were confident they could fulfill the production schedule of 30,000 cubic feet of granite a month, and Goldwin Starrett had even moved to Northfield to be sure. But the early skepticism of the superintendent of the neighboring quarry was proving accurate, with the sheds rarely meeting half their original target. Thompson-Starrett’s treasurer later admitted that at first his company simply did not know enough to estimate how quickly it could work; once it learned, it still had transportation challenges. Until the railroad spur from Bethel finally opened late in 1905, a year behind schedule, the only way down the mountain was over unpaved, occasionally impassible roads, resulting in several periods when the stonecutters in Northfield had little to do.

The logical approach to accelerating production, hiring more quarrymen and cutters, collided with the terms of the granite contract and the conditions on site. Thompson-Starrett was paid only when stone reached Washington, which on most jobs would not have been a barrier; the firm simply would have stored the blocks in an unused spot. In this case, however, the widespread filling meant there was little space available, and the slow progress on the foundations, and therefore the walls, meant that the masons were using previously delivered stones slowly. Laborers could have shifted material every time a gap opened up, but that would have required hiring additional men and have increased the chance of damage through handling. Given these conditions, Thompson-Starrett concluded that faster production was more cost than revenue. It did offer to add men and equipment

in Vermont if it was paid as soon as the granite was cut, but the B&O resisted, hoping that Thompson-Starrett’s desire for income would make it build more quickly.

D.H. Burnham & Co. was simultaneously criticizing what granite had been set. Thompson-Starrett’s contract required “clean, very whitest sand” in the mortar, since any discoloration indicated the presence of minerals that would ultimately cause stains. Not long after masons began setting stone in April 1905, however, Burnham accused the contractors of failing to meet this standard. Through two months of telegrams and letters he attacked the “constant ignoring of our orders,” especially after he had twice discussed the issue in person with Theodore. Starrett admitted there had been initial mistakes, but pointed out that those blocks had been taken down, cleaned, and reset. He added he was as confused as anyone else, since superintendent Wilmann had, in front of Burnham, approved the sand now rejected as “yellow.” Starrett apologized for an “honest misunderstanding” and explained that he was, as always, only trying to satisfy a friend. “I have not asked you to do anything to please me nor do I desire that you should,” Burnham snapped back. “Business is business and we should keep our personal matters separate.”

It was June 15th when Burnham told Theodore that either he or Ralph must move to Washington in order to “give this thing exclusive attention...at once.” He tried to make his command sound like a compliment, explaining that only with one of these two “masters” on site could the work be pushed. He also used the kind of personal considerations he had so recently dismissed, reminding the Starretts that he had recommended them to Cassatt. He concluded with a threat: “It will not avail your reputation to explain afterwards that legally you are not to blame for delay. What the heads of great corporations look

for in a man is success under difficulties, and nothing goes with a worse grace than constant explanations of failures.”

Burnham likely issued this demand only after consulting with Brown, since any serious resistance would have ended up with the PRR engineer. The two men probably hoped that Burnham’s history with the Starretts would make them more agreeable to this request, but it did not. Though Theodore admitted that he was “desperate about this job,” the last eighteen months had convinced him that the problem was the B&O and its contractors, particularly on the filling. “Let Mr. Strouse wreak all the destruction he likes,” he told Burnham, and then “it will be up to us.” Until then, however, “For me or anyone else in our organization to go to Washington to scrap with Mr. Strouse is a great deal worse than to wash our hands of all our other business and go to China.”

This answer reflected both personal and corporate conditions at Thompson-Starrett. Theodore had always been somewhat mercurial, as was clear from his working for five different contractors during the 1890s. By now, brother Paul would later write, his “nerves were shot,” largely because of clients’ constant demands for faster and cheaper. The firm now had projects from Boston to Winnipeg, and its investors were increasingly concerned about finances. The delays in Washington were raising Thompson-Starrett’s costs for men and equipment, and it was hard to see how the situation would soon change.

Despite their initial resistance, within two weeks the Starretts gave into Burnham’s demand. While a more generous schedule for granite payments helped, the main factor seems to have been Burnham’s warning about how quitting would affect the company’s future business. Walking off the job would damage, perhaps permanently, the possibility of future commissions—from Burnham, the Pennsylvania or the B&O,

even from the many potential clients following from the sidelines—and so Ralph Starrett reluctantly headed south to Washington.

III

When reconstruction of the city’s railroad facilities started, only a few people in the capital were thinking about how it would affect daily life. Most preferred to gaze off into the future, to the time when residents and visitors would be enjoying an end of grade crossings and a spacious new terminal. But the arrival of noise and mess and inconvenience quickly brought the public back to the present, and anyone who traveled, worked, or lived along the Washington improvement quickly came to question the accuracy of that label.

Though the station was a constant problem for its builders, it produced relatively few complaints from its neighbors. Residents initially worried about dust, but the District required salvagemen to wet structures down before demolition and sent sprinkling trucks to the area once filling the streets started. When a contractor tried to do pile-driving around the clock, the people nearby, their windows open to survive another Washington summer, convinced the District Commissioners to forbid overnight operations.

The situation along the First Street tunnel was more typical. Continental Jewell divided its job into three parts, all of which were underway by 1904. The southern section started at corner at New Jersey and D, SE, curving north through two squares to end at B and First, SE; the middle ran under the west side of First Street to C Street, NE; and the northern continued to Massachusetts Avenue. Each of these pieces created conflict, largely because the contractors emphasized moving quickly, the neighbors living normally.

When it started the southern segment, Continental Jewell closed

the intersection of New Jersey and D and an entire block of C so its steam shovel could move continuously northeast. Digging took place at night, since only then was there room on the Pennsylvania's tracks for cars to carry the excavated dirt to the edge of the Potomac, where it built the approaches to the Long Bridge. This schedule infuriated those along the cut, who described the resulting noise and light, which lasted until 4:30 am Monday through Saturday, as "torture" and "nerve-destroying." People farther away were not much happier, since closed streets forced detours that cost them time and, in some cases, money. Joseph Hornstein discovered that certain deliverymen now refused to supply the grocery he owned just west of New Jersey and D, and he claimed that so many long-time customers stopped visiting that his weekly revenues declined nearly \$100. He demanded compensation from the city and the railroad, but neither common law nor the Union Station Act required such payments.

Officiating the numerous disputes between contractors and residents were the District Engineers. At their head was Col. John Biddle, a Spanish-American War veteran who had taken over as Engineer Commissioner less than a month after news of Union Station first leaked out. Though several of his top assistants, such as Capt. Jay J. Morrow, were also in the Army Corps of Engineers, most of the department's employees were civilians. Among those with the most public contact were Highway Engineer C.B. Hunt, a District native who had worked for the city for more than a decade, and his assistant Charles Fernald, who lived just half-a-dozen blocks east of the Capitol.

Members of the department needed thick skins as well as engineering skill. A 1905 article noted the "innumerable throngs" who wanted Biddle to spend "a generous slice" of the city's public works

budget near their property. Since there was never enough money for every project, his choices invariably provoked criticism from those left out. Hunt learned how personal those attacks could be in 1900 when he recommended locating the B&O's much-needed freight yards in Eckington. Members of the North Capitol and Eckington Citizens Association responded by describing him as cold-blooded, unreliable, and a lackey for the railroad.

The southern section of the tunnel showed how the Engineers, once they had decided on the methods they believed would best serve "the community at large," spent many hours with the neighbors. They took steps to limit disruptions, in this case building boardwalks on D Street and a footbridge over the cut along C. Fernald pointed out to those nearby that the shovel moved as much as seventy-five feet a week, which limited how long its noise lasted in any one area, and would be done by the end of 1904. He added that only if digging occurred at night could the walls be built during the day; if that schedule were reversed, the racket of concrete production would continually disrupt the sleep of those near Continental-Jewell's staging area. Most important, as he told one woman, "work of [this] magnitude...must have facilities for its execution, and the steam shovel is the best appliance yet devised to accomplish that result."

Those explanations did not placate everyone, particularly those near New Jersey and C. During construction of both the southern and central sections of the tunnel, the staging area ran almost around the clock: during the day, electric motors ground out power and gravel clattered from metal bins into the concrete mixer; at night, hopper cars dumped dirt onto the trains for the Potomac. Even if they learned to block out the noise, residents could never ignore the dust that digging and mixing continually produced. It climbed relentlessly into their



The New Jersey Avenue staging area. The structure in the middle of the picture is a concrete plant; the white area on the far right is laundry hanging from the back decks of the homes along the construction site. (*Library of Congress*)

homes, and nowhere was it more annoying than in laundry. Working-class families could not afford to send their clothes and linens out, and it would be decades before washers and dryers were common. Laundry therefore had to be done at home and hung to dry, which created a dilemma. Given the cramped quarters most people could afford, a clothesline was most convenient outside, but putting it there meant that clean wash did not stay that way.

The people along the tunnel's center section experienced a different type of disruption. After several months of discussions with the city, the PRR and Continental Jewell had decided that they would bore this segment through Capitol Hill. During the summer of 1905, however, it became clear that something was underfoot. A trolley on

First Street stopped dead in its tracks because its power slot—the city's ban against overhead wires meant streetcars picked up their electricity underground—had squeezed shut. Residents reported that the walls of their homes now had holes, some big enough to accept a fist. The District engineers had to rope off sidewalks that had pitched and cracked, and appearing in front of the Library of Congress were a bowl-shaped depression, broken curbs, and tilted lampposts.

All of these problems had the same cause. To keep their job site free of the water that percolated through the soil, the contractors had sunk two 6' x 8' shafts along First Street, both of which extended below the bottom of tunnel excavation. Gravity sent water flowing into the bottom of these sumps, which were drained by steam-powered pumps. While removing what lay underground helped the workers, it regularly produced settlement at the surface. Those affected began filing damage claims against the Pennsylvania (Continental Jewell was considered its employee), starting with the trolley company, which had maintained service by excavating five feet of earth and bracing its tracks with large timbers. Another came from Superintendent of the Capitol Elliott Woods, whose men had to rebuild a wall that had sunk as much as ten inches, and a third from the city, which had to repave First Street. In each case the PRR paid, because by law it had to leave the street in the same condition as when work began.

Residents also asked for compensation, but with no success. Some claims were fraudulent: the city had photographed the houses nearby before construction started, and the pictures documented that much of what homeowners blamed on tunneling had existed previously. Even when someone like Margaret Jones, a widow who lived near A Street NE, could show that the cracks in the walls of her home on First Street were new, she gained nothing by suing. Precedent allowed an adjoining

property owner or those “claiming under him” to drain his land “if essential to the full enjoyment of his estate,” and the railroad had no trouble proving that it needed its route, which it had obtained from the city, to stay dry.

The northernmost section of the tunnel, which ran from C to E Street, demonstrated other ways construction could upset daily life. It was a rare contractor who saw cleanliness as next to godliness: about this time, for example, a man living next to a Thompson-Starrett site in New York won \$5,000 from the builders because “sand was dumped in front of his home, stones piled up, and dust came into his windows in clouds... iron girder tumbled on his house.” Travelers on First Street found themselves negotiating an obstacle course: the trench for another stretch of cut-and-cover had swallowed the western lane, while building materials—timber for shoring the sides of the cut, stone and brick for the tubes, dirt for backfill—spilled from the sidewalk into the eastern, even though the Engineers at least twice ordered Continental Jewell to clean up.

The tunnel was not, however, the most disruptive kind of construction. That black mark—brown was perhaps a more appropriate color—would go to the changes that adapted the city streets to the new railroad facilities. Those behind Union Station had to be lowered so they slid under the viaduct; the ones in front had to be raised to create a smooth run up to the plaza. A 1902 study had called the District one of the “best-paved cities in the world,” but once regrading started, few people had anything good to say about the roads in this area.

Biddle and the Engineers again worked to balance the interest of builder and resident. According to the original schedule for behind the station, McMullen & McDermott would first cut down the five cross-town streets—Florida Avenue and H, K, L, and M—between

Third and North Capitol Streets. (The city and the railroad had agreed early on that I Street would not go through.) They would work one side at a time, which would allow some traffic to keep moving and underground utilities to be reburied. They would then regrade Second Street, also a side at a time, and finish with the mid-block alleys. (There was little to do on First Street, since the station now largely covered it.) Contractors would then lay new asphalt as soon as possible to keep rain from turning exposed dirt into mud, though any schedule depended on Congressional appropriations. The District admitted there would be some inconvenience, as when intersecting streets were at different heights, but it again promised to minimize disruptions while encouraging progress.

One subway, as the District Engineers called the passages to run below the tracks, attracted the most attention. Not only did H Street carry four lanes of traffic, it was also a main pedestrian route and hosted the area’s only streetcar line to downtown. It would also be the longest subway, stretching over 800 feet in order to pass under more than thirty tracks. The Engineers were so worried that it would become a damp, dark, and even dangerous tunnel that during the previous winter, Captain Morrow had toured major Northeastern cities to discover what had worked elsewhere.

The Engineers and the B&O had negotiated for several months before settling on a design for the H Street subway in June 1904. The railroad quickly decided to have McMullen & McDermott start working immediately so they could finish before winter. Residents would then have to alter their travel only for a few months, after which they would have a good alternative in case work on the other subways lagged. Completing H Street would also give the B&O some insurance if trouble developed along Massachusetts Avenue, the area’s other

major cross-town route. Biddle had earlier declared that at least one of those two streets had to remain open at all times; since Massachusetts was going to require thousands of cubic yards of fill, a prompt finish behind the station would give the railroad margin for error out front.

But the schedule for H Street bogged down even more quickly than the one for the terminal. In the middle of September, Biddle announced that “due to various delays,” he was suspending further work so it could remain open through the winter. Residents already understood that among the delays were the other four subways, since their poor condition increased the importance of keeping H Street in service. But the biggest problem were along H itself, including collapsing banks that were forcing the contractors to remove twice as much dirt as they had expected.

Work was supposed to resume quickly with the return of warm weather, but Fernald reported in May 1905 that four of the five streets under the viaduct were “more or less in a condition of unserviceability for public use.” The exception was H, which remained passable only because McMullen & McDermott had done little since the fall. When the B&O then applied to close the street completely for two months, Fernald urged Biddle to deny the request, since “there is no evidence that the estimate of Mr. Strouse, as to the [new] date of completion... has any value.” Biddle concluded that the city so needed H Street in full service that he had to grant the railroad’s request, but he did so only after imposing additional conditions. The contractors could close the road only for one month, had to build wooden sidewalks on its north side, and had to get M Street, currently closed, in good condition so that drivers always had a clear, if somewhat lengthy, detour.

The lives of the people in the two- and three-story brick row houses near the corner of K and Second Streets showed how disruptive

regrading was. District native William Upperman knew when he bought his home at 207 K that that the area was “not the best,” but once preparations for construction had removed all the street lamps, his block was “swarmed with loafers after dark.” Charles and Theresa Schupbach, Swiss immigrants who had rented around the corner at 1005 Second, complained in early 1904 that the removal of the street’s asphalt the previous fall forced them “to wade through mud and slush;” later in the spring, when the east and west lanes were at different heights, they reported that their ten-year-old son had hurt himself falling off the embankment. Conditions were so awkward during the summer, when McMullen & McDermott had regraded one lane of K Street but none of Second, that the city ordered the contractors to build a stairway so pedestrians could negotiate the intersection. In the fall, lowering the alleys created problems for people like Kate Flynn, who lived two doors west of Upperman. She protested that she could not afford to underpin her stable after digging exposed its foundations.

Though excavation was finished by the winter of 1905, its effects were not. Lowering K as much as twelve feet to get it under the viaduct had exposed banks on either side of the road, and each rain produced muddy run-off that made the street’s temporary board sidewalks so slippery that residents refused to use them. They instead walked in the roadway, where they knew they were fairly safe: until Congress appropriated money for repaving in 1907, delivery wagons stopped visiting the area during wet weather for fear of getting stuck.

Condition in front of the station might have been even messier. Bringing Delaware Avenue to the front doors, for example, required raising it ten feet at D Street, twenty-three at E, and thirty-six at the plaza. While much of the fill came from the Ivy City yards, there were additional sources for dirt, such as the northern section of the

First Street tunnel and the excavations for the two new Congressional office buildings—one each for House and Senate—on either side of the Capitol. The contractors also used ash from the Capitol's furnaces and, until the Commissioners stopped the practice, loads of municipal garbage.

Tracks for the dinky trains moving this material appeared at some point on every street in the area and, in one case, even farther south. In September 1904, in order to bring over 80,000 cubic yards of dirt from the site of the new House Office Building at B and First Streets SE, a train began running just ten feet from the east front of the Capitol. Watching the engine and cars shuttling along this route, one local sardonically applied to it the name of the Pennsylvania's most elegant New York-Washington express, the Congressional Limited. The train maintained a "daily except Sunday" schedule until November, when senators returning from recess objected to how its noise interrupted their work and spooked their horses. They quickly revoked its charter, forcing the contractors to use wagons to move the last ten percent of the material.

The northern end of the Congressional's run offered another example of the balance the District Engineers tried to maintain. All the homes along North Capitol between B and C lay on the west side of the street, and their residents threatened to sue the city once they learned that the dinky train would run close to their curb. They wanted the tracks to the middle of the road, claiming the ten extra feet would protect the access of deliverymen and maintain "the peace and quiet of the neighborhood." Morrow pointed out that their proposal would prevent the fire company on the east side of the street from using its hook-and-ladder, since it would not have enough room to turn out of its driveway. He added that the tracks would be fenced, that the train

could not run on Sundays, and that it would operate only for a couple of months. The group decided not to go to court, and the work was done, as promised, by the end of autumn.

Delaware Avenue demonstrated that filling the streets, just like lowering them, made local life a struggle. Its regrading had started in the middle of 1904, with the contractors proceeding away from the station block-by-block. Crossing streets again initially remained at their original elevations, with the dirt at each intersection sloped to allow turns. But the height of the changes, such as the additional twenty-three feet at E Street, made that climb difficult under the best conditions and almost impossible on a wet day or with a fully loaded wagon. Nor did travel return to normal once the intersecting streets were raised to the same level. The District knew that the fill would take several years to settle, and so it refused to pave with anything more substantial than cinders. The resulting roadway was bumpy in dry weather, soggy during and after rain or snow.

Those along Delaware Avenue—or any street with substantial fill—suffered even after construction was done. The contractors worked only within the public right-of-way, leaving adjacent residents in valleys as deep as fifteen feet. (The Terminal Company owned the empty lots near the biggest build-ups.) These slopes sent rain cascading into yards and basements, and residents, businessmen, and even the local police precinct flooded the city with pleas for relief. The District Engineers did install temporary gutters to control overflow from the street, but they soon became blocked with dirt. Otherwise, the District could not afford to help, the railroads by law did not have to, and the commission awarding compensation because of the grade changes would not complete its work until 1911.

These conditions spilled into local life in several ways. A number

of people on the west side of the street tried to reduce their daily climbs by building wooden bridges from the embankment to new entryways they punched into their second floors. The owner of the three-story brick rowhouse at 322 Delaware, Mary Howard, now received just \$12.50 per month in rent, half the amount before construction. While a landlord like Howard, who lived farther up in Northeast, could avoid the mess, the elderly couple next door could not. Mr. and Mrs. Joseph Bauer had bought their home twenty years earlier, when he was a clerk at the War Department. But he lost that job during the same 1894 recession that put the B&O into bankruptcy and never found another, and he was now over eighty and blind. The Bauers told the Commissioners they just wanted to spend the end of their lives someplace peaceful, but they had little money and no one would pay much for their property. They pleaded for relief, but Biddle had to inform them that their house was outside of the area that the law allowed the city to buy.

Situations like the Bauers' seemed to wear out the Engineers. They had an enormous amount of work: starting in June 1901, when Rea first contacted Beach, their file on the Washington improvement grew to more than 3,000 records. Nearly half of those entries resulted from a citizen question or complaint, each of which required a written response that often demanded research. Chronic underfunding meant the Engineers had traditionally treaded water; after railroad construction started, only the hiring of new men kept the department from drowning.

It was more than volume that exhausted the Engineers. On top of reasonable protests and arguments came situations where residents were willfully difficult. In early 1905, coal dealer D.K. Hackman wrote, "I have been informed that arrangements are being made for the almost

immediately blockading" of his yard at the corner of Massachusetts and North Capitol. He attacked the city for depriving "me of my means of making a livelihood" and demanded six months to wind up his business. The engineers, who prided themselves on their "courtesy," told Hackman that his surprise was difficult to understand: not only had the general effect of filling the streets "been a matter of common knowledge for over two years," but three months earlier Fernald had explained the work to him in person.

The engineers were even blunter with the Southwest Washington Citizens' Association. To simplify the handling of traffic during the 1905 inauguration, the Pennsy had decided to wait until after the ceremony's conclusion to undertake the major work on its new route to the Potomac. The SWCA saw this pause as a chance to "improve" the railroad's design and gave the city plans that changed the crossings of five different streets. After a time-consuming review, Hunt concluded that this version would be less convenient and more costly and had the city reject it.

The association offered many subsequent objections, such as claiming that contractors were blocking the streets and that the viaduct was occupying more land than the law allowed. By 1906, the Engineers had lost patience, describing one protest as not true "even in the slightest degree." Though the department's official response to the SWCA omitted that phrase, it was less tactful the next year when the association complained about a temporary station the PRR was building at Seventh and Maryland, SW. Morrow told the other Commissioners (he had succeeded Biddle a few months earlier) that the Engineers' work "has been considerably hampered" because the association had "continued, at short intervals, during the past two or three years, to flood...[us] with letters and resolutions, nearly all of

which are as unreasonable as this one.” He persuaded his colleagues that they should stop graciously accepting multiple versions of the same objection, since the responses took time from more productive tasks. He then told the SWCA, apparently with some pleasure, that its requests were “unreasonable.”

The Engineers often found the B&O just as difficult. (Surprisingly, given its history in the city, the PRR was generally agreeable.) Recognizing that there was a lot of material to move, the city had allowed the railroad to lay dinky tracks across a half-dozen streets, receiving in return a commitment to keep the resulting intersections passable. From the beginning, however, the Engineers felt that the B&O failed to fulfill its promises. Late in 1903, for example, Fernald found that the railroad’s contractors had used dirt in the approaches to the rails, not the stone they had promised. The consequence was obvious on Massachusetts Avenue, where two loaded wagons had been abandoned in the middle of a crossing after they became stuck in the mud. Though he finally agreed to have his contractors lay down stone, Strouse first complained, “there does not seem to be any end of expense to which we will subjected.” Such statements were unlikely to create a good relationship with the Engineers, who believed the B&O had received a privilege. Because they had to keep working with the railroad, the Engineers did not publicize such statements, a reticence that brought them additional abuse. About that time, the aptly named Sarah Bogg told the “City Dads” in early 1904 that if they were to eliminate the soggy crossings she regularly encountered on Massachusetts, “it would make us all pray for instead of cursing you morn and eve.”

A final factor increased the tensions among the Engineers, the residents, and the builders. They could initially comfort themselves with the belief that the conflicts and disruptions, no matter how

unpleasant, would be over by the middle of 1905. Instead, by that date it was clear that work, and therefore the unhappiness it was causing, would continue for many more months—and no one knew just how many.

IV

For all the sophisticated technology that went into their construction, Washington’s new railroad facilities were, in the end, hand-made. The men were important in part because of how much of today’s equipment had yet to come into common use. The employees of McMullen & McDermott, for example, could not move dirt with a dump truck, a backhoe, or a bulldozer: they had to shovel it in and out of wagons, then regrade it with horse-drawn scrapers. But even when modern methods such as electricity or I-beams were available, their successful implementation depended on the skill of the contractors and their employees. As a result, from the tunneling under First Street to the roof of the station, the key to each project were the workers who created it from thousands, sometimes millions, of pieces.

There were simply too many contractors using too many different men—and because of the attitudes of the time, they were all men—to develop an exact number for how many people worked directly on the Washington improvement. One 1904 story estimated the total at 5,000; another in 1907 put the count between 5,000 and 10,000. Even the lower figure indicated how significant railroad construction was, since it meant five percent of the city’s labor force was working on the improvement.

These men varied widely in background, skills, and pay. At the bottom, both physically and financially, were roughly 1,000 laborers. Most were referred to as “muckers,” a name that recognized that they

spent their days in the dirt along the new rights-of-way in Northeast and Southwest, out in the yards, and down in the tunnel cuts. After the steam shovel on Virginia Avenue took such a big scoop that neighboring houses nearly tumbled into the trench, for example, the contractors sharply cut back its use. Moving in were approximately one hundred men, who spent the winter of 1905 digging in chilly water up to their shins.

Typically Italians or eastern Europeans, the muckers migrated along the East Coast from construction project to construction project. Most did not fit the immigrant mythology: they typically planned to stay in America only long enough to earn what they needed to purchase the farm they would settle on back home. They found their jobs through padrones, Italian-American contractors who provided construction companies with large temporary labor forces. Though padrone translated into “patron,” these men exhibited little of the kindness their name suggested; most were notorious for exploiting their men.

In return for working ten physically demanding hours a day, a mucker received \$1.50 and free housing in a one of the half-dozen camps padrones had set up near job sites. Though the worst accommodations, unventilated freight cars, were closed after a few months, a *Post* reporter who visited one camp in Ivy City found that its operators had spared almost every expense. Nearly 100 workers were jammed into two 14' x 30' “undressed board shanties, covered with tar paper,” inside of which was a single wood-fired stove and two levels of wooden bunks without mattresses. Nearby were sheds under which the men used open fires to prepare their meals—typically pasta, bread, and sweets—from supplies they had obtained at overpriced camp stores. The reporter’s disgust with these conditions, and with the people who created them, was

most obvious when he caustically quoted the response to his question about the absence of toilet facilities. “Muckers’ don’t wash,” claimed the camp operator. “What would be the use of water?”

Discrimination made a laborer’s even less pleasant. Because some Washingtonians claimed construction would fill “the Capital City with the scum of Southeastern Europe,” the police constantly watched the camps, even after finding that this group of “foreigners has occasioned less supervision than...any similar number of residents of the city who have lived here all their lives.” Bigotry was not confined to locals, with many Italians refusing to associate with Hungarians, and almost all Europeans avoiding blacks.

Above the laborers were artisans of all sorts. Those at the station included hoisting engineers, steelworkers, stonecutters, bricklayers, fireproofers, carpenters, electricians, plumbers, plasterers, painters, glaziers, boilermakers, blacksmiths, and roofers. The steelworkers showed how most men specialized even within a trade: there were the raising gangs, who created the building’s skeleton by running temporary bolts through the holes manufactured into the I-beams; the fitting-up gangs, who squared and tightened those pieces; and the riveting gangs, who permanently fastened the beams together. Crafts had divisions according to skill and experience, such as master and journeyman, and were in many cases predominantly one ethnic group. Bricklayers were most often Irish, for example, while granite setters were typically Italian.

Artisans lived better than the muckers, but most still struggled. They typically earned between \$4 and \$5 per day, or about what Henry Ford would soon give someone on the Model T assembly line. But construction was a much more erratic source of income, because bad weather stopped work (and therefore pay) and because the end of one

project required searching for another. One researcher of the time estimated that even a successful man received a paycheck only 215 days each year, often by following opportunity—such as the rebuilding of San Francisco after the 1906 earthquake—around the country.

As was true in every major American industry, the higher-paying jobs in construction went to whites. Blacks could carry bricks but not lay them, could dig trenches by hand but not by steam shovel. One of the few exceptions came with the sandhogs, the men driving the First Street tunnel under Capitol Hill. That work was so dangerous and difficult that African Americans were allowed to do it, and their abilities earned them twice as much as they would have as muckers. “They are mostly negroes, but they are paid \$3 a day,” wrote a surprised reporter, who failed to connect their exceptional wage with his next observation, “their places are difficult to fill.”

Up through the project were a series of supervisors. Contractors normally had their own foremen, whose daily wages ran around \$6 or \$7. Managers like Wilmann and Strouse earned about twice as much, with the latter receiving \$3,300 a year after a raise in September 1905. Cassatt’s annual salary at this time was reputedly \$75,000; Burnham’s income varied according to each year’s projects, but by 1912 his firm owed him \$750,000 in undistributed profits.

Construction also supported people who never touched building materials. The liveryman transporting the Engineer Department’s inspectors received \$5 a day supplied by the B&O and the PRR. One of the few women around the site was E. M. Perkins, a widow who supported herself, her two children, and her sister by running a lunch stand that fed the men building the terminal.

Though the characteristics of the workers varied greatly, they all shared at least one concern. Changing weather, shifting routines, heavy

equipment and material in motion, heights, and pressure to work fast created such constant potential for injury that constructions workers were among the types of workers—lumberjacks and chemical plant employees were others—to whom life insurance companies refused to sell policies. Contractors’ casual attitude towards safety was clear at Union Station: there was no fence around the site to keep out passersby, just a small sign near what would be the main entrance that read “Danger/Keep Out.”

Incomplete records make it impossible to tell exactly how dangerous the Washington improvement was, but at least five workers died directly from their jobs. The toll started in 1903, when two local black laborers, 49-year-old Andrew Lankins and 26-year-old Edward Farrell, drowned in the Potomac when their boat capsized as they were moving equipment for the new highway bridge. It ended four years later, when a falling girder knocked white foreman Samuel Frizzell off scaffolding in the coach yard. Another half-dozen men died in connection with the construction, largely from being run down while walking along the tracks. Typical of this kind of fatality was Pisqualo Ozzi, a mucker who froze as a B&O express approached. Yet these figures, based on newspaper stories because neither the city nor the contractors compiled a count, are likely too low. Though the *Post* never reported that 26-year-old ironworker Charles Ballenger had died from a thirty-foot fall from scaffolding, it did later run a story that his parents were suing Thompson-Starrett for negligence.

Injuries were much more common, if even less carefully documented. Between January and June of 1904, for example, local papers told of two black muckers injured when the walls of the trench they were digging collapsed; of two Italian laborers hurt by a similar cave-in; of two men whose fingers were amputated after they were

crushed moving supplies; and another worker hit by timbers that fell when the derrick moving them collapsed. Lawsuits again revealed that many accidents never made it into the papers, as with a Continental Jewell employee who said his broken ribs resulted from being hit by a dirt car with faulty brakes.

The danger extended to people around the country supplying the station, and the stonecutters in Northfield faced a particularly insidious problem. The hardness of granite meant the men in the sheds were really crushing, rather than cutting, away excess material, a process that produced a fine silica dust that easily made its way into the workers' lungs. The body's immune system tried to fight these particles by covering them with fibrous tissue, but the resulting cysts eventually filled so much of the lung that it had too few alveoli available to transfer oxygen into the bloodstream. The first sign of silicosis, as it became known, was normally a dry cough; most victims then began suffering from other, often fatal, respiratory and heart problems. It normally took less than ten years in the sheds before a man began displaying these irreversible symptoms.

Workers understood how costly an injury could be. Few had health insurance, so treatment meant paying out of pocket. Not until 1911 would Wisconsin become the first state to implement workmen's compensation; until then, workers had to sue to win damages, a process they normally found too complicated or expensive. Time off the job meant no income, a particular problem for men whose erratic paychecks made it hard for them to save, and a severe injury could prevent someone from ever returning to his trade.

Workers tried to balance their need to earn against their desire to enjoy their lives. Early in the summer of 1904, contractors across the city had extended employees' standard week from six days to seven.

Though this schedule applied to most projects, its biggest advocates were the managers of the companies working on the station, who saw it as the only way they could complete their assignments on time. Agreeing with this shift were many of the muckers, since more hours brought them closer to having the money to go back home.

But most skilled workers resisted. The station was a key part of a construction boom running through Washington during this period, and the resulting demand for men was pushing up wages and allowing locals to stay home. (It was also producing whining from some contractors, who were happy to charge more during these good times but attacked workers for seizing the same opportunity.) The artisans preferred to spend each week's seventh day with friends and family, but there was still enough competition for jobs that they were reluctant to resist the new schedule. A switchman who said he had gone six weeks without a day off explained, "If I decline to work on Sunday, when I come Monday, I will find another man in my place."

This fear led most men to say little, but local religious leaders spoke up. They argued that this schedule demoralized the workers, though it was clear they knew little about the men they were supporting: one protest claimed that longer weeks prevented the muckers from assimilating into American society. The ministers' true concern seemed much more parochial, as they also complained that congregations adjacent to job sites were finding it impossible to hear their pastors because of coupling cars, picks on stone, and steam shovels. The ministers were effective lobbyists, and in August the protests they had directed at Cassatt led him to order the contractors to stop Sunday work.

Most artisans believed that the best way to higher incomes was more pay per hour, and their main vehicle towards such increases was

unionization. By the turn of the century, each of the major construction trades had a national (sometimes international) union that issued membership cards to dues-paying members, shared information through magazines like the Stone Cutters' Journal, and coordinated organizing efforts across the country. Their locals in major cities had two interconnected goals: to set a standard wage for standard hours and to ensure that contractors hired only its members. Negotiations with the builders' association in Washington during the spring of 1905, for example, led to a one-year agreement that gave members of Local 1 of the Bricklayers and Masons' International Union of America \$5 for each nine-hour day, a ten percent increase over the rate that had applied for the previous four years.

But the labor situation was never simple. Unions had internal disagreements, as when members of Local 1, on a sympathy strike against employers who refused to let workers in other trades bargain collectively, rejected for several days their international's order to return to work. Disgruntled members sometimes formed a new local, alienating their colleagues and making it easier for contractors to divide and cut wages. Unions also battled each other, as when the bricklayers and the tilesetters argued over who would install the concrete panels that made up the terminal's roof.

But the biggest fights arose when contractors tried to hire men without union cards. Most of the firms working on the terminal accepted union contracts because of the stability they provided, and Thompson-Starrett was even expelled from the New York City builders' association in 1905 for settling separately with striking carpenters. The consequences of the alternative was clear in the middle of 1906 when a subcontractor hired a handful of "snakes," as the union members called them, as part of the crew installing drains in the sheds over

the platforms. Not only did the union plumbers on that assignment immediately walk off, but also joining them in sympathy were the 200 other tradesmen working on the project. Everyone returned when the subcontractor agreed to keep the men without union cards off the site until arbitration decided whether they could continue.

Not all disputes were so easily untangled. The steel contractor for the express building and the powerhouse was the American Bridge Company, which in 1901 had become part of J.P. Morgan's empire. Like most of the firms that Morgan had brought under the U.S. Steel umbrella, American Bridge was vertically integrated: it operated its own plant in a Pittsburgh suburb immodestly named Ambridge, had its own delivery cars, and sent its own managers to job sites to supervise erection. While this start-to-finish system generated substantial profits, it also gave the International Association of Bridge and Structural Iron Workers many points on which it could pressure the company each time it tried to hire non-union men.

Early in 1905, the union called a nationwide strike against American Bridge when it turned out that the company had sublet a project for the New Haven Railroad to a non-union firm. Negotiations had almost produced a settlement when the international discovered that the Ambridge plant was employing twenty-five men without cards. The company refused to fire them, citing the prerogatives of management, and so the strike continued into the summer, by which time union steelworkers were ready to assemble the superstructures of the express building and the powerhouse. Because American Bridge was handling that work, however, the international told its members to stay away to increase the pressure on the company to fire the twenty-five non-union men. By the end of the fall, Carothers reported, activity on both buildings had "absolutely stopped," because without a framework,

other artisans had nothing to do. The situation could have been much worse: American Bridge had won the contract for the station's steel, but Thompson-Starrett was doing the erection to simplify building the walls.

Because it would be paid only when it finished its work, American Bridge tried to restart the job in February with non-union workers. Racing from Chicago to stop them was Ernest Graham: as D.H. Burnham & Co.'s main negotiator and a good friend of labor leader Samuel Gompers, he knew that the other trades, who so far had only sympathized with the strike, would walk out if snakes came in. After several more weeks of discussion, Carothers and Graham decided to pay American Bridge for its material and shifted the erection contract to the Youngstown Steel Company, which later that spring resumed work on the two buildings with union members.

While the men fought hard for good wages, many of them saw in their jobs more than just a paycheck. Most were proud of the skills they had, and they seemed to take a special pleasure in using them to create a landmark. Not only did many of the men pose for photographs in front of their assignments at Union Station, but several had the building listed first among the achievements in their obituaries.

The four-man riveting gangs helped show why men the line felt such pride in their work. The first man, known as the "heater," used a coal-fired forge to raise each rivet to nearly 1000 degrees, leaving it soft enough to work. Grabbing the rivet with three-foot tongs, he pitched it as far as fifty feet towards the "catcher," who waited with a pail or paint can. He used his tongs to slide the fastener through two holes, one in each of the carefully aligned I-beams. As the "bucker-up" braced the head end of the rivet with a metal bar, the "riveter" held a cupped die over the shaft protruding on the other side of the beam.

The fourth man then hammered the die—it would be twenty years before the invention of a pneumatic rivet gun—to squash the stem into a second cap. (The rivets contracted when they cooled, pulling the two I-beams together.) By the time the riveter had finished hammering, the catcher already had the next rivet in place, a routine that allowed the quartet to drive as many as xx in an hour. Each man could do every job, and they often worked from narrow plank platforms more than fifty feet above the ground.

Getting the granite from the ground to the walls of Union Station drew on an even wider range of talents. It started with a quarryman in Bethel, whose training allowed him to look at a bed of stone and see vertical joints, imperceptible to most people, along which the stone would split cleanly. Workers then drilled a row of shallow holes along one of these natural seams, into which they placed two semi-circular metal spikes (the "feathers") that together were slightly smaller than the hole; between the feathers went a metal wedge (a "plug"). A quarryman then gently hammered a row of plugs, evaluating the sound of each strike to ensure that pressure increased evenly. The feathers ultimately split the stone along the joint, often creating a face five or six feet high that was far smoother than any chisel or saw could generate. The quarrymen determined which seam to use based on diagrams draftsmen in Northfield has created; these "shop drawings" outlined every piece of granite the terminal needed, and so the workers could create blocks of a size that required only minimal finishing.

The drawings were also crucial to the stonecutters in Northfield. When a load of granite arrived at the sheds, a foreman evaluated every block: one with a stained corner, for example, might help form an arch, since the flawed area would be removed during manufacture. He assigned each piece to a cutter and attached a shop ticket, an even



The roof of the ticket lobby at the end of 1906. Barely visible at the top of the picture are two steelworkers, working without a net. (*Library of Congress*) more detailed diagram that showed, often down to one thirty-second of an inch, how it should be finished. While strength helped a worker, success really depended, as one manual for apprentices explained, “more upon his intelligence than his brawn.” He had to “size up” a stone to know where to start, where problems might occur, and which chisel and hammer in his toolbox to use at which moment.

Covering the walls of Union Station required another display of coordination. The process began with a hoisting engineer, who used his derrick to lift one block at a time—his assistants identified which one to send next from the number the men in Northfield had painted on its side—to the masons working on the top of the walls. The engineers needed a delicate touch, or the xx pound stone, which hung from the chain that spooled out of the derrick’s arm, would swing into a wall or,

more dangerously, a worker. The typical team of four to eight masons prepared for a new course of granite by stretching a line from one end of the row to the other; it showed the position of the top front edge of each new block. Using his trowel—it “becomes almost an extension of [your] arm,” a mason would later note—each man quickly “battered” the blocks below with a thin layer of mortar. After the stone arrived by derrick, the worker relied on the mason’s line, a level, and his eyes to set it accurately into the wall. He raked off any mortar that had squeezed out (skillful battering would produce little excess), and prepared for the next stone. Good foremen were vital on this job too, since only if the fastest masons handled hardest jobs, such as windows and corners, would the team finish together. While most workers accepted the dirt of construction by wearing dark clothing, stonemasons highlighted their neatness by choosing white shirts and light overalls.

The men with most specialized talents on the Washington improvement were invisible to the public. The Pennsy and Continental Jewell had originally planned to build the middle section of the First Street tunnel using the “shield method,” a standard technique for digging through soft and predictable material. (Removing rock normally required blasting.) The sandhogs would bore through Capitol Hill protected by a shield, a metal arch driven forward by hydraulic rams. But the two companies reconsidered once they discovered how much water ran underground, since the “soft and treacherous” mixture of sand, clay and mud was likely to seep around the leading edge of the shield, slowing progress as the sandhogs had to remove extra material. Problems would continue once the tunnel was built, since the same moisture would gradually permeate the tunnel’s masonry and create instability. Preventing damage required waterproofing, which had to be done from outside the walls, and a shield large enough to provide

working space would be very difficult to maintain.

The builders next proposed extending the cut, but that produced a new set of objections. Residents wanted to protect the elm trees that, as in many American cities, shaded their street. The utility companies opposed an approach that required rebuilding gas, sewer, and streetcar lines, and Superintendent Woods said that a twenty-five foot wide gash on the east side of his grounds would violate the law that required him to preserve the Capitol's landscape. The Pennsylvania and Continental Jewell had their own concerns, since they would have had to keep the trench walls from collapsing and to prevent passersby from a sixty-foot fall.

In September 1904, the companies agreed to stay underground by using the "drift" method. It began with engineers marking out three horizontal shafts, or drifts, in a triangle about thirty feet on a side. Those dimensions differed significantly from those of the finished tunnel, which would be fifty feet wide and twenty-four feet high, for two reasons: the instability of the dirt forced each of the permanent tubes to be built one at a time, and the need for waterproofing required extra working room.

The sandhogs began a drift, which was slightly taller than and about twice the width of a typical house hallway, by producing a frame from four 10" x 10" pieces of wood. They started with a sill across the bottom, embedding its ends in the earth to reduce shifting, and then added the two posts and the cap, or top member. To create a ceiling, they used long-handled hammers to drive "poling boards" forward into the dirt above the cap; they inserted these 3" x 8" planks, each approximately six feet long, outside of the posts to form walls. (The boards were held in place by shims.) The sandhogs then used picks and shovels to excavate the drift, dumping the dirt onto the narrow gauge

cars running back to the staging area. They installed another frame about every thirty inches, bracing it against its neighbors, and three eight-hour shifts moved north about ten feet.

After a month, additional workers entered the top drift in order to create the wooden arch that would protect the area in which masons would build the first tube. The new sandhogs began by standing round wooden posts on each sill, placing them just inside the existing square pillars. Along the tops of the new posts they laid "crown bars," wooden poles 24' long and 1' thick that ran parallel to the drift. Together the posts and the crown bars were the same height as the original pillars; as a result, when the sandhogs removed the latter, the new structure supported the cap and the ceiling. The workers then took down the



The entrance to the driven section of the First Street tunnel. In the lower left and lower right corners are the bottom drifts. (*Library of Congress*)

planks forming the wall and drove poling boards into the exposed dirt, angling them slightly downward.

The men next dug out and down, which they could do because the new boards formed the start of a ceiling. When they reached the middle of the first poling boards, they added new posts and crown bars, resting them on unexcavated dirt rather than wooden sills. (They often inserted supports in sets of two to protect themselves in case one piece of wood failed.) When they came to end of the poling boards, the sandhogs inserted more supports and pounded in more planks, sharpening the angle downward to create the curve of the arch. Repeating this process a half-dozen times brought the passageway down to the side drift, where the footings had been strengthened with concrete. The men proceeded to work their way back up to the top by bolting a large timber between each pair of crown bars, ultimately producing a segmented arch whose ribs directed the weight of Capitol Hill down to the footings.

Technology now helped the workers build the permanent tunnel. Continental Jewell brought in a small steam shovel to remove the dirt under the arch, modifying it so its smoke did not make the atmosphere intolerable. As the shovel moved forward, men extended its stack with extra section of pipe hung from the ceiling, which carried the exhaust back to the mouth of the tunnel. Following the shovel were three moving scaffolds, each of which straddled the tracks for the dirt cars. These “travelers” lifted the workers as much as twenty feet above the tunnel floor, helping them create the permanent tube through which the trains would run.

Again, however, men were the key to construction. About 100 feet behind the shovel were the masons who, with help from small derricks attached to the first traveler, built the tunnel walls from stone



The top drift of the First Street tunnel, looking back to the southern entrance. In the foreground are the original square frames; closer to the light are the poles and crown bars

of round posts (the initial ones had been removed when the arch had been completed to clear out the work area) between the arch and then backfilled in between, much as had been done with the foundations for the station. Aiding in the latter step was the final traveler, which ran just ahead of the one carrying the wooden centering for the arch. It had two key components, a mechanical hoist that lifted buckets of dirt up to the men and a pivoting conveyor belt that distributed the material. The dirt was not simply spread around, however; instead, the men used tamping bars—round poles with flat discs on their ends—to pack it tightly.

Succeeding as a sandhog took strength, skill and self-possession. The job was demanding physically, with each day filled with hours of

swinging a shovel, axe, or hammer. The men also had to use their heads, starting with understanding how to coordinate their movements within a tight space. Though few had much formal education, the sandhogs also needed to make dozens of accurate calculations each shift. During construction of the drifts, they constantly adjusted the spacing of the frames, trying to install as few as possible to speed progress but knowing that softer earth demanded more support. They had to position the poling boards carefully: those in the ceiling of the drifts had to tilt slightly upward, so the next set could start on top of the subsequent frame, while those going laterally had to curve smoothly downward to the side drifts. The entire tunnel also had to keep to the course the surveyors laid out, following a curve to the left on the southern end and gentle rise as it moved north.

And the men had to do all of this in a dark and dangerous setting. Though electricity and compressed air had improved the atmosphere of a tunnel under construction, conditions were still among the most difficult in construction. Sandhogs often went their entire shift without seeing the sky, and they knew what hung overhead. Each man was aware of mine shafts and railroad tunnels that had collapsed in the past, and a one-hundred-foot stretch of the cut-and-cover section of this tunnel had caved in when its bottom timbers failed. Luckily, that failure had happened so slowly that everyone escaped, but it was a reminder that each man's fate depended on the others. With work taking place around the clock, each sandhog had to trust what had been done before.

The work under First Street documented more than just the skill that the Washington improvement demanded. Though this project, like most of the others, remained behind schedule, its progress was one way to measure how close the capital was to enjoying new railroad facilities. By the fall of 1905, there was light at the end of the tunnel,

and it came from a woman with an ax.

V

On October 14, nine people—the three Commissioners, C.B. Hunt and another of the District Engineers; Continental Jewell's local manager; and four people associated with the Pennsylvania Railroad lawyer, including general agent Joseph Crawford and his daughter—gathered at the New Jersey Avenue staging area. There they climbed into the dinky cars that normally carried dirt out of the tunnel and rolled under Capitol Hill, stepping down when the tracks ended below C Street. They walked a block north, stopping in front of the few inches of dirt that remained between the center and northern sections of the tunnel. A sandhog then handed 17-year-old Caryl Crawford an ax; with two swings she poked a hole in the wall and sent sunlight into the drift.

This breakthrough, reported proudly in the local papers, was one of several bright spots over the next year. Within a few months, freight trains started to roll through the expanded Virginia Avenue tunnel. In April 1906, Cassatt was on the first passenger train to reach the station; in June, the front of the terminal hosted a full-scale plaster model of one of the triumphal arches through which travelers would enter the building. Later that summer, the B&O began using its relocated wye between the Washington and Metropolitan Branches, and in the fall, a two-car train made the first trip through the First Street tunnel.

Helping encourage these events was a July 1905 meeting intended to fix the problems that had occupied the first two years of construction. Coming together at 301 Delaware Avenue, a row house the B&O had converted into its project office, were the men most responsible for the station and surrounding area. In from Chicago were

Burnham, Anderson, and Graham; from New York, Theodore Starrett; from Baltimore, Carothers and John Greiner, his chief assistant; and hosting them were “locals” Strouse, Wilmann, and the newly arrived Ralph Starrett. Together the nine men had produced a plan designed to address ongoing problems, agreeing that Thompson-Starrett would repair the damaged foundation piers, that the Baltimore & Ohio would fill faster, and that Anderson would go to Vermont to help accelerate granite deliveries. At the end of the meeting, the Starretts promised that the building would be open at the start of 1907, which would leave the railroads comfortably inside the Union Station Act’s five-year deadline.

Despite the successes that followed, however, the meeting had a limited effect. After spending an hour on site just before Christmas, Cassatt sent Burnham the kind of letter no one wants to receive from the boss. “I was disappointed to find the work going on very slowly,” Cassatt wrote, his characteristic understatement making his displeasure even clearer. “Little or nothing seems to be doing in the interior and there were few men at work anywhere.” Others soon felt this pressure. After New Year’s, Graham told Thompson-Starrett, “you are falling behind your promise” to have two-thirds of the granite on site by June, and at the end of January, Carothers brought up the railroads’ ultimate concern. At the present rate, he told the Starrett brothers, “we will not get into the Terminal Station for two years.”

Two changes in personnel during 1906 emphasized how long the work was taking. William Brown should have been the PRR’s chief engineer from planning to opening, but he had step down that March when he reached the company’s mandatory retirement age of 70. A more startling replacement came late in December, when complications from a heart condition killed Alexander Cassatt. His

health had been deteriorating for some time, to the extent that his wife had been pushing him to retire. Yet he continued at a demanding pace, which included overseeing construction of the New York station, negotiating with federal officials about legislation to control railroad rates, and serving as the final word on the work in Washington. When Burnham wanted an upgrade—\$3,000 to buy special bricks so that the powerhouse and its smokestack matched, for example—he often went directly to Cassatt, who still supported a first-class station. It was an attitude far different from his successor’s: James McCrea would later suggest saving money by furnishing the Presidential suite with chairs and tables made not from mahogany, which was used throughout the public areas, but from wicker.

A further shift in leadership occurred early in 1907. Thompson-Starrett’s board had remained concerned about the company’s financial condition, and on January 20, it decided to replace Theodore with Albert Boardman. Starrett could not protect himself, since his decision four years earlier to bring in outside investors meant he no longer held a majority of the stock. Now “a broken man,” Theodore would later sue the company that still carried his name, claiming it had cheated him out of hundreds of thousands of dollars.

Thompson-Starrett’s directors were not the only ones worried about how dim the light from the end of the tunnel was. In public, the station’s owners had treated deadlines like tourists waiting for a trolley on a sunny day: they might have missed the one they had hoped to make, but another, almost as good, would be along soon. But as predicted debuts—the spring of 1905, the summer of 1906, the start of 1907—kept passing by, opening the Washington improvement became increasingly urgent.

In construction, time really was money. Each delay had a direct

cost, since contractors could charge the railroads for men kept idle or for materials that became more expensive. Between 1905 and 1907, for example, the price of maple flooring went up thirty percent and wages for some artisans rose fifty percent. Falling behind was expensive in other, less explicit ways. For both the contractors and the owners, the uncertainty of schedules prevented them from employing their resources fully, including on other projects.

The failing schedule also meant a loss of revenue. Until the building was open, neither line could ask the federal government for its \$1.5 million payment, nor could they move in and start charging the tenants. PRR and the B&O had funded construction of their joint facilities by issuing approximately \$12 million of bonds, and they had sold themselves \$5 million in WTC stock. They planned to service the debt and pay dividends by billing the railroads serving Washington, something they could do only when the trains were running.

The railroads' desire for income grew stronger when they realized just how much the budget had ballooned. There were the larger bills, in amounts to be determined, from the contractors whose work had been delayed. There were alterations, as when the railroads and the architects agreed that the front portico would look much better by spending another \$57,000 to change the domes from plaster to terracotta. And there were additions, such as the purchase of \$500,000 of land on the east side of the station in order to build more southern tracks and better mail handling facilities.

But only in March of 1907 did someone actually recalculate the price of progress in Washington. As the PRR and the B&O prepared to develop the schedule of charges for using the station, A.C. Shand, who had replaced Brown, discovered that the railroads had not produced a comprehensive cost estimate for nearly three years. Even before he

had definitive numbers, Shand saw enough to warn Carothers "that unless you and I take some radical steps in the near future to shut off the expenditure of money in the District of Columbia the original estimates of the cost of construction work will be overrun enormously." "Enormously" was no exaggeration: further research revealed that all the work in Washington would total not the original \$16 million, but more than \$25 million.

By now, however, finding dramatic savings was nearly impossible. There were minor reductions, as when Chicago artist Lorado Taft lost his contract to decorate the panels at the end of the concourse, but construction was simply too far along for major changes. The station could not be made smaller, nor could limestone take the place of the granite. Carothers recognized this difficulty when, after sympathizing with Shand, he noted, "I do not believe, however, that we can curtail in finishing up the parts of this improvement very greatly without marring its appearance and usefulness."

Carothers soon identified another reason why savings were so hard to find. One of the few jobs not yet started was installation of the interlocking, the centrally controlled signals and switches that routed trains safely to and from the gates. Shand had earlier dismissed "these interlocking experts," including some of his subordinates, who asked for the most modern—and therefore expensive—system, but Carothers argued that they had little choice. "The operation of this Terminal," he wrote, "is going to be encumbered by many difficulties on account of the District people and the close supervision which will be given by the U.S. Army Officers stationed in Washington, and I do not believe we can have any but the very best devices."

As a result, the only way to stanch the red ink was to start using the new facilities as soon as possible. When Shand made his calculations,

unfortunately, that approach faced many obstacles. The First Street tunnel was finished, but the huge fans that would remove locomotive smoke were not yet started. The new yards and the roundhouses were several months from being able to handle equipment. Union Station was the biggest difficulty. None of its major elements—steel, brick, or granite—were done, which meant people like the electricians and the plumbers still had much to do, and one senior Pennsylvania engineer predicted that it would be another year until vital areas such as the waiting room, the ticket offices, and the restaurants were ready.

These problems inspired another major meeting at 301 Delaware in March 1907. Eager, perhaps even desperate, to get the station on line, Carothers, Strouse, Graham, Farnham, and George Martin, the newly named station superintendent, decided to rely on an idea that had been discussed for more than a year. The terminal would open before it was complete, using those facilities that were done and adding whatever temporary ones were needed.

Under this plan, the Baltimore & Ohio would move in first. Its lack of southern service meant that none of its ninety-five daily trains needed a completed tunnel, and it had to remove its old depot and right-of-way as soon as possible to finish filling that area before the five-year window closed. The B&O would operate from the building's east end, where construction was more advanced. Foreseeing what might happen, Carothers had in 1906 overruled Burnham and told the contractors to work east to west. During this interim period, all travelers would act like dignitaries, coming in through the state entrance. Once in the future Presidential suite, they could continue straight ahead to the concourse or turn left into the restaurant, which would be the temporary waiting room. South of this space was the permanent women's room, which would be finished in time; north was the lunch room, which

would also be ready. Because the western half of the station would still be under construction, its services would be set up in the concourse: the east end would include a wooden enclosure for the men's toilet and booths for the ticket office and information desk, while the west would have a temporary baggage counter.

The Pennsylvania and the southern lines would follow the B&O in a month. This interval would allow workers to prepare the tunnel and to ready the additional gates to handle 135 more trains each day. The PRR was also worried about the five-year deadline, since one section of new track along Maryland Avenue could be completed only after the approach to the Sixth Street Station was removed.

The Baltimore & Ohio predicted it would relocate May 1, a deadline that explained why the meeting's notes were filled with tasks to be done "quickly" and "at once" and "immediately." The railroad soon abandoned this plan, however. When the Pennsylvania changed its mind and announced it would not shift until October, the B&O realized that it would have to bear the new station's operating cost alone for five months, tripling its current expenses. It also abandoned the May 1 schedule and began working with the PRR on a new one.

Setting an opening date illustrated how the two lines, though they had generally cooperated during construction, still competed. In 1906, feeling increased pressure from the federal officials concerned about monopolies, the PRR had sold about half the shares it owned in the B&O, thereby further limiting the incentive either of the two had to cooperate. As both lines prepared to shift to Union Station, the advantage in the short run seemed to be with the Pennsylvania, since a staggered schedule meant that only the B&O would suffer the problems that invariably appeared with a new facility. In addition, because Congress was in a second year of arguing over how the streetcar

companies should reach the terminal, travelers might prefer the more convenient Sixth Street depot. For its part, the PRR wondered whether its rival would gain in the long run. Though the B&O might not have through service, within a month its passengers would no longer have to change depots to connect with a train to the south.

The two companies continued planning through the summer and early fall. After several inspections that included McCrea, Carothers and Shand, they announced that the B&O would enter Union Station on October 27, with the others moving November 17. Both dates were Sundays, which allowed the railroads to take advantage of the lighter traffic that began Saturday afternoon. The owners agreed that during the B&O's sole occupancy, it would pay only what it would have at its old terminal; the remaining charges would later be distributed among all users.

People across the country had been readying for the opening for some time. As early as January, *Scientific American* had announced, "The great Union Station at Washington is nearing completion. There is probably no piece of work under way in America which excites more interest and curiosity." In August, readers of *Harper's Weekly* learned a great deal about "The President's New Railway Station," at least some of which was true: the article claimed that the "biggest station in the world" was made of "white marble." Three days before the southern lines moved, the *Atlanta Constitution* reported that the terminal would give travelers from its region "welcome relief after decades of railway accommodations that would have disgraced a city of one-third the size."

The greatest interest was, naturally, in the capital. The B&O, aware of how much was left to be done, declined the Board of Trade's suggestion of a grand opening celebration, but the railroads did work

on public relations. On Friday the 25th, the *Pennsylvania* ran an ad that described the timing of the moves and regretted that the station, "as far as the interior arrangements are concerned, is not finished to that degree of completeness in which the Washington Terminal Company has endeavored." That same morning, officials of the Baltimore & Ohio took local reporters around the building, a tour that led to glowing profiles in the next day's papers. Those articles capped thorough coverage, with the *Evening Star* featuring the preparations on its front page five times between the 15th and the 26th. It was in that last issue that the *Star* made its most sweeping statement: tomorrow would not simply open "a new era in railroading," but would be an event of "signal importance in the history of Washington."

The railroads' desire for complimentary coverage had grown



The front of the station in the summer of 1907. On top of the far left pier is a sample statue, while a steam shovel is barely visible on along the left. (Library of Congress)

stronger after a blow-up in the middle of the month. The cost overruns had led the railroads to discuss adding 25¢ to every ticket, in effect a five to ten percent tax. The idea leaked to the press in the middle of the month (the PRR suspected it was the Southern testing public reaction), which forced Vice-President Rea to defend the proposal at a Congressional hearing. He called it fair compensation for creating a “magnificent station for the capital of the nation at a cost far greater than we would have been justified in incurring if we had dealt with the matter from a purely business standpoint.”

This self-congratulatory tone pointed out the absence of Cassatt and his diplomatic skills. Since 1901 the railroads had received much credit with Congress and residents for actions that served the good of the capital. They now seemed to revert to their 19th century behavior, and the surcharge had the potential to damage more than perceptions. “It is not improbable,” the *Post* noted, “that the first attempt to tax a passenger...would have aroused such intense public indignation as to have worked great injury to the railroads through adverse legislation” on issues like rates and mergers. The owners also belatedly realized that justifying the charge would require revealing how far over budget they were, hardly the admission they wanted to make, and so they quietly dropped the proposal.

The scene at the station during this period was increasingly frantic. Since the summer, both the city and the contractors had brought in extra workers, with the latter also using lots of overtime. The pace had accelerated in October, “armies of men hurrying in the fight against time,” and during the final week, artisans seemed to be everywhere:

In a room just off the concourse, employees of the telephone company worked with all their might installing booth telephones. Outside the extreme eastern room,

which is to serve temporarily as a waiting room, men were completing the cement flooring of the circular carriage stand, while other men worked on the floor of the waiting room. Everywhere there was hurry, commanding calls, the chorus of smiting hammers and awing steel—a veritable chorus of labor.

Finally, fifty months after construction had started and twenty-five after it was supposed to end, the B&O finished preparations for a brief but historic trip. Over the previous two weeks it had sent cartloads of material, such as its information booth and its newsstand, over to the new building. The real move began on the afternoon of the 26th, a gray but comfortable Saturday. As day changed to night, forty yardmen put rolling stock into place behind Union Station, laborers drove wagons filled with furniture, books, and railroad documents from the old depot to the new, and armed guards accompanied thousands of dollars of tickets to their new home. Amid this activity, employees, some of whom had dressed in the finest clothes, and residents paused for a photograph to commemorate the event. Fifty-five years of service ended when the last train pulled away at 2:52 a.m., heading up the Metropolitan Branch for Pittsburgh. Half an hour later, the last wagon of materials rattled up the street; on top rode passenger agent S.B Hege, who cried “The ship’s gone down, boys!”

Within four hours, Union Station had become the site of a celebration. The lack of an official event had not discouraged the public, more than a thousand of whom had gathered to welcome the first arrival, the 6:30 am from Chicago. Its crew would not enjoy that honor: appropriately, considering the terminal’s history, the train was late, and the terminal actually went into service just before 7 when a Pittsburgh to New York express pulled in. Though a drizzle later

developed, between 25,000 and 30,000 people admired the building over the course of the day, walking where they could, peering from behind ropes at the unfinished waiting room and the ticket lobby, and buying tickets, either as souvenirs or for an inaugural ride. The very first sale was made by H.R. Howser, the B&O's oldest agent in Washington, to H.P. Baldwin, its chief local agent.

Workers then focused on the next move. Starting on November 14th, a new wave of wagons brought over books, furniture and even an 1873 timetable listing the 17 daily trains that initially served Sixth Street. About a quarter past four on the morning of the 17th, an Atlantic Coast Line train to Richmond became the last regularly scheduled service to leave the depot; a little later, the cast and crew of a touring company of "Ben Hur" earned the distinction of the last passengers to ride across the National Mall. At 6:45, the first Pennsylvania train left Union Station, arriving five hours later at New York—or, more accurately, in Jersey City, as the tunnels under the Hudson would not be open for another two years.

The station would be big news for some time. *The New York Times* and the *Times of London* each placed the opening on its front page, while the papers in Boston and Atlanta also noted its debut. Up in Vermont, the *Northfield News* reported both the October and November moves, proudly describing the building as "a lasting monument to Bethel granite." The terminal also attracted professional notice in journals like *Railroad Gazette* and *Railway Age*. Washingtonians remained fascinated with their new gateway for some time: good weather on a Sunday early in December brought 20,000 to look at the building, and "...every [resident] in the throng showed the same delight in viewing the structure as do the visitors from towns in the country."

For Daniel Burnham, the most welcome praise may have come

in a brief, private letter from New York. The only one of the three men at the center of the terminal's creation still alive, Burnham had spent the fall in Chicago because of an infected leg. But just before the Pennsylvania Railroad moved in, someone who understood what a long, difficult trip it had been reported on the building. In Washington to discuss the renovations he was to make to the White House, Charles McKim had also visited the capital's new gateway. When he arrived home in Manhattan, McKim summarized what he had seen with a word Theodore Starrett would have appreciated. "My dearest Dan'l," he wrote, "Your station is great."