The United States Capitol in 1801 was the largest and most ambitious building program on the continent—and it was much more than that. The Capitol would symbolize the young nation’s high ideals as a free democratic republic and it would be an architectural model for the growing country. It also was America’s first grand effort to build a modern building of such huge scale.

President Thomas Jefferson and Surveyor of Public Buildings B. Henry Latrobe (see p. 38 for portrait) worked together with a rare synergy to build the Capitol between 1803 and 1809, and by the time James Madison came to office, the Capitol was functioning as America’s first world stage. But it didn’t last long. In August 1814, British troops attacked Washington and burned the Capitol—as well as the other public buildings in Washington City. Latrobe’s main interiors were destroyed, including the famous Hall of the House of Representatives. The Statue of Liberty that presided over the Hall was disintegrated. Because of the haste for reconstruction beginning in 1815, and the unself-consciousness of the age, the design history of the Capitol between 1803 and 1809 to the War of 1812 is scant. No topographical images exist of Latrobe’s rich neoclassical interiors.

When I first came to this story, I was frustrated by the lack of visual evidence. Jefferson had suggested it might be the “handsomest” room in the world—but was it? Latrobe himself touched on the crux of the problem when he wrote: “To give an adequate description of a building unaccompanied by drawings, is always a vain attempt.”

In an effort to revisit the lost masterpieces of the Jefferson-Madison-era Capitol, I’ve recreated much of the design using digital technology. To me, this is a type of treasure hunt. Behind the actual design and construction of the Jefferson-
Madison Capitol lies a powerful story of human drama, conflict, determination, and genius. I will try to give a quick overview of the backstory here as a way of introducing my research and explaining the drawings I’ve created.

The First Decade of the U.S. Capitol

The cornerstone of the U.S. Capitol was laid by George Washington in September 1793. Washington and Secretary of State Thomas Jefferson envisioned a Capitol that would represent the political, philosophical, and architectural aspirations of the world’s first modern democratic republic. In Jefferson’s romantic ideal, the building also would reflect the ancient monuments of Greece and Rome and be a world-class contemporary of its European counterparts.

The plan was to have Congress occupy the Capitol in 1800. As soon as the ambitious building program was underway however, the plan began to unravel. The man who had won the competition for the Capitol’s design, Dr. William Thornton, did not execute the project due to his lack of real architectural knowledge and experience. The three architects who executed the work during the years of the Washington and Adams administrations was marked by changes of plan, ill will among principals and city commissioners, difficult logistics in the newly laid out city, and generally shoddy workmanship.

By 1800 only the North Wing (fig. 1), the Senate side of the building, was complete. In 1801, the House of Representatives
met in the room intended for the Library of Congress, and Jefferson took the oath of office in the Senate Chamber, the only available principal rooms. In May 1801, Hoban was asked to build the House chamber following the original plan, and work on the South Wing’s foundations began. The elliptical footprint of the main chamber rose precariously, but as no exterior walls yet existed, it grew into a large, freestanding, elliptical brick room. This proto-chamber, nicknamed the oven, or the bake oven, was connected to the North Wing by a covered passage (fig. 2). In the spring of 1801, the start of his administration, the designing and fastidious Jefferson was certainly frustrated by the chaotic construction site on Capitol Hill.

Jefferson knew of Latrobe and had been impressed with his designs for the Washington Navy Yard. In their brief acquaintance they held a great esteem for each other as educated professionals, artists, and philosophers. Jefferson solicited Latrobe’s advice on many projects henceforth; Latrobe would call Jefferson the planter of arts in America. Their friendship lasted until Latrobe’s death in 1820. Certainly, Jefferson imagined that this erudite, robust, European-trained architect, engineer, and naturalist could raise the construction of the Capitol to its

Fig. 2. Reconstruction drawing of the Capitol as it appeared in 1803, showing the oven connected to the North Wing by a covered walkway, created for the Architect of the Capitol.

Fig. 3. Latrobe, United States Capitol, Washington, D.C., Plan of principal story and chambers (ca. 1808). Latrobe redesigned the Capitol’s interiors within Thornton’s original exteriors. Latrobe thought Thornton’s exterior design was comically old-fashioned.
worthy level, and in 1803 he appointed Latrobe as surveyor of public buildings.

Nevertheless, the following ten years would prove a brutal ordeal for Latrobe in his service to Jefferson (and later President Madison), akin to Michelangelo’s service to Julius II at the Sistine Chapel. The South Wing of the Capitol rose where the oven stood, and the North Wing, in large part, was rebuilt. As the United States’ inchoate constitutional form of government emerged as a political idea, its physical and symbolic representation rose simultaneously from the promontory of the Hill, truly an unusual moment in the course of any political history.³

Latrobe's Neoclassicism

B. Henry Latrobe was born in 1764 in Fulneck, England, of English, French, and American ancestry. Latrobe was a product of his hometown's Moravian educational system and later, a Moravian school in Saxony. After his education, through which he gained fluency in many languages and toured the continent, he returned to England and began to practice architecture by about 1784. In 1791 he embarked on his own as a seasoned architect and engineer, with a developed aesthetic involving public works, engineering works, and large masonry structures.

American architecture in 1800 was largely based on traditional engineering, pattern book examples, and drawings that could be cobbled together by craftsmen and journeymen—usually without a unified vision. In fact, Thornton's winning design for the Capitol was largely based on ideas from William Chambers's *Treatise on Civil Architecture*, first published in 1759. Thornton's exteriors of the North and South Wings, his principal contribution to the finished Capitol, have the distinct flavor of the English Baroque style.

Coming to America in 1795, Latrobe embodied the modern, formally trained European architect, qualities most certainly admired by Jefferson. Latrobe's architecture was characterized by the strength and simplicity of volumes and forms, the expression of structure, and the use of "determinate" or unified light sources: "As all the Architecture (in the Hall) is solid and projected, its whole Effect will be lost by the destruction of determinate shadows, on which it depends."⁴

Latrobe reduced his surfaces and elements to simple, graceful forms, shunning superfluous ornament, even mocking churches of the "dark ages" ornamented with the "heads of monkies [sic] and cats and every possible distortion of the human body and countenance:"

Nothing is so easy as to ornament walls with foliage, with wreaths, festoons . . . especially if it be not required that these things should have the remotest relation to the purpose of the building upon which they are carved, or that they should contribute to the real or apparent strength or convenience of the structure. . . . And on this account we find ornaments increase in proportion as art declines, or as ignorance abounds.⁵

He indicated explicitly to Jefferson that he chose an architectural solution based on its function rather than its form (presaging Louis Sullivan's form follows function dogma by ninety years). In a letter to Jefferson during a heated debate Latrobe wrote, "It is not the *ornament*, it is the *use* that I want."⁶

Glossary

**DETERMINATE SHADOWS** was the phrase Latrobe used to describe the passage of light over time throughout a room.

**ENTABLATURE** refers to the superstructure of moldings and bands which lie horizontally above columns, resting on their capitals.

**HIPPODROME**, meaning a space consisting of two half-circles linked by a central span, is derived from the Greek and Roman stadiums for horse and chariot racing.

**LANTERN** or **LANTHERN** in architectural terms refers to the rooftop structure, often a cupola, designed to admit daylight into the space below.

**METOPE** is a rectangular architectural element that fills the space between two triglyphs (vertically channeled tablets) in a Doric frieze, which is a decorative band of alternating triglyphs and metopes above the architrave (the lintel or beam resting on capitals of columns).

**PIANO NOBILE** is an Italian term literally meaning the "noble floor." It is the level of the major public spaces within a building, and in classical architecture the piano nobile is usually referenced or projected into design elements on the façade.

**POCHÉ** is a French term literally meaning "pocket," but in architecture it refers to either the structural material or the secondary spaces that shape figural rooms.
Although an architect of the Enlightenment, Latrobe had a deep respect for historical resources. *Antiquities of Athens*, published in London in 1762, was a detailed and extensive archaeological record of ancient Greek architecture by James Stuart and Nicholas Revett. A copy of *Antiquities* was in the collection of the Philadelphia Library Company at the time Latrobe lived in Philadelphia, and as a self-proclaimed “bigotted Greek,” he borrowed from it. The ancient Greek buildings detailed in this tome are refreshingly simple and strong, like Latrobe’s architecture, and Latrobe preferred this language for its adaptability to invention. Greek elements appear in Latrobe’s designs as graceful adaptations that met his particular aesthetic. For the twenty-four principal support columns in the Hall of the House of Representatives, Latrobe used his own version of the Choragic Monument of Lysicrates in Athens.

Latrobe, like Jefferson, was curiously afoot in both the Romantic world of nature and human imagination and the Classical world of reason. Latrobe’s letters suggest a man who could swing from melancholic and desperate in the travails of his life, to powerfully optimistic and self-assured in his successes; he could be savagely satirical and wickedly funny when describing the absurdities of life he encountered. But he was also intensely analytical. He could write extemporaneously on the sciences—structure, geology, hydrology, navigation—and also could ruminate tirelessly on music, art, people, and current events. He’s even credited with writing the first description of jazz music, which he had heard in New Orleans late in his life.

The Design of the South Wing

Latrobe’s first task as surveyor of public buildings was to build out the Capitol’s South Wing as prescribed by the plan. In the early spring of 1803, the South Wing’s foundation had risen to about ground level, and the large, elliptical, brick bake oven built by Hoban in 1801 rested on the footprint of what was scheduled to become a great elliptical chamber. This proto-chamber was woefully under-designed and within a year began to tilt and crack. Latrobe’s initial report of design and construction, issued within months of taking office, found the South Wing to be so insufficient that he recommended removing the foundations and the oven and starting over.

Starting over gave Latrobe the chance he needed to bring his superior ideas to bear. In designing the chamber, Latrobe proposed to Jefferson to raise the level of the Hall to the second story or the *piano nobile*. He created a detailed program, designed offices to accommodate the program, devised an entry sequence and ensured that structural and mechanical systems were in place. He also understood the inefficiency and difficulty of building an elliptical room, and therefore redesigned the chamber as two half circles connected with a central span, effectively making a hippodrome. Latrobe knew that in the carving of an elliptical entablature, every stone of each quarter ellipse would have a slightly different curvature based on the ellipse’s major and minor axes. As a hippodrome, all curved stones in the entablature would be of the same radius, thus streamlining the stone-carving process. Additionally, the
straight center band of the hippodrome, twenty-five feet in length, would be shaped by intermediate cubic structures of sandstone (the entry cabinet and the Speaker’s cabinet) and above, a strong vaulted support for the half domes to thrust upon. Jefferson did not want to deviate from the plan by changing the room’s approved shape from an ellipse to a hippodrome. But after Latrobe’s polite presentation and an ensuing discussion, Jefferson conceded to the architect.

The exterior walls, three and a half feet thick and buttressed at the corners with giant sandstone piers, essentially poché for the figural space of the Hall, were vaulted inward ten feet to meet the hippodrome-shaped roof support system consisting of entablature, twenty-four support columns and support wall.

Another conflict arose between Latrobe and Jefferson, however. They disagreed on the architectural order for the main columns. Jefferson wanted to use a Roman Doric from the Theater of Marcellus and Latrobe wanted to use the Corinthian from the Monument of Lysicrates in Athens. Latrobe demonstrated to Jefferson in a drawing that a Doric order in the Hall would not work because of the inability to achieve square metopes at the current column spacing. Jefferson, the stickler for classical rules, again demurred to the architect. Latrobe suggested using Jefferson’s favorite entablature as a compromise (a simplified version) from the Temple of Jupiter Stator in Rome, also known as the Three Columns in the Roman Forum.

Latrobe now had a clear mandate to build the chamber in his own aesthetic vision with his own structural solution. Essentially, building the Capitol’s chambers inside of Thornton’s Baroque box became an infill project for Latrobe, not unlike Sir John Soane’s Bank of England, or Robert Adam’s 1760s infill of the Syon House whose exterior walls dated to the 16th century. All Latrobe had to do was maintain Thornton’s design for the exterior elevations (fig.3), which he disliked and thought laughingly old-fashioned.

The Halle aux blés

Now that the South Wing’s major parameters were established, and the brick and sandstone walls of the roughly 120-foot by 94-foot edifice rose, Jefferson and Latrobe turned their attention to the roof that would rise above the entablature inside the hippodrome. Here, the last major design conflict would arise between the architect and the client. In 1804, Jefferson suggested strongly to Latrobe that the Hall should have a skylit roof, similar to what he’d seen at the Paris grain market (Halle aux blés) in 1785, when he was United States minister to France.

Jefferson thought the grain market’s roof the most dazzling display of light he’d ever seen. He first saw it on an excursion with the pretty Maria Cosway, a married twenty-six-year-old Italian-English artist (fig. 4). The forty-three-year-old Jefferson (fig. 5), a recent widower, was smitten with Cosway and visited many sites around Paris with her. In his famous Head and Heart letter to her, the future American President described the market as, “the most superb thing on earth.”

Latrobe resisted the Jefferson’s suggestion for a glass roof
similar to the Halle aux blés for both technical and philosophical reasons. Technically, the roof would drip—either through direct leakage or as a result of condensation. Philosophically, Latrobe thought that direct light within this solemn legislative chamber would be entirely wrong. Again, the strong-willed architect and the president faced off against each other, with Latrobe writing Jefferson: “So spangled a ceiling, giving an air of the highest gaiety, will I think destroy the solemnity that is appropriate to the object of the edifice.”

The Paris grain market (fig. 6) was designed by Nicolas Le Camus de Mézières and was built on the site of the Hôtel de Soissons by 1767. Le Camus incorporated Catherine de Medici’s Colonne de l’Horoscope in his open circular building. Jacques-Guillaume Legrand and Jacques Molinos designed the glazed roof which, completed by 1783, had captured Thomas Jefferson’s romantic imagination (fig. 7). The grain market was so admired for its function, its circulation, and its lighting that it quickly became regarded as one of the preeminent industrial buildings in Europe. In 1803 the Legrand-Molinos roof was destroyed by fire. An iron and glass roof replaced it in 1813. The site is now the Bourse de commerce.

Latrobe wanted to light the Hall of the House of Representatives with a large cupola or lantern (lanthern) in the center of the roof. The lantern’s vertical sashes would be far more resistant to leakage and breakage, and would deflect light indirectly into the room providing what he called “unity of light.” Jefferson dismissed Latrobe’s Lantern design, as he claimed there was no classical precedent for it.

Jefferson was not seduced by Latrobe’s arguments. This became their most difficult disagreement regarding the design and construction of the Capitol. Finally, a frustrated Jefferson simply told Latrobe to do what he (Latrobe) thought best, but made his own desire quite clear:

I cannot express to you the regret I feel on the subject of renouncing the Halle au bless (sic) lights in the Capitol dome. That single circumstance was to constitute the distinguishing merit of the room, & would solely have made it the handsomest room in the world, without a single exception.

In this standoff, it was Latrobe who blinked. He then proceeded to build the glazed roof in the style of the Halle aux blés as the President had wished.

As late as November 1806, when the logistics of ordering glass for the roof became a topic of discussion, Latrobe still tried to persuade Jefferson of the suitability of a lantern scheme by providing him a beautiful watercolor perspective drawing of the Capitol’s exterior from the northeast, showing how attractive and yet minimal the lanterns would appear on both the North and South Wings (fig. 8).

Latrobe had one more trick, however. As he designed the domed roof to cover the eighty-five-foot-long hippodrome roofopening, he designed into the center of the framing plan a ring of timbers strong enough to hold a large lantern (just in case the roof leaked). The entire glazed dome contained one
Fig. 7. Recreation of the interior of the Halle aux blés by the author.
hundred skylights in twenty vertical bands, and its spring was 12 feet 6 inches from the top of the forty-foot-high entablature. Another French architectural model was used for the roof framing. Latrobe reported to Washington’s principal newspaper: “This enormous roof is in thickness only 16 inches and is a very remarkable specimen of excellent carpenter’s work. It is constructed on the plan of Philibert de l’Orme . . . and is pierced with square lights . . . in all 100.” He also stated in this report that the South Wing could be solidly vaulted if necessary. The built dome was covered with sheet iron on the exterior and plastered on the interior. The interior was faux-painted by George Bridport of Philadelphia to simulate coffered panels alternating with the bands of skylights. The completed chamber was ready for the House of Representatives by 1808.

A monumental allegorical sculpture of a sitting Liberty was designed by Latrobe and carved by Giuseppe Franzoni, and was completed in its plaster state by September 1807. The Liberty, a story unto itself, was an integral part of Latrobe’s design sequence. The rest of the chamber was finished off with platforms, carpeting, mahogany desks and chairs, a Speaker’s Throne, Argand lamps and an Argand chandelier, gilt railings, and deep crimson baize curtains draped between the majestic 26-foot 8-inch tall columns that rested atop the seven-foot hippodrome wall circumscribing the room.

The Destruction

On August 24, 1814, a combined British force led by Rear Admiral George Cockburn and Major General Robert Ross marched into Washington, supposedly in retaliation for the destruction of York (now Toronto) in 1813 by American forces. Both the Capitol and the White House were burned as well as other public buildings. Cockburn’s lieutenant, ordered to burn the Capitol, is reported to have said as he stood at the entrance, “it is a pity to burn anything so beautiful.”

The Enigma

In Paris in the summer of 2001, having won the Gabriel Prize for drawing, I studied several of Thomas Jefferson’s favorite buildings in an attempt to better understand his aesthetic and his design principles. My research led to the Halle aux blés,
Fig. 9. Recreation drawing by the author showing Jefferson inspecting the roof framing of the Hall of Representatives.
Figs. 10A and 10B. Recreation drawings by the author showing the different effects of (A) the built version (Jefferson) and (B) the unbuilt version (Latrobe).
Fig. 11. Recreation drawing by the author of the completed chamber from the east looking southwest.
Fig. 12. Recreation drawing by the author of the completed chamber at the entry sequence.
and then to the story of the construction of the Capitol and Jefferson’s confluence with Latrobe. As an architect and artist, I became transfixed by the enigma of this most beautiful room, as well as the specific and practical design solutions the architect faced and how he solved them. But no topographical drawing or painting exists of this American architectural masterpiece. Could this American treasure be pieced back together so we can see it? What can we learn about the structure and construction of the South Wing by recreating it? Whose ideas were better regarding the lighting of the chamber? Jefferson had speculated that the chamber would be the “handsomest” in the world. Latrobe himself stated to Congress in his 1806 report, “That it will be a splendid room,—probably the most splendid Legislative Hall that has ever been erected,—is certain.”

This was a perfect opportunity for me to explore an architectural history using the power of the computer. Although the drama and the narrative of the major characters during this time period provide an extraordinary and compelling history, oftentimes the description of lost art or architecture is reduced to an unsatisfying recitation of attributes. My goal was to bring the chamber back to its full glory and allow visitors to see for themselves the old Hall of Representatives.

A Methodology for Recreation

My first step was to examine closely Latrobe’s existing construction documents. No more than twenty of Latrobe’s original construction documents relating to this phase of construction of the South Wing are in the Library of Congress. The drawings are not complete; the design varies greatly over the course of many years; and many are at small scale.

Following the course of the narrative of letters from about 1803 to 1815 between all the principals involved, it became clear I needed to make a careful timeline of decisions and changes, as the construction process was in a state of constant flux. Essential facts used to construct my computer model mostly came from these letters and drawings and my time line. A computer model does not allow fuzziness, so every element has to be defined. When determining a key dimension or architectural form, I often tried to rectify many conflicting
bits of information. For example, all of the design documents depicting the vault between the interior entablature and the exterior wall show a segment of an arch. In two detailed topographical drawings of the Capitol’s ruins (1815), one by Latrobe himself and one by his stone carver Giovanni Andrei, essentially showing the as-built condition, the vault is depicted as a barrel vault of a five-foot diameter. Sometimes a dimension noted on a drawing might be countermanded later in an informal letter, or a decision may be referred to obliquely, or a design change may occur as two drawings jump in scale. In some cases I simply could not determine a detail or dimension, in which case I would design an element based on a similar example by Latrobe, maintaining the spirit of his intentions.

My actual synthesis began by creating a computer model of the architecture as pure geometry. Two things make these geometric pieces look real. One is the texture they have, and the other is the lighting of the computer scene. I created realistic textures using an imaging program and projected them onto the geometry. Projecting the image onto geometry is called texture mapping, which can make a simple gray cube look like a block of sandstone, for instance. Lighting is the crucial next step, as the lighting of a large interior space with windows, skylights, deflected light, and reflected light is quite complex. When a final scene involving geometry, texture mapping, bump mapping, and lighting is assembled, it’s viewed through a software camera that has all the attributes of a real camera, either a still camera or a moving picture camera. The camera, following motion picture standards, can be tracked, panned, dollied, orbited, or zoomed, to achieve the desired composition. Once a camera composition is established, and many settings are fine-tuned, the scene is rendered as a still image or as an animation—now all the data regarding geometry, material, and light is synthesized based on a camera angle and lens opening by the computer’s CPU and the computer’s memory. The rendering process is roughly equivalent to photographing the final scene, but neither the camera nor the scene actually exists. Camera renders for stills are usually set at larger resolutions, and renders for animation are set at video resolution, knowing that the effects of perception and motion blur will communicate a sequence of frames into believable motion.
Conclusion

I believe the pre-fire first Hall of the House of Representatives’s great beauty derived from its proportional excellence, its simplicity of materials, and its overall restraint. Latrobe as well as others remarked that the streaming light from above through the skylit roof was striking and beautiful. Latrobe describes the work of his two chief stone carvers Giovanni Andrei (specializing in flora) and Giuseppe Franzoni (specializing in figures) as nothing less than brilliant. Certainly the room had flaws. It leaked; water condensed on the skylights; it had reverberation problems; it needed to be expanded before it was even complete.

Was Latrobe’s method of lighting the chamber a better solution? We don’t know for sure, but through computer imaging I have tested certain results at certain levels. This first version of the Hall of Representatives was acclaimed for its grandeur and beauty. Latrobe was rehired by Madison in 1815 to rebuild the burned Capitol and in the second design, the exterior walls remained virtually the same but the internal chamber changed radically. George Hadfield, an architect of the Capitol in the 1790s (and Maria Cosway’s brother), lauded the first House chamber for its republican simplicity and preferred it over the second one, which was finished in 1819.

When the first Hall of the House of Representatives ultimately became a monumental ruin in August 1814, it passed from America’s first world-class building into the dreamlike realm worthy of a Greek ruin. Through computer imaging, it can now be seen again.

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Notes

1. Jefferson to Latrobe, Oct. 10, 1809, in The Correspondence and Miscellaneous Papers of Benjamin Henry Latrobe, ed. John C. Van Horne and Lee W. Formwalt, 3 vols. (New Haven, Conn.: Yale University Press, 1986), 2:776-77. Jefferson wrote: “I think that the work (the Capitol) when finished will be a durable and honorable monument of our infant republic, and will bear favorable comparison with the remains of the same kind of the ancient republics of Greece & Rome.”


