Building History, Description and Significance

Statement of Significance
The AIB, built between 1879 and 1881 and originally known as the National Museum Building, was constructed to house the vast foreign and domestic donations to the United States (U.S.) government of exhibits from the 1876 International Exposition in Philadelphia, which commemorated the Centennial of American Independence. It also was built to house the growing Smithsonian Institution collections that could not be accommodated in the Smithsonian Institution Building, now known as the Castle. It was the first of a group of purpose-built museums built by the SI with a combination of federal and private funding. The AIB possesses integrity of location, design, setting, materials, workmanship, feeling, and association. The building was listed in the District of Columbia Inventory of Historic Sites in 1964 and, in 1971, it was listed on the National Register of Historic Places and designated a National Historic Landmark.

Historical and Institutional Significance
The AIB was constructed to receive, exhibit, and preserve the collections of the natural resources, arts, and industries belonging to the national government and was the beginning of what is now one of the greatest museum complexes in the world. In this building, the SI developed methods of museum administration, specimen preparation and preservation, classification and labeling, exhibition, and education outreach that became standard practice in museums worldwide. Sharing exhibits, plans, and publications with museums in other cities and countries, the National Museum served as a model institution assisting in the development of other museums. The natural resources, arts, and industrial innovations of the United States were introduced to cities across the nation and world-wide through the participation of the SI and the National Museum in the great international expositions of the 19th and early 20th centuries. And, the National Museum contributed immeasurably to the understanding of this country’s cultural history — particularly that of Native American and Pacific Rim societies — through its preservation of the collections from U. S. government-sponsored expeditions of exploration of the 19th century, as well as the collections of various government departments.

The museum also has been a vital cultural force in the nation’s capital through a series of both popular and professional lectures and publications, instituted at the very beginning of the SI’s occupation of the building. In the 20th century, demonstrations, classes, and publications extended the educational advantages provided through the Institution and the museums.

Architectural Significance
The AIB is a fine and unique example of early, innovative museum design inspired by the design of international exposition buildings following the 1851 success of the Crystal Palace in London. Through the adroit manipulation of mass, scale, line, proportion, and color, the design avoids the monumentality typical of museum buildings, welcoming the public to explore, celebrate, and learn about the natural resources, arts, and industries of the United States. It is an early example of a building in which integrity of form is expressed directly through structural and functional clarity. The AIB also exemplifies the use of new building technologies and design attitudes to quickly, inexpensively, and ingeniously construct a new building type. The building — the
last remaining brick building facing the Mall — is an exceptional example of brick masonry architecture, in both design and craftsmanship, as used in a major government building in a city where monumental stone architectural design prevails for such buildings. Finally, its modern Romanesque style purposefully complements the historical Norman Romanesque style and scale of the Smithsonian Institution Building.

The AIB is a major work of the notable Washington architectural/engineering firm of Cluss & Schulze with Adolf Cluss, FAIA, as architect-in-charge. Cluss was the premier architect in Washington during the Civil War and Reconstruction period, designing model urban public schools and markets for the city. Among his best known works are the old Department of Agriculture Building, the National Museum, and the Army Medical Museum on the National Mall. He also was well-known for many private commercial, institutional, and residential buildings in Washington, D.C.; Baltimore, Maryland; and Alexandria, Virginia.

The design of the AIB reflects a close, 25-year working relationship between Cluss and Smithsonian Secretary Spencer Fullerton Baird, during which time the programmatic requirements for a national museum gradually and thoughtfully developed. Cluss’ relationship with General Montgomery C. Meigs also is significant to the building and evident in the initial exchange of design sketches between the two men, the structural solutions developed, and the design of the AIB’s heating system.

**Identification of Primary Period of Significance**

Period of Significance is defined as an extent of time when a property attained its most important characteristics or was associated with important events, activities, or persons. Because the significance of the AIB includes both institutional and architectural significance, the primary Period of Significance for the building must represent not only the character-defining features of the design and construction but also reflect the influential changes in the Institution. The primary Period of Significance is, therefore, between 1881 and 1902 as it represents both the architectural and institutional significance of the AIB.

**1881 to 1896: A Museum for the Public**

The initial years after the building’s completion reflect the physical realization of the building’s design concept at a time before the roles of the SI were formalized. The need for the building was catalyzed by the acquisition of the Centennial Exhibition collection. The design and funding of an appropriate structure also contributed to and allowed the expansion of the mission of the SI. This commitment and undertaking by the SI is remarkable given the Institution’s mere 35 years of existence. (The design intent and influences on Cluss are examined in the section of this report on the history of the building and its context. The critical roles of the building commission and the SI secretaries are detailed in the Historical Background and Context section where the detail of their missions, contributions, and goals for the collections are enumerated.)

Joseph Henry (Smithsonian Institution Secretary from 1846 to 1878), while leading the establishment of the SI, set forth the need for a more modern museum building than the first Smithsonian Institution Building. Spencer Fullerton Baird (Smithsonian Institution Assistant Secretary until 1878 and Secretary until 1887) played a significant role in the establishment...
George Brown Goode, the Smithsonian’s assistant director and later director during its first 15 years, defined and shaped the policies and organization of the SI. He described the importance of museums as “a necessity in every civilized community” that existed to “serve the needs of the general public through the display of attractive exhibition series… and thus stimulate and broaden the mind…”\textsuperscript{2}

The inaugural ball for President Garfield contributes to the significance of the museum as both the site of that important presidential inaugural event and the opening event for the museum. The selection of the new museum building for the ball reflects President Garfield’s connection to the Smithsonian Institution as a Regent and, therefore, his investment in the development of the first public museum contributing to the mission of the SI. Remarkably, there are photographs documenting the temporary decorative treatments and finishes created to accommodate the event.

While, initially, Goode was pleased with the building, his later writings indicate that he struggled with the building’s ability to support the model of a public museum. The growing SI led him to make physical changes to the building from 1882 until his death in September 1896. During these years, Baird, as Secretary, and Goode, as Assistant Secretary in charge of the National Museum, directed the changes, described in the Semi-Annual Report of the Superintendent of Buildings, indicating that the original concepts based on the exposition building model did not fit the needs of a contemporary museum. In Goode’s estimation, “A single entrance and one consecutive line of progress through the halls is most advantageous, both to administrator and visitor, and should be duly considered…….”\textsuperscript{3} The four entrances and open plan based on models of exposition buildings did not provide this arrangement, and the changes made to enclose spaces into distinct galleries reflect Goode’s view and were a significant departure from the original Cluss plan.

Early building changes to accommodate changed functional needs obscured the entirely open character of the building envisioned by Cluss, which reflected his commitment to the democratic ideals. The open physical and visual connections between the interior spaces derived from the exposition building model, which were fully realized by Cluss, were muted by the infill of many of the arched openings in order to approach an exhibition model reflected in the design of most major museums of the late 19\textsuperscript{th} and early 20\textsuperscript{th} century. The continual changes to the National Museum Building may have been arrested if requests for funding for another museum building were not repeatedly turned down or reduced by
Congress. In 1882, according to Spencer Baird, the size of the building was already "inadequate" (reprint USNM AR 1903, 263-6), but this, combined with the programmatic changes, meant that the pure volumes of space were altered along with the experience of the building. This change set the stage for alterations that would continue throughout the 19th and 20th century.

The exterior of the building experienced minor changes between 1881 and 1896 and none of these modifications radically compromised the integrity or the significance of the massing, volume, material, and detailing of the exterior. Modifications to the exterior at this time included: excavation for the coal vaults, repairs to the slate roofing, repairs and additions to skylights, additions to skylights and the cutting of the opening in the east elevation for the café, and the removal of the second layer of glass on the double-glazed single sashes. The most significant changes relate to changes in the material integrity of the exterior with the openings for the café and North West Pavilion window and the removal of the second layer of glazing within the double-glazed windows. None of these changes impacts the significance of the initial design of the building.

The interior of the building experienced changes reflecting the increasing expansion of the collections. All of the interior changes that decreased the transparency of the spaces were reversible. Changes in the interior finishes that contribute to the significance and integrity were minor and due to their functional failure. The plaster on the underside of the structure was removed and replaced with corrugated iron sheets. This change did not diminish the clarity of the expression of the exposed structure within the Rotunda, halls, courts, and ranges. Finish floor materials were changed as the exposed concrete slab was not considered an appropriate finish and the wood floors installed for the inaugural ball deteriorated due to moisture penetrating the concrete slab-on-grade. The temporary statue of "America," erected for the ball, was removed from the Rotunda and replaced in 1881 by a fountain and basin, which later, in 1890, was surmounted by the plaster cast of "Freedom."

The Cluss-designed National Museum retains a high degree of integrity of its material, massing, and scale. Its significance is related to the structural and material clarity. Changes to the building are incurred from two primary forces: the increased demand on the space, and the failure of some of the original materials and technology integrated into the construction of the building.

1896-1902: Growth of Collections and Hornblower & Marshall
This period represents the rapid expansion of the SI and its new mission and vision under the direction of Samuel Pierpont Langley. During this time, the SI continued to seek funding to expand to a third museum — this would later become the National Museum of Natural History — while the National Museum continued to be modified to contain an increasing collection, staff, and research programs. Most significant to the changes to the architecture of the building were the additions made by the architects Hornblower & Marshall that include galleries, skylights, building systems improvements, and the modifications to the interior finishes within the main public spaces.

Footnote 9: August 29, 1896 Letter/annual report for fiscal year ending June 30, 1896 to Dr. G. Brown Goode from Henry Horn, Superintendent (SIA, RU 158, USNM, 1881-1964, Curators’ Annual Reports, Box 23). Dec. 4th: "One light of glass [has] been removed from the sash in several of the offices of the Museum. In their present condition (double lighted) the only way to clean the glass, was to remove one light. This always kept the glass in a dirty condition on the inside, and made the windows unsightly. By the change, they can be cleaned whenever necessary..."

Footnote 10: February 28, 1890, Letter from Edward Clark, Architect of the Capitol, February 28, 1890 and Senate Doc. 2740, 5pt Congress, 2nd Session, April 8, 1890. "Building had reached extremely overcrowded conditions."

Footnote 11: April 16, 1890, Letter from Lester F. Ward, Dept. of the Int. U.S. Go. Survey to Prof. Goode (SIA, RU 198, Box 13) Complained of crowded towers and balconies; requested curtains or shades to be furnished along the large south windows of the balconies to protect from sunlight.

Footnote 12: 1884 William J. Rhues, Visitor’s Guide to the Smithsonian Institution and United States National Museum in Washington, Washington, DC: Judd & Detweiler, Printers (SI-AHHP, Box 4). On the main floor there are seventeen halls which freely communicate with one another by wide and lofty archways, furnishing 80,300 square feet of floor space.
1: Rendering
Cluss rendering of the National Museum interior with galleries as a concept and emphasis on daylighting (black and white version SIA RU 95, Box 32, Folder 17, Neg. No. 76-8437, June 1878)

Of these changes, the most significant physical and spatial changes extant today are the result of the introduction of the galleries in three of the halls. The construction of galleries was accompanied by more infill of the arched openings and the addition of skylights to improve daylighting, in advance of the ongoing electrification of the building to provide for artificial light. These galleries were a departure from the Cluss final design.

Among numerous early plans, renderings and written records, an 1878 Cluss rendering shows galleries in the halls (See Figure 1). It is unknown who asked for the rendering or whether the concept was generated to add programmatic space within a limited footprint or as a spatial/architectural concept.

The design of the new railings and the new decorative painting scheme depart from the Cluss design and represent a transition into the Beaux Arts style, popular for public architecture at the time. Grace Lincoln Temple developed an interior finish scheme that aligned with the changes proposed and completed by architects Hornblower & Marshall.18,19,20,21

The additions and modifications that follow 1902 do not have significance as they eroded the initial design and modified the structure of the building. Infill and separation of exhibit halls removed the sense of openness and the spatial transparency developed in the Cluss design.

Footnote 13: June 30, 1893, Letter/annual report to Dr. G. Brown Goode from Henry Horan, Superintendent (SIA, RU 158, USNM, 1881-1964, Curators’ Annual Reports, Box 23). July 5: Granolithic floors, to replace rotted original wood floors, were laid in “Gents retiring room.” Jan. 23: Cotton screens placed between piers above the wall cases on both sides of the North Hall and moulding put at the top of the screens as a finish.

Footnote 14: May 28, 1881, Letter to Cluss from Baird (SIA, RU 33, Vol. 111, #462) Baird suggests taking plaster off ceiling in southwest rooms as an experiment to remedy the falling plaster. “It is now proposed to substitute corrugated iron for the lathing...”

Footnote 15: July 19, 1881, Letter to Baird from Cluss and attached clipping from Evening Star (SIA, RU 28, #14473). Plaster ceiling taken down as result of pieces continuing to fall. An investigation had revealed there “was not sufficient key to support the weight of the plaster.”

Footnote 16: March 31, 1881 Request for “Proposals for Marble and Slate Tiling and for Slate Floor Slabs,” Smithsonian Institution (SIA, RU 7081, Box 28).

Footnote 17: Rendering Cluss rendering of the National Museum Interior with galleries as a concept and emphasis on daylighting (black and white version SIA RU 95, Box 32, Folder 17, Neg. No. 76-8437, June 1878)

Footnote 18: June 30, 1893, Letter/annual report to Dr. G. Brown Goode from Henry Horan, Superintendent (SIA, RU 158, USNM, 1881-1964, Curators’ Annual Reports, Box 23). July 5: Granolithic floors, to replace rotted original wood floors, were laid in “Gents retiring room.” Jan. 23: Cotton screens placed between piers above the wall cases on both sides of the North Hall and moulding put at the top of the screens as a finish.

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Footnote 21: March 31, 1881 Request for “Proposals for Marble and Slate Tiling and for Slate Floor Slabs,” Smithsonian Institution (SIA, RU 7081, Box 28).

Evaluation of Significance 1.4

Historical and Institutional Significance
In the 1870’s, the role of the SI was just beginning to be defined regarding the preservation, research, and interpretation of collections and their use for education of the public. There were few precedents for museums in the United States at that time.

The significance of the exposition building as the model for the National Museum in conjunction with the context of the acceptance of the collections from the Centennial Exhibition in Philadelphia into the national collections are key elements to understanding the identification of the primary Period of Significance.

The exhibition buildings were economical, fireproof, efficiently constructed, and expressed a clear hierarchy and organization of spaces, which influenced the defining aspects of the National Museum Building. The grand volumes of the National Museum Building were constructed on a tight schedule on the heels of the long economic depression of the mid-to-late 1870’s. With that fiscal setting as a backdrop, it is very significant that
the building was claimed to be the most economically constructed public building ever undertaken by the U.
S. government. Construction was realized with inventive uses for slab-on-grade, iron trusses, day lighting, steam heating, and, except for some select materials, use of regional and local raw materials and labor.

The Greek cross plan and visible iron work structure were influenced by the construction of exposition buildings, including the Crystal Palace in London and the Halls of the Centennial Exposition in Philadelphia. These structures displayed a variety of types of open web steel trusses. The AIB was documented in several reports as using the recently developed Pratt type truss at the suggestion of General Meigs; however, analysis shows that trusses over the halls may be a particular custom hybrid type. The framing of the transition from the Rotunda to the courts and of the courts also is a unique construction as discussed in the structural section of this document. The double layers of custom-fabricated trusses that transition from the Rotunda walls to the Court roof systems have been problematic. The combination of the connections to other portions of the structure with the actual bearing conditions are some of the possible causes of the issues with these trusses. A full structural model will document the issues with the trusses, the masonry structure and the roofing system. The Court roof systems also have caused issues as their compression ring system for the monitors have been altered to address load-bearing and water degradation.

The National Museum was established in 1846 by the Federal Government to display the Wilkes Exploring Expedition collections which was transferred to the care of the Smithsonian Institution in 1858. Overcrowding of Renwick’s Smithsonian Institution, or the Castle as it is better known, prompted the Smithsonian to request appropriation from Congress to construct a new building to house its growing collections of natural history. The A&I Building, completed in 1881, was known as the National Museum Building until 1911 when Annual Reports began referring to it as the “Old Museum Building” or Old Building” to reflect the construction of the Smithsonian’s National Museum of Natural History. The name Arts and Industries Building first appears in the 1916-1917 Report of the Superintendent of Buildings and Labor.22

The AIB is a significant example of a public building designed by one of the most prominent and prolific architectural firms in Washington, D.C., Cluss & Schulze. The designs from their office included many Washington, D.C. civic landmarks including: Franklin School, the old Department of Agriculture, Eastern Market, and Calvary Baptist Church.

The AIB was listed on the National Register of Historic Places and designated a National Historic Landmark in 1971.

The nomination for listing the AIB in the National Register of Historic Places in 1971, summarized earlier in this document, states that the significance of the building is in the areas of Architecture, Art and Industry and is “the best preserved” example in the United States of 19th century world exposition
architecture. It states that the building reflects the three aspects of this style of architecture: enclosure of a large volume, tasteful and dramatic detailing, and economy of construction.

Cluss stated that the style of the building was:

A modernized Romanesque style of architecture adopted for the new building in order to keep up a relationship with the Smithsonian building, which is designed in Norman, a variety of this style. To modernize this style was found necessary on account of the different building material, and to do justice to the purposes of the building with its modern demands of perfect safety and elegance of construction, of greatest possible available floor space, of easy communications, efficient drainage, a well calculated and pleasing admission of light, free circulation of air, and all other hygienic dicta. The external architecture is based upon the general arrangement of the interior, and shows plainly the prominence of the four naves and the careful management of the light for the central portion of the building.23

The effect of the “admission of light” and “free air circulation” created voluminous spaces culminating impressively with the rotunda. The 2000 Preservation Plan accurately describes the character of the space as:

…soaring halls, with their clerestory windows and monitors, created an experience that was not easily forgotten and offered a formal setting for display of the world’s treasures.24

The 1884 Visitor’s Guide to the SI and the United States National Museum concisely identifies the primary purposes of the building as:

It is a Museum of Record, in which are preserved the material foundations of an enormous amount of scientific knowledge...

It is a Museum of Research, by the policy which aims to make its contents serve as fully as possible as a stimulus to and foundation for the studies of scientific investigators...

It is an Educational Museum of the broadest type, by reason of its policy of illustrating by specimens every kind of natural object and every manifestation of human thought and activity...

This was the beginning of a new era for museums, modeled from the SI mission and taking its physical manifestation from the design, massing, and function demonstrated in the AIB. The AIB’s influence also extended to many of the Smithsonian’s other museums and the Zoological Park, which can trace their inception to collections in the AIB. The AIB remains a significant landmark in the United States of America, not only in association with the formative years of the Smithsonian Institution, but also through its role in the earliest years of American museology.

Footnote 21: 1903-1904 Annual Report of Superintendent of Construction & Labor, 1903-04 (SIA, RU 157, Building Management Department, 1881-1973, Box 1). Interior: work included painting; erecting “two new Paradigm skylights” over WN and WS ranges; stenciling of walls in Rotunda; covering of iron beams and other unsightly areas in exhibition halls with compo-board; removal of double glass from double glazed windows; and elaborate scaffolding was reconstructed in the Rotunda for use in stenciling walls (June 1904).


Architectural Significance
Architects and Engineers
General Montgomery C. Meigs, Adolf Cluss of Cluss & Schulze, and Joseph Hornblower and James Rush Marshall of Hornblower & Marshall comprise the group of engineers and architects associated with the development and modifications to the AIB during the primary Period of Significance. All of these men were significant in the development of the building and were well known and recognized professionals of their time.

General Montgomery C. Meigs was well known and politically connected within Washington, D.C. Trained at West Point, Meigs continued as a career officer in the U.S. Army. He is recorded as having developed some initial concepts for the museum but, rather than directly designing the building, it is more likely that he influenced Adolf Cluss in the building’s design.

Adolf Cluss, of Cluss & Schulze, was the primary architect and engineer as detailed earlier in this text. Cluss had many significant contributions to the development of Washington, D.C. and its architecture. He was recognized for working with brick and integrating innovative building heating and ventilating systems within his architectural solutions. Both of these areas of expertise are expressed and continued in his design for the AIB. It is likely a combination of the welcoming character of the exposition architecture and Cluss’ intent that this become a museum for the public that developed the form and materials used in this building.

Joseph Hornblower and James Rush Marshall were established professionals known for their Beaux Arts style of architecture. They had several commissions with the SI, including the renovation of the National Museum and the design of what would become the New National Museum. Their galleries and modifications within the AIB represent a departure from the final design concept of Cluss.

Architecture
Site
The location of the museum was selected and defined by its relationship to the SIB, as well as its relationship to the National Mall. The Mall was initially conceived by Pierre Charles L’Enfant in 1791 as a part of his plans for Washington D.C. L’Enfant envisioned a 400’ wide open space, one mile long, “agreeable and convenient to the whole city which …will have an easy access to this place of general resort.” L’Enfant envisioned various public buildings along the Mall that would be “attractive to the learned and afford diversion to the idle.”

The Smithsonian Grounds, given by the Congress to the SI, were part of the original public reserve intended by L’Enfant in the original plan of Washington that was first identified as “The Mall” in 1802 map.

L’Enfant’s vision for this “Grande Avenue” did not materialize, and for many years the area was not developed. The SI’s role in the development of the Mall began with the construction of the SIB (1847–1855). In 1851, architect and horticulturalist Andrew Jackson Downing designed a landscape plan for the original public reserve intended by L’Enfant; however, not much was implemented due to lack of funding. The plan included landscaping of what would later become the Smithsonian Grounds. At the time the National Museum opened, the Smithsonian Grounds were closer in appearance to the naturalistic garden Downing had intended, with “broad lawn surfaces

Footnote 25: Later known as the National Museum of Natural History (NMNH)


Footnote 27: Mathew Carey’s 1802 map first identified the area as “The Mall.”
planted with the choice selection of evergreen and deciduous trees and shrubs."

When the AIB was planned, the SIB was the only building on the grounds. The selection of the site was completed after examination of options for additions to the SIB. The site adjacent to the SIB was mandated within the existing parcel of the Smithsonian Grounds established in 1847. Legislation located the building 50' off the southeast corner of the first SIB, and not to block the view of it from the Capitol. The AIB continued the tradition of accessibility to the public that L'Enfant had envisioned for buildings along the Mall. While the grounds were to provide recreation, the museum was intended to perform activities to educate the citizens. A park in the vicinity of the museum was considered an important feature and was a common setting for museums of this era, beginning with the Museum of Natural History in Paris, France.

The AIB reinforced the democratic ideals symbolized in the original design of the Mall by L'Enfant, which intended to reflect the democratic ideals of the new nation. The first found site plans for the AIB indicate curvilinear paths and a protected entrance at grade with the surrounding landscape, easily accessible from the Mall (See Figure 3).

It was not until the beginning of the 20th century that the McMillan Commission created a plan that lead to the development of the National Mall as it appears today (See Figure 4). The McMillan plan transformed the picturesque and informal Mall into a formal and monumental Beaux Arts composition. Beginning with the National Museum of Natural History edifice that opened in 1912, the buildings that continued to be added along the Mall were more formal and monumental.

Exterior
Spatial Massing and Hierarchy
Cluss stated of the National Museum that:

… The external architecture is based upon the general arrangement of the interior, and shows plainly the prominence of the four naves and the careful management of the light for the central portion of the building.
The hierarchy of this building is the expression of the arrangement of the volumes and it represents the importance and relationship of the interior spaces. The rational volumetric hierarchy and the arrangement of these volumes are primary character-defining features of the building. The composition of volumes also plays a role in minimizing the impression of a massive building — the museum, with its 2.3-acre footprint, was rather a large building — and in reducing it to the scale of more common buildings.

Since the National Museum Building was designed prior to the widespread use of artificial light and mechanical ventilation, the volumes are further articulated by a picturesque roofscape of clerestories and monitors that brought in ample daylight and induced air movement.

As described in earlier sections, the halls of the AIB radiate from the central Rotunda capped with a dome-like structure and a cupola with a folded metal roof and finial reaching 108’ above grade (See Figure 6). The hierarchy of the interior volumes is clearly expressed as the halls project in each of the four primary cardinal axes. The towers at the ends of the halls rise next in height to indicate the initial four primary entrances of the building and the corner pavilions and annexes with tall tapering towers maintain the four corners of the square structure (See Figure 7).

The entire composition of spaces revolves around the Rotunda, the tallest, most decorated and representative space in the building. The Rotunda was the symbolic aspirational “center” and served for reference and orientation, particularly during the time it housed the “Freedom” statue.
Building History, Description and Significance

The initial design intent of the interior transparency between the halls and courts is echoed on the exterior of the building with the variety of roof heights and forms, choice of roofing materials, and placement of monitors at the high points of these roofs.

Physical elements
The integrity and context of the physical components are critical to establishing the period of significance for the building. Critical to the integrity are both the degree to which material is extant from the Period of Significance and the condition of this material.

Masonry
Red brick was the building material of choice for Washington in the 1860’s through the 1880’s. Brick was considered a modern material, fireproof and economical, and Cluss preferred to use brick to show that buildings were “not tied to other cultures, classes and styles.”

The structural polychromy used on the exterior of this building is a character-defining feature that maintains a high degree of integrity today. The use of brick as a common material helped the public to relate to other common buildings such as markets and schools. The large areas of red brick combined with the stylized color details that accent the structure make this building unique.

The repetitive uses of decorative masonry elements are an indication of building economy; however, there is no lack of detail or interest in the composition of any of the exterior building. The arches vary in scale according to location, and are accentuated by the ornamentation and the use of pattern and color. The arched openings translate in form and scale to the interior spaces of the building (See Figure 8).

On the exterior of the building, the integrity of masonry materials is high with limited exceptions. The majority of the red, black, and buff bricks remain as original materials with limited areas of repairs since the construction of the building. The blue glazed brick was replaced to an undocumented extent in 1969; the color is noted as slightly lighter than the original glazed brick but this could be due to the patina of the glazing or accumulation of dirt. The analysis of the color difference is not stipulated in the documentation about the scope of work. The composition of the exterior brick patterning and detail retains its original intent and integrity.

Since the construction of the building, there is little documentation, with the exception of minor repair, for any work on the granite and gneiss stone elements. The sandstone sills and door surrounds show repairs, replacements, and repeated waterproofing treatments. Although the sandstone has had numerous repairs, the work and replacement do not diminish the importance of this material in the composition of the exterior façade.

Roof
Draped over the varying heights and volumes, the roof is comprised of gable, dome, hip, shed, and pyramidal forms. Seen as a composition, they express the scale and relative importance of each space inside as well as the challenge to bring daylight and air into each space through clerestories, skylights, monitors, and vents. Roof surfaces were originally covered with three colors of slate except at the ranges and the low sloped transition areas where flat-seam tin metal was used. Although the materials themselves are not unique, the form of the roof and the connectivity of the types of roofs are significant to the understanding, history, and technology of the building. The current covering systems, while not properly functioning to maintain a waterproof envelope in all locations, do not drastically change the appearance of the initial construction. Slate remains at towers and pavilions while a variety of metal roof systems have been employed reflecting a continual effort to keep water out of the building (See Figure 9).

The materials are not unique in themselves but the expanse and composition of these roofs over the truss system is significant to the building. The visual integrity of the original materials has been compromised as batten roofs rather than original flat-seam roofs cover the ranges. Numerous repairs over time to address structural and environmental issues compromise the visual integrity of these roofs primarily at perimeter flashings and valleys. Overall, the significance of the form of the roof and the relationship to the interior of the building remains unchanged and the composition of the roof planes, volumes, and forms is a strong character-defining feature of the AIB.

Monitors and Skylights
The significance of the monitors in the roof is that they provide a texture to the expansive roof planes and they are critical to the function of the interior of the space. The use of this vertical translucent glazing was a topic under discussion in the development of museums in the late 1800’s. At that time, research was beginning to be developed for the impact of unfiltered daylight on collections. Cluss was familiar with the use of indirect lighting and ventilation with monitors in his public market structures. The application of indirect lighting combined with ventilation is not apparent in other museums of this period.

Construction modifications have been made to the monitors since their initial construction. The windows featured wood sashes that were replaced by metal, and openings were often altered for modern ventilation. The range roofs were modified as the galleries were built inside the museum in order to increase daylight in the spaces. Dating to 1900, the court skylights are significant because they reflect the changes to the museum building around the turn of the 20th century, when, with the construction of galleries, more light was needed in the exhibit spaces (See Figure 10).
Exterior Doors
There are four main entrances to the building and one side entry off the first floor of the North West Pavilion. All five entry points have existed since the original construction. Many of the initial design features were executed as detailed by Cluss with the exception of the decorative etched glass on the four tower entrance doors. The location of entrances on each elevation reinforces the designer’s intent to create the feeling of openness and to welcome the public into the building.

The function and detailing of the south and west entrances changed through time. Soon after opening as a museum, the only functional doors were at the North and East Towers and there was a door off the North West Pavilion. The entrances eventually became specialized, however, with the only public entrance on the north elevation and the only service entrance on the east elevation; the door at the North West Pavilion served the museum director’s offices.

Though all entrances were not consistently in use as public entrances, all entrances have been restored and reflect the expressive character of the initial. With the exception of the gates at the west entrance, which have been restored, the present gates and doors are replicas.

Facing the Mall, the north entrance was intended and has remained the primary entrance, reinforcing the importance of the location of the building along the Mall (See Figure 11). This entrance was differentiated with the Buberl statue, a roof mounted flag pole, and a stone entrance plinth paved with red, white, and black marble, with three steps leading from the sidewalk to the area in front of the entrance.

The four entrances reinforce the museum’s intent that the museum’s collections be open to public access. This is significant as it reinforces the accessibility to the general population.

Glazing and Windows
The window openings are critical to the character-defining features of the AIB. They punctuate the masonry skin, create rhythm on the elevations, and allow for a lightness of form and physical translucence of the space. The window system of the AIB serves to provide both light and ventilation.

Constructed with double glass panels separated by a 3/4” wood stop, the windows were early examples in the search to provide some insulating value and reduce the heat load requirements for the building.31 The references to the window glazing note a distinct design intent to provide transparent glass at the pavilion and tower work areas; light-diffusing glass at all the exhibit spaces, including the Rotunda, was described in documents as ground, milk, and etched. Decorative colored glass was limited to the windows over the entrances at the end of the halls, again emphasizing the economy of ornament consistent to the initial design. The decorative and

Footnote 31: SIA RU 71, Box 10.
ground diffusing glass was set in both wood and iron frames. Wood frames were used in lower areas and iron in clerestory and monitors.

The original windows in the 17 original exhibition spaces were double glazed for insulation and set in wood frames, incorporating ground glass at one face of one pane of the glazing assembly to achieve a translucent finish. This “frosted” effect diffused and scattered light. Besides allowing light, windows helped with the air circulation and ventilation of the interior of the building. Windows were designed to be a part of the ventilation system, at offices were double hung while at the public spaces, windows had steel some pivoting sash.

Although the openings for these windows retain their significance and integrity, the units and their frames were all replaced with insulated glass in new wood sash during the 1980’s restoration project. Decorative colored glazing, at the ends of the four halls, was retained and set in new wood frames during this renovation (See Figure 12).

The window assemblies articulate a progression from the monumentality of the façade to the human scale. The windows in the towers and pavilions are divided in one, two, and three panels of various widths while the windows in the ranges are typically divided vertically into three equal widths. Their scale is further reduced through horizontal dividers into smaller panes of fixed and operable panels. These proportions and geometries are based on Cluss’ “modernized Romanesque style” (See Figure 13).

The variation in window types throughout the building indicates a variation of interior uses. Like the masonry system, the window system is rich in detail while addressing economy through the repetition of form. With the exception of the Rotunda, each primary building element (halls, ranges, courts, pavilions, and towers) is repetitive, thus each window type is found in numerous locations throughout the building. Although the existing window frames, sash, and glass are replacements, the proportion and detailing were maintained and they are a character-defining feature of the building.

Awnings were significant features that began to be installed at windows soon after the museum opened, first at the office windows (See Figure 14) but later, even at the ranges. Awnings were likely added on an as-needed basis, and at no point did all windows feature awnings.

Ornament and Details
The use of ornament is significant to the style of architecture and the architecture of Cluss. It is also indicative of the expressed economy of the building and stands in contrast to the more romantic style of the Smithsonian Castle. Decorative features on the
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14: Tower and Hall Windows
AIB
Circa 1906-08 (SIA RU 95, Box 32, Folder 12, Neg. No. 20041)

15: North West Pavilion
1880 (SIA RU 95, Box 32, Folder 7, Neg. No. 2002-10693)

16: Buberl Statue
May 2009

17: Rotunda
1873 Vienna Exposition (Albert Ellery Berg, The Universal Self-Instructor New York: Thomas Kelly, Publisher, 1883)


Footnote 33: David Ovason, in The Secret Architecture of Our Nation’s Capital: The Masons and the Building of Washington, DC, (New York: HarperCollins Publishers, 2002), 29, speculates that the material was chosen as an “homage” to Smithson and his scientific discoveries related to zinc. Calamine, a type of zinc ore, was renamed smithsonite in Smithson’s honor in 1832 by a French scientist. Smithsonite was a principal source of zinc until the 1880s.

The exterior of the building were integrated into the color of some of the materials used, including buff, blue glazed and blackened bricks. Masonry decorative features include sandstone trefoil medallions and other decorative sandstone ornaments.

Other ornament is focused around the entrances to maximize impact. Details in carved stone, stained and painted glass at the end of the halls, and the iron gates provide a definition of character for the structure. The most prominent decorative entry element is the metal Buberl statue over the north entrance of the building, facing on the National Mall.

The significance of the roof ornament is that it accentuated the hierarchy established by the volumes and heights of each roof. Initially cast iron, the metal finials on the courts, Rotunda and towers provide the appearance of focusing the forms of the monitors and roof planes to a single point.

Between the towers, additional detail was placed for visual emphasis and is consistent with the economy of ornament typical of Cluss’ work. Acroteria topped the stone-framed entrances, the peaks of the pediments of the pavilions, and at the corners of the pavilion monitors. Other galvanized iron ornaments included functional vent stacks placed at the bottom corners of the pavilion pediments (See Figure 15).

Buberl Statue
A painted zinc sculpture was installed above the north entrance in 1881 prior to the completion of the cladding of the roof (See Figure 16).

The statuary grouping is critical to the definition of the north entrance as the primary entry and is a direct reference to exposition architecture as represented by the Rotunda of the 1873 Vienna Exposition (See Figure 17).

Columbia “Protecting Science and Industry” was designed and constructed by Caspar Buberl (1834–1899). Born in Bohemia, now the Czech Republic, Buberl immigrated to the United States in 1854 and seems to have designed several war memorial statues out of zinc sheets, an inexpensive material used for statues beginning with the 1830s in what is now Germany. Zinc statues (cast or made of sheets)
were introduced to the U.S. by German sculptors who immigrated after the 1848 Revolution. One of Buberl’s first major works is a 10’ zinc statue of Robert Fulton, constructed in 1872 in Fulton Park, New York. He went on to work with Montgomery Meigs on the Pension Building in 1882, creating the entire frieze of that structure followed by several significant Civil War and military monuments and memorials. The statuary at the AIB appears to be his largest and most prominent commission at that point in his career.

**Interior**
The character-defining features of the interior of the AIB include the hierarchy and organization of the volumes, the visual transparency between the spaces, and the decorative treatments of the main public spaces.

**Spatial Organization**

**Rotunda**
The Rotunda is the central and ceremonial focal point of the structure and, as such, is a space of primary significance in the building. It served as the point of reference and orientation within the open, flexible floor plan.

In the center of the Rotunda, the placement of “America”, a plaster statue designed by Buberl and installed before the Garfield inaugural ball; the fountain; and, between 1890 and 1967, “Freedom”, the plaster model created by Thomas Crawford for the casting of the statue that tops the dome of the Capitol all emphasize the significance of this space.

**Halls**
The halls retain their significant expressive volume although their verticality and openness to the courts was altered by the addition of the galleries. Because of the age of these modifications and the relationship to the function of the history of the building, the galleries retain significance in their own right. The halls were designed to be vast open rooms with significant height not only for the awe of the open structural volume but also to allow for dispersion of daylight and the greatest flexibility for exhibits. These spaces were filled with a variety of cases and objects from skeletons to airplanes based on the exhibition needs of the SI. Between 1896 and 1902, the galleries were designed and constructed by Hornblower & Marshall. The “Union Jack” design railing system included post-mounted lighting at alternating stanchions. That these spaces provided both exhibit space and storage for the museum suggests that their construction was undertaken primarily to relieve pressure on the Institution for much needed space rather than any desire to address original design intent of the building.

**Courts**

Original renderings of the halls show intended views and easy spatial flow between the courts, the halls, and the ranges. The courts were intended as tall volumes lit from above to provide additional daylight into the adjacent halls and ranges while providing ample daylighting and ventilation within the court volume proper. Between 1896 and 1899, galleries were constructed, modifying the original spaces. Skylights were added to increase daylight as the construction of the galleries blocked some of the daylight from reaching the exhibits and less light was shared with adjacent spaces.
The expression of the volume of the courts is not easily understood in the building as it exists today. The infill of floors and use of this space for shafts and vertical circulation has compromised this significant feature of the interior hierarchy and flow of space in the building. These areas are the most spatially-compromised, but are of primary significance to the original spatial intent of Cluss.

Ranges
These eight rectilinear spaces flank the courts and are adjoining the halls. The shed roofs allow for a clear span from the court and hall masonry walls to the exterior structure. All of the interior walls were pierced with large openings to provide ample daylight as well as movement and visual continuity between the spaces. With the increase of collections, the ranges also were altered by the Hornblower & Marshall design to include galleries; the South East Range included an entire second floor. The wall openings between these spaces have been opened and closed many times over the years as needed by changing interior functions. The volume of the ranges is now only understood from the exterior. The spaces have been subdivided for administrative and other assembly functions. The former Discovery Theater space is the only location where the interior volume of the range can be read.

Towers
Towers are present at the end of the halls. They were intended as shelter for the entrance doors and provided support space on the upper floors. These spaces, while retaining their structural components, have been partitioned for administrative uses and walls have been furred out for mechanical ventilation systems.

Pavilions
The pavilions retain all the original bearing walls and the vaulted ceilings, as well as the original cast iron stairs, which are character-defining features for these spaces. Although partitions were added, modifying the spaces, the first two stories still retain a good degree of integrity. Of all the pavilions, the North West Pavilion, which housed the offices of the director of the museum and had more detailed finishes, retains a higher level of integrity.

Circulation from these spaces was altered with the installation of the galleries and full second floors at the ranges and annexes. The third floor of the pavilions does not retain historic fabric. The most dramatic modification at third floor level occurred at the South East Pavilion, when a photography laboratory was installed in 1908–1909. It included the demolition of the exterior wall and the installation of a large angled skylight in the 1980's. This modification has since been reversed.

Annexes
With the exception of the library, in the North West Annex, the other annexes were intended for secondary functions to the museum and have suffered significant modifications. Because of its function and the restored configuration, the library is the only annex space that is significant.

A hierarchy of significance is noted in the following floor plans:
Diagram of Design Significance

Refer to Intervention Diagrams for fabric modification recommendations related to integrity and significance. These diagrams refer to initial design hierarchy only.

Legend:

- 1 (Higher Significance)
- 2
- 3 (Lower Significance)
Diagram of Design Significance

Refer to Intervention Diagrams for fabric modification recommendations related to integrity and significance. These diagrams refer to initial design hierarchy only.

Level of Significance:
- 1 (Higher Significance)
- 2
- 3 (Lower Significance)
Diagram of Design Significance
Refer to Intervention Diagrams for fabric modification recommendations related to integrity and significance. These diagrams refer to initial design hierarchy only.

Level of Significance
1 (Higher Significance)
2
3 (Lower Significance)
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Structure
The character-defining features of the AIB structure are in the openness maintained by both the load-bearing masonry and the trusses supporting the roof of the AIB. The original roof cladding systems are significant for their experimental attempts to enclose the expansive and varied roofs of this building; however, these systems have been modified.

Masonry
The masonry arch systems are significant in that their implementation has been pushed to a point where the open space defined is stronger than the solid used for the structure. Open arcades between the Rotunda, halls, courts, and ranges maintain sightlines and visual transparency within the building.

Trusses
The roof structure plays a significant role as a character-defining feature of the AIB. The trusses and purlin systems exhibit functionality and material honesty indicative of Cluss’ work. The truss components were designed efficiently and expressively for their particular role within the truss system. The individual pieces are sized as required for the loads they handle without additional ornamentation or decoration. The truss components and trusses themselves are repetitive and economical and yet they transcend this functionality and economy, creating a picturesque effect where the only ornamentation to the architecture is the beauty of the structure itself. Spanning approximately 62’, and supported at the ends on the masonry walls, the trusses at the halls are of a hybrid, unique double Fink/Pratt design. The structural system of the roofs at the square courts is unique, with four intersecting wrought iron trusses spanning the same distance as the trusses in the hall and supported in the masonry walls. The trusses in all public spaces were spaced 13’ on center.

Although the forms of roof trusses vary per location and application, the lightness of the truss system is an elegant counterpoint to the robust masonry system of the original exhibit hall walls below, particularly at the primary halls (See Figure 18). Historical photos taken prior to the Hornblower & Marshall gallery intervention show soaring spaces, where air and light flow freely between the exhibit spaces, and into the heights of the halls. Though the building has changed over the years and spaces are no longer open to one another as they once were, this quality is still evident at the hall spaces where the original intent of open volume still exists. Like other building systems, the roof trusses first and foremost function structurally as they ought to, while defining the quality and character of the spaces below.

The same can be said of the Rotunda structural system. The roof beams are plain, repetitive,
The small beams are arranged logically, spanning from the center oculus to the 16-sided rotunda wall with an intermittent ring allowing the depths of the beams to be consistent. However, the effect of the Rotunda roof is the highlight of the space, befitting the focal point of the entire building. Light shines in through the clerestory windows below the dome, seemingly lifting the roof from the wall structure below. Light through the oculus lifts the monitor roof in a similar fashion, pulling the planes of the dome apart and extending the volume of space upward. The beams radiate from the center of the dome, in a sunburst pattern, functioning not only structurally, but decoratively as well (See Figure 19).

Corrugated Iron Roof Panels
Originally, the AIB ceiling had a plaster finish that began failing and, in some cases, falling shortly after the building was completed. The plaster was considered fire resistive and appears in early photographs as a dark surface above the light color plaster masonry walls. The iron ceiling panels were either applied over plaster that remained in place or used to cover areas where it had been removed. Since there have been numerous re-roofing projects, it is not known whether the current corrugated iron panels in many locations are original to this early retrofit or how much plaster, if any, remains.

Similar to the other structural roof components, the iron panels are repetitive elements that serve a function and contribute to the quality of the space below. In the primary hall spaces, the linear corrugations of the iron panels combined with the structural purlins between the roofing system and trusses create a pattern and “density” at the ceiling plane (See Figure 20). This density, combined with the lightness of the roof trusses allows the trusses to visually disappear against the backdrop of the ceiling, heightening the effect of the vertical spaces of the halls (See Figure 21).

The roof decking above the iron panels are not believed to have any historical significance since numerous replacements and repairs to the roof have occurred throughout the history of the building.
Stairs and Railings
A number of stair systems exist within the AIB. The most significant systems date to the time of original construction and the subsequent Hornblower & Marshall alterations and additions. Like numerous other building elements, the stair systems consist of a series of repetitive elements with some decorative qualities that contribute to the character of the building.

The following series of photographs shows the evolution of the South Hall and railings in this area of the building. The railings, as designed by Cluss, consisted of a simple pipe rail with a decorative fan at the stanchions and a decorative lower panel that skirted along the floor (See Figure 22). As galleries were added in the building, the initial railings were pipe rails with an upper and mid-rail horizontal pipe spanning between simple unadorned stanchions (See Figures 23 and 24).

The Hornblower & Marshall stair and railing additions and alterations were part of a larger building intervention that consisted of the addition of mezzanine galleries in three of the four halls, most of the ranges, and in all of the courts. They should be seen in conjunction with simultaneously occurring decorative treatments to the floors and plaster surfaces. The original primary spiral stairs, located in the Rotunda, between the arched openings to each hall, were replaced with two-flight stairs in the same location. The railings line the stairs as well as the edge of each mezzanine floor plate (See Figure 25). Simply due to their presence in so many exhibit halls, ranges and courts, the railings attached to the mezzanines have a significant impact on the character of the exhibition spaces. The lamp portions of the posts no longer exist. Current research has not revealed the detailing of these railings and how power was delivered to the stanchions. In the halls and Rotunda, these railings modified the transparency of the Cluss railings. Many of the railings in the court and range galleries were case railings.

From a functional perspective, the stair and railing system components were designed for versatility and can accommodate multiple configurations as seen in various locations. From an architectural perspective, the repetition of the ornamental components adds
a visual richness to the interior environment. The significant existing original stairs generally occur within the pavilions and at the ends of the primary halls between the second and third floors. The pavilion stairs are typically straight-runs with landings, the hall stairs are spiral. Each consists of a series of cast iron treads, risers, balusters, and handrails with decorative elements at the vertical surfaces, and eyelets for baluster support (See Figure 26)

The stair systems are another example of architecture itself constituting the building’s decoration in that their functional and decorative nature greatly contribute to the character of the spaces where they are located.

Ceiling Finishes
The ceilings cannot be considered independent of the delicate iron truss roof structure. While, initially, ceilings in the 17 galleries were finished with plaster, this quickly changed. Ceilings in the Rotunda, halls, courts, and ranges are currently an expression of the roof structure and iron purlin system. Initial early changes to remove the failing plaster and replace or cover the material with corrugated iron panels does not hinder the significance of the context of the hall or Rotunda. The ceilings, as initially designed in the courts and ranges, are not extant nor understood in the current configuration of the building. In the halls and courts, the original ceilings were painted a dark color, in sharp contrast to the light-colored trusses, while in the ranges the ceilings were the same light color as the trusses.

Most of the ceilings of the towers and the pavilions retain their plaster-finished brick vaulted; a few were modified as the spaces were reconfigured and include some acoustical tile systems.

Wall Finishes and Plaster
A number of wall finish and plaster details contribute to the character of the original 17 exhibit spaces, including decorative stencil painting and scoring of the plaster surface to resemble stone masonry joints. The character of the interior spaces is a direct result of the plaster surfaces on masonry bearing-wall system. The scale of the masonry piers and arched openings between them relate to the volume of space they enclose and the openness between spaces as originally intended. There is a progression from heavy to light as the masonry makes its way vertically up to the Rotunda. The subtle detailing of the applied orders, recessed planes, scored coursing, decorative paint, and plaster finishes with clerestory windows above add a delicacy to the structure as it moves up before transitioning to the lightness of the ceiling. While still apparent in the halls today, the original intent can be seen in historical photographs taken prior to the Hornblower & Marshall interventions, where the large-scaled openings allowed cross views from halls into courts and ranges, and the true
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28: Detail at Rotunda
Circa 1902 (SIA AIB File, Folder: Rotunda)

character of the spaces is revealed (See Figure 27)

The decorative stencil painting at the AIB has been altered through the years. It currently exists in the Rotunda and the halls. The original stenciling consisted of three-dimensional designs of geometric patterns coupled with floral motifs and calligraphy, with multiple precedent sources and influences. Several of the motifs of the original decorative paint were also encountered in other decorative elements, such as the brackets at the balconies, the colored glass, the gates, the medallions, and the ornamental stone signs above each of the entrances. As seen in historical photographs, the extent of the original stenciling was greater than currently exists, encompassing the panels below the Rotunda clerestory windows and the spandrels above (See Figure 28).

The original decorative painting design appears to have been influenced by principles set forth by one of the most influential books on interior decoration, *The Grammar of Ornament* (1856) by Owen Jones. A British architect, interior decorator, and one of the superintendents of works for the 1851 Exhibition, Owen Jones thought that “form without color is like a body without soul.”34 In the book, Jones lays down 37 propositions for the arrangement of form and color. Many of his principles were derived from detailed observations of Oriental art, particularly the Moorish art as seen in the Alhambra, which, in Jones’ opinion, encompasses “the speaking art of the Egyptians, the natural grace and refinement of the Greeks, the geometrical combinations of the Romans, the Byzantines, and the Arabs.” Some of the decorative motifs at the AIB resemble plates of Moresque ornaments in the book.35

The second stenciling scheme was designed by


Footnote 35: http://digital.library.wisc.edu/1711.dl/DLDecArts.GramOrnJones

Grace Lincoln Temple in 1903, at the time of the larger Hornblower & Marshall interventions, and incorporated more geometric motifs with semi-circular arches rather than the original decoratively-painted pointed arches. This treatment is more visually consistent with the gallery column and raling details which, taken together, transform the interior decorative treatments from the Cluss scheme to a more Beaux Arts influenced scheme. The Lincoln Temple painted decoration was applied to the Rotunda where it was limited to the lower section of the walls. Overall, there were fewer spaces with decorative paint compared to the original decorative scheme. Historic photographs do not show the 1903 decorative paint at the spandrels in the halls and courts.

The original scoring of the plaster surfaces of the Cluss design and minor changes in plane on the interior of the building subtly break down the scale and mass of the wall surfaces and define the character of the original exhibit spaces. The scoring contributes to the reading of scale of the interior spaces in addition to the functional role it plays as control joints to prevent cracking of the plaster surfaces. The scoring is intended to resemble stone
joints. The “stones” are proportional to the scale of the applied orders and reinforce the geometries of the massing and openings within the massing. For example, scoring exists at arched openings, outlining their shape for tectonic effect. This is particularly evident in the original 17 exhibition halls in historical photos (See Figure 29). Due to the infilling of openings between the spaces and the application of new finishes, the scoring is no longer a prominent feature. Traces of the scoring still exist, differentiating the original fabric of the building from later alterations.

The pilasters are further detailed with a plaster bead within a reveal approximately 4’ 9” from floor level at the original masonry walls and piers. This detail has been replicated frequently on numerous infill walls. Within the larger context of the exhibition spaces, the bead acts as a “base” element for the masonry piers and the applied orders of pilasters. Its location is based on the overall proportions of the walls of the exhibit spaces. From a functional perspective and in relation to human scale, the bead acts as the upper boundary of the wainscot at the Rotunda, and can be seen in historical photographs dating into the 1920’s (See Figure 30).

The tall arched openings, taken together with the decorative treatment of plaster and applied stenciling, are character-defining elements in the scale of the monumental volumes of the Rotunda, halls, and courts (See Figure 27).

Floor Finishes
The quality of materials, finish, and decorative elements of floors is proportional to the hierarchy of the spaces where they occur. The replica patterned encaustic tile floor of the Rotunda is the most decorative and detailed, appropriately installed in the focal point of the entire building (See Figure 31).

The marble floors in the halls, with the polychrome motif, are the next most elaborate and refined floors (See Figure 29). Less expensive, simple terrazzo floors were installed at the courts and ranges around the turn of the 20th century, replacing the original wood floors. The floors at all the galleries added following the Hornblower & Marshall design in spaces were finished with terrazzo.
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A recurring theme in Cluss' work is the functionality of design elements. According to architectural historian Tanya Edwards Beauchamp, "Cluss' aesthetic persuasion was picturesque and he worked toward intricacy and variety of massing, surface, texture and color, and silhouette. He abhorred what he considered meaningless ornament, however, and attempted to involve all design elements in the function of the structure."\(^{36}\) She adds, "...concern for modernity, for craftsmanship and honesty in the use of materials, leads away from the Romantic historicism of the ante-bellum years to more relevant contemporary concerns."\(^{37}\)

The floors of the AIB have been through a number of material changes through the years. The hall and Rotunda floors were originally intended to be troweled concrete with wood floors in the remaining spaces. By February 1881, temporary wood flooring over a base of concrete was installed in the halls and courts for the Garfield inaugural reception (See Figure 21).

The current encaustic tile floor at the Rotunda dates to the 1970's renovation project. The hall and floors went through extensive repairs, but still retain a good degree of integrity. The terrazzo floors at galleries retain a high degree of integrity. The integrity of the terrazzo floors at the courts and ranges is unknown, as many of the floors are currently covered by modern flooring materials.

The flooring in the Rotunda and halls is significant either because of the original fabric that remains or the good replica of original materials. These floors convey to the visitor the importance of the space and create visual interest without being overwhelming or in competition with collections.


Fountain and Statuary

The original statue “America,” and later the octagonal fountain and statue “Freedom,” emphasized the centrality of the Rotunda. “America,” holding a very innovative electrically-lit torch that was “to revolutionize the world and make dark places to shine”\(^{38}\) remained in the Rotunda only for a brief period, “Freedom” decorated and provided orientation in the Rotunda for 77 years. Removed in 1967, this statue is highly significant to the understanding of that space during the Period of Significance because of the symbolic message it carries, as well as the fact that it is the model for the statue that sits atop the U.S. Capitol dome.

The 1881 fountain was removed in 1929 and reconstructed during the 1970s project. Together with the plantings and the settees introduced in the Rotunda, the fountain was intended to provide a relaxing respite for the visitors in route to various exhibits. For periods of time over the years, fish swam in the fountain. Today, the fountain remains as a primary contextually-significant feature in the Rotunda. However, the absence of “Freedom” hinders the understanding of the place of the Rotunda in the hierarchy of public spaces.

Systems

The building was to house the collection of the National Museum and its designers were determined to provide a healthy environment for the collections and a pleasant experience for the visitors.

Use of cavity masonry walls to limit moisture in a building was not a new method of construction. In 1859, Andrew J. Downing was reporting that

Historic Structure Report & Conditions Assessment

Smithsonian Institution Arts & Industries Building

08.31.2009
“hollow walls have long been the favorite mode of construction in various parts of Europe and in some places in this country.”  However, hollow masonry construction was increasingly used not only to minimize dampness in the walls but also for the insulating properties of the air in the cavity. Cluss anticipated that the heating load would be minimized if hollow walls were used.

Literature published in the 1880s warned against walls becoming damp not only from water rising from the ground but also from exposure to weather outside or water vapor inside, suggesting, that by “leaving in the interior walls a cavity two inches across, and communicating by ventilating holes with the outer air, any moisture which penetrates the brick is rapidly evaporated.”

Heating by direct radiation through radiators was considered the cheapest and, generally, the most comfortable. No smoke or dirt and no risk of fire were among the main advantages of this system, while condensation deposited on walls, dry air, and unsatisfactory ventilation were the main drawbacks of heating by steam. General Meigs designed the steam heating system at the National Museum and the 1879 specifications called for the offices to be heated to 72 degrees Fahrenheit and the halls to 68 degrees Fahrenheit when the external temperature was at zero degrees Fahrenheit. Steam had been used in the U.S. since the 1840s, and General Meigs was involved in the construction in 1856 of a steam system in one of the wings of the Capitol. Four low pressure steam boilers were originally installed in the basement of the South West Pavilion “having seventy-two tubes of 3 inches in diameter. [...] Two main-supply steam-pipes were 8 inches in diameter; the total radiating surface of the steam-coils was 13,680 square feet.” “Bundy” radiators were placed around the base of the walls in the exhibit spaces. In 1881, a furnace was added in the basement of the North East Pavilion.

To further reduce the load for heating, General Meigs called for installation of double-glazed windows. “With regard to the saving of heat by double glazing, General Meigs has pointed out that about one-third of heat is lost through two glasses placed within one-fourth of an inch between than them though a single glass.”

Beginning with the first year of museum operation, awnings were installed at locations determined solely by the request of the occupants of the interior spaces. There are some images of awnings installed on the ranges but this was not as common as installations on the pavilions and towers. From the images, it does not appear that this was a planned design change to the building. This helped reduce the solar gain and possible bright light and glare entering the building, particularly at the towers and pavilions where office were located.

Originally, the building had a sophisticated security system. Theft was an issue at several institutions in D.C. The museum had an early security system tied into the communication system. Three hundred windows and eighty-five doors in the AIB were connected to an electric 100-drop annunciator that indicated to an attendant at the main office which window or door was open. Specimen cases were connected to an 81-drop annunciator. In 1883, the journal Nature was reporting that the museum “is one of the best cases in the Unites States of the practical application of electricity. In so large a building it

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Footnote 40: Letter from Cluss & Schultze to General W. T. Sherman, December 8, 1879. (SI-AHHP Box 12)


Footnote 42: Minutes of Proceedings of the Institution of Civil Engineers (Published by the Institution, London, 1883), 164.

Footnote 43: Minutes of Proceedings of the Institution of Civil Engineers (Published by the Institution, London, 1883), 172.

Footnote 44: Bundy radiators were made of vertical iron pipes, cast in couples or loops, *Minutes of Proceedings of the Institution of Civil Engineers* (Published by the Institution, London, 1883), 172.

Footnote 45: Steam-Heating Problems, or Questions, Answers, and Descriptions relating to Steam Heating and Steam Fitting, from the Sanitary Engineer, (New York: The Engineering and Building Record, 1889), 49.
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32: Roof
Court roof, May 2009

33: North Hall
Circa 1885-1890 (SIA RU 95, Box 42, Folder 13, Neg. No. 4319)

was found advisable to take advantage of the best means of communications, first being its systems of telephones and call-bells, by which those in any room can communicate with every room in the building." In addition to the electric security system, the first floor windows in the pavilions and towers were provided with metal grilles.

Daylighting was originally the primary means of illuminating the AIB and was a major force in shaping the form of the building and its roofscape (See Figure 32).

Windows and clerestories flooded the volumes of the exhibit spaces with natural light. The tops of display cases were glass to allow the ambient natural light to illuminate the collection pieces on display (See Figure 33).

Originally, nighttime illumination of the exhibit spaces was unnecessary since nighttime use of the exhibition spaces was never contemplated. The selection of the site and the large footprint of the building that resulted in the dense 300’ × 300’ block made daylighting more difficult, resulting in the varying heights of the different roof elements that are a major character-defining element of the building exterior. Windows punched into the masonry bearing walls used translucent glazing at ranges, taller building masses with clerestory windows at halls, and monitor windows at the interior court spaces. Large, clear glass windows in the relatively small spaces of the towers and pavilions and Rotunda windows high above the floor in the center of the building provided daylighting while defining the form of the building, and in turn, its character.

Electricity was initially provided for the 1881 presidential inaugural ball; however, it was limited to two “powerful” lights in the Rotunda and a few lights outside. This was one of the first times a public building in Washington displayed electric lights.

Lighting in the offices was provided by gas fixtures; gas piping was installed in all halls for possibly lighting of the exhibits at a later time. In 1883, the Brush Company organized an exhibit in the lecture room (West North Range) of the Brush storage battery system. A battery was placed in the room and connected to 40 Swan incandescent lights. After the exhibit ended, the dynamo remained into place. By 1890, it was reported that the main halls, the East North Range, East South Range, and North West Court were lighted by electricity, while gas fixtures were added to several other ranges. In 1901, $3,500 was appropriated for the installation of permanent wiring for lighting the public halls. Additional funding was received during the next year for fixtures and lamps. By 1902, funding was secured for “a complete installation of wires and fixture throughout the Museum building.”


Footnote 48: Not even the Capitol preceded the AIB. The first attempt to install electric lights in the Capitol dates to March-May 1882, when the American Electric Light Co. installed an experimental plant to light the restaurant. For several years manufacturers installed temporary systems at their own expense trying to convince the government to invest in electric lights. The Electrical Engineer, February 1888, p. 70.

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