The Hall of Architecture, which remains almost entirely intact, may not contain original monuments, building façades, or architectural ornamentation, but it is a unique assembly of nearly 150 objects that can never be duplicated. Having an exceptional collection at the Carnegie Museum of Art is exciting because plaster casts have developed a new significance. Due to the effects of environmental pollution, the quality of monuments in situ (such as the Porch of the Maidens on the Acropolis in Greece) has diminished. Therefore, Pittsburgh's plaster cast of this monument more accurately represents its original intended appearance. In a number of cases, when an original has been destroyed, a plaster cast has served as a surrogate for the lost work.

This year marks the centennial of the Hall of Architecture. In honor of the occasion, the Heinz Architectural Center at Carnegie Museum of Art is featuring the exhibition *On a Grand Scale: The Hall of Architecture at 100*, from September 22, 2007, through January 27, 2008. Research for *On a Grand Scale* led to discoveries about the creation of the Hall of Architecture itself. This article details a number of significant occurrences involving Andrew Carnegie and the Hall's creation. Although not intimately involved with the day-to-day tasks of assembling the collection, Carnegie was responsible for the initial idea of creating a great hall dedicated to the display of plaster casts. It is significant that the 1907 Carnegie Institute building addition was created with the purpose of housing a cast collection. The architectural firm Alden and Harlow, inspired by the ancient myth of the Seven Wonders of the World, modeled the Hall of Architecture after the Mausoleum at Halicarnassus. The firm counts Carnegie Institute as its most important project. Alden and Harlow also designed banks, offices, mansions, and a series of Carnegie libraries in Pittsburgh and surrounding communities.

The following events demonstrate Andrew Carnegie's personal interest in the formation of a cast collection: his May 1891 trip to view the plaster cast collection at the
Slater Memorial Museum in Norwich, Connecticut; his observations concerning the World's Columbian Exposition of 1893 in Chicago; and an 1895 visit to the Metropolitan Museum of Art with W. R. Frew, president of the Carnegie Library Commission and John W. Beatty, director of the Department of Fine Arts. Before discussing these events, a brief history of cast collections in the United States will help put the Hall of Architecture in context. Finally, to understand the historical significance of the Hall of Architecture, the article will consider how Carnegie's passion for collecting architectural casts differed from his contemporaries.

A BRIEF HISTORY OF CAST COLLECTIONS IN THE UNITED STATES

The history of cast collections in the United States is a lesson in museum studies. Early museums were developed as a response to the great national collections housed in Europe, such as in the Vatican, Louvre, and British Museums. Americans, eager to establish collections, lacked the funds necessary to purchase substantial quantities of original artworks. As a result, plaster cast reproductions (already popular in Europe for decades) evolved as worthy additions to burgeoning museum collections. At the time, museums favored casts over inferior original art because with modest funds, comprehensive collections could be formed. Edward Robinson's 1891 essay, "The Cost of a Small Museum," demonstrates how affordable comprehensive cast collections could be by highlighting the actual costs of realizing the Slater Memorial Museum's collection. Excluding the expense of the building, the gross cost to Slater was "exactly $27,112.97," what would have been over half a million dollars in 2006. Considering this modest sum, it is not surprising that copies of premiere Greek and Roman sculpture lined the galleries of the Corcoran Gallery of Art, Metropolitan Museum of Art, Art Institute of Chicago, and Museum of Fine Arts, Boston.

With casts, museum-goers could compare and contrast masterpieces throughout the history of art. This type of museum experience was not possible with original works because there simply were not enough examples to create encyclopedic collections. Cast courts provided visitors with a new method for appreciating art and culture. As a result, the general public, unable to travel abroad, was treated to an incredibly edifying experience. In the 1870 article, "Museums of Art as a Means of Instruction," the author professes the value of museum instruction:

A museum of art would afford us adequate instruction in the vestiges of the ancient civilizations—a solemn and beautiful teaching—it would foster reverence, without which man is barbarian, and obnoxious to every fine and noble sense of different things.

By providing the grandest hall of casts imaginable, Andrew Carnegie hoped to culture the masses of Pittsburgh. Carnegie's address at the "Presentation of the Carnegie Library to the People of Pittsburgh" on November 5, 1895, included remarks about the cast collection, which was already in progress:

Already many casts of the world's masterpieces of sculpture are within its [the Museum's] walls. Ultimately, there will be gathered from all parts of the world casts of those objects which take highest rank. The Museum will thus be the means of bringing to the knowledge of the masses of the people who cannot travel many of the most interesting and instructive objects to be seen in the world; so that, while they pursue their tasks at home, they may yet enjoy some of the pleasures and benefits of travel abroad. If they cannot go to the objects which allure people abroad, we shall do our best to bring the rarest of those objects to them at home.

In this endeavor, Carnegie and his staff benefited greatly from the expertise of museum professionals already well-trained in the nuances of cast collections. In addition, the popular press documented much information on how to select, properly display, and care for casts. For example,
Walter Smith's *Art Education: Scholastic and Industrial* (1873) dedicates an entire chapter to casting and casts. Smith provides concise descriptions concerning the casting process and the properties of a quality cast. In 1885, Lucy Mitchell contributed an article to *American Architect* arguing that casts serve as an important adjunct to the study of archaeology. By 1917, the College Art Association, the foremost association of art historians in America, published lists of dealers in casts and graded lists for use by schools and colleges considering the purchase of reproductions. However, it was believed that the most useful tool in making out orders for casts was prepared under the direction of the Special Committee on Casts of the Metropolitan Museum of Art, titled "A Tentative List of Objects desirable for a Collection of Casts." This 1891 document records nearly all obtainable casts. Arranged chronologically, it lists cast makers' names and the numbers necessary for placing an order, as well as the sizes and locations of the originals. The completeness of the list and its usefulness to institutions interested in acquiring casts may explain why other collections contain many of the same examples present in the Met's collection, including the portico of the Erechtheum, Choragic Monument, and a model of the Parthenon.

Sales catalogs also served as invaluable resources for museum staffs. Carnegie Institute possesses an extensive and well-preserved collection of them, including examples from international dealers. In addition to containing notes about dimensions and price lists, the catalogs are illustrated, first with prints and later with photographs of casts. Hand-written notes and dog-eared pages demonstrate that these catalogs were working documents. A number of the covers bear the initials H.W.K. for Henry Watson Kent, inaugural curator and librarian at the Slater Memorial Museum. Looking through them, one can note checkmarks, cross-outs, and corrections to the price lists and dimensions. Examples of these catalogs will be on display in *On a Grand Scale*.

Edward Robinson's 1891 article, "The Cost of a Small Museum," underscores a desire to encourage and assist in the establishment of other museums. Robinson's protégé, Henry Watson Kent was one of the
individuals Carnegie called on to help select the casts for the Hall of Architecture. Like his predecessor, Kent produced a pamphlet for the prospective museum maker. Titled *The Horace Smith Collection of Casts of Greek and Renaissance Sculpture: A Brief Statement of the Cost and Manner of Its Installation*, this pamphlet provided information about the cost of and answered basic questions surrounding the creation of a plaster cast collection. Kent offered the reader advice about lighting and color of walls as well as detailed instructions concerning the care of casts, as the porous nature of plaster presents problems for its care. The only way to prevent scratching and soiling of the surface is by hardening the plaster. Kent recommended treating casts with a chemical spray process invented by Friedrich von Deschend of the Berlin Museum. The effect of hardening the plaster made casts easier to dust and even permitted washing. The pamphlet's remarkable level of detail reflects Kent's great interest in all aspects of the collection. In addition to his writings, he included illustrations of gallery furniture (pedestals, a bench, and a photograph case) and a cast label.11

**ANDREW CARNEGIE VISITS THE SLATER MEMORIAL MUSEUM**

On a research trip to the Slater Museum in July 2006, I tried without success to find evidence of Carnegie's presence at its 1888 opening celebration. From archival material there, it is clear that he missed a grand affair, a who's who of New England elite. Kent details the festivities in his memoirs, *What I am Pleased to Call My Education*. Among the prestigious attendees from universities and museums was keynote speaker Charles Eliot Norton, professor of the History of Fine Arts at Harvard University.12 Other notables included W.P.P. Longfellow, the architect; Martin Brimmer, first director of the Boston Museum of Fine Arts; Mrs. John L. Gardner, the art collector; and J.H. Twachtman, the American Impressionist artist. Although absent from the opening festivities, Carnegie would eventually see the collection. Kent documents their initial interaction in his memoirs. On Saturday, May 2, 1891, the Metropolitan Museum of Art's Special Committee on Casts and a number of other guests, including Carnegie, visited Norwich to study the installation in the Slater Museum. While the Special Committee contemplated how to expand the Met's cast collection, Kent provided Carnegie with a private tour. Kent reports that his honored guest "didn't seem greatly interested, except in the electrotype copies of Greek coins...."13 Kent's final assessment was that "[Carnegie] was not interested in what Slater had done for Norwich or the casts themselves...."

Despite this perceived lukewarm reaction, Carnegie presented funds for a large
collection of casts to Carnegie Institute and asked Kent to help in its formation. He worked closely with John W. Beatty from 1904 to 1906, selecting casts and planning the installation. Kent’s correspondence with Beatty and his staff in Pittsburgh, as well as agents abroad, is well documented in the Carnegie Institute archives. Kent’s greatest contribution may have been accessing information about cast manufacturers for Beatty. He demonstrates his familiarity with the ordering process through the letters he wrote to cast companies (on Beatty’s behalf) inquiring if particular casts could be produced in a year’s time. On March 15, 1905, Beatty wrote to Kent: “I am extremely anxious to place orders.... As you go over the lists [of obtainable objects], bear in mind the importance of selecting a sufficient number of casts that can be secured in one year.” Beatty wrote to Kent again on March 23, 1905: “Our fund will permit us to include a few large, commanding things, but they really ought to be things we can secure in one year.” The large examples Beatty was considering included the portico of the Erechtheum, Choragic Monument, Pantheon, the façade of Saint-Gilles-du-Gard, Notre Dame, Hypostyle Hall, and the House of the Butchers’ Guild. Kent was responsible for writing to the manufactures of these models and casts to inquire if they would agree to produce and ship within one year. The task of assembling the collection under such a strict deadline was daunting. In a letter to Beatty dated April 13, 1905, Kent lists the reasons why he cannot promise to have the architectural casts in time:

The difficulties of setting up the Architectural casts will be these: many of them will be in innumerable small pieces, some in several thousand, and it will require not only a long time for each cast, but many men to do the work. Is it doubtful if we can find enough men to do so large a piece of work so quickly. Let us center all our attention on the
Sculptural casts and undertake to get them ready, and do what we can on the Architectural collection without any promises... I am very sorry to have to say this if it disappoints you, but I would rather disappoint you now than later.

Against these odds, Beatty, with the help of Paul Navaz and Roland Knoedler working in Paris, secured a cast collection with architectural examples. By August 24, 1905, an exhausted Beatty wrote to Kent: “I have finally assured the delivery of St. Gilles, complete, and Bordeaux, in time for our opening. I will never be able to tell you of the many difficulties overcome, or what it cost in labor and patience to do this.” Beatty goes on to admit that the work and worry of the statuary and architectural collections had taken its toll on him in the form of “two nervous, breakdown spells within thirty days.”

Kent was an important resource in the ordering process and played a substantial role in securing Pittsburgh’s collection. He was one of only three people individually thanked in the Director’s 1907-1908 Annual Reports documenting the opening of the Hall of Architecture and listing the acquired casts.

Carnegie’s trip to view the casts in Norwich and his encounter with Kent had important, positive implications for the future of the Hall of Architecture. By 1949, the year he published his memoirs, Kent reported that, “The architectural casts on display now [in the Hall of Architecture] number 145; of sculptural 84. No figures were published on the cost of the Pittsburgh collection, but because of the number of large architectural pieces, it considerably exceeded that of the Slater Museum.”

THE WORLD’S COLUMBIAN EXPOSITION OF 1893

Carnegie’s experience at the 1893 World’s Fair in Chicago was an equally significant event leading to the formation of a cast collection in Pittsburgh. Taking in the sights at the fair excited and inspired him, so much so, that he penned an essay titled “Value of the World’s Fair to the American People,” which appeared in the January 1894 issue of The Engineering Magazine. This first-person account demonstrates Carnegie’s passion for architecture and his belief that it could enrich the masses. In his essay, he marvels at the diversity of cultures and the value of reproductions:

The Javanese village, the street in Cairo, the German village, and even the sight of the reproduction of Blarney castle and many other national scenes were object lessons which gave the best possible substitute for personal inspection of the original... From a national point of view, the chief good from such an exhibition as we are just now considering arises from the gathering together of the people of the different sections. In a first-person account, Carnegie did not forget this lesson. He sought to recreate in his Pittsburgh museum the excitement and affinity for architecture he had experienced in Chicago. The working class people of what was then the Smoky City were precisely the people Carnegie referred to when he wrote, “The few who travel much fail to remember that the masses of the people travel but little.”

Carnegie’s involvement in one detail related to the casts’ installation, the question of nudity in the classical statuary, further supports the premise that the Hall of Architecture was intended for those people unfamiliar with high art experiences. A telegram on November 4, 1895, between Carnegie and W.R. Frew, documents an exchange in which Carnegie wrote:

I strongly recommend nude to be draped since question has been raised... We should begin gently to lead the people upward. I do hope nothing in the gallery or hall will ever give offense to the simplest man or woman. Draping is used everywhere in Britain except London. If we are to work genuine good we must bend and keep in touch with the masses. Am very clear indeed on this question.

Fig leaves, which could be purchased from P. P. Caproni & Bro. in Boston for 75 cents apiece, provided the modesty Carnegie demanded. They remain today as a sign of his participation in the Hall’s planning.
The first two events referencing Carnegie, his visits to the Slater Museum and the World’s Fair, represent important beginnings for the Hall of Architecture. However, one of his early attempts to acquire casts did not succeed. In 1885, Carnegie, Frew, and Beatty surveyed the casts in the Metropolitan Museum of Art. This visit was a logical beginning to the formation of a Pittsburgh collection. The Met’s cast collection originated in 1883 when Levi Hale Willard left the museum a large sum of money for the purchase of casts, photographs, models, and other objects instructive in the art and science of architecture. It is notable that their collection of sculptural casts was not begun until 1886, when Henry G. Marquand gave a fund for the beginning of such a collection.

In contrast to the Slater Museum, the Met’s cast collection emphasized architectural examples. It apparently made an impression on Carnegie, Frew, and Beatty. Following their visit, Frew appealed to Louis Palma di Cesnola, director of the Metropolitan Museum of Art, for casts to be produced from the Met’s molds. Cesnola’s response, however, was decidedly negative:

I remember with pleasure your visit here with Mr. Carnegie and Mr. Beatty and also the conversation we had in reference to furnishing your institution with casts from such moulds [sic] as we have, but I also stated, and I am afraid you have forgotten it, that at present I have no room wherein to make these casts as they require a great deal of space for setting them up, drying them, etc. Up to the present moment, although I know that I have over two hundred moulds, I have been unable to prepare a list of them as my two moulders [sic] are kept so very busy. As soon as I have some spare time at my disposal, I shall have a list made of all the moulds with the cost of each cast to us and will send you a copy of it.

Considering Andrew Carnegie’s stature, Cesnola’s response could be considered curt. Such a response is intriguing because it represents something that the Hall of Architecture did not become: strictly modeled after the inventory at the Metropolitan Museum of Art. Instead, what followed was an incredibly elaborate process of ordering casts from all over the world.

The Production of Plaster Casts

As described above, Beatty and Kent studied lists of obtainable casts. The majority of architectural fragments and sculptural casts were then ordered directly from production houses in Europe. For instance, institutions such as the British Museum and Louvre sold casts of original artifacts in their collections to museums and art schools. These examples proved readily accessible and many could be purchased for less than $10. The production process in the late 19th century required skilled workers to
produce casts from piece molds, which were commonly made of plaster and soaked in linseed oil for increased durability. As the name suggests, these molds were made up of many small portions. Created in multiple parts, the cast production process required crafts people to reassemble the finished pieces. As a result, casts taken from piece molds have seam or mold marks. These thin lines can be found on casts in the Hall of Architecture. Manufacturers did not remove the marks because they were a means of judging a cast's quality. Angular projections at the junction of two pieces demonstrated a cast of poor quality from an old mold; these casts were to be rejected. At the time the Hall was created, the majority of casts were produced from piece molds because they could be used multiple times to create a large number of casts. The molds could also be preserved indefinitely.

The ordering process was labor-intensive. In addition to the work in Pittsburgh, assembling a world-class collection involved contracting agents and crafts people abroad. Hundreds of translated letters and telegrams went back and forth between Pittsburgh and Europe. From the Institute’s archives, it appears the only day work ceased was Christmas. One needs only to sift through the correspondence concerning the transport of the crates containing the casts, including steamer, railroad, and customs records, to grasp the enormity of this undertaking. Letters from Europe notified Beatty and his staff that a shipment would be arriving in New York. Paul Navez, an agent working in Paris on behalf of Carnegie Institute, wrote on January 12, 1906: “I have the honor to inform you of shipping by the steamer “Roma,” leaving Marseilles tomorrow, 62 cases, SG 1 to 62, containing the first part of the church of St. Gilles, i.e. the upper part of the monument.” It is easy to imagine the men anxiously checking the newspapers to confirm that steamer’s safe arrival. Once in New York, cases of casts were loaded on to trains bound for Pittsburgh’s Shadyside Station. Kent provides insights into the installation process in a letter to Beatty dated July 12, 1905:

[P. P. Caproni, a cast manufacturer in Boston, Massachusetts] thinks that he would be able to do the [installation] work, with the help of ten men, in two months. Caproni’s work can be facilitated in the following way: When a shipment of casts arrives, it should be stored carefully,
with the cases in the order of their appearance in the invoice. When Caproni is ready to begin his work, there should be men ready to carry the casts in the order of their cases to the exact places where they are to stand, as shown on my plans. Then the moulders [sic] should set up the pieces having simple joints and requiring little mending at once, leaving the broken pieces and the more difficult ones until the last.

Architecture is an art form everyone in a community experiences. In contrast, Carnegie’s fellow captains of industry, such as Henry Clay Frick, J. P. Morgan, and Andrew Mellon, acquired original works of art from Europe, often with the help of buyers, most notably Joseph Duveen and Bernard Berenson. These collectors competed for Old Master paintings and other artworks that could be neatly carted out of Europe in trunks, or in the case of Morgan, a lover of miniatures, in the palm of a hand.22

The contributions of American collectors such as Frick, Morgan, and Mellon should not be underestimated. This point is only raised to further demonstrate Carnegie’s unique collecting interest and the complexity of realizing the Hall of Architecture. The fact that Pittsburgh’s cast collection emphasized architecture made it stand out from the majority of cast collections in the United States focused on sculptural casts. Not surprisingly, this unparalleled display was more costly and complicated to create. The gem of the collection, the façade of Saint-Gilles-du-Gard, was cast from the original pilgrimage church in France. Unlike the piece mold process detailed above, it was created using the waste mold technique. The molds were essentially destroyed after producing one cast. This dramatic undertaking required special permission from the French
government's Commissioner of Fine Arts, as well as a cash gift to the mayor of the town, J.L. Peyron. The exhibition *On a Grand Scale* documents the history of this cast, including the initial survey of practicing architects asserting its architectural significance, Beatty's attempts to have a cast made from existing molds, and finally, its fantastic arrival via four different steamers in Pittsburgh.

**OUR GRAND HALL**

Carnegie intended to provide Pittsburghers with the grandest hall of casts ever imagined. The final result immensely gratified him. At the 1907 inauguration ceremony, Carnegie likened the creation of Carnegie Institute to the myth of "Aladdin and the Magic Lamp" because the realization of the project seemed like a dream. However, no rubbing was required. Despite Carnegie's demonstrated interest and involvement in the Hall of Architecture, his remarks reflect his belief that, aside from providing the funding, he did not have any part in creating it. His modesty reflects his appreciation for the effort of the museum's staff and its supporters. One hundred years later, the Hall of Architecture is one of the most visited areas in the museum and continues to serve as a vital resource for aspiring artists and art historians of all ages. *On a Grand Scale* celebrates this legacy by exploring the questions of how this collection came to be in Pittsburgh and why architectural collecting was important to the museum then, as it is today.

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5. In February of 2006, Sotheby's auctioned off the remaining plaster casts in the Metropolitan Museum of Art's collection. Prices ranged from $60 to $51,000 for a copy of a Renaissance relief. The sale total (lot 1-177) was $502,530.


7. Presentation of the Carnegie Library to the People of Pittsburgh, with a Description of the Dedication Exercises, November 5, 1895.


13. Ibid., 105.

14. Ibid.

15. The deadline was imposed due to the re-dedication of Carnegie Institute planned for April 1907.


17. Kent, What I am Pleased to Call my Education, 106.


19. Ibid.


23. Carnegie Institute, *Memorial of the celebration of the Carnegie Institute at Pittsburgh, Pa., April 11, 12, 13, 1907*; comprising a complete description of the exercises connected with the eleventh celebration of Founder’s Day of the Carnegie Institute and opening of the enlarged Carnegie Library Building, containing the library, museum, music hall, and art galleries, founded by Andrew Carnegie (Pittsburgh: printed by order of the Trustees, 1907).