The Zinc Statuettes of Cornelius and Baker

Carol Grissom

Slush casting of zinc statuettes in the United States was pioneered around 1853 by the Philadelphia-based Cornelius and Baker, then the largest gas-fixture company in the country. The technique permitted three-dimensional castings suitable for chandeliers, table lamps, and mantel decorations to be quickly and inexpensively made. Imitation-bronze paint made the dull gray metal attractive. Statuettes after Clark Mills's equestrian Andrew Jackson were acquired by a number of important collections, including the White House (in 1859). Outside of this, the company's early domestic "bronzes"—genre figures, copies of French statuettes, reductions of antique statues, and American subjects—are little known.

THE PHILADELPHIA firm of Cornelius and Baker was renowned during the mid-nineteenth century for high-quality lighting fixtures; its pioneering role in casting the then-novel metal zinc, however, has been largely unnoticed.[1] By 1853, the company not only produced decorations for chandeliers in zinc, but it used a new method for zinc casting that employed metal molds, known as slush casting. By this means, it could make three-dimensional replicas more quickly and at much lower cost than by the predominant sand-casting technique of the period.

Over the next two decades, the firm used the slush-casting technique to produce the zinc statuettes that are the subject of this article. The most well-known statuette, a 2-foot-high version of Clark Mills's over-life-size *Andrew Jackson on Horseback,* is found in the collections of major American museums. Other statuettes are surprisingly little known, given their quality and connection to the premiere lighting company of the day.

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The author would like to thank Don Fennimore for his generous assistance as well as collectors Daniel W. Mattausch and Nancy E. Mattausch.

[1] Denys Peter Myers, *Gas Lighting in America: A Pictorial Survey, 1815–1910* (New York: Dover, 1978); J. Kenneth Jones, "Cornelius and Company of Philadelphia," *Antiques* (December 1983): 1218–22; Horace Greeley et al., *The Great Industries of the United States* (ca. 1872; repr., New York: Garland, 1974), 307–16.

Company records for Cornelius and Baker are lost, and, in consequence, well-provenienced statuettes are primary sources. Census records, catalogs of exhibitions at the Franklin Institute, two Cornelius and Sons trade catalogs, and business histories supply further information about the company's production and practices. Subject matter and contemporary paintings provide evidence of the statuettes' place in the period's art and taste.

Zinc Statues in Europe and the United States

The history of zinc casting of works of art, their types, and techniques of fabrication are vital to understanding Cornelius and Baker's contribution to zinc casting and contextualizing its statuettes. Zinc ore is found abundantly throughout the world, but only after smelting was successful in Europe during the eighteenth century did the gray-colored zinc become one of the least expensive of all metals.[2] During the first decade of the nineteenth century, rolling zinc into sheets created a product useful for roofing, which led to the distinctive gray skyline of Paris to this day. At first, however, zinc supplies exceeded demand to the point that in 1825, a prize was offered by a Prussian industry association for

[2] The late date for zinc smelting can be accounted for by the fact that zinc does not occur in nature as a metal and is difficult to win from zinc ore. The metal vaporizes at a lower temperature than that required to break down zinc ore, so that a method of capturing and condensing the vapor has to be used to produce metal.

new uses of the metal.[3] Sculpture would prove to be one of these uses. Zinc melts at a much lower temperature than other statuary metals such as bronze and iron, and it can be joined using ordinary lead-tin solder.[4] Fabrication of statues in zinc could thus be carried out at far lower cost than for other metals.

Decorations designed by the influential Prussian state architect Karl Friedrich Schinkel for the St. Nicholas Church in Potsdam are the first confirmed artistic castings in zinc (1832; fig. 1).[5] Schinkel was interested in zinc as a new material, but the savings that zinc statues offered also made them attractive for the decoration of buildings constructed for the parsimonious Prussian monarch Friedrich Wilhelm III. Three principal zinc foundries in the Berlin area—Moritz Geiss, S. P. Devaranne, and Friedrich Kahle and Son—subsequently produced large quantities of life-size statues, many of which are illustrated in company catalogs.[6] These included copies of ancient statuary like the *Borghese Gladiators* (fig. 2), popular neoclassical statues such as Antonio Canova's *Hebe,* and prominent commissions, such as the eighteen figures modeled by Ernst Rietschel for the pediment of the Berlin Opera House (1844).[7]

In Berlin, life-size statues made of zinc were cast in sand, adapting the methodology employed there for everything from iron cannon to the iron cross given to war heroes and delicate filigreed jewelry made of iron.[8] Sand casting involves making impressions of a model in sand to create negative molds into which molten metal is poured to replicate the model. The molding process was relatively complicated for a three-dimensional statue cast in one piece or only a few pieces, as was more or less obligatory for higher-melting statuary metals like iron and bronze until the advent of welding at the end of the nineteenth century. Molds had to be laboriously made from sand in sections (known as piece molds) in order to be able to free the model from the sand without damaging its impressions. Alternatively, a wooden model carved from many pattern pieces could be intricately assembled in sand in such a way that it could be safely disassembled without damaging its impressions. Robert Woods's 15-foot-high cast-iron statue of *Henry Clay* (1853), for example, was cast whole from a model comprising 150 wooden pattern pieces.[9] In addition, whether making piece molds or using a wooden model, a core had to be made in order to produce a hollow casting.

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[3] Ernest A. Smith, *Zinc Industry* (London: Longmans, Green, 1918), 13.

[4] Zinc melts at 419°C compared with 850–1,000°C for bronze and as high as 1,539°C for iron.

[5] Sabine Hierath, "Künstlerischer Zinkguss im 19. Jahrhundert in Potsdam," in *Material und Möglichkeit: Zinkguss des 19. Jahrhunderts in Potsdam* (Potsdam: Stiftung Preussische Schlösser und Gärten Berlin-Brandenburg, 1997), 4–30. It has been claimed that fabrication of the earliest artworks made of zinc in the Western world, notably a *Bust of Louis XVIII* displayed by Malpas at an exposition in 1819 and works by David d'Angers, occurred in France. Ophélie Ferlier, "La sculpture monumentale en zinc," *Histoire de l'art* 57 (October 2005): 93–104. However, while David d'Angers wrote that his *Bust of Ennius Quirinus Visconti* (1820), now in the collection of the Musée de Beaux Arts in Angers, was made of zinc, analysis has shown instead that it is composed principally of lead. Carol A. Grissom, "Analytical Report for David d'Angers's *Bust of Ennius Quirinus Visconti,*" Smithsonian Center for Materials Research and Education (now the Museum Conservation Institute), Report no. 5944, December 6, 2005. Other works said to be made of zinc, such as David d'Angers's *Crucifixion* (1820) on the façade of the Cathedral at Angers, have not been analyzed as far as is known, but it seems likely that they are also made mostly of lead. Friedrich Kobler, "Über Zink und Zinkguss," in *Zinkguss,* ed. Peter Mottner and Martin Mach, Arbeitshefte des Bayerischen Landesamtes für Denkmalpflege 98 (Munich: Bayerisches Landesamt für Denkmalpflege, 1999), 16–49. Statue production in zinc was not significant in France, but a few examples are found on the Petit Palais (1900) in Paris, featured in Ferlier's article and a more extensive text: Ophélie Ferlier, "La sculpture monumentale en zinc à la fin du XIX^{e} siècle, les artistes, les fondeurs, les techniques de mise en oeuvre, la conservation, à partir d'un exemple: Les groups sculptés de la couverture du Petit Palais à Paris," Monographie de muséologie de l'Ecole du Louvre, 2004.

[6] S. P. Devaranne, *Zinkguss Arbeiten nach Entwürfen und Modellen bewährter Baumeister, Bildhauer und Zeichner unserer Zeit; so wie nach Antiken Skulturen und älteren und neueren Kunstwerken geformt und ausgeführt in der Zinkgiesserei für Kunst und Gewerbe,* catalog, vols. 1–6 (Berlin: L. Sachse, 1845–47); Moritz Geiss, *Zinkguss-Ornamente nach Zeichnungen von Schinkel, Stüler, Persius, Schadow, Strack, Knoblauch, Stier und Anderen,* catalog, vols. 1–21 (Berlin: Lüderitz, 1841–52); F. Kahle, *Architektonische und plastische Verziernungen, Ornamente, Kirchen-Geräthe, Statuen und Skulturen nach Zeichnungen Stüler, Persius, Hesse, Strack, v. Arnim, Häberlin, Gottgetreu u. A.; bestehend aus Akroterien, Palmetten, Rosetten, Vasen, Capitälen, Säulen, Modellons, Consolen, Gitter, Reliefs und Monumenten in Zinkguss ausgeführt von F. Kahle, in Potsdam,* catalog, vols. 1–3 (Berlin: n.p., 1856); F. Kahle and Sohn, *Architektonische Verzierungen, Ornamente und Skulpturen aus dem Modell-Lager der Zinkguss—Waaren—Fabrik von F. Kahle & Sohn in Potsdam,* catalog, vol. 14 (after 1871).

[7] American-made copies of the *Borghese Gladiators* were available from J. L. Mott Iron Works and M. J. Seelig and Co., although no examples have been located. A copy of Canova's *Hebe* remains today in the Schlosspark at Neustrelitz in Germany. Nicola Vösgen, "Berliner Zinkguss des 19. Jahrhunderts, Katalog," in *Korrosionsschäden an Zinkskulpturen,* Berliner Beiträge zur Archäometrie 14 (Berlin: Staatliche Museen zu Berlin, 1997), 334–35. At least five American-made copies of the statue in zinc were placed atop fountains in the United States, although none are extant. Carol A. Grissom, *Zinc Sculpture in America, 1850 to 1950* (Newark: University of Delaware Press, 2009), 301–3. Statues for the pediment of the Opera House were cast by Geiss and remain in place today on Unter den Linden, Berlin's premiere boulevard. For more information on Berlin-made statues, see Sabine Hierath, *Berliner Zinkguss: Architektur und Bildkunst im 19 Jahrhundert* (Cologne: Letter Stiftung, 2004); Vösgen, "Berliner Zinkguss," 319–487.

[8] Derek E. Ostergard and Elisabeth Schmuttermeier, eds., *Cast Iron from Central Europe, 1800–1850* (New York: Bard Graduate Center for Studies in the Decorative Arts, 1994).

[9] C. T. Hinckley, "A Day at the Ornamental Ironworks of Robert Wood," *Godey's Lady's Book* 46 (July 1853): 5–12. The statue remains atop a column in Pottstown, PA.

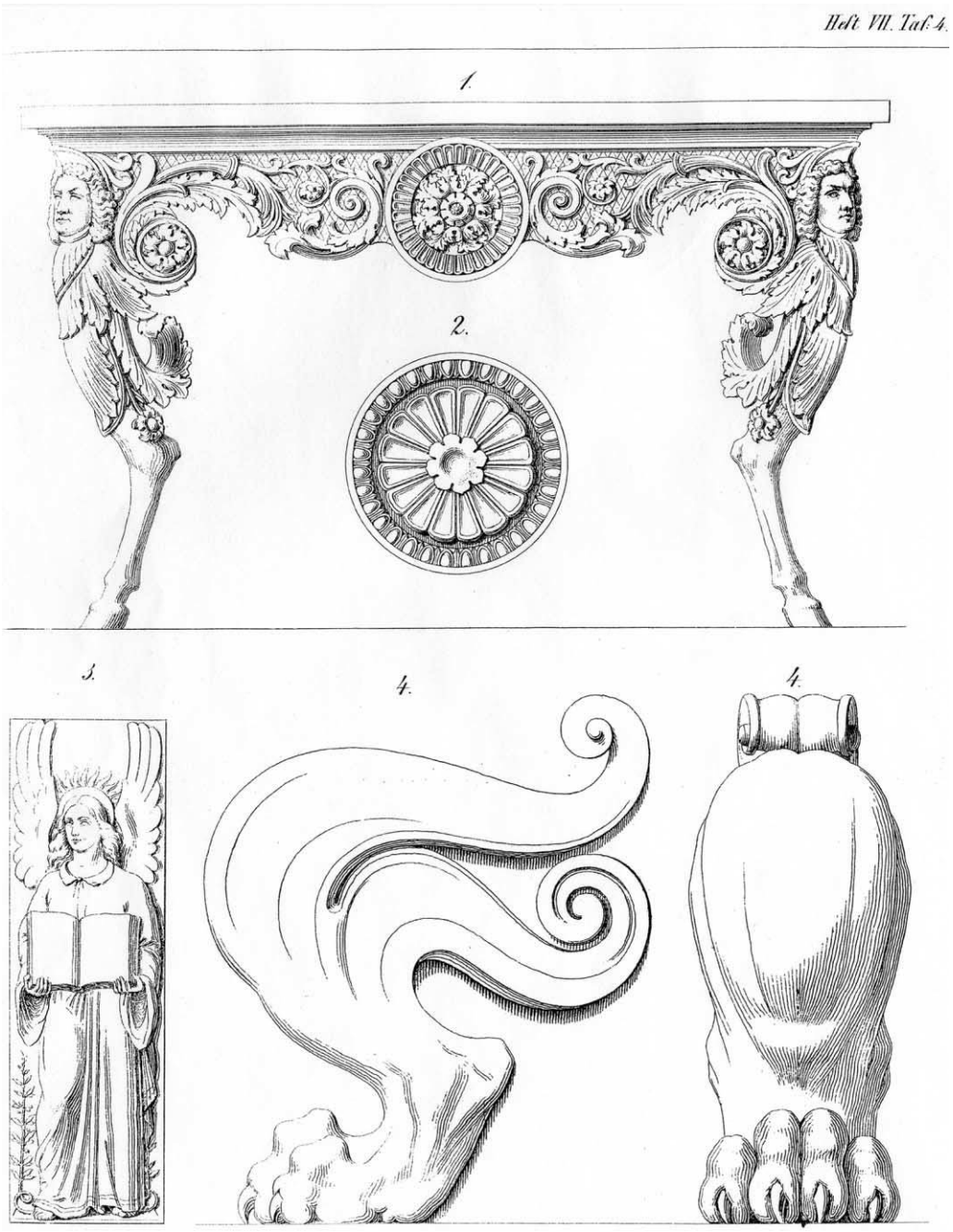

Fig. 1. (1) Table legs for the Royal Palace in Berlin after Karl Friedrich Schinkel; (2) Rosette; (3) Relief figure in the St. Nicholas Church in Potsdam, after Schinkel, model by August Kiss; (4) Bench legs, after Schinkel, model by Kiss. From Moritz Geiss, *Zinkguss-Ornamente nach Zeichnungen von Schinkel, Stüler, Persius, Schadow, Strack, Knoblauch, Stier und Anderen* 7 (Berlin: Lüderitz, 1844), plate 4.

Sand casting a statue in zinc was far easier than in iron or bronze. Simple two-part sand molds were generally used for the multiple (and usually many) pieces into which a model for a zinc statue was divided.[10] After casting, the pieces were easily assembled by soldering to form the statue, and paint was applied to disguise the soldered joins.

[10] Exceptions were difficult-to-cast portions of life-sized figures, which were sometimes slush cast. The last president of J. W. Fiske compiled a list of molds and patterns held by the company: cast-iron molds used mainly for slush casting heads of figures and zinc patterns for sand casting the largest portions of statues. Joseph Warren Fiske III, "List of Statue Patterns," unpublished manuscript, June 6, 1975. He also has both cast-iron molds and zinc patterns in his personal collection.

Fig. 2. Probably Moritz Geiss, *Borghese Gladiators,* entrance to the Charlottenberg Palace, Berlin, 1867. Zinc. (Photo, Carol Grissom.)

Schinkel's stature and promotion of the metal contributed to the creation of zinc art foundries in other German cities. In a few cases, zinc statues were cast at traditional bronze foundries that cast in sand, also the predominant technique for bronze casting during the nineteenth century. Notable in this regard is Ferdinand von Miller's famous Royal Foundry in Munich, which cast many important bronze statues for the US market.[11] In other cities under Germanic influence, foundries for casting zinc statues were set up, notably in Vienna, Budapest, and the Scandinavian capitals.[12] Because of the low costs of building a zinc foundry and production, statuary in zinc was especially popular with new nation-states like Norway and Hungary that

[11] The Royal Foundry cast at least forty-three different statues or reliefs in zinc, among them statues for two of Mad King Ludwig's castles, Linderhof and Herrenchiemsee. Kobler, "Über Zink und Zinkguss," 34–35.

[12] Ibid.; Friedrich Kobler, "Figurlicher Zinkguss in Österreich im 19. Jahrhundert," *Österreichische Zeitschrift für Kunst und Denkmalpflege* 47 (1993): 158–65.

desired sculptural decoration and monuments but lacked the far more significant resources and skilled labor necessary for bronze casting.

In the early years of the United States, public sculptures were few in number, and they were mainly imported or carved in stone or wood. It was not until the mid-nineteenth century that the first large American-made bronze statue was erected—Clark Mills's *Andrew Jackson on Horseback*—sand cast by the sculptor himself between 1848 and 1853.[13] Thus, the domestic art metal industry was in its infancy when, in 1852, a low-relief zinc casting was exhibited at the Castle Garden Fair in New York by the recently immigrated sculptor Moritz J. Seelig (b. 1809). In his native Germany, Seelig had gained wide experience in using a range of metals and methods for making sculpture. After he arrived in New York in 1851, however, he "applied himself exclusively to the production of zinc statuary and ornamentation, for the two-fold reason that no similar establishment existed there, and that his method was far superior to the usual ones."[14]

The Seelig foundry followed the German tradition of making life-size figures mainly by sand casting, and it even copied many Berlin-made zinc statues, including the renowned *Amazon on Horseback Attacked by a Lion,* modeled by August Kiss and originally cast in zinc at the foundry of Moritz Geiss in Berlin (fig. 3).[15] A zinc statue can be disassembled by heating the lower-melting lead-tin solder joining material between zinc pieces, and the disassembled pieces can then be used as patterns for casting new statues in sand (in lieu of less durable plaster patterns). Evidence that this was done is provided by nearly identical measurements and details for German-made *Amazon* statues and an American-made copy sold by the J. L. Mott Iron Works. Mott claimed to have spared no expense in acquiring models in Europe, and M. J. Seelig and Co. almost certainly cast the statues for Mott.[16] Seelig's foundry would eventually produce the majority of life-size zinc statues for purveyors in the New York area, not only those sold by Mott but also J. W. Fiske and William Demuth and Co.[17]

The earliest extant zinc statues in the United States are a life-size *Benjamin Franklin* placed on the Franklin Lyceum in Providence in 1858 (fig. 4) and two-thirds-life-size figures placed on the Swain (*Public Ledger*) Building in Philadelphia that same year.[18] Swain Building statues included the same *Benjamin Franklin* as on the Franklin Lyceum (but smaller in size), a *George Washington,* and—suitable for the newspaper building—the printers *Johann Gutenberg* and *Johann Fust.* Also erected in 1858 was Savannah's *Forsythe Park Fountain,* the first of

[13] Michael Edward Shapiro, *Bronze Casting and American Sculpture, 1850–1900* (Newark: University of Delaware Press, 1985), 34–45.

[14] Henry R. Stiles, ed., *The Civil, Political, Professional and Ecclesiastical History and Commercial and Industrial Record of the County of Kings and the City of Brooklyn, N.Y., from 1683 to 1884* (New York: W. W. Munsell, 1884), 816–17.

[15] Modeled by Kiss in 1839, a bronze cast of the *Amazon* was made for the entrance to the Altes Museum in Berlin in 1843, where it stands today (a bronze copy cast in 1929 is on the grounds of the Philadelphia Museum of Art). A copper-plated zinc copy of the *Amazon* won first prize for Geiss at the Crystal Palace Exhibition in London in 1851, and it was much publicized in exhibition literature. The statue was then exhibited at the Crystal Palace Exhibition in New York in 1853–54, where it was destroyed by fire. An American-made zinc cast was exhibited by the J. L. Mott Iron Works at the Centennial Exhibition in Philadelphia in 1876. Mott listed the statue in its catalogs from 1874 to 1919, and the Jordan L. Mott Jr. family displayed a copy in the conservatory of their home at 2122 Fifth Avenue in New York. Michael Henry Adams, *Harlem Lost and Found* (New York: Monacelli, 2002), 53, 55. This statue was almost certainly made at the foundry of M. J. Seelig and Co., which listed it in its 1876 catalog. The only statuette Seelig is known to have made is a 20-inch-high copper-plated *Amazon on Horseback Attacked by a Lion,* also listed in the company's 1876 catalog.

[16] J. L. Mott Iron Works, *Illustrated Catalogue of Statuary, Fountains, Vases, Settees, etc., for Parks Gardens and Conservatories* (New York: Slater, 1873), preface. Many of Mott's and Seelig's statues are the same models as those produced by the German zinc foundries. Four copies of Geiss's *Amazon* were examined: at Schloss Fantasie in Donndorf, Germany; in the garden of a private home in Augsburg, Germany; on the grounds of the ill-fated Prince Maximilian's Miramare at Trieste, now in Italy; and in most detail at Armsmear, the home of the gun magnate Samuel Colt in Hartford. These were compared to an American-made copy at the Shelton Historical Society in Shelton, Connecticut, featuring a plaque of the J. L. Mott Iron Works on its fountain base. Copies of other statues produced on each side of the Atlantic have yet to be located for direct comparison.

[17] Many Mott and Fiske catalogs have survived, especially in the collections of the Library of Congress, Winterthur Library, the New York Public Library, the Smithsonian Institution Libraries, and the Metropolitan Museum of Art Print Study Room. For lists and locations of these catalogs, see Grissom, *Zinc Sculpture,* 631–35, 648–52. An important Demuth catalog in the collection of the Library of Congress is now missing pages showing statues, but fortunately they are reproduced in Frederick Fried's *Artists in Wood* (New York: Clarkson N. Potter, 1970), 32–61.

[18] The over 6-foot-high statue of *Franklin* is now located at the Citizens Bank in Providence, along with a $300 receipt for the "bronzed" statue written by a representative of the cast-iron entrepreneur James Bogardus. J. P. Morgan gave a copy of this same *Franklin* to Vassar College, now in front of the Henry M. Sanders Laboratory of Physics. The 6-foot-high statue is illustrated in the 1870 catalog of Janes, Kirtland, and Co., and both sizes are listed in the M. J. Seelig and Co. catalog of 1876. Two copies each of four figures stood on the Swain Building in Philadelphia until 1952, when the building was demolished to make way for the Mall, now known as Independence Park. One of each figure type from the Swain Building is now in the collection of the Free Library of Philadelphia. Margot Gayle and Carol Gayle, *Cast-Iron Architecture in America: The Significance of James Bogardus* (New York: Norton, 1998), 181–84, 248. A second copy of the *Washington* from the collection of the late Stewart E. Gregory was likely from the Swain Building, since it stands atop a square cast-iron plate like statues at the Free Library; it was sold at auction in 1979 (Sotheby Parke Bernet Sale no. 4209, January 27, 1979). A third copy of *Washington* in a private collection in Washington, DC, instead stands on a zinc plate.

Fig. 3. August Kiss, *Amazon on Horseback Attacked by a Lion.* From Moritz Geiss, *Zinkguss-Ornamente nach Zeichnungen von Schinkel, Stüler, Persius, Schadow, Strack, Knoblauch, Stier und Anderen* 9 (Berlin: Lüderitz, 1844), plate 6.

many cast-iron fountains decorated with zinc statues (now replaced with copies). Statuary production seems to have halted during the Civil War, but afterward there was a significant demand for low-cost memorials to the common soldier. Several hundred zinc statues of infantrymen were erected, particularly those made by the Monumental Bronze Co. and its affiliates (fig. 5).[19] Statues of angels named Faith, Hope, and Charity decorated funerary memorials made by the same companies. Indians in the style of their wooden forebears began to be sold by the tobacconist wholesaler William Demuth and Co. as alternative signs for tobacco shops around 1870.[20] As their roles as advertisements for tobacco shops went out of fashion during the 1880s, a statue known as the Indian Chief began to be placed atop civic monuments honoring local Indians, a practice that would continue until at least 1920.[21] Surfaces of these statues were painted or otherwise treated to imitate other materials, mainly bronze but also stone and polychromed wood. The types described here—architectural figures, fountain statues, war memorials, Indians, and cemetery monuments—are representative of the several thousand zinc statues erected in the United States, mainly during the last quarter of the nineteenth century. After 1900, use of zinc for statues diminished

[19] The *Academy Hill Monument* is made of "white bronze," a cast-zinc sandblasted product of the Monumental Bronze Co. A survey of zinc statues of soldiers and other military figures in the United States showed that 78 percent were produced in the trademarked white bronze exclusively made by the Monumental Bronze Co. and its affiliates. White-bronze statues and monuments were made by sand casting, with parts assembled using zinc (instead of the usual lead-tin solder) and surfaces sandblasted to imitate stone. Grissom, *Zinc Sculpture,* 57–61, 85–86, 486–553, 647–48; Carol A. Grissom and Ronald S. Harvey, "The Conservation of American War Memorials Made of Zinc," *Journal of the American Institute for Conservation* 41 (2003): 21–38.

[20] Fried, *Artists in Wood,* 28–75; Grissom, *Zinc Sculpture,* 75–92.

[21] *Tobacco* 4 (February 24, 1888): 3 noted that "men who use Indians generally have goods older than the squaw or buck that stands guard over them."A statue of *Lawrence,* a Christian Indian of the Mohawk nation, was erected atop a fountain in Schenectady in 1887. Among the latest copies of this statue is *Chief Logan* of the Mingo tribe, erected around 1920 on the courthouse grounds in Williamson, West Virginia.

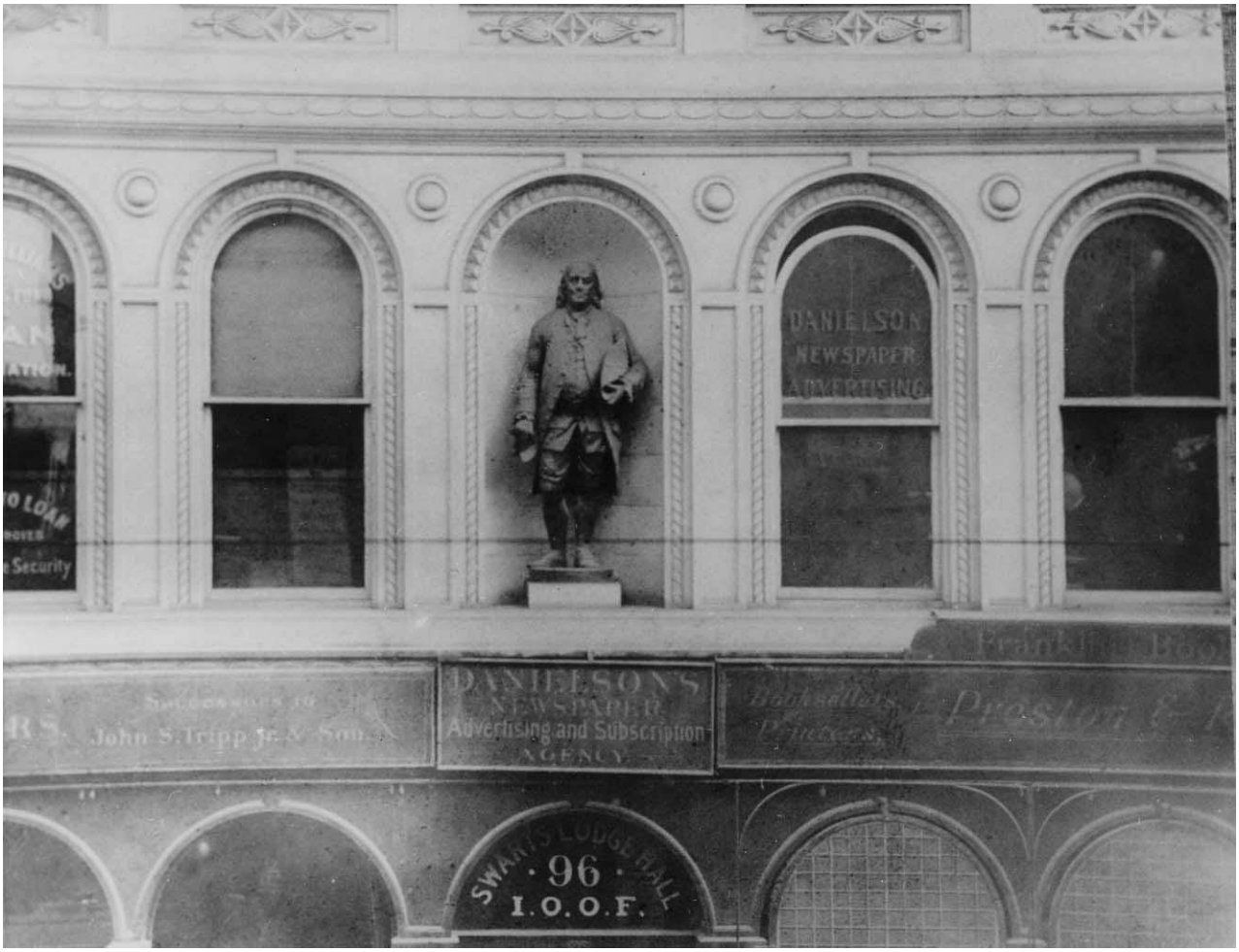

Fig. 4. *Benjamin Franklin,* façade of the Franklin Lyceum, Providence, 1858. Zinc; H. 77″. (Rhode Island Collection, Providence Public Library.)

rapidly as bronze became de rigueur and the period of "statuemania" waned.[22]

Cornelius and Baker

Cornelius and Baker's zinc production was exactly contemporary with early casting of life-size zinc statues in the United States, but the company followed an altogether different path in making statuettes, apparently because of its roots in the light-fixture business as well as differences dictated by scale. Moreover, as will become clear, Cornelius and Baker relied more on France than Germany in regard to both the technology and sources for its zinc statuettes.

The firm was started by Christian Cornelius, a silversmith who had emigrated from Amsterdam to Philadelphia and in 1827 founded Cornelius and Co. as a manufacturer of lamps and chandeliers. It became Cornelius and Son in 1831 after Robert Cornelius (1809–93) joined the firm. Upon Christian's death in 1851, the partnership Cornelius, Baker, and Co. formed between Robert and his brother-in-law Isaac F. Baker; it became Cornelius and Baker in 1855. The company had the honor of being the only American gas-fixture firm to exhibit at the influential Crystal Palace Exhibition in London in 1851.[23] By that time, it employed more than five hundred men and had a showroom on Chestnut Street and two large factory buildings

[22] The last known catalog, J. W. Fiske's *Ornamental Iron and Zinc Fountains* (1953), illustrates statues that the company sold for more than eighty years, such as the figure of a boy holding a fish plumbed to spurt water through its mouth. A *Crucifixion Group* produced by the Chicago-based Daprato Statuary Company was erected in Huron County, Michigan, in 1956. It was made of copper-plated zinc that the company introduced in 1913 and termed "orbronze."

[23] *The Crystal Palace Exhibition: Illustrated Catalogue,* Art-Journal (London) 3 (1851; repr., New York: Dover, 1970), 212.

Fig. 5. Monumental Bronze Co., *Academy Hill Monument,* Stratford, CT, 1889. Zinc; H. 35′. (Photo, Carol Grissom.)

(fig. 6).[24] By far the largest manufacturer of gas-lighting fixtures in the country, in 1860, its annual products were valued at $1,000,000, an enormous sum for that date (see tables 1 and 2). The firm lasted eighteen years, dissolving in 1869 to become Cornelius and Sons, which ceased manufacturing by 1878.

The Cornelius family had a penchant for the latest technology, which fit with its seminal casting in zinc. According to family legend, Christian Cornelius melted down his wife's entire silver service (apart from the cream jug) while experimenting with silver-plating techniques.[25] His son Robert Cornelius studied with eminent chemistry and geology professors and, for a few years beginning in 1839, became an important figure in the new process of daguerreotyping.[26] Two of his contributions to photography are directly related to the family's metalworking business: production of high-quality silver coatings on the copper plates used for daguerreotypes and development of a polish that produced a particularly smooth finish on their silver surfaces. He was also among the first to use a bromine accelerator that reduced exposure time, contributing to the immediacy for which his portrait daguerreotypes are known. Already in 1841 he received the first of fifteen patents related to lighting, but he devoted himself full time to the gas-fixture company only in 1842, when the use of gas for illumination began to take off in Philadelphia.[27] Englishmen reporting to the British government on US industry at the Crystal Palace Exhibition held in New York (1853–54) noted the firm's "immense advantage over both foreign and domestic competitors" on account of Robert Cornelius's "various discoveries and expedients, both mechanical and chemical."[28]

In the early years, Cornelius and Son formed lighting fixtures mainly in brass: ordinary candlesticks for daily use and high-end gilt-brass girandoles for display on parlor mantels. The three-branched

[24] Census records show 529 employees for the company in 1850 and 550 in 1860. US Census, Manufacturing Schedules for Philadelphia, 1850 and 1860, both accessed at the National Archives, Washington, DC. Montgomery Meigs reported that the company employed around 500 men when he visited in 1855. Wendy Wolff, ed., *Capitol Builder: The Shorthand Journals of Montgomery C. Meigs, 1853–1859, 1861* (Washington, DC: US Government Printing Office, 2001), 280; available at http://www.access.gpo.gov/congress/senate/meigs/index.html. *The Crystal Palace Exhibition* noted 700 men in 1851, but that number is apparently an exaggeration.

[25] William Cornelius, "A Brief History of Robert Cornelius," *Papers Read before the Historical Society of Frankford* 3 (1937): 110–13.

[26] William F. Stapp, *Robert Cornelius: Portraits from the Dawn of Photography* (Washington, DC: Smithsonian Institution Press, 1983). An important 1839 *Self-Portrait of Robert Cornelius* is now in the collection of the Library of Congress, accessible at http://www.loc.gov/pictures/resource/cph.3g05001/#.

[27] Robert Cornelius's first patent was for a droplight (US Patent 2008, March 18, 1841). Six patents were for some version of "gas lighting by electricity, frictional spark generator." The first of these was US Patent 32354, May 21, 1861, and the last, US Patent 44708, October 18, 1864.

[28] Joseph Whitworth and George Wallis, *The Industry of the United States in Machinery, Manufactures, and Useful and Ornamental Arts* (London: Routledge, 1854), 125–26; the same account is published as George Wallis, "Special Report of Mr. George Wallis," in *New York Industrial Exhibition* (London: Thomas Harrison, 1854), 99 (note).

Fig. 6. "Cornelius, Baker & Co., Manufacturers of Lamps, Chandeliers, Gas Fixtures, &c…," W. H. Rease, lithographer, Wagner and McGuigan, printers, Philadelphia, ca. 1856. (Library Company of Philadelphia.)

Table 1
Data on Cornelius Lamp and Gas-Fixture Companies Extracted from US Census Records

Year	Company	Capital invested	Value, raw material	Average number hands	Annual wages	Value, products
1850	Cornelius & Co., Mulberry Ward	$300,000	$14,200	500	$122,400	$500,000
1860	Cornelius & Baker, E. D. of 10th Ward	$700,000	$6,000	550	$204,000	$1,000,000
1870	Cornelius & Sons, 28 District, 10th Ward	$600,000	$290,000	500	$300,000	$650,000
1880	Cornelius & Co., Manufacturers	$1,500	$200	5	$2,000	$5,500

Source.—Data from the US Census Manufacturing Schedule for Pennsylvania, accessed at the National Archives, Washington, DC.

girandoles were sold in sets of three, often decorated with two-dimensional figural reliefs cast in simple two-part sand molds.[29] The backs were undecorated but would not be seen when displayed against a chimney breast. As chandeliers became more popular with the advent of gas, three-dimensional figures would have been desirable, and it seems likely that Cornelius and Baker began to cast in zinc to more cost effectively make three-dimensional decorations for them. Once metal molds were made, three-dimensional castings could be produced quickly in zinc by the slush-casting technique. For a commercial firm like Cornelius and Baker, time was money, and the company subsequently produced an enormous quantity of decorations for lighting fixtures in zinc, including statuettes.

The exact date that Cornelius and Baker began to cast in zinc is unrecorded, but the company would certainly have become aware of the possibilities of zinc through its attendance at the Crystal Palace Exhibition in 1851, where Geiss's zinc *Amazon* was considered "*the* object of the Exhibition: about this doubts seem at rest."[30] Names of fixtures listed as displayed by the company at the Franklin Institute in 1853 can be associated with known zinc-decorated chandeliers, suggesting that Cornelius and Baker had begun casting in zinc by that date.[31] By 1855, the company was definitely producing chandeliers decorated with zinc castings for the Tennessee State Capitol, as well as zinc capitals for the US Capitol (figs. 7 and 8).[32] Statuettes and reading lights known to have been made of zinc were exhibited by Cornelius and Baker in catalogs of exhibitions at the Franklin Institute in 1856 and 1858.[33] At the same time, the company continued producing

[29] See H. Parrott Bacot, *Nineteenth Century Lighting: Candle-Powered Devices, 1783–1883* (West Chester, PA: Schiffer, 1987), 153–99, for an excellent discussion of girandoles. There are a few notable exceptions to the usual two-dimensional girandole figures. Three-dimensional gilt-brass statuettes of *George Washington* and *Benjamin Franklin* on three-branched girandoles attributed to the Cornelius firm appear to be identical to zinc figures on the Presidential Chandelier (1864) in the US Capitol. The model used for brass casting could have been used for creating molds for slush casting, but the entirely different methods for casting brass and zinc figures would have necessitated use of different molds.

[30] C. H. Gibbs-Smith, *The Great Exhibition of 1851* (London: Her Majesty's Stationery Office, 1950), 132.

[31] Franklin Institute, *Catalogue of the Twenty-Third Exhibition of American Manufactures, Held in the City of Philadelphia by the Franklin Institute of the State of Pennsylvania, for the Promotion of the Mechanic Arts, from the 18th to the 29th day of October, 1853* (Philadelphia: William S. Young, 1853), 14–15. Likely chandeliers with zinc decorations listed in the 1853 catalog include "2 15 Light Chandeliers, Indian figure with Flambeau" and "2 6 Light Chandeliers, Crusaders." The former probably refer to one of several Indian statuettes made by the company; the latter may refer to the Richard Coeur de Lion–type figures on armorial chandeliers purchased for the US Senate hallway around 1858 and a Richard Coeur de Lion reading light listed in the 1858 Franklin Institute exhibition. Franklin Institute, *Report on the Twenty-Sixth Exhibition of American Manufactures, Held in the City of Philadelphia, from October 15, to November 13, 1858, by the Franklin Institute, of the State of Pennsylvania, for the Promotion of the Mechanic Arts: Together with a Catalogue of the Articles Deposited previous to October 15, 1858* (Philadelphia: William S. Young, 1858), 11. In the company's 1854 display, several items described as "bronze" were almost certainly made of zinc and painted to imitate bronze. Franklin Institute, *Report on the Twenty-Fourth Exhibition of American Manufactures, Held in the City of Philadelphia, from November 14, to December 2, 1854, by the Franklin Institute, of the State of Pennsylvania, for the Promotion of the Mechanic Arts: Together with a Catalogue of the Articles Deposited previous to November 14, 1854* (Philadelphia: Barnard & Jones, 1855), 18. Moreover, a statement about figures indicates the three-dimensional modeling afforded by slush casting in zinc: "A very decided improvement is noticed in the modeling, especially in the execution of the human figure." Ibid., 57.

[32] Montgomery Meigs saw chandeliers for the Tennessee State Capitol in production at Cornelius and Baker in 1855. The capitals at the US Capitol are found atop columns and pilasters on principal stairways leading to Senate and House chambers. Meigs correctly noted that they were cast in zinc but wrongly said that they were "afterwards bronzed by the electrotype." Wolff, *Capitol Builder,* 135, 234–35, 280–81. Rather, the acanthus-leaf decorations cast in zinc were painted to imitate bronze, backed by gold-colored spun-brass drums. W. T. Chase, "Final Report: Examination of Column Capitals in Senate Staircase, U.S. Capitol Building," unpublished report, Architect of the Capitol records, February 9, 1999. Spun-brass globes and other elements were typical backdrops for zinc decorations on chandeliers, such as those at the Vermont and Massachusetts state capitol buildings.

[33] Franklin Institute, *Report on the Twenty-Fifth Exhibition of American Manufactures, Held in the City of Philadelphia, from the 11th to the 29th day of November, 1856, by the Franklin Institute, of the State of Pennsylvania, for the Promotion of the Mechanic Arts, Together with a Catalogue of the Articles Deposited previous to November 10, 1856* (Philadelphia: Barnard & Jones, 1857), 17–18; Franklin Institute, *Report on the Twenty-Sixth Exhibition,* 10–11.

Table 2
Total Value of Lamp and Gas-Fixture Products and Number of Companies in Three Cities

Year	Cornelius total	Cornelius %	Philadelphia (No. of companies)	New York City (No. of companies)	Boston (No. of companies)	Total
1850	$500,000					
1860	$1,000,000	50	$1,400,000 (6)	$600,000 (17)		$2,000,000
1870	$650,000	12	$1,200,000 (9)	$1,300,000 (16)	$3,000,000 (10)	$5,500,000
1880	$5,500	<1	$400,000 (5)	$2,500,000 (14)	$50,000 (2)	$2,950,000

Source.—Data on Cornelius companies from the US Census Manufacturing Schedule for Pennsylvania. Data for 1860 from US Census Office, *Manufactures of the United States in 1860* (Washington, DC: Government Printing Office, 1865), 523 (Philadelphia), 381 (New York). Data for 1870 from Francis A. Walker, *The Statistics of the Wealth and Industry of the United States, Ninth Census* (Washington, DC: Government Printing Office, 1872), 3:728 (Philadelphia), 3:703 (New York), 3:677 (Boston). Data for 1880 from US Census Office, *Report on the Manufactures of the United States* (Washington, DC: Government Printing Office, 1883), 422 (Philadelphia), 417 (New York), 262 (Boston).

Note.—Amounts are rounded to the nearest $100,000 or, when below this amount, the nearest $10,000.

girandoles in gilt brass through at least 1858 and probably years later (many clients would not yet have had access to gas); only one girandole, however, is known to have been decorated with a figure cast in zinc.[34]

Analyses of samples confirm that Cornelius and Baker employed the nearly pure zinc necessary for successful casting, although the metal is often incorrectly referred to as pot metal, white metal, or—the favorite term of antique dealers—spelter.[35] Yet, the company never seems to have advertised its use of zinc. While there is considerable detail about its brass and bronze casting in contemporary literature, casting in zinc is rarely mentioned.[36] The company's figural lighting fixtures made for state houses in Ohio and Tennessee and Philadelphia's Academy of Music are repeatedly cited without any reference to their zinc composition. Rather, zinc "statues" and "reading lights" (often featuring "statues" with the same names) exhibited by Cornelius

[34] In 1858, Cornelius and Baker exhibited "15 Sets Girandoles. Assorted patterns. Silver and Gilt." Franklin Institute, *Report on the Twenty-Sixth Exhibition,* 11. Apparently on account of the Civil War, this was the last exhibition until the twenty-seventh exhibition in 1874, which displayed only gas fixtures. Franklin Institute, *Catalogue of the Franklin Institute Exhibition, Open from the 6th to the 31st October, 1874* (Philadelphia: Jackson Brothers, 1874), 24. An imitation-bronze zinc figure of a Putto with Wheat (Summer?) is exceptional in appearing on an otherwise gilt-brass girandole attributed to the company. Bacot, *Nineteenth Century Lighting,* 193. The same figure appears on the Presidential Chandelier (1863) at the US Capitol and on a Cornelius and Baker chandelier at the Vermont State House, although the latter is not original to the building.

[35] Results for energy-dispersive X-ray analyses performed at the Smithsonian's Museum Conservation Institute showed that sculptural decoration of Cornelius and Baker's armorial gasolier in the collection of the US Senate and the Smithsonian American Art Museum's *Andrew Jackson on Horseback* were made with remarkably pure zinc. Carol A. Grissom, "Final Report on a Technical Study of the Cornelius & Baker Armorial Gasolier of the U.S. Senate," unpublished report no. 6091, Smithsonian Museum Conservation Institute, February 28, 2007; Carol A. Grissom, "Addendum to the Final Report on the Smithsonian American Art Museum's *Andrew Jackson on Horseback,*" unpublished report no. 5964, Smithsonian Museum Conservation Institute, Washington, DC, 2007. X-ray fluorescence analyses of three Cornelius and Baker statuettes in a private collection also showed that the primary constituent was zinc. Catherine Matsen, Winterthur Analytical Report no. 5126, Scientific Research and Analysis Laboratory, Winterthur Museum, November 10, 2008. Results for nearly 300 analyses of zinc statues in Germany showed an average amount of 98 percent for zinc, 1.8 percent for lead, 0.2 percent for tin, 0.11 percent for iron, 0.06 percent for cadmium, and 0.01 percent for copper. Josef Riederer, "Korrosionsschäden an Zinkskulpturen," in *Korrosionsschäden an Zinkskulpturen,* 102–35. Similar amounts have been found for American sculpture. Carol A. Grissom, "The Conservation of Outdoor Zinc Sculptures," in *Ancient and Historic Metals,* ed. David A. Scott, Jerry Podany, and Brian B. Considine (Los Angeles: Getty Conservation Institute, 1994), 279–304.

[36] C. T. Hinckley, "The Manufacture of Gas and Gas Fixtures," *Godey's Lady's Book* 46 (March 1853): 197–203. It is possible that zinc was not yet being cast at the factory when copper-alloy casting was observed for this 1853 publication. The account is repeated in essence in five references that follow. Whitworth and Wallis, *The Industry of the United States,* 125–30, and essentially the same account published as Wallis's "Special Report of Mr. George Wallis," 98–104; *Description of the Establishment of Cornelius & Baker, Manufacturers of Lamps, Chandeliers & Gas Fixtures, Philadelphia* (ca. 1858; repr.; Rushlight Club, 1999), 23–24. The date that this twenty-four-page pamphlet was written can be established by the fact that statues for the House of Representatives clock are about to be sent out, an event which occurred in 1858. The original introduction, however, notes that the text had already been "published in one of our daily papers"; hence, the publication of the pamphlet may have been later than the date of the account. Edwin T. Freedley, *Philadelphia and Its Manufactures: A Handbook Exhibiting the Development, Variety, and Statistics of the Manufacturing Industry of Philadelphia in 1857* (Philadelphia: Edward Young, 1859), 352–56. Edwin T. Freedley, *Philadelphia and Its Manufactures: A Handbook of the Great Manufactories and Representative Mercantile Houses of Philadelphia in 1867* (Philadelphia: Edward Young, 1867), 416–19; Greeley et al., *The Great Industries of the United States*; Charles Robson, ed., *The Manufactories and Manufacturers of Pennsylvania in the Nineteenth Century* (Philadelphia: Galaxy, 1875), 510–11.

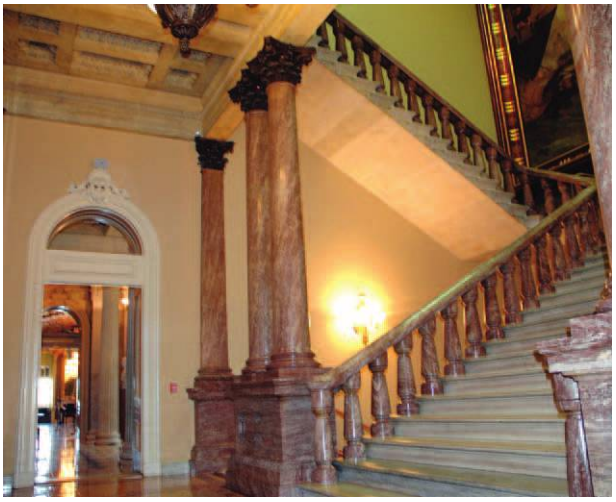

Fig. 7. Cornelius and Baker, Senate staircase capitals, US Capitol, 1855. Zinc and brass. (Photo, Carol Grissom.)

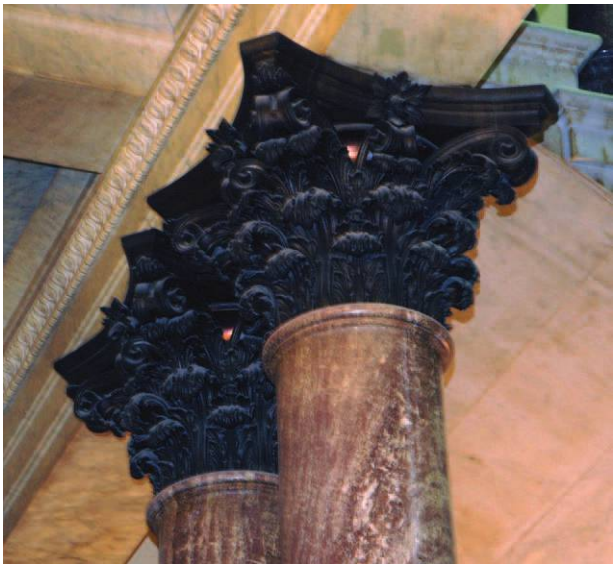

Fig. 8. Detail of capitals in fig. 7. (Photo, Carol Grissom.)

and Baker at the Franklin Institute in 1856 and 1858 are invariably referred to as "bronze."[37] An 1875 catalog issued by the next iteration of the company (Cornelius and Sons) identified thirteen bronze finishes available for its light fixtures without mentioning zinc, nor is zinc mentioned for items displayed by the company at the Centennial Exhibition in Philadelphia in 1876.[38] This was not unique to the Cornelius companies: other gas lighting companies generally did not identify their metalwork as zinc, particularly in trade catalogs. Moreover, this phenomenon was not confined to the United States. In France, bronze founders became so enraged with what they saw as the abusive use of "bronze" for zinc that in 1910 they formally established that the term "bronze" could be used only for copper-containing items and that the term "bronze-imitation" had to be used for those that did not contain copper; in 1935, a law was enacted in France that bronze had to contain greater than 65 percent copper.[39] Finally, ignorance of the metal is not confined to the nineteenth century. In his late twentieth-century introduction to the reprint of an 1860 catalog of lamps produced by his family's Dietz and Co., Ulysses Dietz correctly noted that many were made of spelter, but he incorrectly identified this old-fashioned term for zinc as "a copper and nickel alloy."[40] Even the preeminent authority on gas fixtures, Denys Peter Myers, failed to identify many gas fixtures illustrated in his important reference as made substantially of spelter, in other words, zinc.[41]

While nineteenth-century literature is largely silent on reasons for the lack of recognition of zinc, we can speculate. The metal, its cast surfaces dull gray, was considered unattractive.[42] Surfaces of zinc works of art were invariably treated to imitate other

[37] That the statues and reading lights were made of zinc is ensured by reference to known statuettes corresponding to items listed in Franklin Institute catalogs. In the 1856 exhibition, "bronze" items included statues of "Zouave & Highlander," "Mercury," "Buffalo," "Stag," and "Glove and Books"; a "1 Lt. Pillar" also featuring "Mercury"; reading lights featuring "Tamborine," "Brigand," "Franklin," "Washington," "Water Carrier," "Knight," and "Hunter"; and a "Segar Lighter" featuring an "Old Man." Franklin Institute, *Report on the Twenty-Fifth Exhibition,* 17–18. In 1858, "bronze" items included statues listed as "Indian and Hunter," "Zouave and Highlander," "Indian," "Departure and Return," "Horse Prior," "Russian Hussar," and "Fireman"; a "1 Lt. Pillar Morning"; and reading lights featuring "Herald," "Grecian," "Antique," "Armor," "Page," "Chinese," "Indian," "Hawker," "Warrior" (apparently three different statues), "Richmond," "Departure," "Return," "Standard Bearer," and "Richard Coeur de Lion." Franklin Institute, *Report on the Twenty-Sixth Exhibition,* 10–11.

[38] "Either of the following colors of Bronze at the same prices: ROYAL, FRENCH, VERDE, ROYAL AND ROMAN, VIENNA AND ROMAN, MOORISH, VIENNA AND LAVENDER, ROYAL AND LAVENDER, VIENNA AND GREEN, NEW VERDE, ETRUSCAN, ARGENTINE." Cornelius and Sons, *Gas Fixtures,* no. 7, 1875 price list. Phillip T. Sandhurst, *Industrial and Fine Arts of the World: As Shown at the Philadelphia and Other International Exhibitions* (Philadelphia: Ziegler, 1879), 284, 289, 290.

[39] In 1910, an accord was established by the Réunion des fabricants et des industries du bronze in agreement with the Chambre syndicale du bronze d'art. Marie-Thérèse Baudry, *Sculpture: Méthode et vocabulaire* (Paris: Imprimerie nationale, 2000), 300, 643.

[40] *Victorian Lighting: The Dietz Catalogue of 1860* (Watkins Glen, NY: American Life Foundation, 1982), 18.

[41] Myers, *Gas Lighting.* Myers identifies only the chandelier in plate 63 as made of "spelter," thus failing to correctly identify fixtures with zinc decorations at the Vermont State Capitol (plate 53) and in the President's Room at the US Capitol (pl. 54). Figures on fixtures illustrated in another fifteen plates are likely made of zinc (plates 23, 26, 27, 37–39, 43, 45, 48, 50–51, 56–57, 78–79).

[42] One author described the color as "repulsive" and "inartistic." Charles Tomlinson, ed., *Cyclopaedia of Useful Arts, Mechanical and Chemical, Manufactures, Mining, and Engineering* (London: Virtue, 1852), 1:xcvi. The eminent American sculptor J. Q. A. Ward (1830–1920) wrote that "there is no way of keeping the zinc in presentable condition except by painting or electroplating with copper, neither permanent." Michael Richman, *Daniel Chester French: An American Sculptor* (New York: Metropolitan Museum of Art, 1976), 41.

materials, which effectively rendered the metal invisible. This contributed to a general lack of knowledge of the metal, which is still largely in evidence today. It is rare to find zinc statues correctly identified in spite of the metal's popularity for decorative objects with an industrial quality, such as Pottery Barn's 2002 "zinc collection" of ashtrays and vases, and its use as a metal for cladding buildings, such as Raimund Abraham's award-winning Austrian Cultural Institute (2002) in New York City. Cornelius and Baker's successful painting of its zinc decorations in imitation of bronze, a metal alloy that was far better known, gave them a desirable association with fine art. Thus, in referring to its statuettes and gas fixtures as bronze, Cornelius and Baker took the more conventional (and lucrative) approach to be expected from a commercial enterprise.

Slush Casting

Captain Montgomery Meigs was a rare contemporary exception in correctly referring to Cornelius and Baker's zinc castings as made of zinc, perhaps on account of his training as an engineer and his wide-ranging curiosity. As superintendent in charge of construction of the US Capitol extensions for the Senate and House of Representatives chambers from 1853 to 1859, he proposed that Cornelius and Baker make capitals for the Senate staircase in October 1854, noting in his journal in February 1855 that they were to be cast in zinc.[43] Beginning around 1857, Meigs also ordered many zinc-decorated chandeliers and gas fixtures from Cornelius and Baker for the building, such as those for the Senate hallway (fig. 9).[44] Moreover, after visiting Cornelius and Baker's premises in June 1855, he described the technique of slush casting used at the factory: "The small figures … used as decorations for the chandeliers … are cast in a moment, and the mold has a large orifice, being reversed. The liquid material pours out, except a small quantity which is chilled by contact with sides of the mold and which remains to make the figures. These figures, which are made of zinc, are afterwards colored by various processes and made to imitate bronze or gold, as needed."[45]

[43] Wolff, *Capitol Builder,* 135, 234–35. In April and May of 1855, Meigs also had the head of the Capitol's foundry Federico Casali cast a snake and a lizard in zinc. Ibid., 265, 267.

[44] The shield and associated weapons at the center of the chandelier were cast in brass, but other sculptural decorations, such as the armets on either side of the shield, were slush cast in zinc, which probably had a bronze finish when new. A more elaborate chandelier recently acquired by the US Senate features figures that may be associated with crusaders or Richard Coeur de Lion.

[45] Wolff, *Capitol Builder,* 280.

Fig. 9. Cornelius and Baker, chandelier, originally in the main entrance to the Senate chamber, US Capitol, 1858. Zinc and brass; H. 41″. (Collection of Daniel W. Mattausch and Nancy E. Mattausch; photo, D. E. Hurlbert, Smithsonian Institution.)

Slush casting can be used only for small castings because a single person has to manipulate the composite of metal molds into which molten zinc is poured, sloshed around to coat the mold surfaces evenly, and poured back out. The method takes its name from the slushy character of the cooling metal as it is poured out. For millennia, a similar process has been used for casting plaster and coating molds with wax during lost-wax casting. Its prior use for metal casting, however, was limited mainly to casting small items such as spouts and spoons in low-melting alloys like pewter.[46]

[46] M. Salmon, *Art du potier d'étain* (Paris: Moutard, 1788), 62, plate 8. Salmon's illustration is reprinted in Ledlie Irwin Laughlin, *Pewter in America: Its Makers and Their Marks* (New York: American Legacy Press, 1981), 1:17, plate 3.

The metal molds required for slush casting in zinc were expensive on account of the skilled craftsmanship required to make them, and slush casting became economical only when small items were wanted in multiples, such as for the decorative and interchangeable parts of Cornelius and Baker's multiarmed chandeliers and other elements of lighting fixtures.[47] Not only did the molds have to be properly divided to allow the zinc casting to be freed without being caught by undercuts, but precise fitting together of the molds was desirable to minimize finishing at mold junctures (parting lines) after casting. The molds had to be made of a metal with a higher melting point than zinc, but there are no records indicating what metal Cornelius and Baker employed. Brass seems most likely, however, since it was easy to finish and used for molding zinc statuettes made by the Ansonia Clock Company in 1884; more tedious-to-finish cast iron was used for J. W. Fiske's slush-casting molds for statue parts.[48] Once made, metal molds produced excellent detail and significantly reduced the amount of time that would be required for finishing other types of castings. Thus, copies could be reproduced quickly and inexpensively. A contemporary comparison of slush casting and sand casting notes: "It is not the difference in cost of metal which accounts for comparative cheapness of the immitation [*sic*] bronze. It is the economy in the cost of labor. Real bronze can be cast only in sand moulds, hence the process is difficult and slow, a new mould being required for every piece cast; while zinc is readily cast in metal moulds which last for years."[49]

The technique of slush casting in zinc was developed in France, where it is said to have been discovered in 1845.[50] It was the principal method in use in Paris for casting zinc until the end of the nineteenth century. The strong Parisian bronze-casting industry provided high-quality molds that enabled production of an enormous quantity of French statuettes, which were exported in large quantities, especially to the United States.[51] One critic noted: "Walking the streets we are attracted, in almost every window where fancy goods are exposed, to a crowd of statuettes looking like bronze, and representing every pose and contortion of the human figure—Gladiators, Venuses, Cupids, Mercurys, Nymphs, Satyrs and Hunting Dianas. … An ordinary worker can make twenty of these a day, and thousands of such workmen are employed in France and Germany making them up 'for the American market.'"[52] French workmen may have brought the technique to Cornelius and Baker, although it is likely that the company's experienced workmen could also have produced the requisite metal molds.[53] However, slush-cast zinc statuettes seem to have been rarely produced in Germany.[54]

A Detailed Look at the Exceptional *Andrew Jackson on Horseback*

The best-known zinc statuette produced by Cornelius and Baker is the 2-foot-high *Andrew Jackson on Horseback* (fig. 10), almost certainly made from a plaster

[47] That Parisian slush-casting molds were "very costly" is noted by G. W. Yapp, ed., *Art Industry: Metal-Work* (London: Virtue, 1878), 37.

[48] "Clock Making and Its Progress in Brooklyn: The Ansonia Works Described—the Metals and Minerals Used in Watch Making," *Brooklyn Eagle,* August 24, 1884, 11; available at http://eagle.brooklynpubliclibrary.org/. See n. 10 regarding Fiske's slush-casting molds.

[49] Asher and Adams, *Asher and Adams Pictorial Album of American Industry, 1876* (New York: Rutledge, 1976), 49; this is a reprint of selections from the 1876 edition published by Asher and Adams under the title *Asher & Adams' New Columbian Rail Road Atlas and Pictorial Album of American Industry.*

[50] Julien Turgan, "Mines et fonderie de zinc de la Vieille-Montagne," in *Les grandes usines: Ètudes industrielles en France et à l'étranger* (Paris: Michel Lévy Frères, 1865), 3:238; M. G. Servant, *Rapport sur les bronzes d'art, fonts diverses, métaux repoussés* (Paris: Imprimerie nationale, 1880), 6; Paul Poiré, *La France industrielle ou description des industries françaises,* 3rd ed. (Paris: Hachette, 1880), 624; Albert Susse, *Bronzes d'art et d'ameublement,* Rapports, Commissariat Général à l'Exposition internationale de Chicago (Paris: Imprimerie nationale, 1894), 32–34.

[51] In 1878, e.g., there were 1,200–1,300 workmen at seventy-five companies producing around 9 million articles. *Exposition universelle internationale de 1878 à Paris, Catalogue official* (Paris: Imprimerie nationale, 1878), 2:196. As many as 80 percent of the candelabra and statuettes made by the Parisian firm of J. Boy are said to have been exported. Bernard Metman, "Répertoire des fondeurs du XIX^{e} siècle," *Documents sur la sculpture française et répertoire des fondeurs du XIX^{e} siècle,* Archives de l'Art français, n.s., 30, no. 178 (Nogent-le-Roi: Libraire des Arts et Métiers-Éditions, 1989). Candelabra with figures sculpted by Albert Carrier-Belleuse, which were sold by Boy, still decorate the staircase of the Union League of Philadelphia. Grissom, *Zinc Sculpture,* 271. New York–based gas-fixture companies are known to have imported items. Archer and Pancoast Manufacturing Company, e.g., advertised itself as an "Importer of French Bronzes and Crystal Chandeliers." Archer and Pancoast Manufacturing Company, advertisement, *American Gas-Light Journal* 22 (January 2, 1875): 14. Although it is unclear whether Mitchell, Vance, and Co. imported statuettes, the company was listed as "Mfrs. & Imps. Gas Fixtures" in an 1859 R. G. Dun and Company report, New York, vol. 323, p. 842, R. G. Dun & Co. Collection, Baker Library Historical Collections, Harvard Business School.

[52] "Cheap Art," *Crayon* 2 (October 17, 1855): 248.

[53] Workmen at the company were said to include "eight or nine Englishmen, the rest being Germans, French, and Americans; but the majority are undoubtedly native workmen." Freedley, *Philadelphia and Its Manufactures: A Handbook Exhibiting the Development,* 356.

[54] Production of life-sized statues from sand casts was dominant in Germany. The only known examples of smaller items are models for large bronze sculptures, which include Ferdinand von Miller's maquette (1869) for the *Tyler Davidson Fountain* in Cincinnati, now in the collection of the Cincinnati Art Museum (acc. no. 1952.198), and a reduction of the *National Monument to Our Forefathers* (1889) after William Rimmer at Plymouth, Massachusetts, in a private collection.

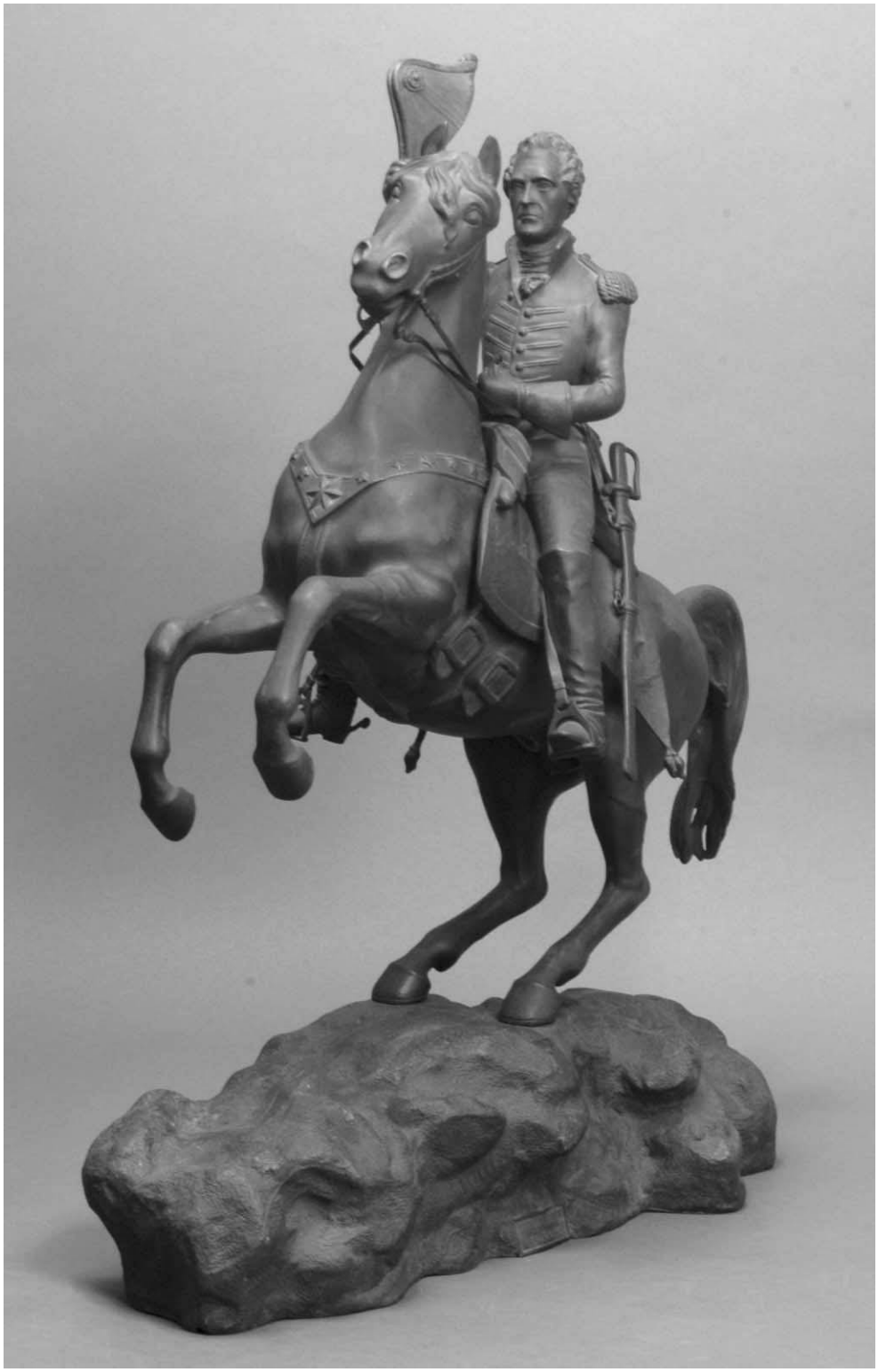

Fig. 10. Cornelius and Baker after Clark Mills, *Andrew Jackson on Horseback*. Marks: "PATENTED/ May 15/1855" (*right base*); "CORNELIUS & BAKER/ PHILADELPHIA" (*left base*). Zinc; H. 24″. (Tennessee State Museum, Nashville; photo, Shelley Reisman Paine.)

model for Clark Mills's over-life-size bronze statue erected in 1853 in Lafayette Square opposite the White House. In 1855, Mills submitted an illustration of the monument for a design patent, probably in anticipation of both the statuettes and a full-scale bronze copy in New Orleans (1856).[55] An inscription cast into the statuette's right base, "PATENTED/ MAY 15/1855," references the sculptor's application for the design patent, while Cornelius and Baker's die-stamped brass label was generally soldered to the corresponding spot on the left base (fig. 11).[56] No further documentation has been located regarding Mills's relationship to the Cornelius and Baker statuettes, but in 1859, a copy of the statuette was given to the White House, where it remains today.[57] A second copy of the *Jackson* statuette entered the collection of the New-York Historical Society in 1859.[58] More recent interest in these statuettes is attested by the fact that at least nine were acquired by museums from private collections over the past thirty years.[59] Around twenty copies are known, and more likely exist. Purchase prices have steadily increased to nearly six figures.

A plaster model shown to the monument committee in mid-1848 has been proposed as the original model for the statuette based on its poor likeness of Jackson, since at that date, Mills had not yet studied Jackson's portraiture in detail.[60] At least two plaster models with connections to Mills are extant: one in the collection of the North Carolina Museum of History (fig. 12) and the other at the Maryland Historical Society. These two plaster models are comparable to the zinc statuette in dimensions and form, including the rendition of Jackson's face, although the three are not identical.[61] The North Carolina copy is more detailed than the Maryland copy: the braid pattern is defined on Jackson's epaulets, for example, whereas it is not on the Maryland copy. These discrepancies do not pose a problem, however, since other plaster copies are known to have been made.[62] Moreover, Cornelius and Baker's foundry might well have altered whatever plaster model it received prior to casting.[63]

Fig. 11. Detail, Cornelius and Baker plaque, *Andrew Jackson on Horseback.* Brass. (Private collection; photo, Carol Grissom.)

Examination of ten copies of the *Andrew Jackson on Horseback* revealed many details about the company's fabrication methods.[64] Each was soldered together from more than twenty cast-zinc sections

[55] US Patent application, no. 704, May 15, 1855. The statuette may have been used as part of fund-raising efforts for the full-sized New Orleans bronze, since a number of statuettes have been found in collections in the New Orleans area. Shapiro, *Bronze Casting,* 181 n. 68. In 2006, a copy was sold from the New Orleans collection of Ray and Martha Ann Samuel by New Orleans Auction Galleries, sale 0603, lot 58, May 20. At least three others have been sold from New Orleans collections by James Graham and Sons in New York. Cameron Shay, personal communication, 2005–6.

[56] The plaque located at the bottom edge of the left base below the horse's rear hooves reads "CORNELIUS & BAKER/ PHILADELPHIA." Apparently, the same die was used to stamp plaques for a number of years: letters on *Jackson* and other Cornelius and Baker statuettes have identical spacing, tilt, and heights.

[57] White House acc. no. 1859.1451.1.

[58] New-York Historical Society acc. no. 1859.6.

[59] Other Washington, DC, copies are found in collections of the Smithsonian's National Portrait Gallery (acc. no. 85.8), US Department of Treasury, and Blair House (acc. no. BH-2007.0167). Copies are also in the collections of the Morris Museum of Art, Augusta, GA (acc. no. 1989.03.236); Crystal Bridges Museum of American Art, Bentonville, AK; Tennessee State Museum, Nashville (acc. no. 2001.101); Andrew Jackson Historical Park Museum, Lancaster County, SC; Virginia Military Institute, Lexington (acc. no. 1982.0050); and Virginia Museum of Fine Arts, Richmond (acc. no. 2006.37). A copy formerly in the collection of the Greenville County Museum of Art in Greenville, SC, is now in private hands.

[60] James B. Barber, *Andrew Jackson: A Portrait Study* (Washington, DC: National Portrait Gallery, 1991), 216.

[61] The plaster model in Raleigh (acc. no. 51.42.1–2) was given by Mills to a Presbyterian minister, David X. Junkins, and to the museum in 1951 after several changes in ownership. The copy in the collection of the Maryland Historical Society (acc. no. 1945.30.1) was given by Mills to Charles W. Buckingham, the uncle of its donor (Mrs. Raymond Hughes).

[62] Clark Mills was a plasterer by training, and he likely made many copies. Two additional plaster statuettes, e.g., are known to be lost. Mills presented a copy to a Mr. Ravenel, which was destroyed in Charleston during the Civil War. D. E. Huger Smith to John Bennett, January 30, 1918, Catalogue of American Portraits, National Portrait Gallery, Smithsonian Institution, Washington, DC. A copy in the National Collection of Fine Arts (no. XX12), a forerunner of the Smithsonian American Art Museum, has been missing since 1977.

[63] In another instance, Meigs was unhappy with Francis Vincenti's plaster models for the US Senate stairway capitals, and when he sent them to Cornelius and Baker, he exhorted the company to "exhaust the skill of their artists and chasers upon them before they begin to cast." Wolff, *Capitol Builder,* 201. By "chasers," Meigs apparently meant the men who finished the plaster models; normally, the term is applied to those who finish metal objects.

[64] Copies were examined in the collections of the Crystal Bridges Museum of American Art (before acquisition by the museum), Blair House, the National Portrait Gallery, the Smithsonian's American Art Museum, the White House, the New-York Historical Society, the Tennessee State Museum, the Virginia Military Institute, the Virginia Museum of Fine Arts, and a private collection (formerly in the collection of the Greenville County Museum of Art).

Fig. 12. Cornelius and Baker, *Andrew Jackson on Horseback*. Plaster, copper reins (replacements); H. 25″. (North Carolina Museum of History, Raleigh; photo, Eric N. Blevins.)

in addition to sheet-zinc horse's reins, stirrup straps, and sword straps (fig. 13).[65] This is not surprising given the complex form of an equestrian statue, but it is far more than for most other Cornelius and Baker statuettes, typically comprising only a

[65] Two additional castings are not visible in the view illustrated in fig. 13. Small cast pieces are also part of the horse's tack, while other portions of the tack were cut from sheet zinc. Sand casting was probably used for simpler parts of the statuette, such as the four parts of the *Jackson* statuette's base that lack undercuts requiring piece molding.

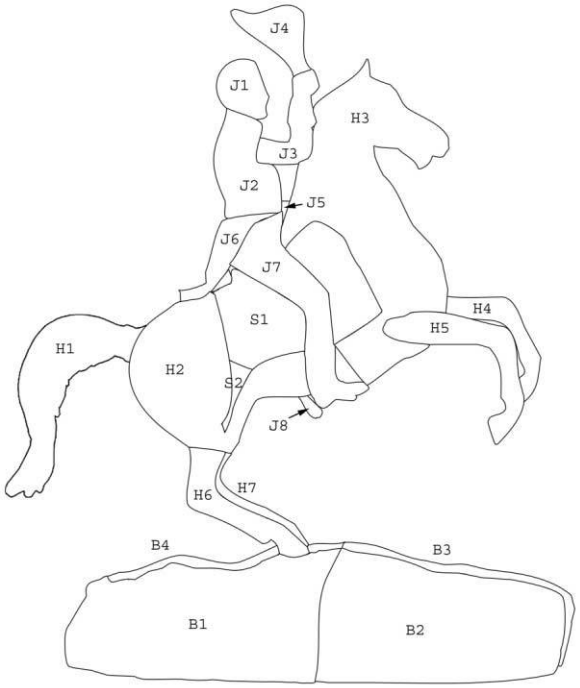

Fig. 13. Schematic drawing of *Andrew Jackson on Horseback* showing twenty-one castings. (B) base; (H) horse; (S) saddle; (J) Jackson. (Drawing, Carol Grissom.)

handful of castings.[66] Evidence of the slush-casting technique can be seen by close observation of Jackson's head. It shows that four metal molds were used for its casting (for each half of Jackson's face and the top and back of his head), evidenced by seams where metal leaked out between them (fig. 14).

Unique to the *Jackson* statuettes are quarter-inch-diameter iron rods inside the horse's hind legs, visible in X-radiographs and fixed with heavy nuts on the underside of the base.[67] While the rods provide support for the horse and rider, the hind legs of the rearing horse are invariably cracked, almost certainly because of the weight they support and the fact that there is movement at the pivot point attachment of the horse's feet whenever the statuette is moved. Fortunately, the iron rods are successful in keeping the cracked pieces of the legs together. In contrast, Jackson's raised right arm has frequently been broken off, probably from the

[66] *The Departure* and *The Return,* e.g., are each cast in three main parts, consisting of most of the figure, the raised arm, and the base with tree stump. In addition, accoutrements like the knapsacks and canteens were cast separately and soldered to the figures.

[67] Conventional X-radiography was done at the Smithsonian's Museum Conservation Institute, and X-radiographs made using an iridium source confirmed that the rods are continuous. Shelley Reisman Paine, conservator, personal communication, July 2006.

Fig. 14. Detail of Jackson's head, with arrows to mold-parting lines. (Smithsonian American Art Museum; photo, Carol Grissom.)

weight of the statue on the arm when laid down on its side, as it might well have been during transport.[68] In contrast to bronze, the principal drawback of cast zinc is that it is brittle and easily broken.

Examination also revealed many small differences among copies, attributable to assembly from so many pieces and finishing by hand. There are slight differences in the positioning of parts from one statue to the next and in postcasting chasing. The seam on Jackson's trousers, for example, may be unmarked or delineated by a single or double inscribed line.[69] The mold juncture along the top side of the horse's tail on one copy bears rough cross-wise marks of a file used to quickly remove metal that leaked out between molds. On other copies, the same area was carefully chased to imitate the lengthwise hairs of the tail.[70]

[68] Right-arm breakage of copies in the collections of the National Portrait Gallery and Smithsonian Museum of American Art led to treatment of their *Jackson* statuettes by the author. Carol A. Grissom, *Andrew Jackson on Horseback,* unpublished report no. 5957, Smithsonian Center for Materials Research and Education (now the Museum Conservation Institute), Washington, DC, March 7, 2006, and "Treatment Report for *Andrew Jackson on Horseback (SAAM 1983.101.5),*" no. 5964, Smithsonian Museum Conservation Institute, September 20, 2006. Right-arm breakage has also been seen on copies in Lexington and Nashville.

[69] Such treatment of the seams on Jackson's trousers can be seen on copies in the collections of the Smithsonian American Art Museum, National Portrait Gallery, and New-York Historical Society copies, respectively. For a detail photograph of a seam on the copy at the New-York Historical Society, see Grissom, *Zinc Sculpture,* 472.

[70] The Smithsonian American Art Museum's copy has little chasing compared to examples in Lexington, Virginia, and Nashville.

Nearly all *Jackson* statuettes have hidden lettering that in most cases seems to reflect initials of finishers inscribed during chasing, including "AK," "CC," "F," "FF," "FV," "S," "V," and "X." Most of these letters are found on more than one copy, and at least two copies bear multiple sets of letters.[71] Letters are located in places hidden from the casual viewer: underneath the horse's hooves and tail or Jackson's boots and coattail, as well as on the underside of the base. One can imagine that it was a workman's pride in making the *Jackson* statuettes that led to the inscription of initials, since they have not been found on any other statuettes. An inscription on a copy of the *Jackson* statuette at the Virginia Museum of Fine Arts seems to be an exception: the roman numeral "XXIII" is inscribed beneath the horse's tail and one hoof, which would seem to indicate the statuette's place in an edition.[72]

Evidence suggests that at least three more copies of the *Jackson* may have been cast after the demise of Cornelius and Baker. None of the three bears the Cornelius and Baker plaque. Two of the statuettes lack tassels on the saddle blanket, likely because the tassel portion of the mold had become damaged. The third has a base measuring about one-sixth the size of the standard base, which is unique among copies as far as is known. Detail appears less sharp on these copies, indicating that casting occurred after molds had become worn. Nevertheless, it is clear that the molds were the same as for Cornelius and Baker–inscribed copies: sectioning is the same, and identical cracks in the proper right horses' manes reflect the same flaw in its mold.[73]

The metal molds used for slush casting would have been valuable company assets passed on to Cornelius and Sons and sold at its demise to a willing buyer. In 1878, in fact, the New York–based Mitchell, Vance, and Co. announced that it had acquired the company's patterns: "We are prepared to manufacture and offer for sale the varied and elegant patterns of Cornelius and Co. [*sic*], of Philadelphia—who, having discontinued manufacturing, have transferred that portion of their business to us. Thankful for patronage generously bestowed, we solicit its continuance."[74] Since the arrangement with Mitchell, Vance, and Co. was for the manufacture of "all their goods including all the Patterns and Designs of the old house," the transfer almost certainly included molds for slush casting in zinc.[75] At least nine Cornelius models appear in catalogs of Mitchell, Vance, and Co.: for example, Cornelius and Baker's *Herald* (fig. 15) appears to be identical to Mitchell, Vance, and Co.'s statuette on two table lamps (nos. 0112 and 0968).[76]

Faux finishes were invariably applied to all types of zinc works of art to simulate bronze, gold, polychrome wood, and stone, primarily using paint but also by plating, gilding, and even sandblasting.[77]

[71] The White House copy has "AK" under the center of the horse's tail, "V" under the top of the horse's tail, and "FF" on the underside of the base. The New-York Historical Society copy has the letters "CC" under the horse's tail and "F" under Jackson's proper right coattail. Grissom (ibid., 472–75) lists additional inscribed initials and includes a photograph showing the "F" under Jackson's coattail.

[72] Shapiro (*Bronze Casting,* 42) proposed that inscriptions are edition marks. An "X" under the right boot heel of a copy at the Crystal Bridges Museum of American Art could represent the tenth copy in an edition, but a "V" found on statuettes at the White House, in Lexington, and in Nashville more likely represents the initials of a person, since it is found on several copies.

[73] Copies at Blair House and in a private Washington, DC, collection lack the Cornelius and Baker plaque, as does a copy with a small base at the Smithsonian American Art Museum. Grissom, "Treatment report for *Andrew Jackson on Horseback*." The copies without tassels are at Blair House and in the private collection. At least one other statuette of size similar to the Cornelius and Baker *Andrew Jackson* was cast in bronze but is entirely different in detail, including a tree prop under the horse. This statuette, also inscribed "PATENTED/MAY 15/1855," was sold in February 1994 at Adam A. Weschlers and Son in Washington, DC. It is probably the bronze statuette seen in a private collection in Huntingdon Valley, Pennsylvania.

[74] Mitchell, Vance, and Co., advertisement, *Harper's Weekly,* October 5, 1878, 800.

[75] Report on Cornelius and Co., September 9, 1878, Philadelphia, vol. 133, p. 296 a/94, R. G. Dun & Co. Collection, Baker Library Historical Collections, Harvard Business School.

[76] Other Cornelius figures can be seen in plates 25, 26, and 269 in Mitchell, Vance, and Co.'s *Picture Book of Authentic Mid-Victorian Gas Lighting Fixtures* (1877 or earlier; repr., New York: Dover, 1984). These include a Franklin (no. 0108, 15 inches) like that on the Presidential chandelier at the US Capitol; a Revolutionary Soldier (no. 098, 16 inches) like figures on light fixtures in the Vermont State House; a Knight (no. 0882, 16 inches) like that in the Cornelius and Sons catalog with an 1875 price list (no. 5678, 17 inches); a Mercury (no. 0962, 21 inches; no. 1550, 19 inches to burner) like that on a pair of reading lights in the Vermont State House and pairs of standards flanking the two staircases in the lobby of Philadelphia's Academy of Music; Hiver (no. 0838, 15 inches) like that illustrated in the Cornelius and Sons catalog and on a light fixture in the Vermont State House; a Hawker (no. 078, 17 inches) like that on the Presidential Chandelier and at the Vermont State House; a Herald (no. 0112, 15 inches, and no. 0968, 18 inches) like that in fig. 15, in the Cornelius and Sons catalog, and on a Vermont State House fixture; a seated Chinaman (no. 0534, 10 inches) like that in a private collection in Washington, DC; and a Stag (no. 0902, 14 inches). The catalog from which the *Picture Book* was made lists the company's address as 597 Broadway, from which Mitchell, Vance, and Co. moved in 1877 to 836 and 838 Broadway. Thus, it dates no later than 1877, suggesting that Mitchell, Vance, and Co. had a connection to Cornelius and Sons before 1878, when it announced that it had taken over production for Cornelius. Some illustrations are mirror images of the statues, likely a function of the reversal that occurs when printing plates are engraved.

[77] While Cornelius and Baker electroplated its brass fixtures, and its electroplating capacity in silver is described in the literature, plating has not been found on any zinc castings to date, Meigs notwithstanding (see n. 32). Hinckley, "Manufacture of Gas," 201. Copper plating was common in Europe, but it was rare in the United States

Fig. 15. Cornelius and Baker, *Herald*. Mark: "CORNELIUS & BAKER" (*base*). Zinc; H. 12⅜″. (Collection of Daniel W. Mattausch and Nancy E. Mattausch; photo, D. E. Hurlbert, Smithsonian Institution.)

Not only did these finishes provide attractive alternatives to the gray metal, but they served to unify surfaces crossed by joins of lead-tin solder, which is darker in color and smoother in texture than zinc. In the case of the *Jackson* statuettes, imitation-bronze paints unified the twenty-odd sections. Such finishes are often so good that it is not unusual for museums to identify their zinc statuettes as made of bronze.[78] The New-York Historical Society's copy of the *Jackson* statuette has a particularly attractive finish that appears to be original to the statuette's arrival at the museum in 1859. Imitation-bronze coatings often contain copper or brass flakes; in some other cases, they may have been created using only a translucent coating of dark brown tint.[79] Cornelius is known to have experimented with coatings to find a lacquer that was "quite permanent under any variation of temperature," probably an oil-resin coating that was baked on.[80] Most original coatings on Cornelius and Baker statuettes were thinly applied and are now brittle and dulled by time.

Other Cornelius and Baker Statuettes

Cornelius and Baker sold many other zinc statuettes in the range of 1–2 feet in height, nearly all in private collections and rarely published up to now (see the appendix).[81] In this text, statuettes' names are in italics when identification is obvious, such as for a statuette of *George Washington*; inscribed on an exemplar; or recorded in contemporary literature. Names supplied by the author are in roman typeface.

Attributions are best provided by foundry marks, either cast into the statuette's base, often on the top surface near the center front edge, or stamped into an attached brass plaque like that found on *Jackson* statuettes (see fig. 11).[82] Imitation-bronze statuettes

until introduced in 1913 for the religious statues of the Daprato Statuary Company. Grissom, *Zinc Sculpture,* 85–86, 589–90. By 1879, sandblasting was used to approximate the duller appearance of stone on zinc cemetery monuments termed "white bronze"; see also references in n. 19.

[78] Shapiro, *Bronze Casting,* 41–42.

[79] Most of the coatings sampled on seven autograph statuettes in a private collection were found to contain copper-alloy flakes. Carol A. Grissom, "Imitation-Metal Paint Study," no. 6240, Smithsonian Museum Conservation Institute, 2010. Copper was also found on four other autograph statuettes in the same collection. Matsen, Winterthur Analytical Report no. 5126.

[80] Whitworth and Wallis, *The Industry of the United States,* 127. In 1853, a gum dissolved in alcohol was said to be applied by brush to heated objects apparently made of brass, but it is not clear if this practice continued or if the same substance was used on zinc castings. Hinckley, "Manufacture of Gas," 201. Linseed oil was found on a statuette of *America* (an Indian) in a private collection. Matsen, Winterthur Analytical Report no. 5126.

[81] A recent exception is Donald L. Fennimore, "Cornelius & Baker's Answer to the Rage for Parlor Sculpture," *Antiques and Fine Art* (Autumn/Winter 2010): 150–54.

[82] In several instances, both types of foundry marks are found on different copies of a statuette, notably for the *Zouave* and *The Departure.* Close observation of examples suggests that plaques initially were applied after casting and letter dies subsequently were stamped into the molds, interrupting "grass" on the bases. The opposite sequence could not have occurred, since there is no evidence of removal of an inscription from the grassy areas on copies with plaques. Also, arguing for this sequence is that cast-in inscriptions

Fig. 16. Cornelius and Baker, *Zouave.* Mark: "CORNELIUS & BAKER" (*base*). Zinc; H. 16¼″. (Private collection; photo, Laszlo Bodo.)

bearing foundry marks include a *Herald* (see fig. 15), *Liberty,* a *Zouave* (fig. 16), the pair of *The Departure* and *The Return,* the racehorse Lexington with Gilpatrick Up, a *Joan of Arc,* a *Knight,* a Puppeteer, a small seated figure of a Fiddler, and an *Old Mortality* inkwell.[83] A smaller group of genre figures bearing

Fig. 17. Cornelius and Baker, Organ Grinder. Mark: "CORNELIUS & BAKER" (*base*). Zinc (modern polychromy); H. 11⅛″. (Collection of Daniel W. Mattausch and Nancy E. Mattausch; photo, D. E. Hurlbert, Smithsonian Institution.)

inscriptions and now painted with naturalistic paint includes an Organ Grinder (fig. 17), mate to the Puppeteer; a *Laughing Man*; a *Weccacoe Volunteer Fireman,* and a small seated figure of a Chinaman.[84]

would be more permanent than attached plaques, and, once stamped into the molds, a step would also have been eliminated in marking the statuettes.

[83] Known examples of these statuettes have cast-in inscriptions on top surfaces of their bases near the center front edges, except for Lexington with Gilpatrick Up, *The Return,* and some copies of *The Departure* and *Zouave,* which instead have the standard Cornelius and Baker brass plaques soldered to their bases. Lexington and the Puppeteer are illustrated in Fennimore (ibid.).

[84] The Organ Grinder and its mate the Puppeteer appear in a 1901 catalog of the Ansonia Clock Company as no. 1101 Italians, height 13½ inches, $9 per pair finished in Japanese Bronze. Ansonia Clock Company, *Catalogue of the Ansonia Clock Company* (1901; repr., Arlington, VA: Arlington Book Co., 1988), 157. Given the time lag, it seems most likely that the Cornelius and Baker and Ansonia statuettes have a common source, such as a pair of French statuettes, rather than being made in the same molds. A mirror-image *Lachender Mann* (Laughing man) was cast in iron by the Berlin-based Devaranne around 1840, illustrated in Uwe Kieling, "Siméon Pierre Devaranne," *Bildende Kunst* 32, no. 7 (1984): 326–28, fig. 5. The *Fireman* is illustrated in Anthony N. B. Garvan and Carol A. Wojtowicz, *Catalogue of the Green Tree Collection* (Philadelphia: Mutual Assurance Co., 1977), 137–38. Formerly in the collection of the Mutual Assurance Co., the *Weccacoe Volunteer Fireman* was sold to a private collector by the Schwarz Gallery in Philadelphia. An image

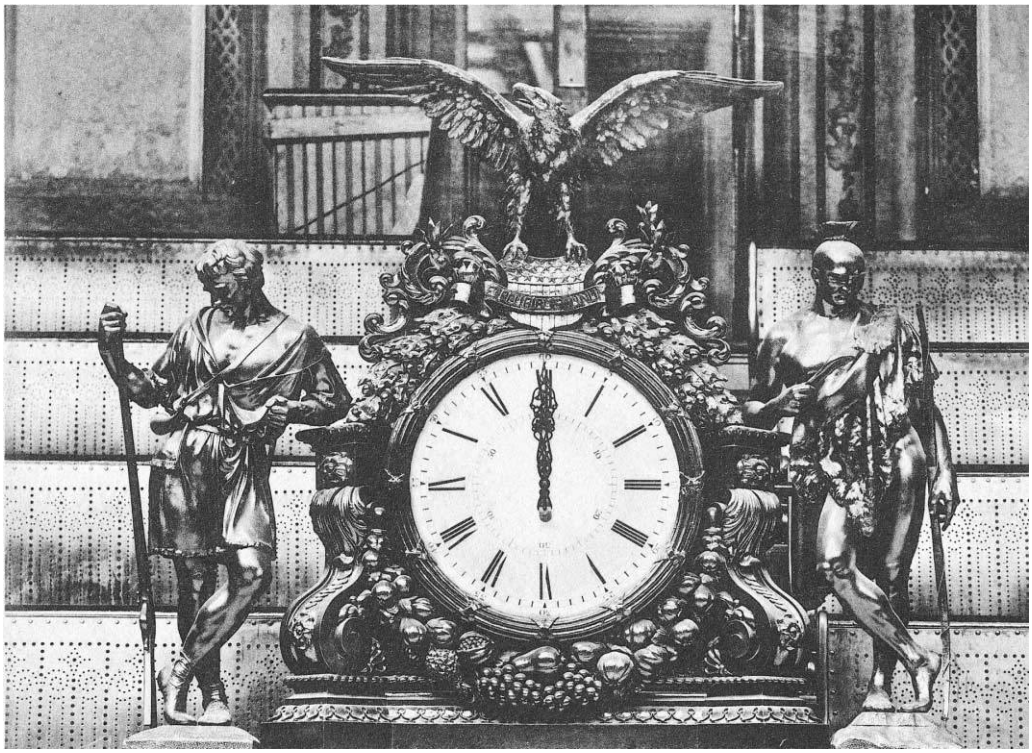

Fig. 18. US House of Representatives clock, statuary modeled by William Rinehart, 1857; *Hunter* and *Indian* cast by Cornelius and Baker, 1858; *Eagle* cast by Archer, Warner, Miskey, and Co., 1858. Bronze, H. 40″ (*Hunter*), 42¾″ (*Indian*). (Architect of the Capitol; photo, Glen Brown.)

Silvery gold-colored paint containing tin flakes has been identified on the zinc decorations of an armorial chandelier with figures from a US Senate hallway but has not otherwise been found on statuettes.[85]

A few larger zinc statues were made by the company, but they seem to have been the exception. These include a 29-inch-high statue identified as a *Western Hunter* and the approximately 3-foot-high pair of statues of an *Indian* and *Hunter,* the latter also known as a *Pioneer.*[86] The pair was modeled by William Rinehart and originally cast in bronze by Cornelius and Baker for a clock (1858) in the new US House of Representatives chamber (fig. 18).[87] Correspondence reveals that William F. Walters, whose collection forms the nucleus of the Walters Art Museum in Baltimore, queried Montgomery Meigs about the Capitol's legal arrangement with Cornelius and Baker, apparently in defense of Rinehart, for whom he provided patronage. He wrote that the company had "not only duplicated the figures and exposed them for sale; contrary to what I was informed was the understanding with them, but parties in their place of business representing them, have denied the true authenticity of the works and

of the Chinaman also appears in Mitchell, Vance, and Co.'s *Picture Book* (see n. 76). The Organ Grinder and probably the *Weccacoe Volunteer Fireman* have cast-in inscriptions, while the *Laughing Man* and Chinaman have the standard Cornelius and Baker brass plaques. Since paint has not been sampled on any of these statuettes, however, it has not been confirmed that polychromy is original.

[85] The armorial gasolier (acc. no. 59.00002.001), one of three that graced a Senate hallway, was acquired around 2006 by the US Senate with most of its original painted finish present. The tin-flake paint was identified by energy-dispersive X-ray analysis on a sample taken from an axe; a similar paint appears to have been used on the chandelier's crusader figures. Grissom, "Final Report on a Technical Study."

[86] Both the 29-inch-high *Western Hunter* and Rinehart's 3-foot-high *Hunter* are illustrated in Fennimore's "Cornelius & Baker's Answer to the Rage."

[87] The *Eagle* was cast in bronze by Archer, Warner, Miskey, and Co. "Antique bronze" consisting of ninety parts copper, ten parts tin, and two parts zinc was specified for the clock statues. X-ray fluorescence analysis found approximately equal quantities of tin and zinc (6–7 percent) on the *Hunter* and slightly more tin (7–8 percent) than zinc (5 percent) on the *Indian.* Analysis was performed on the statues in their exhibit case located in the chamber below the Capitol's Rotunda. Carol A. Grissom and Jeff Speakman, "Metallic Composition of a *Pioneer* and *Indian* by William Rinehart surrounding a Clock Made for the U.S. House of Representatives of the U.S. Capitol," report no. 6237, Smithsonian Museum Conservation Institute, Washington, DC, December 1, 2008. Zinc copies of the pair at the Vermont State Capitol and in private collections rest their elbows on a tree branch in lieu of the clock and would likely have been sand cast on account of their size. A copy of the *Hunter* is illustrated in Fennimore's "Cornelius & Baker's Answer to the Rage."

claimed them as having been originated in their establishment."[88]

The most comprehensive contemporary sources of information about Cornelius and Baker's products are reports and catalogs of exhibitions held at the Franklin Institute in Philadelphia, where the company exhibited from 1825 to 1874.[89] Particularly important are catalogs for exhibitions in 1856 and 1858, which list thirty-six different subjects in "bronze," almost certainly consisting of zinc painted to imitate bronze. Among the items are fourteen different "statues" as well as figurative "light pillars," "reading lights," and "cigar lighters."[90] In many cases, names listed in the exhibit catalogs can be associated with statuettes and lighting fixtures for which the company's identification has otherwise been elusive, although uncertainties remain (noted with asterisks in the appendix).

A Cornelius and Baker catalog remains the holy grail of gas-fixture enthusiasts, but two of at least seven Cornelius and Sons' catalogs from the 1870s survive, and some statuettes illustrated in them date from the time of Cornelius and Baker in the 1850s and 1860s.[91] For example, the statuette *Hiver* illustrated in one of the catalogs was placed on brackets at the Vermont State House by

Fig. 19. Top row: *Été, Hiver,* Samuel de Champlain, and *Grecian*; bottom row: Boy Playing Flute, *Herald, Knight,* and *Russian Hussar.* From Cornelius and Sons, *Gas Fixtures,* n.d., plate 315. (Historical Society of Pennsylvania.)

1859 (fig. 19). The statuette named Boy Playing Flute on the same catalog page must have been made around 1863, when it was used on Cornelius and Baker's chandelier in the President's Room at the US Capitol.

All statuettes shown in the two Cornelius and Sons' catalogs are illustrated as part of lighting fixtures. The eight statuettes shown in figure 19 are part of gas table lamps of a type then referred to as "reading lights" or "portables."[92] These lamp figures were also sold separately as statuettes, for example, the *Herald* (see fig. 15). The lamp was made from the statuette simply by drilling and tapping into the base and bugle for the addition of brass tubing and a cloth-covered rubber hose.[93]

[88] William F. Walters to Montgomery Meigs, May 27, 1859, Architect of the Capitol records, Washington, DC.

[89] A silver lamp made by Christian Cornelius was exhibited already in 1825 at the Franklin Institute and was followed by a company display as early as 1831. Franklin Institute, *Report of the Second Annual Exhibition of the Franklin Institute of the State of Pennsylvania, for the Promotion of the Mechanic Arts* (Philadelphia: Franklin Institute, 1825), 51, and *Report of the Seventh Annual Exhibition of the Franklin Institute of the State of Pennsylvania, for the Promotion of the Mechanic Arts* (Philadelphia: J. Harding, 1831), 17. Robert Cornelius was active as a member of the board of managers in 1856. Franklin Institute, *Report on the Twenty-Fifth Exhibition,* 5.

[90] While the statues and reading lights are invariably listed as "bronze," chandeliers, pendants, brackets, and light pillars decorated with statuettes were available as "bronze," "gilt," "verd. Antiq.," or "Artistic." Ibid., 17–18; Franklin Institute, *Report on the Twenty-Sixth Exhibition,* 10–11. See n. 37 for names of statues and reading lights.

[91] Copies of the two Cornelius and Sons catalogs are in collections of the Smithsonian Institution (SI) and Historical Society of Pennsylvania (HSP), both entitled *Gas Fixtures*; the HSP catalog is also reproduced in *Lamps & Other Lighting Devices, 1850–1906* (Princeton, NJ: Pyne, 1972), 20–43. The SI catalog is designated no. 7, indicating six earlier catalogs; it includes a price list for 1875 and an illustration of Memorial Hall at the Centennial Exhibition of 1876 on the back cover. The HSP catalog is undated but almost certainly earlier. The company apparently numbered plates consecutively, ranging in the HSP catalog from 301 to 322 and in the SI catalog from 421 to 458; thus, 300 plates from the beginning of the series and nearly 100 between the two catalogs have not been located. Most item numbers in the HSP catalog are in the 6,000 range, with the page of reading lights with statuettes showing numbers ranging from 2,288 to 6,688. Item numbers for the SI catalog are in the 7,000 range with the exception of one 6,000-range statuette that is part of a standard. The two catalogs do not share any illustrations.

[92] Cornelius and Baker's statuette-decorated lamps are referred to as reading lights in catalogs of exhibitions at the Franklin Institute (*Report on the Twenty-Fifth Exhibition,* 18; *Report on the Twenty-Sixth Exhibition,* 11). The contemporary gas-fixture company Mitchell, Vance, and Co. instead referred to them as portables (*Picture Book,* plates 34, 51, 75).

[93] The hose for a reading light is visible in a historic interior dated ca. 1865. Myers, *Gas Lighting,* plate 51. The reading light appears to be the same as Mitchell, Vance, and Co.'s no. 0242, 14 inches, inscribed "THE YOUNG PATRIOT" and illustrated in the company's *Picture Book,* plate 19.

Statuettes illustrated in the Cornelius and Sons' catalog with the 1875 price list are limited to three figures atop standards: a *Knight* in armor, a Falconer with dead fowl, and a Gaul-type figure wearing a fur shirt.[94] The standards ranged in price from $15 to $20.25 without separate prices for statuettes.

Cornelius and Baker statuettes and reading lamps were apparently sold complete with circular wooden bases, such as those illustrated in the Cornelius and Sons catalog (see fig. 19). *The Departure* and *The Return* (fig. 20) show slightly different versions of wooden bases from those in the catalog. Cornelius and Baker statuettes without bases in circulation today could have lost the original bases or may have been removed from chandeliers. Those that decorated reading lights can be distinguished readily, however, by brass and rubber tubing or holes made for attachment of tubing.

Attribution of statuettes to Cornelius and Baker can also be made by comparison to figures on well-documented lighting fixtures. In particular, Cornelius and Baker's chandeliers, brackets, and reading lights sold to the Vermont State House (erected 1858–59) are a treasure trove of authentic statuettes. They add to the list of provenienced statuette figures of *George Washington, Benjamin Franklin, William Penn,* Hiram Powers's *Greek Slave,* Thomas Crawford's *Freedom,* Giambologna's *Mercury,* a Minuteman (or Green Mountain Boy), Revolutionary Soldier, *Hawker* (Falconer), *Commerce, Science, Prudence,* Eloquence, an Indian Maiden, an Oriental Girl, a Woman (nude) with Dove, and a figure identified as Christopher Columbus.[95] In a few cases, subjects on chandeliers can be identified by names cast into bases, including the Indian known as *America, Simon Kenton,* and *Prudence* (figs. 21 and 22). These three

Fig. 20. Cornelius and Baker, *The Return.* Zinc; H. 12¾″. (Collection of Daniel W. Mattausch and Nancy E. Mattausch; photo, D. E. Hurlbert, Smithsonian Institution.)

statuettes appeared on chandeliers (now lost) in the Ohio State Capitol Building during the 1850s, but their names can be seen cast into the bases of statuettes on an 1864 chandelier in the President's Room at the US Capitol.[96] Among twelve additional

[94] Plate 452, no. 7348, a Knight in armor on a standard, is also listed as available with statuettes no. 7350 (plate 387), nos. 6994 and 6996 (plate 359), and nos. 6684 and 6686 (plate 315); no. 6686 is a statuette in the earlier catalog identified as a *Russian Hussar* (see fig. 19). The other two statuettes are plate 455, no. 6684, a Falconer with dead fowl; and plate 455, no. 7740, a Gaul wearing a fur shirt. Cornelius and Sons, *Gas Fixtures.*

[95] Daniel Robbins, *The Vermont State House: A History and Guide* (Montpelier: Vermont State Historic Preservation Committee, 1980), 78–80; Winslow Ames, "The Vermont Statehouse and Its Furniture," *Antiques* (August 1965): 200–204; Myers, *Gas Lighting,* plate 53. *Freedom Triumphant in War and Peace,* sometimes referred to as Columbia, reflects an early model for Thomas Crawford's bronze statue atop the US Capitol, which was not put in place until 1863. The figure wears a freedom cap, rather than the elaborate eagle headdress that was substituted for the final version of the statue. Another copy of the statuette from a private collection can be seen in Pamela Scott, *Temple of Liberty: Building the Capitol for a New Nation* (New York: Oxford University Press, 1995), 136, and in Grissom, *Zinc Sculpture,* 194. Other statuettes at the Vermont State House include *Hiver,* two copies of the *Herald,* and the pair of *The Departure* and *The Return.*

[96] Copies of *America* and a *Buffalo* made for chandeliers at the Tennessee State Capitol in 1855 are now in the Tennessee State Museum. *America, Prudence,* and *Simon Kenton* were on gas fixtures installed in the Ohio State Capitol beginning around 1858, as were *Science, Commerce, Liberty,* and a large *American Eagle. Simon Kenton* is identified as having been placed on the Ohio chandelier "in honor of the original settler of that State." *Description of the Establishment of Cornelius & Baker,* 23–24. The *Simon Kenton* statuette is related to J. Q. A. Ward's plaster model made in 1855 for the city of Columbus, Ohio. Lewis I. Sharp, *John Quincy Adams Ward: Dean of American Sculpture* (Newark: University of Delaware Press, 1985), 141–43. Copies made from statuettes at the Vermont State House now decorate replica chandeliers at the Ohio State Capitol. A Cornelius and Baker chandelier in the governor's office of the Massachusetts State House featuring *America, Simon Kenton,* and *Liberty* (with freedom cap) was installed around the same time and remains there today.

Fig. 21. Detail of Cornelius and Baker chandelier, President's Room, US Capitol, 1864, showing *America* (center), *Prudence* (left), and *Simon Kenton* (right). Zinc. (Architect of the Capitol.)

statuettes on the Presidential chandelier are seven additions to the Cornelius and Baker *oeuvre*: a Chinese Juggler, a Girl Playing Autoharp, a *Dancing Figure, Highlander, Tamborine,* a Fisher with Net, and an Indian (or Asian) Male with Jug standing on one foot.[97] Attribution to Cornelius and Baker based on comparison to known items is not without risk, however, since other gas-fixture companies sold similar statuettes.

Susan Greendyke Lechevre, art collections manager, Massachusetts Art Commission, personal communication, May 19, 2010.

[97] *Simon Kenton, Prudence,* and *America* are on the top tier of the Presidential Chandelier at the US Capitol. *Franklin, Washington,* a hunter with a bird in his upraised right hand (probably the "Hawker" listed in the Franklin Institute exhibition's 1858 catalog), a Fisher with Net, an Indian (or Asian) with Jug, and a *Highlander* in a kilt with a sheep over his left shoulder are on the second tier. A Putto with Wheat (Summer?), a Chinese juggler, a naked *Dancing Figure,* a Girl with Autoharp, Boy Playing Flute (see fig. 19), and a putto playing a tambourine (probably the "Tamborine" reading light listed in the catalog for the 1856 Franklin Institute exhibition) are on the third tier. As noted in n. 34, the Putto with Wheat also appears on a girandole attributed to Cornelius and Baker and on chandeliers. Putti playing tambourines are also found on a pair of eight-arm chandeliers at Stanton Hall (1859) in Natchez, Mississippi. Wendell Garrett, *Victorian America: Classical Romanticism to Gilded Opulence* (New York: Rizzoli, 1993), 90–91.

Fig. 22. Detail of Cornelius and Baker chandelier, President's Room, US Capitol, 1864, showing *Simon Kenton* (center), *America* (left), and *Prudence* (right). Zinc. (Architect of the Capitol.)

Moreover, Mitchell, Vance, and Co. apparently continued to cast statuettes in Cornelius and Baker molds, as noted above, and a few statuettes identical to those of Cornelius and Baker appear in catalogs of clock companies as late as 1901.[98]

Two Cornelius and Baker designers are known, although it is unclear to what extent they would have been involved with statuettes: the artist-designer John Henry Frederick Sachse, whom Robert Cornelius daguerreotyped in 1840, and Charles Page, who is said to have been the principal designer of gas fixtures from 1844 to 1864.[99] Western-themed

[98] See n. 84 regarding the Organ Grinder and Puppeteer. It is more likely, however, that clockmakers' statuettes had a common source, probably imported French statuettes. The appearance of *Le Depart* and *Le Retour* in a catalog of the clockmaker Seth Thomas (ca. 1874) tends to confirm that clockmakers were importing and/or copying French statuettes. Tran Duy Ly, *Seth Thomas Clocks and Movements,* 3rd ed. (Johnson City, TN: Arlington Book Co., 2004), 2:1093.

[99] John Sachse's son was Julius F. Sachse, who chronicled the development of daguerreotyping in Philadelphia. Stapp, *Robert Cornelius,* 20, 96–97. A daguerreotype of Sachse made by Robert Cornelius in 1840 is in the collection of the Library of Congress, available at http://www.loc.gov/pictures/resource/cph.3g08990/#.

designs made by the Washington-based Joseph Goldsborough Bruff in 1859 were the basis for statuettes on chandeliers at the US Treasury Building.[100] The architect Thomas W. Richards, the orphaned son of a tailor, worked at Cornelius and Baker in his youth, although what he did there is unknown. As the architect of the University of Pennsylvania's neo-Gothic College Hall (1870–73), the first building on its then-new campus in west Philadelphia, he had the company's fixtures purchased for the building.[101]

Cornelius and Baker was noted for the high quality of its workmanship both in its own time and today.[102] The statuettes are well made, although there is some variation in quality. The castings are generally sharp and have many fine details of backpacks, weapons, and costume. Original coatings can be quite lovely: for example, the bronze finish on the figure of Liberty contrasts with imitation-gold finishes on burnished and matte areas of the accompanying brass drapery and medallion (fig. 23).

Subjects, Sources, and Nineteenth-Century Popular Culture

The clientele for Cornelius and Baker statuettes cannot be known directly in the absence of sales records and examples of identifiable Cornelius and Baker statuettes in photographs or illustrations of nineteenth-century interiors. Exceptional pieces like the *Jackson* statuettes were acquired by museums and wealthy individuals. For example, a *Jackson* statuette owned by William Wilson Corcoran, whose art collection became Washington's Corcoran Gallery of Art, descended to his great granddaughter.[103]

Fig. 23. Cornelius and Baker, *Liberty*. Mark: "CORNELIUS & BAKER" (*base*). Zinc; H. 18¾″. (Private collection; photo, Laszlo Bodo.)

Less costly statuettes may have been purchased for middle-class homes of modest means.

Chandeliers and lighting fixtures decorated with zinc statuettes are better documented than the statuettes alone. Some were purchased by wealthy American citizens for their homes, like Belle Meade Plantation near Nashville and almost certainly Stanton Hall in Natchez, Mississippi.[104] Others lit important public spaces, like the Academy of Music in Philadelphia, the US Capitol, and state capitol buildings in Tennessee, Vermont, Ohio, and Massachusetts. Only one domestic record of a purchase from Cornelius and Baker has been found: a *Benjamin Franklin* reading light bought at a cost of $7 in 1859 for the Smithsonian Institution's first

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Charles Page is identified as having been the principal designer at Cornelius and Baker for twenty years at the time he became partner of a rival company, Van Kirk and Co. "Copartnership Notices," *Philadelphia Inquirer,* February 19, 1864, 5.

[100] Myers, *Gas Lighting,* plates 55–60.

[101] George E. Thomas and David B. Brownlee, *Building America's First University: An Historical and Architectural Guide to the University of Pennsylvania* (Philadelphia: University of Pennsylvania Press, 2000), 50.

[102] The company's products are repeatedly extolled in reports for exhibitions at the Franklin Institute, such as the following: "More than one hundred different specimens … show a marked progress towards perfection both in artistic design as well as color and finish. In color and evenness of tint, the bronzes and verd antiques bear comparison with the best French." Franklin Institute, *Report on the Twenty-Fifth Exhibition,* 5; Bacot, *Nineteenth Century Lighting,* 157, 161.

[103] The legatee, Mrs. David Finley, along with her husband gave the statue to Andrew Jackson State Park in Lancaster, South Carolina, in 1958.

[104] Garrett, *Victorian America,* 90–97.

secretary, Joseph Henry.[105] Henry was considered something of a penny-pincher, but he was the first head of the institution and solidly upper middle class.

Clues about clientele are provided by statuettes' subject matter, which is largely standard middle- to upper middle-class fare of the period, similar to that of other lighting manufacturers.[106] A few zinc figures refer to literature, as did the company's earlier girandoles decorated with the romantic figures *Paul et Virginie,* made popular by the eponymous novel written by Sir Walter Scott. An *Old Mortality* inkwell figure made of zinc, for example, was based on another Scott novel of the same name. A more local inspiration, however, may have been the large stone sculpture of *Old Mortality* erected in 1836 at the entrance to Philadelphia's premiere parklike cemetery, Laurel Hill. Other romantic subjects include knights in armor, perennial favorites of boys big and small.[107] A few genre figures were made, such as the Organ Grinder with his monkey and the Puppeteer noted in the previous section. Copies of antique and neoclassical statues form a larger group that includes statuettes after Hiram Powers's *Greek Slave* and Giambologna's *Mercury.* American subjects such as Liberty, Indians, a buffalo, and the famous American citizens Washington, Franklin, and William Penn are common. The company was able to put new lines into production quickly in response to noteworthy public sculptures, as, for example, the statuette of *Freedom Triumphant in War and Peace* (Columbia) at the Vermont State Capitol soon after its modeling by Thomas Crawford for the US Capitol, and *Simon Kenton* for the Ohio State Capitol shortly after its modeling by J. Q. A. Ward.[108]

In spite of the variety of statuettes, many with American subjects, nearly all had European and particularly French precedents. The figure of *Liberty,* for example, bears the French-style liberty cap (see fig. 23). Even the statuette of an Indian known as America was said to have been copied "with some changes of raiment from a common French bronze" (see fig. 21).[109] Moreover, evidence

Fig. 24. Probably French, *Le Depart* lamp. Zinc; H. 16″. (Collection of Daniel W. Mattausch and Nancy E. Mattausch; photo, D. E. Hurlbert, Smithsonian Institution.)

suggests that zinc statuettes imported from France were copied by Cornelius and Baker. A pair of statuettes with the French names "LE DEPART" (fig. 24) and "LE RETOUR" cast into their bases appear to have been the models for an essentially identical pair made by Cornelius and Baker, who added a cast-in English-language label around each base, inscribed "THE DEPARTURE" (fig. 25) and "THE RETURN." French and American versions exhibit different parting lines, indicating that molds for the American pair were taken from the French statuettes and new metal molds made for slush casting. The parting lines are more difficult to see on the French

[105] Fiscal records, June 1856–December 1859, p. 127, no. 212, vol. 2, folder 1, box 1, RU 110, Smithsonian Institution Archives, Washington, DC.

[106] Categories defined for girandoles and other lighting fixtures sold by Dietz and Co. in 1860 include classical, Eastern exotica, Middle Ages, Elizabethan, Scottish, Indian, and literary figures. *Victorian Lighting,* 12–16.

[107] See, e.g., Mark Girouard, *The Return to Camelot: Chivalry and the English Gentleman* (New Haven, CT: Yale University Press, 1981).

[108] See nn. 95, 96.

[109] Wolff, *Capitol Builder,* 280.

Fig. 25. Cornelius and Baker, *The Departure.* Mark: "CORNELIUS & BAKER" (*base*). Zinc; H. 13¼″. (Collection of Daniel W. Mattausch and Nancy E. Mattausch; photo, D. E. Hurlbert, Smithsonian Institution.)

version, consistent with the exceptionally high-quality bronze molds produced by art foundries in Paris. Other Cornelius statuettes, such as *Été* and *Hiver,* retain French names.

The fact that most statuettes are unpublished and in private collections, in addition to the absence of company sales records, makes assessment of production levels difficult. The appendix, however, provides some indication of surviving statuettes. Apart from the *Jackson* statuette, among the most commonly encountered are *America* (an Indian), the pair of *The Departure* and *The Return,* and a *Zouave.*[110] While all are likely of French origin, it was almost certainly their connection to American events and concerns that made them popular. The theme of *America* portrayed as an Indian is not surprising. Along with its perennially appealing before-and-after images of a long-haired young vagabond leaving home and coming back a clean-shaven, close-cropped veteran, the pair of *The Departure* and *The Return* tapped into the theme of Thomas Cole's well-known romantic 1837 eponymous paintings featuring a medieval knight. Probably the more important factor in their popularity, however, was the American Civil War, which no doubt drew people to purchase war-related figures. For similar reasons, purchasers were probably attracted to the *Zouave,* whose exotic costume was worn by military companies in Philadelphia and New York. Cornelius and Baker's *Zouave* was paired with a *Highlander* in Franklin Institute displays, possibly the kilted figure with a lamb around its shoulders found on the Presidential chandelier at the US Senate.[111] One would expect that the *Zouave* would be paired with a military figure, however, such as a member of the Highlander regiment that was part of the 79th New York Volunteer Infantry, but such a statuette has not surfaced.

Following the tradition set by the girandoles that preceded them, many statuettes were likely displayed on mantle pieces. They might also have been placed on side tables or brackets, like a statuette of a Sir Walter Raleigh–type figure in the parlor of Joseph Henry, the first secretary of the Smithsonian.[112] Figural lamps, however, were often placed on circular tables below chandeliers at the center of a room. In this way, their hoses could be connected to the gas in the chandelier overhead, while providing reading or working light for a family seated around the table. Such lamps are seen, for example, in contemporary photographs and paintings, such as the reading light featuring Giambologna's *Mercury* in *Visiting Grandma* by J. A. S. Oertel (1865).[113]

The Cornelius and Baker statuettes fit within the category of serial sculpture—the casting of multiples—which became popular in many media during the nineteenth century. Such sculpture

[110] Two autograph copies each of the *Zouave, America* (an Indian), and *The Departure,* as well as one copy of *The Return* are in one private collection. Another pair of *The Departure* and *The Return* is in a second collection: *The Departure* is marked, while its mate *The Return* is unmarked but is believed to have been made by the company. A third pair appears on light fixtures in the House chamber at the Vermont State House.

[111] Franklin Institute, *Report on the Twenty-Fifth Exhibition,* 18, and *Report on the Twenty-Sixth Exhibition,* 11.

[112] William Seale, *Recreating the Historic House Interior* (Nashville: American Association for State and Local History, 1979), 170, 171.

[113] Harold L. Peterson, *Americans at Home* (New York: Scribner's, 1971), plate 126. A pair of identical *Mercury* reading lights with Cornelius and Baker plaques are on the clerk's desk in the Senate chamber at the Vermont State House today.

ranged from the low-cost plaster statuettes sold by itinerant salesmen depicted in the painting of *The Image Pedlar* by Francis W. Edmonds (ca. 1850–58) to the high-end serial sculptures in marble and bronze by Jean-Antoine Houdon, Antoine-Louis Barye, and Augustus Saint-Gaudens.[114] The statuettes of Cornelius and Baker would seem to fit somewhere in the middle, although imported zinc statuettes were said to have found "their way into the parlors of the wealthy and the good."[115] Presumably, they would have appealed to approximately the same group as the far more popular plaster groups of John Rogers that appeared after the Civil War, although the subject matter of Cornelius and Baker statuettes tended to be more European, less original, and generally less folksy; in addition, Cornelius and Baker made only individual figures, rather than figural groups. If Joseph Henry's *Franklin* reading light cost $7 in 1859, a statuette of Franklin would have cost less, making its price lower than the more complex Rogers groups, the majority of which sold for $10–$15.[116]

Use of zinc as an imitative material was also consistent with the explosion of imitative materials during this time period. Simulation of more expensive materials has been done since time immemorial. The Romans made wide use of architectural stucco to imitate sculpted marble, for example, and brass was widely used to imitate gold during the Middle Ages. Advances in science and technology during the nineteenth century, however, produced a wide range of new materials and techniques that could be used to imitate older ones. Copper electrotypes were patinated to imitate bronze statues at the Paris Opera, silver plating was used to simulate solid silver, celluloid was made to imitate ivory, synthetic dyes replaced traditional vegetal dyes, and papier-mâché and plaster were painted to imitate marble and wood.

Finally, zinc statuettes filled a desire for bronze statuettes. True bronze statuettes were produced only in limited numbers in the United States during the nineteenth century. A few were made during the late 1840s at Henry Kirke Brown's studio, and J. Q. A. Ward's statuette of *The Indian Hunter* was reproduced after 1860, but it was not until the end of the century that reductions of life-size statues by Frederick MacMonnies and Augustus Saint-Gaudens (such as the *Puritan* and *Diana*) were cast in bronze as significant revenue-producing ventures for artists. These bronzes, however, would have been affordable only by the wealthy. Saint-Gaudens's reductions, for example, were marketed at Tiffany and Co. in New York City.

The Demise of Cornelius and Baker

In 1869, the Cornelius and Baker partnership dissolved as the Bakers retired, and two companies were formed: Cornelius and Sons and Baker, Arnold, and Co. The former consisted of Robert, his three sons, and a son-in-law. The showroom was moved from 710 Chestnut Street to the Cherry Street factory, while Baker, Arnold, and Co. occupied the former showroom.[117] No zinc statuettes have been located inscribed Cornelius and Sons, but, as noted above, the company continued to market Cornelius and Baker statuettes, apparently cast in their molds. Twenty-four figural reading lights can be discerned decorating just half the company's display at the Franklin Institute in 1874 (fig. 26). An approximately equal number of table lamps with statuettes can be counted on the other half of the display—for a total of around fifty![118] About a dozen reading lights with figures can be seen in the company's smaller display at the Centennial Exhibition two years later.[119] However, the fact that the two Cornelius and Sons catalogs issued around this time show a total of only eleven statuettes, nearly all with lower catalog numbers than chandeliers, suggests diminished interest in statuettes by the 1870s. Demand for statuettes on chandeliers no doubt lessened on account of changes in taste, which may have reduced production sufficiently that they were no longer profitable to make.

[114] The painting, in the collection of the New-York Historical Society, is illustrated in Peterson (ibid., plate 90). See Jeanne L. Wasserman, ed., *Metamorphoses in Nineteenth-Century Sculpture* (Cambridge, MA: Harvard University Press, 1975) for discussions of serial sculpture.

[115] "Cheap Art."

[116] Around 100,000 Rogers sculptures were sold between 1860 and 1890. Michael Clapper, "Imagining the Ordinary: John Rogers's Anticlassical Genre Sculptures as Purposely Popular Art," *Winterthur Portfolio* 43 (Spring 2009): 1–40.

[117] Cornelius and Sons consisted of Robert's sons Robert C. Cornelius, John C. Cornelius, and Charles E. Cornelius and his son-in-law Charles Blakiston Jr. Robson, *The Manufactories and Manufacturers,* 511.

[118] A second stereophotograph that shows the entire display of Cornelius and Sons at the Franklin Institute is in the collection of the Library Company of Philadelphia, but its focus is not as sharp as the illustration reproduced here.

[119] A photograph of Cornelius and Sons' display at the Centennial Exhibition is in the Centennial Exhibition Digital Collection (co22295) at the Free Library of Philadelphia, accessible at http://libwww.freelibrary.org/CenCol/. It is also reproduced in Myers, *Gas Lighting,* plate 74.

Fig. 26. James Cremer, stereocard of Cornelius and Sons display, Franklin Institute Exhibition, Philadelphia, 1874. (Library Company of Philadelphia.)

Cornelius and Sons seems to have lost steam toward the end of Robert Cornelius's involvement and his retirement in 1877.[120] The company advertised less often in the *Philadelphia Inquirer* and *American Gas-Light Journal* than previously, and two New York–based firms usurped the company's premiere place in the pantheon of gas-fixture manufacturers at the Centennial Exhibition in 1876.[121] The display of Mitchell, Vance, and Co. was said to have "most fully met the approval of the Judges," followed by that of the Archer and Pancoast Manufacturing Company.[122] The rapid demise of manufacturing at Cornelius and Sons in Philadelphia is indicated by the manufacturing schedule compiled by the US Census office for Philadelphia in 1880: it lists only five employees for the company, reflecting the transfer of manufacturing to Mitchell, Vance, and Co. in New York around 1878 (see table 1). The firm became Cornelius and Hetherington in 1886 and Cornelius and Rowland in 1888 before finally dissolving in 1900.[123]

Baker, Arnold, and Co., the other offshoot of Cornelius and Baker, occupied the former showroom of Cornelius and Baker on Chestnut by August 1870.[124] A few zinc statuettes inscribed "BAKER. ARNOLD & CO./ PHILADELPHIA" are known in private collections, making clear that the company continued casting in zinc. Theatrical themes were popular, including the actor E. A. Sothern dressed as *Lord Dundreary* in *Our American Cousin* (1858) and *J. S. Clarke as Toodles,* a role he performed at Edwin Booth's theater in the eponymous play in 1870. The company exhibited at the Centennial Exhibition in 1876 but did not continue for long thereafter, being last listed in *McElroy's Philadelphia Directory* in 1878.[125]

Gas-Fixture Competitors

During the 1840s, Cornelius and Sons' chief rival in Philadelphia was the firm of Archer and Warner, which became Archer, Warner, Miskey, and Co. in the mid-1850s; Warner, Miskey, and Merrill in 1859; and Miskey, Merrill, and Thackera in 1867. Its production included chandeliers and other fixtures similar to Cornelius and Baker's, but its only known zinc work of art is a bust of *Patrick Henry.*[126] An *Eagle* cast in bronze by Archer, Warner, Miskey, and Co. seems to have been made in competition with the *Hunter* and *Indian* cast by Cornelius and Baker for the same House of Representatives' clock in 1858 (see fig. 18). Moreover, the firm's

[120] Entry for Cornelius and Baker, January 6, 1877, Philadelphia, vol. 133, p. 266 a/11, R. G. Dun & Co. Collection, Baker Library Historical Collections, Harvard Business School.

[121] Advertisements for Cornelius and Baker first appeared in the *Philadelphia Inquirer* on December 18, 1863, and continued sporadically in 1864, probably on account of the ongoing Civil War. They reappeared frequently in late 1868 and early 1869. After the firm dissolved in 1869, Cornelius and Sons advertised in nearly every issue until the end of 1871, when it ceased altogether. The Cornelius and Sons advertisements invariably note that there is no longer a store on Chestnut Street, premises then occupied by Baker, Arnold, and Co. Advertisements for the company appeared in the *American Gas-Light Journal* only from December 1, 1859, through 1862, except for nearly half-page notices at the inception of Cornelius and Sons on August 16, 1870, and October 17, 1870.

[122] Baker, Arnold, and Co., the other offshoot of Cornelius and Baker along with Cornelius and Sons, was mentioned third. US Centennial Commission, "General Report of the Judges of Group XIV," in *International Exhibition, 1876* (Washington, DC: Government Printing Office, 1880), 5:649. Additional laudatory comments about Mitchell, Vance, and Co. are cited in Denys Peter Myers's introduction to Mitchell, Vance, and Co.'s *Picture Book,* iv, v.

[123] Myers, *Gas Lighting,* plate 74.

[124] "Gas Fixtures, &c.," advertisement for Baker, Arnold, and Co., *Philadelphia Inquirer,* August 23, 1870, 8.

[125] A photograph of Baker and Arnold's display at the Centennial Exhibition is in the Centennial Exhibition Digital Collection (co21782) at the Free Library of Philadelphia, accessible at http://libwww.freelibrary.org/CenCo.

[126] William Kloss, *Art in the White House: A Nation's Pride* (Washington, DC: National Geographic Society, 1992), 352. The bust was donated to the White House by Mrs. William S. "Babe" Paley.

French-born sculptor and founder Edmond Baudin modeled the beautiful and elaborately sculpted bronze railings for the staircases at the US Capitol in 1858–59. Nevertheless, census records in 1860 show its total sales at only about one-quarter those of Cornelius and Baker.[127]

Two New York–based lighting companies—Archer and Pancoast Manufacturing Co. and Mitchell, Vance, and Co.—had connections with Cornelius and Baker and seem to have taken over where the company left off in making zinc decorations for gas fixtures.[128] Census records show that production of New York City gas-fixture establishments rose to more than $2.5 million in value in 1880, while dropping to $400,000 in Philadelphia and to just $5,500 at Cornelius and Sons (see table 2).

The Archer and Pancoast Manufacturing Co. seems to have been a competitor of Cornelius and Sons. Ellis P. Archer surely knew the work of Cornelius and Baker from his days in Philadelphia at Archer and Warner, located just three doors away from Cornelius and Baker's showroom.[129] Archer left Philadelphia for New York in 1859, first forming Archer, Pancoast, and Co. and then Archer and Pancoast Manufacturing Co. by 1868.[130] The company's production of statues in zinc seems to have been relatively limited, but a pair of knights on standards was displayed by the company among chandeliers at the Centennial Exhibition in Philadelphia.[131] In an undated catalog from the 1870s, polychromed Sir Walter Raleigh–type figures and a female vase bearer appear on newel lights. A bronzed putto is featured on a standard, and smaller figures appear on cigar lighters.[132]

Mitchell, Vance, and Co., established in 1860, was the larger and apparently more successful of the two New York companies. Its factory took up an entire Manhattan block, and the company was the most consistent of gas-fixture companies advertising in the New York–based *American Gas-Light Journal* during the 1860s and 1870s.[133] To some extent, it played the role of successor to Cornelius and Sons following its acquisition of "all the patterns and designs" when the firm ceased manufacturing in 1878 and its agreement to continue their production. As noted above, the company's ca. 1877 catalog illustrates a number of statuettes similar to those of Cornelius and Baker.[134] In the 1870s, Mitchell, Vance, and Co. expanded products to include clocks, which are illustrated in literature about the company and for which it made movements as well as statuettes.[135] Decorations for clocks are an area into which Cornelius and Baker is not known to have ventured, although the company's statuettes would have been suitable for them. The probable reason is that clock production was still concentrated in Connecticut during the heyday of Cornelius and Baker. Mitchell, Vance, and Co.'s foray into this business no doubt occurred in part because of its proximity in New York during the 1870s to the American Clock Co., which served as an agent for the Connecticut clockmakers.[136]

[127] In 1860, the annual value of products for Warner, Miskey, and Merrill was listed as $225,000, compared to $1,000,000 for Cornelius and Baker. US Census, Manufacturing Schedule for Philadelphia, 1860, accessed at the National Archives, Washington, DC.

[128] Some fixtures sold by these companies were made of copper alloys, but less expensive items were cast in zinc. A Centennial Exhibition report describes Mitchell, Vance, and Co.'s bronze fixtures as "both real and spelter," while Asher and Adams describes the company's products as "both Real and Imitation Bronze." US Centennial Commission, "General Report," 6:684; Asher and Adams, *Asher and Adams Pictorial Album,* 133. Archer and Pancoast's imitation-bronze manufacture is attributed to the inception of domestic zinc smelting in 1860, which likely reduced the cost of zinc. Asher and Adams, *Asher and Adams Pictorial Album,* 49.

[129] Archer, Warner, Miskey, and Co. is pictured at 718 Chestnut in *Baxter's Panoramic Business Director of Philadelphia for 1859,* while Cornelius and Baker is at 710 Chestnut. Copies of this illustration are found in collections at the Library Company of Philadelphia and Historical Society of Pennsylvania.

[130] The company is listed as the Archer and Pancoast Manufacturing Co. in an advertisement in *American Gas-Light Journal* 10 (October 16, 1868): 121.

[131] Phillip T. Sandhurst, *Industrial and Fine Arts,* 291, 293; Asher and Adams, *Asher and Adams Pictorial Album,* 49.

[132] A copy of the undated catalog can be seen in the Print Study Room at the Metropolitan Museum of Art. A few pages are reprinted in Myers, *Gas Lighting,* plates 81, 83, and 85–86.

[133] Asher and Adams, *Asher and Adams Pictorial Album,* 85. Advertisements for Mitchell, Vance, and Co. appeared regularly in the biweekly *American Gas-Light Journal* from October 15, 1860 (vol. 2, no. 113), into 1864 and sporadically from 1865 through June 1867. They reappeared in every issue of the journal from January 2, 1869 (vol. 10, no. 201) through 1879. Archer and Pancoast advertisements appeared erratically from 1868 through 1875. See n. 121 for advertisements in the journal placed by Cornelius and Baker and Cornelius and Sons.

[134] See n. 76.

[135] Sandhurst's *Industrial and Fine Arts* illustrates seven clocks featuring zinc mounts and statuettes displayed by Mitchell, Vance, and Co.: a relatively plain clock (145) and clocks topped by a female figure flanked by putti and accompanied by a pair of urns (280), Diana (282), Art (283), a bust of Shakespeare (285), Nike on a wall clock (286), and Vanity (287); a pedestal with classical reliefs topped by a vase is also illustrated (288). An illustration identical to the clock on page 280 in Sandhurst's *Industrial and Fine Arts* appears on the page describing the American Clock Company in Asher and Adams (*Asher and Adams Pictorial Album,* 85), which features five additional clocks with zinc figures. Records of the R. G. Dun and Company note that Mitchell, Vance, and Co. also made wall-clock movements. Entry for Mitchell, Vance, and Co., April 2, 1872, New York, vol. 323, p. 842, R. G. Dun & Co. Collection, Baker Library Historical Collections, Harvard Business School.

[136] The relatively short-lived American Clock Company purveyed clocks in New York for Connecticut clockmakers such as Seth

In addition to statuettes, both New York–based firms seem to have produced many more statues of larger size than did Cornelius and Baker. On account of their size, they were almost certainly sand cast, including a pair of life-size Indian standards exhibited at the Centennial Exhibition in Philadelphia (fig. 27).[137] An interesting footnote is that both New York companies purchased models for zinc statues from sculptors Olin Levi Warner and Truman H. Bartlett.[138]

Change in Style

During the 1850s, romantic neorococo interior décor featuring elaborately decorated Belter furniture fit with multifigured chandeliers and statuettes of Cornelius and Baker, and to some extent this style continued into the 1860s. In the 1870s, however, neo-Grec and Eastlake styles became fashionable, and only the odd neoclassical griffin or similar decorations interrupted their geometric lines. Gas-fixture catalogs issued from the 1870s onward

Fig. 27. Mitchell, Vance, and Co., Indian Warrior. Zinc; H. 82″ to burners. From Phillip T. Sandhurst, *Industrial and Fine Arts of the World: As Shown at the Philadelphia and Other International Exhibitions* (Philadelphia: Ziegler, 1879), 142.

Thomas and Sons, which retailed some of the same clocks as Mitchell, Vance, and Co. In 1876, Mitchell, Vance, and Co. was located at 581 Broadway, while the American Clock Company was close by at 597 Broadway.

[137] The Indian Warrior and its mate, an Indian Queen, are illustrated in Mitchell, Vance, and Co.'s *Picture Book,* plate 57. The Indian Warrior is the only statue illustrated in a Mitchell, Vance, and Co. catalog entitled *Centennial 1776* (1876), decorating its cover; the catalog can be seen in the Print Study Room at the Metropolitan Museum of Art. Images of the Indian Warrior can also be seen in Sandhurst's *Industrial and Fine Arts,* 142, and in Asher and Adams, *Asher and Adams Pictorial Album,* 85. An *Indian Queen* without lights is in the collection of the Merritt Museum in Douglassville, PA, as well as a private collection. Ralph Sessions, *The Shipcarvers' Art: Shop and Cigar Store Figures in America* (Ann Arbor, MI: Bell and Howell Information and Learning Co., 2000), fig. 90. Newel post figures sold by these companies measure 3–4 feet in height. They are likely copies of French statues, since it was noted that "the Bronzes, especially the large pieces which are copied from the French, are the best productions of the country." Advertisement for Mitchell, Vance, and Co., *Harper's Weekly,* suppl. (August 3, 1872), 616.

[138] Mitchell, Vance, and Co. purchased a statuette of *Abraham Lincoln* (1877) by Truman H. Bartlett (1835–1923) from the sculptor, but it has not been found in the company's catalogs, and no copies of it have been located. Anne Pingeot, "The Paris Salons of the 1870s: Entries for Exhibited Works," in *Rodin Rediscovered,* ed. Albert E. Elsen (Washington, DC: National Gallery of Art, 1981), 309–10. Archer and Pancoast purchased a figure of *May* (1872) from Olin Levi Warner (1844–1896) for casting in zinc and incorporation in a lamp. Warner was to get $5 for each of the first fifty copies. George Gurney, "Olin Levi Warner (1844–1896): A Catalogue Raisonné of his Sculpture and Graphic Works" (PhD diss., University of Delaware, 1978), 262–67. A copy of the statue recently turned up in a private collection in Nevada. George Gurney, deputy chief curator, Smithsonian American Art Museum, personal communication, October 20, 2005.

limited figures to a few table lamps, standards, and cigar lighters. Brass became dominant again for lighting fixtures, perhaps because its advantages over zinc were better recognized. On account of zinc's tendency to crack, the elaborately decorated and thickly cast trough-type arms of zinc fixtures still had to be fitted with brass tubing to reliably supply gas, creating redundancy. Brass arms of chandeliers, by contrast, could be trusted to transport gas. As a result, brass chandeliers would likely have been easier to make, and the resulting reduction of metal meant that they could be lighter in weight.[139]

Gas chandeliers became obsolete as electricity became available at the end of the nineteenth century. During the first half of the twentieth century, elaborately decorated chandeliers failed to match interiors of houses built in the craftsman, the perennially popular federal, the clean-lined art deco, or finally the minimalist modernist style. Much of what was considered the geegaws of the Victorian era was taken to the junkyard or collected during wartime scrap-metal drives. The principal exceptions occurred in more conservative and impoverished parts of the country, where gas fixtures were instead converted to electricity. Even after the replacement of original fixtures at the Vermont State House during the 1960s, many were carefully stored and now grace the building again. A number of original chandeliers, now electrified, continue to light plantation houses in the deep South.

Finally, the decline in the desirability of one material imitating another may have contributed to the demise of zinc: "It is a good sign that at the present time the national taste is setting in the direction of plain metal work. Brass is finished as brass, iron as iron, copper as copper, showing the repugnance felt by people advancing in artistic taste to the shams and paints and varnishes which a past generation endured."[140] Zinc continued to be used, however, for the decoration of clocks and simpler elements of ordinary lamps well into the twentieth century.

Conclusion

Cornelius and Baker, the most influential gas-fixture company in the United States during the 1850s and 1860s, also produced high-quality zinc statuettes, such as Clark Mills's *Andrew Jackson on Horseback* and William Rinehart's 3-foot-high statues of a *Hunter* and *Indian.* Other statuettes were copied from French models but featured the standard romantic, neoclassical, and heroic American subjects salable by a commercial enterprise. They never reached the popularity of contemporary John Rogers's groups and were imitative and replicative. Nonetheless, the company's statuettes deserve a place in the history of American metalwork as part of an interesting development in technology: a new application of the slush-casting technique to the novel metal zinc. The statuettes were always painted, since the metal itself is an uninteresting dull gray, but imitation-bronze paint allowed many to be regarded as bronzes. Thus, the American middle class was provided with relatively inexpensive "bronze" statuettes for the first time. By the same token, paint effectively rendered the metal invisible and unknown. It is hoped that this article will succeed in bringing many more examples of zinc statuettes to light, making this little-known art form and cultural phenomenon more visible and appreciated in its own right.

[139] Myers, *Gas Lighting,* plate 63.

[140] The writer was English, but the sentiment applied in the United States as well. Arthur H. Hiorns, *Metal-Colouring and Bronzing* (London: Macmillan, 1892), 13.

Appendix

Table A1
Cornelius statuettes

Statuette	TN Capitol (1855)	Franklin catalog (1857)	Franklin catalog (1858)	US Capitol Senate chandeliers (1858)	OH Capitol (1858)	VT Capitol (1859)	US Capitol Pres. chandelier (1863)	C&S catalog (HSP) w/price list (1875)	C&S catalog (SI) (ca. 1876)	Mitchell, Vance catalog (ca. 1878)	Private/ museum collections
America (Indian), H. 22½″ (fig. 21)	xx				x		x				xxxx
Andrew Jackson on Horseback, H. 2′ (fig. 10)											20+
Antique			rl								
Armor (fig. 9)		ch	rl, ch	x*							x*
Barge of Cleopatra		br									
Benjamin Franklin		rl, ch				xx	x			#0108	x
Boy Playing Flute (fig. 19)							x	#4330			
Brigand		rl									
Buffalo	x	st									
Castellated		br									
Chinese Juggler							x				
Chinese (seated), H. 5⅞″		ch	rl							#0534 x*	x*
Christopher Columbus					x						
Commerce					x	x					
Dancing Figure		ch					x*				
Departure (p/w *Return*), H. 13¼″, 13½″ (fig. 25)			rl, st			x					xxxx
Eagle		br			x*	x*					
Eloquence						x					
Elizabethian [*sic*]			br, ch								
Été (*Summer*, fig. 19)								#4936			
Falconer (or *Hawker*)									#6684		
Fiddler (seated)											x
Fireman			br, st, ch								x
Fisher with Net							x				
Freedom Triumphant in War and Peace, after Thomas Crawford						x					x
Gaul									#7740		
George Washington		rl				xx	x				
Girl Playing Autoharp							x				
Globe and Books		st									
Grecian (fig. 19)			rl					#5684			

Table A1—*Continued*

Statuette	TN Capitol (1855)	Franklin catalog (1857)	Franklin catalog (1858)	US Capitol Senate chandeliers (1858)	OH Capitol (1858)	VT Capitol (1859)	US Capitol Pres. chandelier (1863)	C&S catalog (HSP) w/price list (1875)	C&S catalog (SI) (ca. 1876)	Mitchell, Vance catalog (ca. 1878)	Private/ museum collections
Greek Slave, after Hiram Powers						xxxx					
Griffin		br, ch									
Hawker (or Falconer)			rl			xx*	x*			#078	
Herald, H. 12⅜″ (figs. 15, 19)			rl			x		#2288		#0112 #0968	xx
Highlander (p/w *Zouave*)		br, ch, st	st				x*				
Hiver (Winter; fig. 19)						x		#4934		#0838	
Horse Grooming											x
Horse Prior			st								
Hunter, Western, H. 29″		ch									x*
Hunter, Rinehart (p/w *Indian*), H. 40½″ (cf. fig. 18)		rl	st			x					x
Indian, Rinehart (p/w *Hunter*), H. 3′ (cf. fig. 18)			rl, st			x					x
Indian (or Asian) Male with Jug							x				
Indian Maiden						x					
Joan of Arc, H. 16¼″											x
Knight (fig. 19)		rl						#5678*		#0882*	
Knight, H. 11½″		rl									x*
Knight		rl									
Laughing Man, H. 6¾″, 7″											xx
Laughing Satyr, Antique		br									
Lexington with Gilpatrick Up, H. 13½″											x
Liberty, with freedom cap and Washington relief, H. 18¾″ (fig. 23)					x*						xx
Mercury, after Giambologna		ltp, st				xxx				#0962 #1550	xxxx
Minuteman (Green Mountain Boy)						xx					
Morning			ltp								
Night			ltp								
Old Man		cl									
Old Mortality, H. 5⅛″											x
											x

Table A1—*Continued*

Statuette	TN Capitol (1855)	Franklin catalog (1857)	Franklin catalog (1858)	US Capitol Senate chandeliers (1858)	OH Capitol (1858)	VT Capitol (1859)	US Capitol Pres. chandelier (1863)	C&S catalog (HSP) w/price list (1875)	C&S catalog (SI) (ca. 1876)	Mitchell, Vance catalog (ca. 1878)	Private/ museum collections
Organ Grinder, H. 11⅛″ (fig. 17)											
Oriental Girl						x					
Page			rl								
Prudence (p/w *Science*; figs. 21, 22)		br				x	x				
Puppeteer, H. 12″											x
Putto with Wheat (Summer?)							x				
Renaissance Courtier									#7348		
Return (p/w *Departure*), H. 12¼″, 12¾″ (fig. 20)			rl, st			x					xx
Revolutionary Soldier						xx				#098	
Richard Coeur de Lion (Crusader?)			rl	x*							x*
Richmond			rl			x*					
Russian Hussar (fig. 19)			st					#6686*			
Samuel de Champlain (fig. 19)								#3346			
Science (p/w *Prudence*)		br			x	x*					
Simon Kenton (figs. 21, 22)					x		x				x
Stag		st	br							#0902*	
Standard Bearer			rl			x*					
Tamborine		rl					x*				x*
Warrior		ch	3 rl								
William Penn						x					
Water Carrier		rl									
Woman (nude) with Dove						xx					
Zouave (p/w *Highlander*), H. 16¼″ (fig. 16)		st	st								xx

Note.—Names in italics are confirmed by recognizable features (e.g., George Washington), contemporary literature, or an inscription on the statuette; those in roman type are assigned by the author. Asterisks indicate uncertainty for examples named but not illustrated in the literature. Abbreviations: HSP = Historical Society of Pennsylvania, SI = Smithsonian Institution, x = a known example, rl = reading light, st = statue, br = bracket, ch = chandelier, ltp = light pillar, cl = cigar lighter, p/w = paired with.