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CHAPTER 3

Brumidi's Painting Techniques

Constantino Brumidi used a number of specialized painting techniques and sophisticated artistic skills to express his artistic vision in the Capitol (fig. 3-1). Knowledge of the variety of Brumidi's painting media and procedures has greatly increased from observations made during the course of recent conservation treatments that removed layers of varnish and overpaint and through scientific analysis of materials. However, research and analysis are ongoing.¹

Brumidi was trained in a variety of disciplines at the Accademia di San Luca; his son described him as "artist, sculptor, architect."² Brumidi himself described to a reporter his thorough academic training: "'In Europe one studies as one does not study in America,' with an eloquent Italian shrug that disposed of American art-training. 'I studied fourteen years. I worked at Rome. In the great schools a boy begins young; he has great works to copy. He works all day and every day. It is the right way.'"³ As a student he would have had courses in geometry, history, and mythology. He copied drawings, drew and modeled copies of classical sculpture, and copied paintings by others. Working from a live model was highly desirable, and Brumidi once signed a petition to the academy requesting one. Knowledge of how to render forms with light and shade, command of the human figure, and understanding of how to compose

groups of figures were essential. Brumidi developed a high level of skill in these areas and won awards in student competitions for copying antique sculpture and paintings by others.⁴

The Technique of True Fresco

In order to paint in the classical tradition, Brumidi had to master a variety of painting media, particularly the difficult medium of true fresco, called *buon fresco* in Italian. The Capitol is the major building in the United States decorated in true fresco. Although in nineteenth-century America the word "fresco" was sometimes loosely used to mean wall painting in general, Brumidi believed that he created "the first specimen of real fresco introduced in America," and he was the only artist working in the United States in the 1850s and 1860s known to be capable of executing a true fresco painting.

Brumidi described the technique as follows:

Fresco derives its name from fresh mortar, and is the immediate [*sic*] and rapid application of mineral colors, diluted in water, to the fresh mortar just put upon the wall, thereby the colors are absorbed by the mortar during its freshness, and repeating this process in sections day by day, till the entire picture will be completed [*sic*].

This superior method [*sic*] is much admired in the celebrated works of the old masters, and is proper for historical subjects, or Classical ornamentations, like the Loggia of Raffael at the Vatican.⁵

Fresco, used for murals in ancient Rome, became prominent again in the Renaissance and reached a height

Fig. 3-1. The President's Room. *In the Capitol, Brumidi employed the full range of painting techniques he had learned in Rome to create rich and impressive settings for important legislative functions. Here the mural techniques include (1) true fresco, (2) tempera, (3) oil, (4) lime wash fresco, and (5) gold leaf. S-216.*



Fig. 3-2. An unusually prominent *giornata*. Because Brumidi cut out and replaced the section of mortar containing the head of Executive Authority, the join was unusually prominent, especially before conservation. S-216.



Fig. 3-3. *Giornate* in Executive Authority. The sections of mortar applied each day usually followed outlines of the forms and varied in size according to the amount of detail to be painted. S-216.

of perfection with Raphael and Michelangelo in the early sixteenth century. The Baroque painters of the seventeenth century applied pigment more thickly, using more vigorous, textured brushwork on rougher mortar, and it was this version of fresco that was revived in early nineteenth-century Rome and taught to Brumidi. (A century later, in the 1930s, fresco was again revived and used for a number of murals in the United States.)

True fresco entails the application of pigments dispersed in water to fresh, damp mortar (often referred to as plaster) composed of lime (calcium hydroxide) and sand. The wall is first prepared with a rough coat of mortar (*arriccio*). The pigment is applied to the second finish coat (*intonaco*), which is applied in sections over the *arriccio* by a mason. Each section of *intonaco* is called a *giornata*, the Italian word for day's work, because the painting on each section of *intonaco* has to be completed in a single day, before the mortar has set—that is, while it is still fresh, or *fresco* in Italian. The joins between the *giornate* are normally discernible only in raking light or on close-up inspection of the surface (fig. 3-2). The mason needs to mix the ingredients consistently and be careful not to splash on the sections already painted.

The very considerable technical difficulties of executing true fresco become evident when one considers that a fresco painter like Brumidi is really constructing a com-

plex but precise monumental work of art like a puzzle, piece by piece, *giornata* by *giornata* (fig. 3-3). This painted puzzle must be so accurately planned and executed that the parts will blend together and that it will be possible to create forms that appear to be components of their architectural environment.

As the mortar sets, or cures, it is transformed from calcium hydroxide to calcium carbonate by combining with carbon dioxide in the air, becoming rock hard in the process.⁶ The pigments are incorporated into the crystalline structure of the calcium carbonate, resulting in a mural painting that is essentially as durable as the wall itself. The fresco painter sometimes mixes the pigments with a fine lime paste to create a paint with a thicker consistency, called “*impasto*,” that is raised from the surface of the wall, and often uses a rougher surface, with larger grains of sand. Reflective flecks of mica in the sand can be seen on close inspection of many of the Capitol frescoes. This baroque technique is often seen in Brumidi's frescoes. In his frescoes, he often modeled or shaded forms with hatched lines, to create a sculptural effect while retaining a sense of transparency in his colors (fig. 3-4).

Because the surface of the mortar is wet when the paint is applied, in the best fresco technique the brush strokes are not reworked, as is done in oil painting, because the surface of the mortar would become muddy. Instead,



Fig. 3–4. Detail of fresco. *On close inspection, one can see the rough mortar, Brumidi's strokes of thick pigment, and his use of parallel hatched or crosshatched lines for shadows in this cherub's face. S-216.*

Photo: Cunningham-Adams.

each brush stroke must be decisive and complete in order that the painting maintain its freshness, clarity, and luminosity. In addition, the brushwork must be bold and expressive in order to project vitality and three dimensionality from the great distance at which frescoes are normally viewed. At very close range, therefore, many well-executed frescoes have a choppy, sketchy appearance that translates into dynamic vitality from a distance.⁷

In addition to the need to work rapidly, the fresco painter faces other constraints. First, the fresco palette is limited to those few pigments that can withstand the corrosive high alkalinity of the lime mortar. These include the earth pigments, such as indian red, earth green, various ochers, siennas, and umbers, as well as some artificial colors, such as smalt, cobalt, or ultramarine blue. Second, major mistakes cannot be corrected by covering over with new paint. Thus, a flawed *giornata* must be chipped off the wall and a new one inserted by applying a new section of mortar, which is then painted correctly. Finally, the artist has to be able to judge how much the colors will lighten as they dry. All these difficulties of execution are rewarded by the result, a durable monumental painting of great luminosity and subtle color.

Before beginning a monumental fresco, a painter like Brumidi must analyze and sketch the architectural space and sources of light. For example, Brumidi often created figures that appear to be lighted from the windows in the room. Next he developed and sketched the overall composition of the murals for a room, showing how the frescoes fit into the architectural and decorative elements (fig. 3–5). He then conceptualized the overall composition and coloring of each individual fresco on a preparatory painting, usually a precisely executed small-scale color

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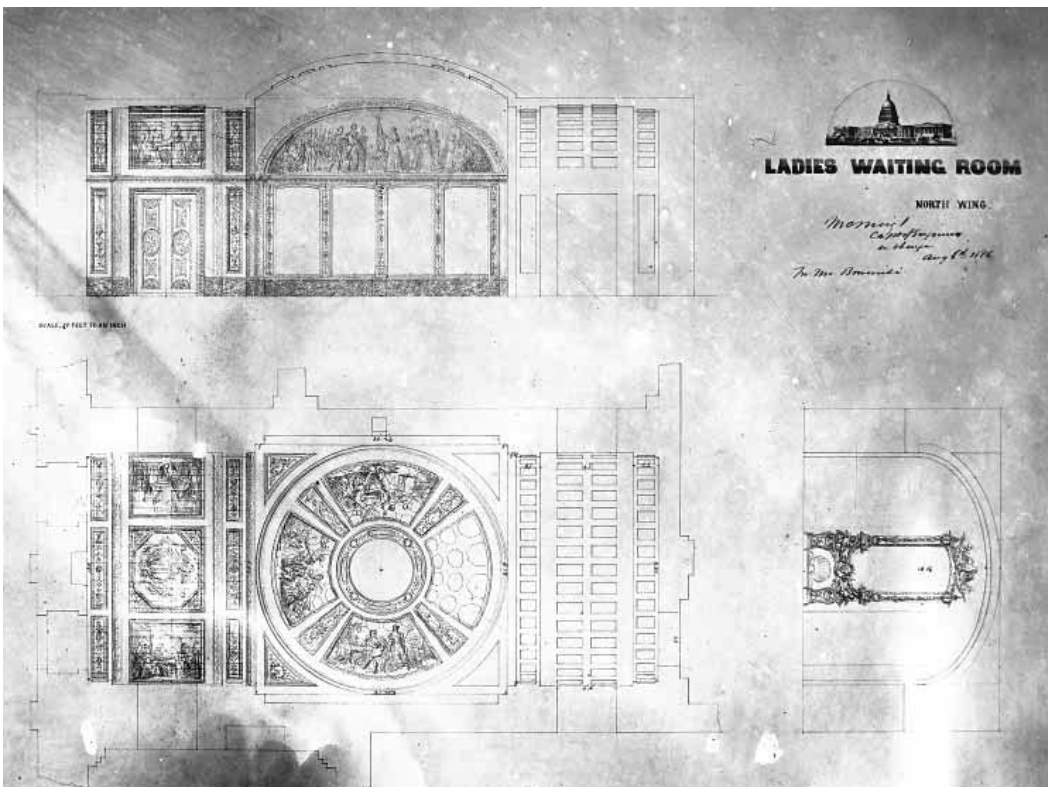


Fig. 3–5. Design for the Ladies Waiting Room. *Brumidi worked out details for murals and decorations in pencil sketches such as this one. The scenes he proposed in 1856, but never executed, featured heroines of the American Revolution such as Betsy Ross and Molly Pitcher. This sketch includes a design for an ornate mirror frame.*



Fig. 3-6. Preparatory oil sketch for Senate Military Affairs Committee room. *Brumidi's small paintings included all of the essential elements for his frescoed lunettes.* Estate of Edna W. Macomb.

Photo: Diplomatic Reception Rooms, U.S. Department of State.



Fig. 3-7. Detail of cartoon for maiden with pearls. *This photograph is the only known image of one of Brumidi's full-size cartoons for the Capitol. The outlines were transferred to the wall by spolvero, dots made by dusting powdered charcoal through pinpricks.* Architect of the Capitol.

sketch in oil or watercolor, which would usually be submitted for approval. A number of his sketches for Capitol murals are known (fig. 3-6). The preparatory painting was then divided into sections. Brumidi had to know how to enlarge the preparatory painting to fit the exact dimensions of the wall, while simultaneously dividing the overall composition into sections for systematic transfer to, and execution on, the individual *giornate*. The composition of each section was enlarged as a drawing on pieces

Fig. 3–8. Details showing types of guidelines made in the wet mortar.

- a. *Incisione*, outlines incised with a sharp instrument around Columbus's compass;
- b. *Puntini*, an outline of small holes made with a spiked wheel in the knee of Legislature; and
- c. *Spolvero*, a dotted outline made by dusting powdered charcoal through pinpricks in the cartoon around the head of a cherub. S-216.

Photo: Cunningham-Adams.



a. *Incisione*



b. *Puntini*



c. *Spolvero*

of heavy paper, to the exact scale of execution. These 1:1 scale drawings are known as cartoons. For large compositions, Brumidi made half-scale cartoons and then enlarged the figures to full size in what he called “working drawings.”⁸ Unfortunately, none of his cartoons is known to have survived, although the image of one was preserved in a photograph (fig. 3–7).

The appropriate cartoon is tacked in place over the damp *giornata*. The outlines of the composition are transferred to the *giornata* by incising the cartoon with a stylus to leave indented guide-lines (*incisione*), by perforating the outlines of the cartoon with a spiked wheel to leave a line of points (*puntini*), and/or by pouncing through the line of perforations with a colored powder to leave a colored dotted line (*spolvero*). These three types of transfer lines are all visible with close-up inspection in Brumidi's murals in the Capitol (fig. 3–8). When the outline is transferred, the artist begins the actual painting of the composition, using the preparatory painting as his guide. Brumidi would normally paint half a life-sized figure in a day, using brushes appropriate for the level of detail (fig. 3–9).

After the fresco dries, the artist may decide to apply some final details in colors that would react with the lime, using traditional water-borne tempera paints, oil paints, or gold leaf, applied on oil or glue adhesives (“sizes”). These are executed *a secco*, on a dry (*secco* in Italian) surface. Unlike true fresco, *a secco* details generally are fragile and poorly bonded to the mortar, and they are thus easily damaged by water or abrasion. The extent, if any, of Brumidi's application of *a secco* details to his frescoes is not yet clear.

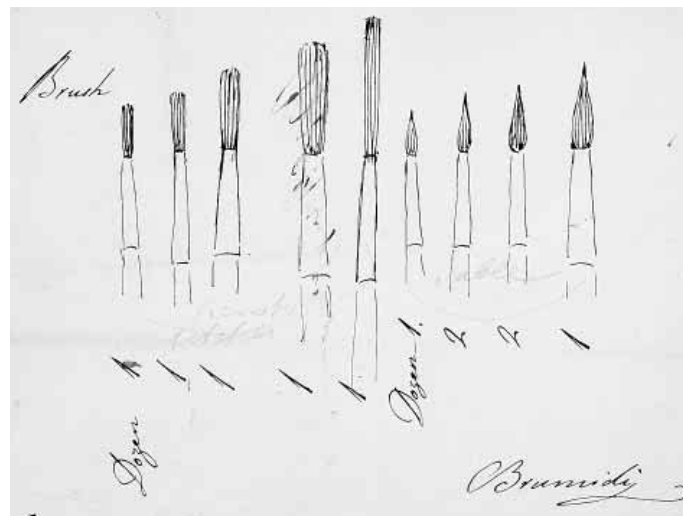


Fig. 3–9. Brumidi's sketch of brushes to be ordered. A variety of types and sizes of brushes, including French fitches and the tapered sable brushes specified here, were needed for the range of painting mediums used for the Capitol murals. Architect of the Capitol.

Other Mural Painting Mediums Used in the Capitol

A technique recently discovered to be part of Brumidi's repertoire is lime wash fresco, *fresco in scialbatura*, which is used to cover large surfaces of simple decoration. The extensive and repetitive decorative trompe l'oeil panels on the lower walls of the Brumidi Corridors and the President's Room (S-216) were executed in this technique (fig. 3-10). Assistants could quickly apply pigments mixed with water to a fresh lime wash brushed over a dampened *intonaco* to create the fields, borders, and basic forms. In this method, the *giornata* joins are not noticeable. In the Brumidi Corridors, the details of the birds, flowers, etc., were enhanced with more intense colors.⁹ Microscopic analysis shows that the wall is covered with several layers of smooth, colored plaster. This technique is more durable than tempera and can be painted efficiently by teams of painters.

Brumidi had extensive experience in Italy decorating walls and ceilings with tempera (often called "distemper" in the nineteenth century). The decoration of the theater at the Villa Torlonia in Rome, thought to have been directed by Brumidi, is executed primarily in tempera.¹⁰ Many of the ceilings and borders in the Capitol were painted in tempera by assistants from Brumidi's designs, with spaces left for Brumidi's true fresco figures and scenes.



Fig. 3-10. Detail showing lime-wash fresco. *The still lifes and illusionistic carved stone borders in the President's Room exemplify the delicate details and rich colors possible with this technique.* S-216.

Tempera is pigment mixed with a water-soluble binder or emulsion, such as the egg used in the Renaissance. In the Capitol, the binding medium was glue, explaining the large quantities of white glue listed on supply orders.¹¹ Tempera can be applied to dry plaster without the time constraints of true fresco, giving painters the leisure to work out details. It has a soft, matte surface. The velvety texture of the tempera is close to the appearance of fresco, so the difference in medium is indistinguishable at ordinary viewing distance (fig. 3-11). Unfortunately, tempera remains water soluble, so that it is sensitive to changes in humidity and can be inadvertently removed if someone tries to clean it with water.

Oil paint is composed of pigment mixed with linseed oil as a binder. It is commonly used for paintings on canvas, as Brumidi did for portraits and altarpieces, but it can also be applied to plaster, as he did for some of the murals in the Capitol (fig. 3-12). It is more durable than tempera, since it cannot be removed with water. The oil produces deeper, richer colors and a surface gloss. Since fresco was not transportable, Brumidi could have carried some rolled-up oil paintings, such as his *Martyrs in a Landscape* (fig. 3-13), to America, as proof of his painting skill.¹²

In many rooms in the Capitol, Brumidi orchestrated the use of multiple techniques to create the effect he desired. In most cases, he was so successful that the viewer is not aware of variations in painting medium.

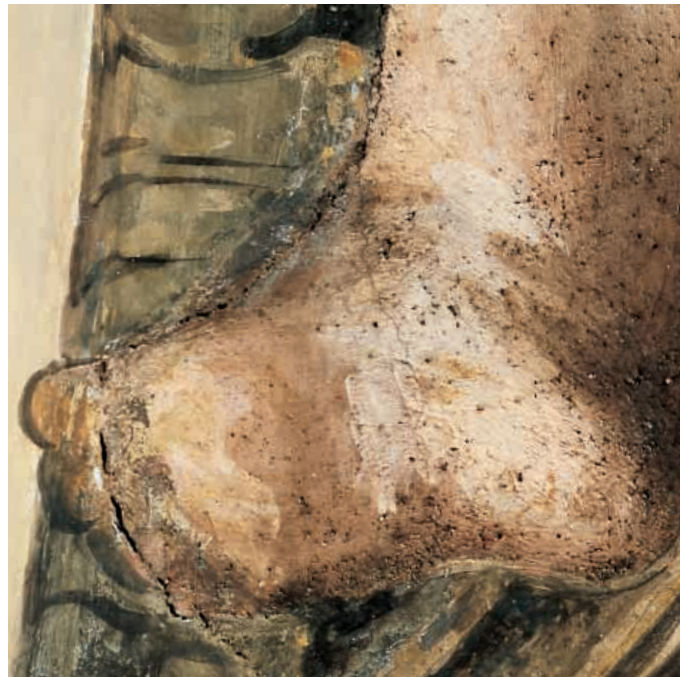


Fig. 3-11. Merging of fresco and tempera. *In this detail from the ceiling, Brumidi painted toes in tempera on the cherub's frescoed foot, a difference not perceptible from the floor.* S-216.

Photo: Cunningham-Adams.



Fig. 3-12. Cherub in lunette painted in oil on plaster. The rich color, soft modeling, and fine detail are characteristic of the oil medium. S-216.

Photo: Cunningham-Adams.



Fig. 3-13. *Martyrs in a Landscape.* This oil-on-canvas painting, which Brumidi is said to have brought with him from Italy, apparently depicts Early Christian martyrs. Architect of the Capitol.

Architectural Painting

In addition to his well-developed skill in working in various media, Brumidi was gifted in the use of rich color and in understanding how to depict forms in light and shade (fig. 3-14). The technique of creating the effects of light and shade and perspective to convince the viewer that he is looking at actual sculpture, paintings with carved frames, or figures floating on clouds, is called “trompe l’oeil,” French for “fool the eye.” His skill in creating trompe l’oeil effects was undoubtedly enhanced by his study of sculpture at the Accademia di San Luca. Brumidi’s only known sculptures are the four marble lunettes in low relief, two angels, and the crucifixion over the altar in the Weld-Clifford Chapel in the crypt of the Church of San Marcello al Corso in Rome (fig. 3-15). It is not known if Brumidi was responsible only for the design, or if he modeled or carved the sculpture as well.¹³



Fig. 3-14. Sketch from Brumidi’s album. This classical figure with leaves instead of legs, perhaps copied from a relief in Rome, uses light and dark to give a three-dimensional effect. Library of Congress.

Photo: Library of Congress.



Fig. 3-15. *Pietà*, one of four marble relief lunettes by Brumidi for a subterranean chapel. The figures are gracefully balanced within the semicircular shape, a skill Brumidi would use later in the lunettes in the Capitol. Weld-Clifford Chapel, Church of San Marcello al Corso, Rome.

Photo: Vasari Studio Fotografico. Courtesy of Henry Hope Reed.

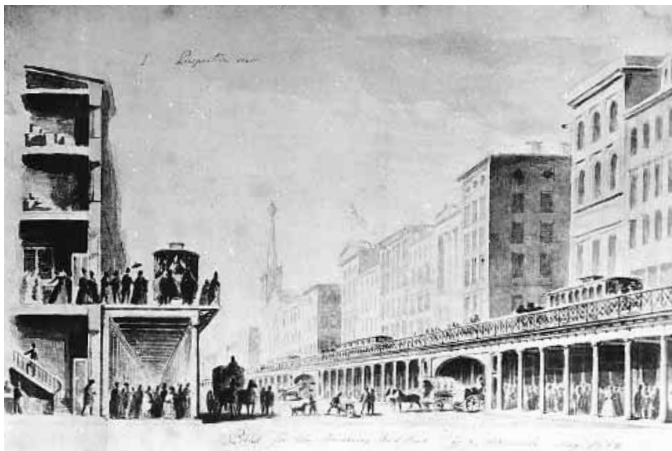


Fig. 3-16. *Project for the Broadway Rail Road, 1862*. This pencil drawing is the only one that has survived of this project, and it hints that Brumidi may have been involved in urban planning. Athenaeum of Philadelphia.

Photo: Athenaeum of Philadelphia.

In the Capitol, he merely sketched a preliminary design for the Brumidi Staircases.

Although there is no evidence that Brumidi ever carried out architectural work, his understanding of the dynamics of architectural space is evident in his designs for the Capitol. This mastery was grounded in his work in Rome, which included the decoration of rooms in the Palazzo Torlonia (see chapter 2). His one known Italian architectural project is a proposal made in 1846 for a grandiose new avenue from the Quirinale to the Vatican, which included the construction of a monumental bridge and a triumphal arch in honor of Pius IX.¹⁴ The only evidence of Brumidi's interest in urban planning in the United States is a proposal, dated May 1862, for an elevated railroad on Broadway in New York City, which was found among the papers of the Architect of the Capitol Extensions and Dome, Thomas U. Walter (fig. 3-16). Brumidi's knowledge of sculpture and architecture enhanced his ability to visualize three-dimensional forms in space and paint them convincingly on flat surfaces within a harmonious whole, thus fooling our eyes into believing we are seeing sculpture and moldings projecting from flat walls (fig. 3-17). His arrival in the United States in 1852 was at a fortunate moment for his career. Only a year earlier, work had begun on the enlargement of the United States Capitol.



Fig. 3–17. Example of trompe l'oeil. *Through his understanding of light and shade, Brumidi created the illusion of carved molding, a framed oil painting, and figures and objects on a ledge. In actuality only the gilded molding over the curved door is three dimensional. S–216.*

The building's neoclassical architecture provided a most appropriate context for the classically based style of painting Brumidi had learned in Rome, and its masonry construction created natural fields for a fresco painter.

Notes to Chapter 3

1. The section "The Technique of True Fresco" was largely written by Constance S. Silver. She, Christiana Cunningham-Adams, Bernard Rabin, and Catherine S. Myers have each separately conducted scientific analysis along with their conservation of Brumidi's murals in the Capitol. The most comprehensive publication on mural techniques is Paolo Mora, Laura Mora, and Paul Philippot, *Conservation of Wall Paintings* (London: Butterworths, 1984).

2. Laurence Brumidi, "History of the Frieze in the Rotunda of the U.S. Capitol, Washington, D.C.," c. 1915, p.3, AOC/CO.

3. "Brumidi's Life Work," *Washington Post*, April 11, 1879, p.1.

4. Records of 1821, 1822, and 1823 prizes and 1823 student petition, Accademia di San Luca, Archivio.

5. CB, "Relative to his Employment at the Capitol," November 30, 1874, AOC/CO.

6. To create lime, limestone (CaCO_3) is dissociated by heat in kilns. Carbon dioxide is released, producing quicklime ($\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$). When water (H_2O) is added to the powdered quicklime, a paste of slaked lime, calcium hydroxide (Ca(OH)_2) is formed. The *intonaco* is made of slaked lime mixed with sand in a ratio of 1:3. During drying,

the calcium hydroxide reacts with carbon dioxide to re-form calcium carbonate ($\text{Ca(OH)}_2 + \text{CO}_2 = \text{CaCO}_3 + \text{H}_2\text{O}$).

7. Christy Cunningham-Adams, "Conservation Treatment Report: U.S. Capitol, President's Room Ceiling," 1995, p. 18, AOC/CO.

8. MCMJ, April 18, 1855 (A–527); "Brumidi's Life Work," p. 1.

9. Christy Cunningham-Adams, "Brumidi Corridors Restoration Plan," January 4, 1994, AOC/CO, and Mora et al., "Conservation of Wall Paintings," p. 11.

10. Conversation with Alberta Campitelli, Curator of the Villas of Rome, August 16, 1994, and her article on the restoration, "Il programma di restauro di Villa Torlonia: primi interventi," in "Villa Torlonia," *Ricerche di Storia dell'arte*, n. 28–29 (1986), pp. 182–223.

11. Supply orders for Brumidi, 1856–1863, AOC/EXT.

12. The painting was donated by Zeake Johnson, former Sergeant-at-Arms of the House of Representatives, in memory of his wife Theodosia McK. Johnson. She purchased the painting from Mrs. Elaine Hale Blair of Washington, D.C., in 1959. Mrs. Blair's father had purchased this painting and an *Adoration of the Madonna and Child* from Brumidi, who had brought them with him from Italy, according to memos to the file written in 1959 and 1960, AOC/CO.

13. Alberta Campitelli and Barbara Steindl, "Costantino Brumidi da Roma a Washington. Vicende e opere di un artista romano," *Ricerche di Storia dell'arte: Pittori fra Rivoluzione e Restaurazione*, n. 46 (1992), pp. 49–59, and Maria Sofia Lilli, *Aspetti dell'arte neoclassica: Sculture nelle Chiese romane 1780–1846* (Rome: Istituto Nazionale di Studi Romani, 1991).

14. Campitelli and Steindl, "Constantino Brumidi," pp. 50–54.