Negotiating Value:
Contemporary Practices in the Restoration of Art

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Introduction: The History, Science, and Ethics of Art Restoration

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> "Conservation is an invasive, delicate process… The goal is to put off what may be inevitable for as long as possible."[1]
>
> \- Corey D'Augustine, Conservator, MoMA

When a conservator looks at work of art she opens a dialogue between the work and her eye. Conservator M. Kirby Talley Jr. argues that as much as one may try to keep bias away from this dialogue, this is in fact, not possible. Talley, founder of the State Training School for Restorers in the Netherlands, emphasizes that if we look at a work of art primarily as a source of information rather than as an aesthetic object, we are approaching it with prejudice. Examining a work of art is difficult because unlike utilitarian objects, which are tangible, "works of art have something intangible, something immaterial about them."[2] Because art can be so obscure and subjective, the restoration of a work of art becomes a difficult undertaking. From the literature, it is evident that processes for restoration have changed greatly over time, although the origin of such practices is difficult to define. It goes without saying that the day-to-day maintenance of a work of art, although an important facet of restoration, has been carried out since the origin of art itself, albeit for different reasons, and is now commonly referred to as *conservation.* But as maintenance procedures have progressed, the involvement of science in such practices has increased as well. Nevertheless, one must understand that science is as subjective as any other discipline, and it is for this reason that the main issue in approaching a twenty-first century restoration is not necessarily tradition, scientific knowledge, or historical understanding—it is a matter of ethics.

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[1] D'Augustine, Corey. Personal Interview. 6 Aug. 2008.

[2] Talley, M. K. "The Eye's Caress." *Historical and Philosophical Issues in the Conservation of Cultural Heritage,* ed. Price, Nicholas Stanley, M. Kirby Talley Jr., and Alessandra Vaccaro. United States of America: Science Press, 1996. 4.

In an overview of the history of restoration, art historian R. H. Marijnissen asks, "At what precise moment did people start to conserve and restore works of art?"[3] This question has not yet been answered entirely. It is clear that a comprehensive history of the restoration of art has yet to be written. In his research, Marijnessen found that the origin of conservation dates back to the Italian Renaissance when people became concerned with protecting monuments from the classical period. Beginning in the 14th century, artists in Italy "restored" classical works of art, namely, sculptures.[4] The sculptor, however, did not approach the work of art with the same respect for the original artist's intent demanded today when preserving, as Marijnissen puts it, "evidence of the past." He continues to explain how Greek sculptures that were often polychromatic were stripped of their color in order to comply with contemporary ideals about the "purity" of ancient Greek culture. Restorations such as those would be entirely unacceptable by current ethical standards. Undoubtedly, the previous restorations performed on works of art are thus a major hurdle that conservators are confronted with today. Great numbers of works of art have been lost or destroyed due to misinformed restoration attempts. Styles and tastes changed, and older works of art did not necessarily interest those who lived centuries later or they were altered to reflect the preferences of the time. Though art conservation knowledge and ethics are better and more defined today, tastes are always changing, and thus the practices are as well. Fortunately, with advances in technology it is more likely now to assure that the materials and methods used are, at minimum, reversible.

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[3] R. H. Marijnissen, "Degradation, Conservation, and Restoration of Works of Art: Historical Overview." *Historical and Philosophical Issues in the Conservation of Cultural Heritage,* ed. Price, Nicholas Stanley, M. Kirby Talley Jr., and Alessandra Vaccaro. United States of America: Science Press, 1996. 277.

[4] I place quotations around the word "restored" because what was thought of as restoration in the 14th century is quite different from modern day restoration processes.

The American Institute for Conservation of Historic & Artistic Works (AIC) cites conservation as being "the profession devoted to the preservation of cultural property for the future. Conservation activities include examination, documentation, treatment, and preventive care, supported by research and education."[5] The International Council of Museums Committee for Conservation (ICOM-CC) publishes a code of ethics that states: "all conservation procedures should be documented and as reversible as possible, and all alterations should be clearly distinguishable from the original object or specimen."[6] The AIC vaguely alludes to "treatment" in their definition of conservation and the ICOM-CC mentions "alterations," but what do these terms mean? Both imply that inherent in *conservation* is change but that the emphasis is on preservation. This is in contrast to the definition of art *restoration* wherein returning an object to some prior condition is implied. Recently, museums have begun to refer to a field known as conservation-restoration. The need for the title proves that what "conservators" in most art museums practice, falls somewhere between preserving a work for the future, and returning it to some "original" state. For the purposes of this paper, I will use the term conservator to refer to a museum employee that practices both conservation and restoration. I will refer to conservation as a preventative intervention meant solely to stabilize the object. Restorations, on the other hand, will include those interventions that though they may include preventative aspects, they are defined by the idea that the object is altered in some visual manner.

Restorations often include the addition of paint to a work in order to fill in missing areas and to make the painting more readable as a whole. However, the conservator's

[5] "AIC Code of Ethics and Guidelines for Practice," Aug. 1994. American Institute for Conservation of Historic and Artistic Works. 9 Dec. 2007 <http://aic.stanford.edu/public/outreach/index.html>.
[6] "ICOM Code of Ethics for Museums," 2006. International Council of Museums. 9 Dec. 2007 <http://icom.museum/ethics.html#section1>.

professional code of ethics, published by the American Institute for Conservation (AIC), states that the resurfacing of a work of art is a violation of the conservator's obligations.[7] Corey D'Augustine, a conservator at the Museum of Modern Art in New York explained to me that the MoMA is "concerned with original intention rather than contemporary standards or saleability."[8] However, there must be more value in the museum's displaying a painting in as close to the original condition as possible, or else conservators would not repaint or inpaint at all. Conservator Kristin deGhetaldi at the National Gallery admits that the National Gallery conservators perform "aesthetically pleasing retouching."[9] Patty Favero, a conservator at the Phillips Collection in Washington, D.C., similarly explains her work, saying, "we try to do as much as we can because we want objects to be exhibitable… we want to make something look as good as possible."[10] The crux of all of this is that an object that requires restoration does so in order to improve its exhibitability because in an *art* museum, whether an object is exhibitable or not depends largely on its aesthetics.

James Beck, a prominent Renaissance art historian from Columbia University, is often referred to as having been the most active critic of restoration in the twentieth and twenty-first centuries. Beck felt that it is impossible to restore a painting to its "original beauty" but he admits that oftentimes restoration is essential—not simply "desirable."[11] Beck is best known for his harsh remarks concerning prominent restoration projects, claiming that the conservators often drastically over-clean and misinterpret the original condition of the work of art. In 1991 he publicly criticized the conservators involved with

[7] "AIC Code of Ethics and Guidelines for Practice," Aug. 1994. American Institute for Conservation of Historic and Artistic Works. 9 Dec. 2007 <http://aic.stanford.edu/public/outreach/index.html>.
[8] D'Augustine, Corey. Personal Interview. 6 Aug. 2008.
[9] deGhetaldi, Kristin. Personal Interview. 8 Aug. 2008
[10] Favero, Patricia. Personal Interview. 20 Oct. 2008.
[11] Beck, James. *Art Restoration: The Culture, the Business, and the Sandal.* London: 1993. 12.

the cleaning of a tomb sculpture by Quercia in Lucca, Italy. He was quoted saying it looked "as though it had been scrubbed with Spic and Span and polished with Johnson's Wax."[12] With increasing numbers of restoration critics like James Beck, approaches to restoration and conservation have changed drastically in the last several decades. There are several professional organizations, in addition to those mentioned earlier, which advise conservators about ethical ways to deal with conserving a work of art. The Foundation of the American Institute for Conservation (FAIC), the International Institute for Conservation of Historic and Artistic Works (ILC), and the Regional Alliance for Preservation (RAP) are three of the more prominent art conservation organizations. They all advocate a minimally-interventive philosophy and have changed the focus of restoration towards preservation or conservation.[13]

For works of art that undergo a restoration, not only conservation, finding a way for a conservator to remove herself completely from the object is the first step in restoring the work in an ethical manner. Conservators have a variety of motives for a restoration; there are often religious, political, aesthetic, and commercial motivations and the work of art cannot be understood without bias if these motives are taken into consideration. The fact that restoration techniques often influence aesthetics has given rise to much ethical

[12] Holland, Cotter, "James Beck, 77, Art Scholar and Critic of Conservation, Is Dead." *The New York Times,* 29 May, 2007.

[13] A scientific approach to conservation is especially important in understanding mechanisms of deterioration and how they can be limited, stopped all together, or even reversed. For instance, the different media used in a work of art affect how an object changes over time. Paint is an easily cited example because the way in which it deteriorates or changes over time is complex yet well understood. The use of differential spectral curve analysis (the instrument measures the percent reflectance of different pigments) in studying museum objects gives insight into what color the pigments were at the time of the objects' manufacture, and how they have changed. In the last decade or so restorers have shifted their focus and have asked scientists to assist in developing certain preventative measures. As scientists gain further insight into how a certain object or material deteriorates, they can develop further techniques to stabilize the object, and this is what modern day conservators intend to do. The Getty Institute is especially involved in developing such measures and has recently published several articles suggesting these measures to conservation departments around the world.

debate among art historians. M. Kirby Talley Jr. notes: “since works of art have increasingly come to be considered as objects bearing information of documentary worth… how far one goes in reconstructing losses, how far one goes in disguising worn or poor condition are topics with which to start a war.”[14] Even if the artist and the date of creation are known, there are many aspects surrounding a work of art that may not be known. Iconographical analysis, psychological theories of representation, formal analysis, stylistic analysis, historical documentation, and social and cultural history are all taken into account when faced with a project. Often, for this reason, people infer an artist’s vision or intent. Nevertheless, it is not advisable to infer an artist’s original vision without concrete evidence, nor is it advisable to ignore any of the historical background that is known about that work. In the words of MoMA conservator Corey D’Augustine, “historical understanding is important… but we never really know.”[15]

If a conservator does have conclusive evidence concerning an artist’s intent, she must then decide if it is even possible to get back to the “original.” Many art historians argue that additions and changes to a work of art become a part of the work of art itself. This poses an interesting question, is an object in its original form more authentic than a work of art that has changed over time? Indeed, preserving a painting’s current condition or restoring it to a previous condition will affect how current and future viewers engage the work of art. But, as Talley puts it, “the past is both intriguing and deceptive.”[16] No matter how objective we want to be, our perception is inevitably subjective. In essence, the past

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[14] Talley, M. K. “The Eye’s Caress.” *Historical and Philosophical Issues in the Conservation of Cultural Heritage,* ed. Price, Nicholas Stanley, M. Kirby Talley Jr., and Alessandra Vaccaro. United States of America: Science Press, 1996. 5.

[15] D'Augustine, Corey. Personal Interview. 6 Aug. 2008.

[16] Talley, M. K. “The Eye’s Caress.” *Historical and Philosophical Issues in the Conservation of Cultural Heritage,* ed. Price, Nicholas Stanley, M. Kirby Talley Jr., and Alessandra Vaccaro. United States of America: Science Press, 1996. 5.

will always have a contemporary tint to it. It is for this reason that it is nearly impossible to return to the "original."

I would like to explore these issues concerning art restoration and conservation using two paintings as case studies. Masaccio's *Madonna of Humility* (1423-24) and Ad Reinhardt's *Black Painting, 1960-66* (1960-66). The *Madonna of Humility* was acquired by the National Gallery of Art in Washington, D.C. in 1937 (Figure 1). Upon inspection, the conservators at the National Gallery found that the panel had been severely overpainted over the course of several previous restoration campaigns. When the paint was removed by conservator David Bull in 1997, it was deemed to have lost all of its exhibitable worth and has been in storage ever since. Only recently have conservators and art historians begun to realize that the painting has potentially important historical significance though it may no longer be a pristine aesthetic object.

Reinhardt's *Black Painting, 1960-66* is now owned by the Guggenheim Museum in New York (Figure 20). After many failed restorations, AXA Insurance determined the painting to be a total loss, insurance-wise. Because the work was no longer considered an "exhibitable" Reinhardt painting, the Guggenheim Museum decided to have the painting undergo experimental laser ablation treatment. The museum then had an exhibit focused around the treatment. The black painting is an important example of a current trend in which museums actually exhibit the *process* of the restoration of a work of art.

I will investigate what happened in the life of these paintings that lead both of them to be deemed unworthy of exhibition. Both are examples of severely overpainted objects due to past restoration campaigns. What can objects such as these tell us? Where is their place in the study and display of art? These two objects were so radically transformed that

certain prevailing fundamental conceptions about their original qualities were undermined. Chief conservator at the Guggenheim, Carol Stringari, asks "if the paint applied by the artist is hidden behind layers added by another hand, where does the work stand in relation to other works by the artist, or within the context of history?"[17] Should these works even be shown to the public, considering they no longer exhibit the "hand of the artist" in their altered states? Does it even matter whether, for instance, we can see that artist's brushstrokes in order for a work of art to be ascribed to that particular artist and generate a viewing experience associated with that artist's work? What exactly gives a work of art its 'exhibition value' and sustains the attribution of authorship to a particular artist?

I would like to argue that the goal of restoration is two-fold: It is an opportunity to understand an object historically and it is an opportunity to restore aesthetic integrity or some notion of exhibitability to the work. The most successful restoration campaigns achieve both objectives, but very few of these campaigns are completely successful. Sometimes the conservator is faced with a situation during which she must decide whether it is more realistic to see the painting as an historical object which can be used to study techniques, methods, and materials of the time. Whereas other times the conservator is fortunate enough to work with a painting to which she can "restore" aesthetic value. Unfortunately, the Masaccio *Madonna of Humility* is an example of a painting that, for reasons I will expand upon, is no longer viewed by the Washington National Gallery of Art to be visually coherent enough to be exhibited. For this reason, it makes sense to use the scientific and technological advances of the conservation field to study it historically. The Guggenheim conservators, on the other hand, were able to restore some aesthetic value to

[17] Stringari, Carol. "The Art of Seeing." *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. Manchester, CT: RR Donnelley Andrews, 2008. 38.

the previously "value-less" Reinhardt *Black Painting, 1960-66*. These two cases exemplify the two major goals of restoration, and though oftentimes both goals are not achievable for a single object, the technical and historical understandings of an object are equally as important as its aesthetic value.

A great deal of the discussion that follows is derived from meetings I had with conservators at various art museums between August 2008 and December 2009. I had the opportunity to meet with them in their respective conservation labs in The Phillips Collection, Musée du Louvre, Museum of Modern Art, and National Gallery of Art. With the knowledge gained through these discussions, personal access to conservation files, as well as my additional research, I will attempt to explain this two-fold goal of restoration. First I will investigate the historical value that has been restored to the Masaccio, *Madonna of Humility*. I will then analyze the work that was done on the Reinhardt, *Black Painting (1960-66)* that successfully returned some aesthetic value to the work. In my discussion and conclusion I will compare how the campaigns have successfully "restored" these different kinds of value to the paintings and what implications the knowledge gained from these two restoration campaigns has for the future of art restoration and conservation.

Part I: Art Restoration and Historic Value

Masaccio, *Madonna of Humility* (1423-24)

Part I: Art Restoration and Historic Value
Masaccio, *Madonna of Humility* (1423-24)

"We will inpaint, but not *re*paint."[18]
- Kristin deGhetaldi, Conservator, NGA

By 1422, Masaccio, who had until then followed the contemporary Florentine manner of painting, was rethinking the technical purism that Cennini had advocated. As one of the greatest painters of the Quattrocento period, Masaccio worked "within the perimeters of traditional Florentine practice" but "by pushing the boundaries of technique and by a willingness to experiment within a system that was as rigid as that of the Florentine work-shops and guilds, Masaccio became one of the great innovators of Western Painting."[19] Masaccio's *Madonna of Humility* is a panel painting that exemplifies his changing style and technique, though these differences have sparked much debate over the painting's authenticity as a true Masaccio (Figure 1). In the panel, the Virgin Mary is seated, legs folded, looking straight out towards the viewer. She holds the baby Jesus in her arm as he drapes his own arms around her neck. She is an imposing figure, as she takes up almost three-quarters of the picture. She sits on a pillow and is draped with the cloth of honor as two angels hold a curtain up behind her and the baby. A single white dove with a halo is centered at the top of the composition and the words *"Ave Maria Gratia Plena Do"* the first line of the "Hail Mary" Catholic prayer is painted at the very bottom.

Almost nothing is known about the painting's whereabouts previous to 1886, but it is thought that in this year the painting was acquired in Italy by Prince Leopold-Emmanuel-Louis Croy Dülmen of Vienna. The work was inherited by others in the family

[18] deGhetaldi, Krisin. Personal Interview. 8, Aug. 2008.
[19] Strehlke, Carl B. and Cecilia Frosinini. *The Panel Paintings of Masolino and Masaccio: The Role of Technique*. Milan: 5 Continents Editions srl, 2002. 24.

until Count Carl Lónyay sold the painting in April 1929 to Duveen Brothers, Inc.[20] It was then purchased by the A. W. Mellon Educational and Charitable Trust on December 15, 1936. A year later, in 1937 following Andrew Mellon's death, the painting was donated to the National Gallery of Art in Washington, D.C.

The painting has an extensive restoration history, of which very little is known. According to Italian Renaissance art historian Miklós Boskovits, the painting was restored at least two times prior to its arrival in the United States: once around 1927 in Vienna and again two years later in Paris. When the painting arrived in New York in 1936, William Suhr restored it once more.[21] The painting was cleaned again, and the "damaged" portions of the image were overpainted. The National Gallery of Art (NGA) kept the painting as it was for sixty years before their conservator, David Bull, embarked on a major restoration of the work in 1997 during which he removed, what the National Gallery refers to as, "later additions." Kristin deGhetaldi, a conservator at the National Gallery of Art in D.C., met with me in August 2008 to discuss the museum's conservation department. Ms. deGhetaldi explained that the painting was "dressed up for the market," meaning that what was thought of as "Masaccio" before Bull's restoration, was actually a series of additions to make the painting seem more valuable when it was changing hands in the early 20th century. She admitted, "now people are saying that it was overcleaned" but added, "this is simply what was left after the overpaint was removed."[22] Today, *The Madonna of Humility* is confined to the conservation laboratory, leaned against the wall, probably never to see the

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[20] Shapely, Fern R. *Catalogue of the Italian Paintings*. Washington, D.C.: Editors Office, National Gallery of Art, 1979. 304.
[21] Boskovits, Miklos, and David A. Brown. *Italian Paintings of the Fifteenth Century*. New York: Oxford UP, Incorporated, 2004. 458.
[22] deGhetaldi, Kristin. Personal Interview. 8 Aug. 2008.

walls of a gallery again (Figure 2). Surely, there are many museums that would jump at the opportunity to own and display this Masaccio that the National Gallery deems unexhibitable. Unfortunately, though restorations are meant to improve damaged works of art, the past restorations of the work are actually, in large part, the cause of the painting's sharp decline in value and "exhibitability."

According to the NGA conservation file, in the 1927 restoration in Vienna two layers were applied over the paint film: the initial layer was in egg tempera and the final layer consisted of oil paint.[23] No documentation of this treatment exists though it is known from photographs taken during a later restoration that the restorer took some liberties, inventing lower bodies for the angels (Figure 3). In 1929, Madame Helfer, who was associated with the Duveen Brothers in New York and London, restored the painting in Paris. In this campaign, the lower bodies of the angels were removed and the painting was "cleaned." Despite Mme. Helfer's removal of the lower bodies, it is thought during this restoration of the *Madonna of Humility* considerable "inpainting" was added.[24] According to Colin Simpson, Mme. Helfer made sure that any paintings she worked on were "bright and pretty"[25] (Figure 4). Photographs taken after cleaning but before restoration show how little paint was left prior to her "inpainting" (Figure 5-6). These photographs also lead conservators to believe that Mme. Helfer also repaired splits in the wooden support.

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[23] deGhetaldi, Kristin. *Humility Madonna Restoration Timeline*. National Gallery of Art, Conservation File. Decemeber, 2008.

[24] I refer to what Mme. Helfer did as "inpainting" in quotes because there was so little paint left on the canvas before she began to add paint that she was not filling in missing areas of paint as the word implies, but instead applying paint throughout the entire canvas—something that would be unacceptable in today's restorations.

[25] Simpson, Colin. *Artful Partners: Bernard Berenson and Joseph Duveen*. New York: Macmillan Publishing, 1986. 240. Colin also states that "most of her work can be recognized by a distinctive sugariness, and occasionally by her tendency to use one of her young relations, a Mademoiselle Brachet, as a model." He continues that Miss Brachet can be recognized in the Duveen repaint of the *Madonna of Humility*, recognized by her round eyes and small distinctive mouth.

According to the National Gallery's conservation file, it is possible that the support of the painting was actually thinned down and a new backing was applied to the verso at this time.

On the other hand, conservators are fortunate in that they are fairly certain of what William Suhr did to the painting in the 1936 restoration due to his extensive notes and photographs. When Suhr received the painting he noted a "very unpleasant impression of complete overpaint," adding that it was "stupidly restored [and] in bad condition."[26] It is certain that at this time the support was thinned considerably, or perhaps removed entirely, and adhered to a mahogany panel.[27] As mentioned earlier, he also cleaned the painting and restored it, taking some liberties with the painterly style (Figure 7). The painting arrived at the NGA just a year later, and the earliest records indicate that it was "wiped" in May of 1941 and, in October, the conservators "laid blisters, retouched where necessary, and refinished the surface."[28] The surface was "refinished" again in July 1943 and in 1948 it was "inspected" and the conservators "removed bloom from [the] entire surface."[29] Finally, in 1954, the NGA was able to x-radiograph the painting. Four years later, x-radiographs were again taken and microscopic and photographic examinations were recorded. The 1979 Treatment Proposal reads: "The painting is structurally secure. However, the painting has been excessively restored to the

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[26] *William Suhr Notes*. National Gallery of Art, Conservation File. He also mentions that whoever restored it previously had "no feeling for the tempera technique."
[27] Silberfield, Kay. *Examination Report*. National Gallery of Art, Conservation File. 14, Sept. 1981. The support of the painting is made up of two pieces of vertically-grained wood. The painting is currently rectangular, but it may be have had an arched top originally. Getty Museum archives suggest that the present cradle is that of William Suhr. Suhr's records state that "the primary support panel is made of polar and had been thinned and backed prior to receiving it." He removed the backing, drastically thinned the support, and applied to a 3-ply mahogany panel using rabbit skin glue and varnish. It should also be noted when the file states that the painting was "refinished" it refers to the addition of an additional layer of varnish.
[28] *Repair of Work of Art, Form NGA-43*. National Gallery of Art, Conservation File.
[29] Ibid. Bloom is the thin white dust that forms on beeswax. It is easily removed often using heated air.

point of disfigurement. A curatorial request has been submitted for a complete examination and analysis of the *Madonna of Humility* (including comparison to other accepted Masaccios) which will serve as a guide for the removal of the old restoration."[30] This original proposal asked not only for the painting to be analyzed but also for permission to remove old varnish and restoration, and to fill losses and inpaint as necessary.

An Examination Report from 1981 states that "The photographs taken during Suhr's treatment and the test cleaning just done at the Gallery, indicate the extremely damaged condition of the original paint. It seems unlikely that what does remain could be formed by inpainting into a cohesive enough picture to be exhibitable. The question now is whether removal of the Suhr repaint would be worthwhile."[31] Clearly, at this point, it was felt that the losses would be too great to be easily "filled" or inpainted. A year later, conservator Kay Silberfield submitted a memorandum stating: "Considering that so little remains of the original paint, it would seem to me that removing the overpaint would be a thankless task and the painting ought to be kept as is, a curiosity."[32] Now knowing that the painting could not be restored to its former beauty, NGA curator David Alan Brown and NGA conservator, Victor C. B. Covey, recommended that the Masaccio "be withdrawn from exhibition indefinitely for purposes of conservation and study."[33]

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[30] Leisher, William R. *Treatment Proposal.* National Gallery of Art, Conservation File, 15, Jan, 1979.
[31] Silberfield, Kay. *Examination Report.* National Gallery of Art, Conservation File. 14, Sept. 1981.
After researching the earliest available reproductions of the *Madonna of Humility* the NGA was able to specifically compare the different formal characteristics of the painting. Many differences were found including, but not limited to: the Madonna's face was more sympathetic and the mouth was altered, the Madonna's hands were considerably changed, the angel's wings were longer, the drapery folds had a very different shape, the gold of the haloes was completely reworked, and the halo of the dove and the rays were completely absent in the earliest reproductions.
[32] Silberfield, Kay. *Memorandum.* National gallery of Art, Conservation File. 15, July 1982.
[33] Bull, David and Covey, Victor C.B. *Memorandum.* National Gallery of Art, Conservation File.

More than fifteen years later, for reasons that are unclear, David Bull "restored" the *Madonna of Humility*.[34] All of the previous technical information collected was available to Bull when he began restoring the painting in 1997, but it is hard to say how useful it would have been. Bull uncovered much of what Suhr had added, revealing that the dove and flesh tones of the figures were almost completely lost and severely abraded. Bull's notes reveal that the Virgin's mantle had also been subjected to severe overcleaning in the past, as several losses were exposed when he cleaned the painting. The cloth of honor had also been extremely damaged; as there are only faint traces of the original glazes and the silver leaf that once existed. The gilding found in the background and on the halos was found to be a later addition. It was also determined that one of the only *original* portions of the picture that remains somewhat intact is the gilded lettering on the white border and the greenery just above the lettering along the bottom edge. That being said, the greenery has, unfortunately, faded to a blue tone quite unlike the color it was originally.

Though David Bull was highly criticized for his restoration of the *Madonna of Humility,* there was very little he could do to "save" the painting. Was it better that he tried to remove later overpaintings to get back to the "original?" Having known that this might be impossible or could yield an illegible surface, it was originally determined, and has again been said that it would have been better to keep the object in its overpainted condition. Curator of Italian Renaissance Paintings, David Alan Brown, was quoted saying that Bull should "fill in the bare spots."[35] But unfortunately, the painting was so damaged that it

[34] I use quotations to describe the "restoration" work done on this work to signify that the actual procedure Bull followed was not typical of a defined restoration. He did little more than take away a significant amount of paint from the canvas, thought to have been added by previous restorers. It is for this reason that I wish to point out the use of "restoration" as a somewhat inaccurate term for this particular project.
[35] Bull, David. *Notes*. National Gallery of Art, Conservation File.

would have been ethically inappropriate, after removing the overpaint, to provide new inpainting in order to make the composition coherent. By inappropriate I mean to say that the work would not have been able to provide enough information to fill in the losses without falling into falsification. Accordingly, with the added layers gone, the painting looks as if it were never finished, but had Bull kept Suhr's paint on the canvas, it would have prevented viewers from visually accessing what was truly Masaccio's work. I believe that the restoration performed at the National Gallery of Art in 1997 may not have been successful in terms of aesthetics, but it was very successful in finally exposing what was "truly" Masaccio and in making the painting more suitable for study as a document of the Italian Renaissance.

According to the Italian restoration theorist, Cesare Brandi, "If a work of art is the result of human activity and, as such, its appreciation does not depend on variations in taste or fashion, its historical significance takes priority over its aesthetic value."[36] Though I do not agree that historical significance should necessarily take priority, it is an undoubtedly important aspect of any restoration project. I would like to return, for a moment, to the years prior to Bull's restoration. Why did David Bull decide, or why was he asked, to restore the painting despite evidence suggesting that it was best to leave the painting as it was? For reasons I will elucidate, I have come to believe that one reason might be that the authorship of this painting was in question and that the National Gallery wanted to set matters straight regarding *their* Masaccio.

In Ugo Procacci's 1962 book, *All the Paintings of Masaccio,* he states that, "the very poor condition of the picture makes any verdict impossible. The entire surface has been

[36] Brandi, Cesare. *Theory of Restoration.* ed. Guiseppe Basile; translated by Cynthia Rock. Roma: Istituto centrale per il restauro, 2005. 65.

repainted and only when the repaints are removed will a clear judgment be possible."[37] The work was generally accepted as a Masaccio until the early 1920s, at which point much debate ensued regarding its authenticity as a work by the Renaissance master. After the National Gallery acquired the painting the debates continued, and by 1944 it was demoted to a work "by a pupil or devout imitator."[38] However, others maintained that they were not in a position to be able to accurately judge the painting because of its over-painted condition. In fact, in 2002, several years after the painting was restored, Masaccio scholar Eliot W. Rowlands commented: "I remain convinced as ever that the painting is an autograph work by Masaccio."[39]

The general sentiment at the National Gallery was that the anomalies in the *Madonna of Humility* that caused people to doubt its authorship were results of the previous restorations. For example, in 2002 when a group of art historians, conservators, and scientists from the *Opificio delle Pietre Dure* in Florence came to study the painting for their book *The Panel Paintings of Masolino and Masaccio: The Role of Technique,* they claimed that the main cause for concern was the "absence of a fabric layer and the paradoxical presence of a partial *biacca* layer."[40] However, knowing that William Suhr transferred the painting in his 1936 restoration, the conservators at the NGA contend that this makes sense because the wood of the original panel was shaved down to the gesso and Suhr then added his own ground to compensate for where the paint had thinned.[41] From the conservation

[37] Procacci, Ugo. *All the paitings of Masaccio*. Vol. 6. Translated by Paul Colacicchi. Norwich: Jarrold and Sons Ltd. 1962. 40.
[38] Boskovits, Miklos, and David A. Brown. *Italian Paintings of the Fifteenth Century*. New York: Oxford UP, Incorporated, 2004. 462.
[39] *Correspondence between Eliot W. Rowlands and David Alan Brown*. National Gallery of Art, Conservation File.
[40] Griswold, Susanna. *Memorandum Spring 2002*. National Gallery of Art, Conservation File. 2002.
[41] XRF analysis proved a strong presence of calcium indicative of Massacio's use of calcium-based white gesso

file it also seems that there is, in fact, evidence of a fabric layer in the photographs from Suhr's restoration.

In addition, if one compares the stripped-down *Madonna of Humility* to *The Madonna and Child with Saint Anne* from the National Gallery in London, it seems quite possible that both were executed by Masaccio (Figure 8). The modeling of the draperies and Virgin's head are comparable and infrared reflectography photographs show portions of the picture's underdrawing that are consistent with Masaccio's technique. The group from the *Opificio delle Pietre Dure* also felt that the Virgin's awkwardly positioned legs suggest the painting was not executed by Masaccio, however, one can see a similar positioning in the figure of Saint Peter crouching in the left side of *The Tribute Money* (Figure 9).

More scientific proof that the painting is by Masaccio can be found in the application of the silver leaf. *The Madonna and Child with Saint Anne* exhibits an interesting technique in which incised silver leaf glazed with red lake was found in the virgin's dress[42] (Figure 8). This was a technique that was used in select Florentine paintings of the 1420s and is found in the drape and cushion of the *Madonna of Humility* as well.[43] And so, if David Bull did carry out a treatment to emphasize the historical significance of the work that was in question, why has it been so criticized? For many, Bull's removal of the overpaint did help to solidify an attribution to Masaccio. Additionally, certain art historians felt that the "picture's real and potential beauty became even more evident as later

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ground. Lead was also found throughout the painting and is consistent with his use of lead white in combination with other pigments in order to slightly change the tones in his palette.

[42] Gordon, Dillian. *The Fifteenth Century Italian Paintings*. Vol. I. London: National Gallery Company Ltd. 2003. 205.

[43] Strehlke, Carl B. and Cecilia Frosinini. *The Panel Paintings of Masolino and Masaccio: The Role of Technique*. Milan: 5 Continents Editions srl, 2002. 256.

inpainting was removed."[44] Unfortunately, it seems that many cannot get past the faint image that is the result of Bull's restoration no matter how helpful the overpaint removal was in studying the painting as an historical object.[45]

Historical objects surely have a place in the world of art history; however, in an art museum aesthetics often play a primary role. Indeed, this painting may now be more widely accepted as a Masaccio painting, but now that the overpaint has been removed, it is unable to hold its place on the wall. What does this mean for the *Madonna of Humility*? Since the restoration, has it been completely devalued as an aesthetic object? Or does it still have some kind of inherent value through its association with Massacio, even in its stripped-down state? It would be inaccurate to say that the Masaccio is a total loss for the National Gallery of Art. In fact, the image that appears on their current website shows the painting before Bull's restoration, hence, there must be some worth in the museum's simply owning this Renaissance work of art (Figure 7).

It is quite possible that the reason that the Masaccio has been determined to be unacceptable for the gallery's walls is in large part due to the fact that the National Gallery has such a rich collection of Italian Renaissance paintings. In such a context, a Masaccio in this condition is not exhibition worthy, even if the National Gallery does not have other

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[44] Rowlands, Eliot W. *Masaccio, Saint Andrew and The Pisa Altarpiece*. Los Angeles: Getty Publications, 2003. 22.

[45] I would like to mention that it is, of course, possible that in removing the overpaint part of the "history" of the painting was lost especially because this is something that cannot be brought back. However, in David Bull's defense, any work done on the painting was diligently documented, recorded, and photographed. Above all, I believe that it is quite possible that the historical knowledge that can be gained from the "restored" painting out-weighs that that could have been gained from studying the overpaint (if there indeed is anything more one could learn from it that was not already noted in the conservation file). It is also important to mention that at this point it would be unethical for David Bull to "inpaint" in order to make the painting more cohesive because so little is left, he would, in fact, be "repainting" it once again. In fact, David Bull had added a light amount of inpainting, which to this day has not been removed, however, there is a note in the Conservation File in which David Brown states that it will eventually be removed.

works by this master. The fact that the museum is not under pressure to display the Masaccio may also be due to the fact that this work is not a particularly well-documented painting, nor is it well known to art historians or the public.[46] Admittedly, it would be impossible for a museum the size of the National Gallery to show its entire collection, so choices must inevitably be made about which works to display.

I believe that if a museum decides no longer to exhibit paintings such as these, they should value these paintings in some other way by making them accessible to a different community. This Masaccio should serve another purpose, as I have been told that it certainly will never be exhibited again. In the words of conservator Sarah Fischer, the Masaccio "is an important object, even if it does not conform to the Gallery's 'got to look flawless' philosophy."[47] Paintings such as this one can be given a place in the museum world because it is important to understand, that some of the greatest "masterpieces" in collections worldwide have been restored at some point in time, some more than others. This is something that museums do not always want to advertise or even discuss openly. However, restoration campaigns should be discussed openly. After all, how else will the rest of the world develop a more informed view of conservation?

This damaged Masaccio can serve some purpose, allowing art historians and conservators alike to explore Italian painting techniques and materials from this period and how restorers or conservators have altered them in the past. Susanna Griswold of the National Gallery admits "It is unfortunate that our *Madonna of Humility* has suffered abrasion of the painted and gilded surface to the degree that it only can be described as a

[46] Leonardo DaVinci's *Last Supper* is an example of a celebrated painting that experienced an incredible amount of damage on account of Leonardo's experimental fresco technique and probably would not have been restored to the extent that it has been, were it not such a high-profile painting.
[47] *Correspondence btwn Sarah Fischer and Laurence Kanter*. National Gallery of Art, Conservation File, 2005.

fragment. However, the painting even in its fragmentary state radiates a beauty and expression akin to other paintings by Masaccio."[48] I have been told that conservator Kristin deGhetaldi is about to embark on a study using the Masaccio as a study piece for an exploration into the methods, materials, and evolution of Italian Renaissance painting technique, so, though it will never be exhibited again, its fortunes may be changing in the near future.

[48] Griswold, Susanna. *Memorandum.* National Gallery of Art, Conservation File. May, 2002.

Part II: Art Restoration and Aesthetic Value
Reinhardt, *Black Painting 1960-66* (1960-66)

Part II: Art Restoration and Aesthetic Value
Reinhardt, *Black Painting 1960-66* (1960-66)

"To restore a flat plane of black or white or red is an exceedingly tedious task, requiring an obsession that seems to verge on insanity."[49]

-Carol Stringari, Conservator, Guggenheim Museum

Ad Reinhardt will always be remembered for his explanation of art: "The one thing to say about art is that it is one thing. Art is art-as-art and everything else is everything else. Art-as-art is nothing but art. Art is not what is not art."[50] It is no surprise that the artist famous for this simple, yet esoteric definition of art spent the last seven years of his life ceaselessly painting the same style monochrome canvases over and over again, stating: "I'm just making the last paintings which anyone can make."[51] It was at this time that he began to paint a series of five by five foot canvases with a nine-square grid in barely discernable shades of black.[52] One of these canvases, Reinhardt's *Black Painting, 1960-66,* is a second example of a work of art that has undergone a series of restorations that have deeply affected it (Figures 10-11).

To begin to understand and study *Black Painting, 1960-66*, we must trace its whereabouts since the moment of its conception. It is thought that the Museum of Modern Art originally owned this particular painting. This has been deduced because a

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[49] Stringari, Carol. *Exhibiting a Reinhardt "Cadaver."* 2008. Art Info. 3, March 2009. <ARTINFO.com>.

[50] Lippard, Lucy R. *Ad Reinhardt Paintings*. New York, NY: The Jewish Museum, 1966, 10.

[51] Ibid, 10.

[52] Barbara Rose eloquently describes the process of looking at a Reinhardt black painting. "Looking at the black paintings, we realize it requires an immense effort to see them at all; but that effort is absolutely essential to the kind of experience they afford. For unless one is entirely committed to experiencing them, one has no experience at all, since Reinhardt intended to require of the spectator a commitment as total as that given by the artist. No passers-by or window shoppers will have any sense of the black paintings which require, to be properly seen, an amount of time that grows increasingly precious in our harried lives." From: "The Black Paintings" *Ad Reinhardt Black Paintings 1951-1967.* New York, NY: Marlborough Gallery Inc, 1970. 17.

couple of notes scribbled on the back point to the fact that it was intended to be included in the museum's exhibition, *Americans*, curated by Dorothy Miller in 1963 (Figure 12). There is a note in the museum's exhibition file that around that time, this damaged black painting was returned to Reinhardt to be restored because the painting had deep scratches on the surface that penetrated several layers of paint in addition to a number of stains caused by fingerprints (Figure 11). Rather than restoring *Black Painting, 1960-66*, Reinhardt replaced it with a similar one. The story goes that Miller complained to Reinhardt when he replaced it with another of his paintings, saying "But ours is *the* Museum of Modern Art's picture." Reinhardt sarcastically replied, "I don't know what you're fussing about. I've got paintings here that look more like that painting than that painting does."[53]

The painting's whereabouts after this point are not known. However, CEO of AXA Art Insurance Corporation, Dietrich van Frank, reports that a private collector eventually obtained the painting. The painting was damaged again when the collector loaned the work for an exhibition in the 1990s. While the painting was being handled, something fell onto the canvas resulting in a number of scratches and other deformities. There were many failed restoration attempts and AXA ruled that the painting was no longer exhibitable. It was determined that the work could not be exhibited as a Reinhardt anymore because of how drastically the painting had been changed in the numerous restoration attempts. Reinhardt's brushstrokes were no longer visible to the viewer, nor was his paint. In fact, the paint that Reinhardt had actually applied to the canvas was buried under at least a half a

[53] Stringari, Carol. "The Art of Seeing." *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting.* New York, NY: Solomon R Guggenheim Foundation, 2008. 20.

dozen other layers of paint. In effect, Reinhardt's painting had been extensively overpainted by at least three other people.[54]

In the year 2000, AXA donated the painting that they claimed was a total loss, insurance-wise, to the Solomon R. Guggenheim Foundation in order to be studied. As works that were executed less than fifty years ago, Reinhardt's paintings pose particular challenges for the conservator. Project manager at the Foundation for the Conservation of Modern Art, Dionne Sillé, explains:

> Over the centuries, a structural approach to conservation and restoration has been developed for old masters' art. Practice, theory and training have resulted in clear guidelines. But what about modern and contemporary art? The materials used here are often far more fragile than those of traditional art; moreover, they may have a diversity of meanings. Nevertheless, when faced with the problem of conservation, many museums have to make it up as they go – sometimes with tragic results.[55]

Carol Stringari is quoted in the exhibition catalog that accompanied the exhibit about the restoration of Reinhardt's *Black Painting 1960-66,* saying, "to restore a flat plane of black or white or red is an exceedingly tedious task, requiring an obsession that seems to verge on

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[54] Not all paintings that have been repainted are deemed a total loss. The Guggenheim also owns Robert Rauschenberg's *White Painting* (1951). This monochrome painting was made by applying white household paint with a paint-roller to a canvas. His intention was to produce an entirely "blank" surface entirely free of the artist's touch. Rauschenberg left instructions on how to restore the paintings, if damaged. When the San Francisco Museum of Modern Art exhibited one of these paintings they placed a museum label next to the work justifying their repainting of it, "Since he wanted the works to look fresh and untouched by time, they can be repainted if necessary… As this continual repainting reflects Rauschenberg's original intent, the work is still dated at 1951." A photograph, which can be seen in the *Imageless* catalogue of Julie Barten, a conservator at the Guggenheim, shows a repainting of Rauschenberg's *White Painting* in 2001. The Guggenheim does not mention anything about the repaintings in their museum label. It can be argued that it is better to repaint the painting so that a viewer will get that same feeling of "blankness" that Rauschenberg was after. If the painting deteriorated to a point where there were visible cracks or other kinds of damage, this would not be the case. Yet, at the same time, since it was not Rauschenberg that physically *painted* the canvas, many interpret it as no longer being *his* painting.

[55] Sillé, Dionne. "Introduction to the Project." *Modern Art - Who Cares? : An Interdisciplinary Research Project and an International Symposium on the Conservation of Modern and Contemporary Art.* Minneapolis: Archetype Publications, 2006. 14.

insanity."[56] For these reasons, the painting has been under academic scrutiny and experimental restoration since the donation.

Scanning electron-microscopy-energy dispersive X-ray spectroscopy (SEM-EDX), also known as stratigraphy, was performed on the painting.[57] Fundamentally, a chip of paint was analyzed to show a cross-section of all of the layers of paint on the canvas. The analysis revealed that there were approximately twenty layers of paint. Approximately seven to nine layers are assumed to have been the original paint applied by Reinhardt in the 1960s. On top of these are several layers applied in previous restoration attempts. These findings are consistent with the reports of three previous restoration attempts. In 2000 the Guggenheim committed to attempt to restore it once more.

In this particular case, the restoration was experimental, and this kind of experimentation would never have been allowed on a painting that was not determined to have lost all of its exhibition value. This is why the Reinhardt is consistently referred to as a "study painting" in the exhibition catalogue. With the use of this terminology, the work has been defined as a painting that has lost some of its "inherent value."[58] Christiane Fischer, at the Guggenheim, admits that though the painting is damaged, it is still

[56] Stringari, Carol. "The Art of Seeing" in *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. New York, NY: Solomon R Guggenheim Foundation, 2008. 19.

[57] SEM-EDX is often performed concurrently with Polarized Light Microscopy (PLM). In this method, an x-ray beam is focused on a paint sample and all of the elements present in that sample will produce a characteristic wavelength. Pigments can then be determined based on the wavelengths produced. For example, pigments containing iron, lead, or any other number of metals can be identified. In PLM the sample is looked at under a high magnification scope with a filter to polarize the light. In this technique, different structures of minerals absorb different light and their absorption can be used in concert with the elemental analysis to more specifically identify pigments.

[58] Value is culturally ascribed to an object (and sometimes to intangible entities). Value can be in terms of monetary worth, usefulness, or importance. If value is defined as such, then nothing can truly have "inherent value." In this case, to clarify what I mean by inherent value is- the value that a museum would ascribe to an original work of art by a particular artist that has not been altered by someone or something else.

historically significant. For this reason, the Guggenheim committed the Reinhardt for the purposes of advanced scientific research.

Before the conservators could even begin to approach this major restoration, they needed to learn about Reinhardt's technique and the materials he used. In the words of Harvard H. Arnason, "Ad Reinhardt was one of the most complicated individuals associated with abstract-expressionist painting despite and perhaps because of the fact that his aims were the most simple."[59] These paintings had no subject, object, illusion, association, symbol, or image. What they did have were nine squares in different shades of black that were hardly distinguishable from one another. To quote Sillé "Without an insight into the intentions behind the way modern artists have used their materials, it is hard to select the right conservation and restoration approach."[60] Fortunately, a certain amount of his technique could be inferred from the many photos of Reinhardt working in his studio (Figure 13).

Prominent journalists and historians often interviewed Reinhardt during his lifetime, making information about his paintings, at least the information that he wanted to share with the public, fairly accessible. Still, it was very difficult to know exactly how to go about conserving his works because during his lifetime he personally restored any of his works that were damaged. The fact that he would not let others restore his paintings had major consequences once he passed away. Yves Alain-Bois explains:

> Without explicit recipes to follow, conservators asked to repair a damaged "black" painting – and either courageous enough or ignorant and

[59] Arnason, Harvard H. "The Quest for Art-Is-Art." *Ad Reinhardt Black Paintings 1951-1967*. New York, NY: Marlborough Gallery Inc, 1970. 11.
[60] Dionne Sillé. "Introduction to the Project." *Modern Art - Who Cares? : An Interdisciplinary Research Project and an International Symposium on the Conservation of Modern and Contemporary Art.* Minneapolis: Archetype Publications, 2006. 14.

> inexperienced enough to take on the task – had to come up with their own makeshift solutions, none of them satisfactory. No wonder the least scrupulous among them opted for a complete recoating. The "resurface" "black" painting that they produced was far from approaching the delicacy of the originals, but blemishes were effaced. They restored the picture (the image), but killed the painting—or rather, they buried it alive.[61]

After extended study, the conservators at the Guggenheim discovered that he had a very specific way of producing his black paintings. He began by mixing oil paints with distilled turpentine. He then allowed the mixture to sit so that the pigment and the binder separated into layers. He then skimmed off the binder and was left with highly underbound, saturated pigment (Figure 14). Because of this underbound, saturated pigment that he used, the effect of Reinhardt's method is a flat, matte, saturated canvas that reflects no light no matter where the viewer is standing. The downside is that the pigment is incredibly absorbent. Bois explains that it is for this reason that:

> The worst offenses against Reinhardt's fragile surfaces are made by touch: deprived of medium, reduced almost to the status of pastel, the oil-drained oil paint is thirsty, and it avidly sucks in all the fat that comes into contact with it, including the fat constantly secreted by skin in order to stay alive. Touching a "black" Reinhardt is the easiest, and most definitive, way of ruining it – the dark, greasy fingerprint, seeping through several layers of dry paint and binding them together, is almost impossible to sponge off – and yet it is what many onlookers seem most to desire.[62]

Bois makes two important points, the first, that Reinhardt surfaces are incredibly unstable and second, that one of the effects of his painting technique is the desire to touch the velvety surface. It is precisely this "velvetyness" that was lost when the painting was resurfaced by conservators. In 1961, after successfully completing one of these paintings, Reinhardt was quoted describing it as "a square, neutral shapeless, canvas… one horizontal

[61] Bois, Yve-Alain. "Black Trek, Backtrack." *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. New York, NY: Solomon R Guggenheim Foundation, 2008. 12-13.
[62] Ibid, 13.

form negating one vertical form three dark non-contrasting colors, brushwork brushed out… freehand painted surface which does not reflect its surroundings—a pure, abstract, non-objective, timeless, spaceless, changeless, relationless, disinterested painting."[63]

If one takes a closer look at the cross sections of pigment we can see exactly what layers were added to the painting. There are several different properties in the eleven to thirteen different layers that were determined to have been added by conservators. Fourier Transform Infrared Spectroscopy (FTIR) was used to analyze the organic composition of all of the layers, and thus to determine of what paint type each layer consisted.[64] It is clear from the spectroscopic data that there were three distinctly different chemical components (Figures 15-17).

The mustard colored wave corresponds to the original Reinhardt paint. On top of the Reinhardt pigment layer is a sealant layer, represented by the blue wave. Whoever added this layer knew that the Reinhardt pigments were incredibly underbound, or "thirsty," and would absorb anything added to the painting. It is for this reason that the conservator must have added a sealant and then painted over that layer. Reinhardt would not have used a sealant simply because they are reflective and would never have allowed him to achieve the soft, matte surface texture for which he was looking. Above the sealant layer there are several layers of very bright colors, alternated with thin black layers. These layers, represented by the magenta-colored wave correspond to acrylic paint. The conservator must have assumed that Reinhardt achieved the slightly different tones of

[63] Rose, Barbara. "The Black Paintings." *Ad Reinhardt Black Paintings 1951-1967*. New York, NY: Marlborough Gallery Inc, 1970. 16.

[64] During FTIR radiation is passed through a small sample collected from the painting. The energy from the radiation is either absorbed or transmitted depending on organic compounds found in the paint. In this way, conservators can accurately identify carbon-containing compounds that distinguish oil paint, acrylic paints, and natural resins.

black by adding thin black layers of paint over other colors and thus tried to replicate this faulty technique.[65] On top of these pigment layers were two clear layers that were sprayed on. Perhaps, the spraying was used because the aerosol droplets produced a somewhat matte-effect. However, it in no way mimicked what Reinhardt was trying to attain because it still would have been reflective when viewed from certain angles *and* it would have eliminated all traces of brushstrokes.[66] The painting also had a peculiar tint to it due to a layer of pthalocyanine blue acrylic paint added by a restorer. This blue color is very intense, and though it was covered with sprayed layers of black paint, the blue still came through resulting in an overall bluish-purple tone. These restorations in no way achieved the unique effect, intention, and execution that Reinhardt attained.

The Guggenheim conservators were in a quandary. They needed to find a way to strip the painting of these added layers without affecting the original Reinhardt surface. No proven method for this exists, so, with the help of a generous grant from AXA Insurance, the Guggenheim decided to test a new method known as laser ablation (Figure 18). Ablation is the removal of a material using light which causes the polymers in the paint to vaporize.[67] The depth to which the laser penetrates depends on the intensity of the beam. In this way, the beam can be controlled to remove one layer at a time. The painting was sent to the Institute of Electronic Structure and Laser at the Foundation for

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[65] Reinhardt actually painted exclusively in oil and mixed Mars black with very small amounts of ultramarine, viridian, alizarin, and cadmium red mixed with Mars black to produce the different shades of black he used in his paintings.

[66] This may seem paradoxical to Reinhardt's quote about his "brushed out brush strokes," and although he was indeed trying to remove traces of the hand of the artist from the painting, his paintings were always hand painted.

[67] Laser cleaning is an important, highly precise, innovation in art conservation. The fact that it does not require actual physical contact with the work of art is what makes it an incredibly useful procedure for certain works of art. For example, using water or other liquids to clean could potentially cause long-term degradation to certain materials. Unfortunately, there is not much laser cleaning knowledge and experience in the museum world, and it is important that this change.

Research and Technology (IESL-FORTH) in Heraklion, Crete to undergo treatment. After the appropriate parameters for the laser had been determined each of the restoration layers was removed, one by one, across various sections of the painting's surface.

At first, the laser cleaning left horizontal stripes across the surface of the middle square, so called "tide lines" that clearly would have detracted from the painting's intended experience[68] (Figure 19). The researchers then edited the software program controlling the movement of the optical arm of the laser, so that the arm moved in a random pattern rather than horizontally. This resulted in a "feathering" effect that gives the impression that the paint was applied with a brush. The surface left on the study painting after laser treatment looked equally matte and non-reflective once again, just like the surfaces of unrestored Reinhardt paintings. When one looks at the painting, the two squares that were stripped of the previously added layers using the new programming look noticeably more like the original saturated Reinhardt surface (Figure 19-20).

It seems that this experimental restoration was a success—at least partially. It remains to be seen if the painting was completely cleaned using this technology, if the overall effect would be as promising as the two squares that are now cleaned. None of this would have been possible without the existence of, what Carol Stringari refers to as, a "sacrificial" painting. Were this Reinhardt not determined to have lost all of its value as a show piece, this treatment would not have been used because of damage concerns. But since this was fairly successful, it seems that if the treatment were completed, the work would become valuable as an exhibitable Reinhardt painting once again. Perhaps now,

[68] See the middle square of the painting in Figure 20 and compare to the other two restored squares found on the lower right hand-side of the painting.

simply knowing that the painting has the potential to be restored completely has *already* made it more aesthetically valuable increasing its potential exhibitability.

The laser treatment performed on Reinhardt's painting has been used on other paintings and is currently being fine-tuned for use on other works of art. With new laser radiation treatments, up to 90% of unwanted layers can be removed, while the rest can easily be removed using aqueous solvents. Laser cleaning has a promising future in art conservation because it achieves a clean surface in a shorter amount of time while using less chemicals that could potentially react with the surface pigments. At the *Opificio delle Pietre Dure*, a fifteenth-century painting by Domenico di Michelino was recently cleaned using laser ablation. The conservators report that "By this way, it was possible to achieve a real selective removal of the degraded materials... This approach is in agreement with the latest criteria of contemporary conservation, oriented towards the minimum intervention and the reduction of toxic chemicals."[69] With test cases such as this one and the Reinhardt *Black Painting 1960-66*, this particular conservation method is becoming better understood as a viable option for restoring both Old Master paintings and more contemporary works of art.

The question remains whether the resulting surface of *Black Painting, 1960-66* is acceptable, and how closely it approximates an untouched Reinhardt. To the naked eye it looks strikingly similar, but microscopically we know that it is not exactly the same. It seems doubtful that Reinhardt meant for his paintings to be looked at under a microscope. How the work looks to the naked eye is what really matters with a painting, so this might

[69] Andreotti, A. P. Bracco, M.P. Colombini, A. deCruz, G. Lanterna, K. Nakahara, and F. Penaglia. "Novel Applications of the Er:YAG Laser Cleaning of Old Paintings." *Lasers in the conservation of art work*. New York: Springer Science and Business Media, 2007. 244.

be an acceptable compromise. Unfortunately, unless the Guggenheim commits to investing an exorbitant amount of time and money to restore and stabilize the painting, it will remain in storage. But more importantly, the experimental treatment of Reinhardt's *Black Painting, 1960-66* makes it evident that with today's knowledge and technology, the restoration of an object deemed a "total loss" can indeed be restored to achieve exhibitability.

Discussion and Conclusion: Negotiating Value and Exhibiting *Process*

IMAGELESS

The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting

A Presentation of the AXA Art Conservation Research Project in conjunction with the Solomon R. Guggenheim Foundation and the Museum of Modern Art

Ad Reinhardt in his studio. Photo: John Loengard/TimePix

July 11–September 14, 2008

Ad Reinhardt's *Black Painting, 1960–66* (1960–66) was donated to the Guggenheim Museum in 2000 by AXA Art Insurance Corporation as a study painting after it was deemed irreparably damaged. Over the course of seven years, conservators, scientists, curators, and artists collaborated to examine the issues surrounding the conservation of this painting, including the inherent vulnerability of monochromatic and minimalist paintings to the aesthetics of aging, experimental solutions for conservation, and the associated ethics of these strategies.

Physical examination and scientific analyses of the study painting contributed to a dossier of information about Reinhardt's working methods and earlier restoration techniques. These findings are essential to the understanding of how one perceives an imageless surface of flat planes of color, how an artist's hand (or lack thereof) confers meaning, and how one can define the essential criteria for a painting's authenticity.

Imageless takes the viewer into the world of the conservator as forensic scientist to uncover the mystery hidden beneath the monochromatic black painting. The cutting-edge technologies used in this research project are being tested to expand the current repertoire of conservation techniques. Science, art, and perception co-mingle in this exploration of the motivation of the artist, materials of the painting, and possible treatment and preservation strategies for artworks that rely on unattenuated surfaces to convey meaning. The inherent fragility of these paintings challenges conservators to maintain a flawless surface while adhering to a stringent code of ethics. For comparative viewing and appreciation of the subtleties of surface, *Imageless* concludes with a selection of Reinhardt's black paintings. Presented in low light levels in accordance with the artist's intent, the paintings offer a rare opportunity to appreciate Reinhardt's extraordinary technique and meet the perceptual challenges so often neglected by the casual museum visitor.

This exhibition is organized by the Solomon R. Guggenheim Foundation's Conservation Department in collaboration withthe Sackler Center for Arts Education.

Made possible by a generous grant from AXA Art Insurance Corporation and AXA Foundation.

Discussion and Conclusion: Negotiating Value and Exhibiting *Process*

"I would certainly change a few things were people watching me."
- Patricia Favero, Conservator, The Phillips Collection

When a conservator is asked to restore a work of art, the implied goal is to get the painting back to as close to the "original" condition as possible. However, what we think of as the "original" work of art is oftentimes no more "authentic" than the work of art in its present condition—the object has changed over time and these changes have become a part of that object's history. This idea that restoring a work of art to its "original" condition goes hand in hand with the idea I have explored that restoration has a two-fold purpose—to restore aesthetic value to the painting, and to unveil its historical significance. For those paintings that are restored and for those that are "beyond repair," using the tools of a conservator we can learn a great deal about the "original" painting, its history, the artist, and the time period from which it comes.

The Masaccio *Madonna of Humility* and Reinhardt *Black Painting 1960-66* were both considered "beyond repair" yet both proved to be valuable paintings for the art museums that restored them. The term "restoration" here is, as it often seems to be, a bit problematic. How can two paintings that were deemed "beyond repair" be "restored"? And if this were possible, then why would they be determined a total loss in the first place? The reason they were thought to be irreparable was because they had lost their aesthetic significance as works by their respective artists. Both paintings had been overpainted and the paint applied by the artists was covered with the paint applied by their restorers. Since they were no longer aesthetically valued, they were no longer exhibitable in an *art* museum—as opposed to a more historically focused institution, like an archaeological

museum. Fortunately, their most recent restorations were able to return historic or aesthetic value to them.

Throughout this thesis I have referred to value in two main senses—that of aesthetics and that of the historical. Value, of course, has many meanings in the context of art. I have referred to "inherent value" as the value that resides in a painting made by a particular artist. But truthfully, there is no such thing as inherent value, because value is something that is entirely ascribed. There is an entirely different set of literature discussing how art is valued whether it is a cultural, monetary or other value. However, for this paper I chose specifically to refer to the aesthetic and historical values ascribed to an object because these are the most pertinent to art restoration. More specifically, in any given restoration campaign a conservator must negotiate whether or not she can restore both aesthetic and historic value to a painting.

Though I examined the Masaccio as an example of a restoration campaign that focused on the historical aspects of this two-fold goal it, of course, had aesthetic implications as well. The original goal of the *Madonna of Humility* restoration was to return some kind of aesthetic value to the painting (Figure 1). The notion of an "authentic" Masaccio, it was thought, could be found in Masaccio's original paint that was still left on the panel. In other words, there was, presumably, somewhere this recoverable essential Masaccio brushwork.

The conservators knew that *The Madonna of Humility* was filled in the 1920s in order to make it saleable as a "Masaccio." At that point in time, painting's value was something that looked close enough to a Masaccio, that someone would risk purchasing it as such—this is why paint was added during the 1927 and 1929 restorations.

Unfortunately, since this overpaint has been removed, the overall impression that one gets from the painting is *very* different from what the artist originally intended. Although keeping the overpaint might have conveyed more of the artist's original intentions, the restorer's brushstrokes rather than Masaccio's would have been the vehicle for communicating those intentions.

When the National Gallery of Art eventually did strip away the old overpaint in order to find the Masaccio, what they found was an "original" Masaccio that was so stripped that it no longer had any exhibition value for a museum with such an exceptional Italian Renaissance collection—the paint applied by the artist's hand was no longer in any tangible way existent.[70] It was at this point that restoration, as a means to return aesthetic value to the painting, proved unsuccessful. This is why, originally, David Alan Brown did not want to have the painting restored—he was aware of the extreme amount of damage known from x-ray evidence to lie below the surface. However, after David Bull restored it in 1997, whatever the motivations may have been, the museum was at least able to argue more convincingly, the painting's authenticity. The *Madonna of Humility*, having lost its exhibitable value, became a painting valued for the historical knowledge it could provide.

I would like to clarify that in many ways, part of the history of the painting was lost in David Bull's removal of the overpaint. We no longer have physical proof of the passage of time, though we have photographic evidence of it. For example, the paint added by William Suhr is no longer on the panel, but any spectroscopic data from the pigments have been recorded, as have pictures from every step of the removal. Anything that was added to the Masaccio over the course of its life is surely a part of its history. However, with the

[70] The painting must still have some value for the National Gallery of Art because they still have the picture of the intact (though overpainted) *Madonna of Humility* on their website.

removal of this part of its history, art historians and conservators have access to the surface that can provide insight into the historical moment when the painting was created.

I discussed Reinhardt's *Black Painting 1960-66* primarily as an example of a restoration in which aesthetic value was successfully returned to the object (Figure 20). However, in the process of aesthetically "restoring" the painting, a great deal of historical and technological knowledge was gained as well. When AXA Insurance determined that the painting had lost exhibition value as a Reinhardt, the Guggenheim decided that it could, instead, have value as a study tool. Once the damaged painting was designated as a study tool it became available to conservators, scientists, and historians rather than to the public. The Guggenheim, however, took it one step further by exploiting this case study as an opportunity to educate the public. Recently, there has been an emerging interest in bringing restoration and its processes to light through exhibition. With this current trend, it is possible for paintings that are perhaps not ideal for museum exhibition to have a moment in the public eye. With the Reinhardt black painting, the Guggenheim addressed a major problem and turned it into an opportunity to explain restoration to the public, and how it can be used to potentially "rescue" a painting. Dionne Sillé, from the Foundation for the Conservation of Modern Art explains:

> In preserving and conserving a work of art, the professional necessarily emphasizes different aspects of its meaning than those supposedly intended by the artist. These choices will always be open to debate. It is precisely because artists continually use their imagination and creativity to add new meanings that the preservation and conservation of contemporary art should not be a static process carried out behind the closed doors of the museum: it must be maintained in a dynamic and open discourse with the world around.[71]

[71] Sillé, Dionne. "Introduction to the Project." *Modern Art - Who Cares? : An Interdisciplinary Research Project and an International Symposium on the Conservation of Modern and Contemporary Art.* Minneapolis: Archetype Publications, 2006. 10.

It is rare that the conservation of a work of art is even mentioned on a museum label, let alone be the focus of an entire exhibition. Reinhardt's black painting is an example of the emerging trend in which museums actually showcase the restoration of a work of art. There is certainly a value to the information gained from exhibiting examples such as this one. It is an opportunity for the museum and their conservators to tell a different kind of story to art historians and the public and for them to share new technical processes that they have explored. Perhaps with this current phenomenon it will be possible for paintings that would not normally be accessible to the public to be displayed temporarily. And, of course, due to this innovative restoration campaign, we now know that the painting has the potential to be restored to a point where it can be exhibited again.

This movement in which restoration is being made visible as something that is interesting in and of itself to the public and art historians is important for the future of art restoration and conservation. Institutions such as the Lunder Center in Washington, D.C. are exhibiting the process of restoration in a way that makes museum-goers more aware of what a restoration entails and just how useful it can be. The gallery is essentially a conservation lab with glass walls so that visitors to the gallery can watch the conservation process while listening to and reading a plethora of information that they provide. The most important part of this is that people are realizing that something that was once done behind closed doors should be more transparent.

Robert Storr at Yale University eloquently explains how conservation has become routine in museum practices, "like a built-in health-maintenance system for things instead

of people."[72] Though he believes that conservation is an integral part of the art museum, he also claims that some objects are "beyond caring for" or "'dead' in the sense that what remains no longer conveys the meaning of the work in its original form." I agree that there are select instances where works of art are damaged to a point where they cannot be repaired, for example, those severely damaged in fires, natural disasters, or those lost due to the carelessness of their previous owners. However, I have to disagree with Storr's over- simplification. The *Madonna of Humility* and *Black Painting, 1960-66* were in many ways, as Carol Stringari would say, "corpses" which no longer conveyed the original meanings of the works, but their respective conservators *restored* some kind of original meaning or historical significance to the works.

We are fortunate that with today's advances in science and technology works of art previously considered "beyond caring for" can be redeemed as important objects both historically and aesthetically. The laser treatment performed on the Reinhardt has a promising future, as does the innovative atomic oxygen technique recently developed by the National Aeronautics and Space Administration (NASA). Paintings that would once have been considered beyond repair due to fire-damage can be restored using atomic oxygen exposure.[73] New techniques such as these are increasingly important for more contemporary works of art as well, particularly those that use new materials or "misuse traditional materials." Even eighteenth and nineteenth century artists such as Géricault

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[72] Storr, Robert. "Immortalité Provisoire." *Mortality, Immortality?: The Legacy of 20th-Century Art.* Los Angeles: Getty Trust Publications, 1999. 38.

[73] Miller, Sharon K.R. and Bruce A. Banks. "Atomic Oxygen Treatment and Its Effects on a Variety of Artist's Media." Hanover: National Aeronautics and Space Administration, 2005. Often, soot and char are difficult to remove from paintings using liquid chemicals or abrasive cleaning techniques. NASA developed an apparatus in which an atomic oxygen beam which dissociates diatomic oxygen and produces atomic and ionic oxygen gently oxidizes soot deposited on surfaces returning paintings that have been obscured by these deposits to their original form.

and Delacroix experimented with new materials, specifically "bitumen" black. The areas where they used the pigment have now begun to completely chip or cup, and with current technology are impossible to repair. Works of art such as Géricault's *Raft of the Medusa* (1818-1819) are in such a fragile state because of this material experimentation that, for fear of damage, "they will never leave the walls of the Louvre" (Figures 21-22).[74]

The development of new techniques is extremely important for helping to restore aesthetic value to the objects upon which they are used. Exhibits, symposia, or research that examines these techniques and works of art can then help us better understand the technology used and the history of the works being restored. The Guggenheim's *Imageless* exhibit brought laser ablation technology into the public eye and showcased how the technology could successfully restore a work of art. In displaying the process of restoration, those who attended the exhibit also learned more about Reinhardt's method and its significance for the overall meaning of his illusive works. Not only is the sharing of the technical advances in restoration and conservation important for the future of the field, but the sharing of the knowledge achieved from the restoration of an object is important to its art historical understanding. Conservator Elizabeth Darrow explains:

> If a restorer alters a pictorial surface, this action mediates the viewer's perception of an authentic work; yet art historians have rarely recognized the restoration of paintings in their interpretations. In doing so they treat the work as an intellectual abstraction. In fact, this simplification of analysis is unavoidable when the conservation history of a work is unknown or unknowable.[75]

[74] Bourgeois, Brigitte. Personal Interview. 19, June 2008.

[75] Darrow, Elizabeth. "Necessity Introduced these Arts: Pietro Edwards and the Restoration of the Public Pictures of Venice 1778-1819." *A Richer Heritage:: Historic Preservation in the Twenty-First Century*. University of North Carolina Press: Chapel Hill and London, 2003. 66.

The *Madonna of Humility,* with its recent restoration history, can have a future in teaching the art world and then the public about Masaccio and his methods. I learned a few months ago that The Masaccio was the focus of a symposium at the National Gallery of Art—and maybe one day it will somehow have a moment in the public eye as well. A great deal of information about the particular work and about fifteenth-century Italian art was learned during David Bull's removal of the overpaint. The many photographs of the different moments in the process, that I had the privilege of reviewing, will be important tools for historians to study Masaccio's unique method. As this information becomes more readily available to art historians and the public, it will be possible for new theories about Masaccio and his techniques to be formulated.

It became clear to me almost immediately when I began to conduct research for this project that this open sharing of restoration histories and procedures is lacking and that this must change. When I expressed my interest in institutions like the Lunder Center, Patricia Favero at The Phillips Collection, told me: "I would certainly do things differently were I being watched." And though I know that this would be true for many people working in a "fish bowl," regardless of their task, I think that if this were to become more commonplace we would finally be in a situation where there is a free sharing of techniques and knowledge and the conservation of works of art could really begin to progress.

It is irrefutable that conservation and restoration techniques have greatly improved in the last several decades, and now, the most imperative change is for art museums to share, more openly, the information gained from their own restoration campaigns with the rest of the world. With the work of conservators, works that are damaged can have different kinds of "value" restored to them. The Masaccio is now a historically valuable

painting that will continue to provide insight into the Italian Renaissance. While the Reinhardt, a painting thought to be ruined is on its way to becoming an aesthetically valuable painting once more and even had a moment in the limelight in the *Imageless* exhibit at the Guggenheim Museum. And though *Black Painting, 1960-66* had an instant of popularity, where will it go? Now, the *Madonna of Humility,* is out in the NGA laboratory on hand for conservator Kristin deGetaldi to complete her study of it, but what will happen when it goes back into storage? These paintings, though they have had some kind of value restored to them, will ultimately be pushed aside as more interesting cases arise, and as more well-known paintings are hung in the walls of the museum galleries. How art museums should walk this line between keeping paintings in storage or showing them is another issue that deserves more attention as the future of restoration and conservation is shaped.

As museum conservation departments take on more complicated restoration campaigns, they must keep in mind all that has been learned from these past experiences and be careful in negotiating what kind of value they can restore to their paintings. I have shown how the works of art that I explored were thought to be “lost causes” because they seemed irreparably damaged by past restorations. However, many paintings such as these have a great deal of historical or aesthetic value left within them, and with the resources and technology that we have today we can access that value. In order to continue the advancement of art restoration and conservation, we need to rethink exactly how we assign value to a painting. The redefined role of a conservator, then, is not only to make a painting look museum wall worthy, but also to provide historical context for the art.

Image Appendix

Figure 1. Masaccio, *Madonna of Humility* (1423-24).
National Gallery of Art, Washington, D.C.
Note: Current Condition (2009)
Source: Taken December 2008, NGA

Figure 2. Conservation Laboratory at NGA with Masaccio, *Madonna of Humility* (1423-24).
Source: Taken August 2008, NGA

Figure 3. Masaccio, *Madonna of Humility* (1423-24).
Note: Photographs taken post-1927 restoration, prior to 1929 restoration
Source: Shapely, Fern R. *Catalogue of the Italian Paintings*. Vol II Plates. Washington, D.C.: Editors Office, National Gallery of Art, 1979.

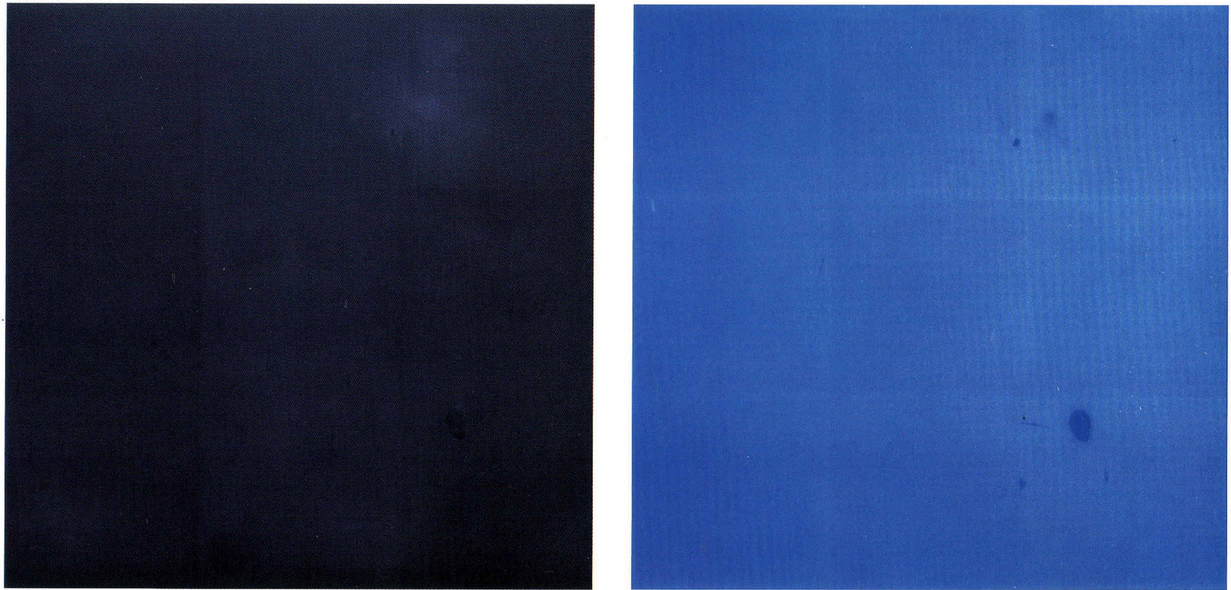
Figure 4. Masaccio, *Madonna of Humility* (1423-24).
Note: Photographs taken after 1929 Restoration
Source: Shapely, Fern R. *Catalogue of the Italian Paintings*. Vol II Plates. Washington, D.C.: Editors Office, National Gallery of Art, 1979.

Figures 5-6. Details, Masaccio, *Madonna of Humility* (1923-24)
Note: Photographs taken during 1928 restoration
Source: Shapely, Fern R. *Catalogue of the Italian Paintings*. Vol II Plates. Washington, D.C.: Editors Office, National Gallery of Art, 1979.

Figure 7. Masaccio, *Madonna of Humility* (1423-24).
National Gallery of Art, Washington, D.C.
Note: Image Prior to 1997 Restoration
Source: nga.gov

Figure 8. Masaccio, *Madonna and Child With Saint Anne* (1424-25).
National Gallery of Art, London, UK
Source: www.nationalgallery.org.uk

Figure 9. Masaccio, *Tribute Money* (c. 1420).
Brancacci Chapel, Santa Maria del Carmine, Florence, Italy.
Source: www.britannica.com



Figures 10-11. Reinhardt, *Black Painting, 1960-66* (1960-66).
Guggenheim Museum, New York, NY
Note: Images before 2000 Restoration. Image on right shown under UV-light. Fingerprints, etc. are visible.
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting.*
Manchester, CT: RR Donnelley Andrews, 2008.

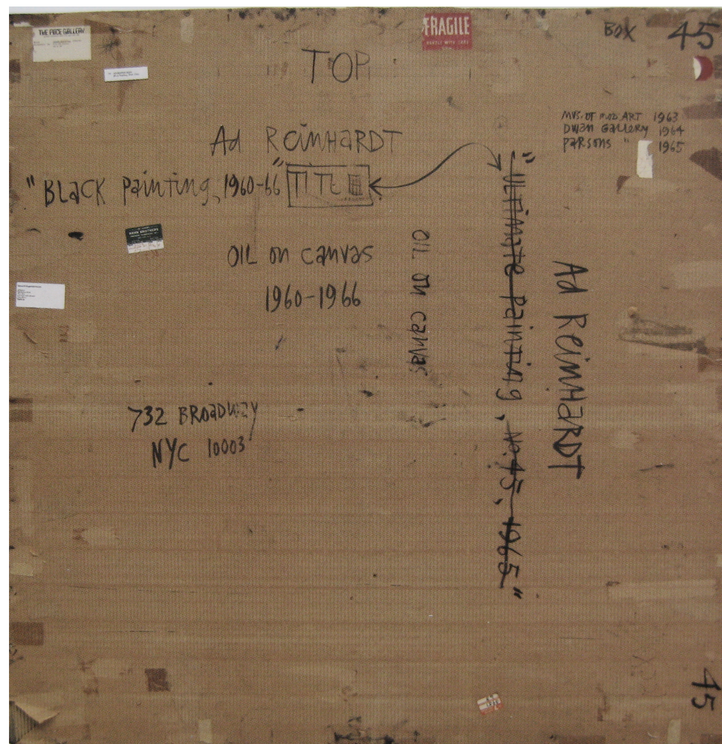
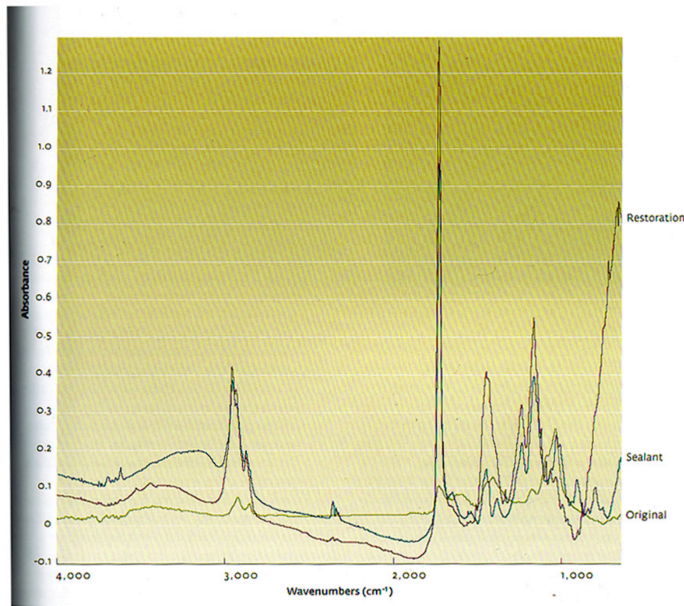


Figure 12. Reverse of Reinhardt, *Black Painting, 1960-66* (1960-66)
Guggenheim Museum, New York, NY
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting.*
Manchester, CT: RR Donnelley Andrews, 2008.

Figure 13. Ad Reinhardt in his studio, New York, July 1966.
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. Manchester, CT: RR Donnelley Andrews, 2008.

Figure 14. Simulation of method Reinhardt used.
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. Manchester, CT: RR Donnelley Andrews, 2008.



Layer	Color	Pigments	Binder	Approximate Thickness (in microns)	Ultraviolet Fluorescence
20	Blue/Black	Pthalo Blue, Mars Black	Acrylic	5	Strong
19	Clear Coating	–	Acrylic	10	Strong
18	Blue/Black	Pthalo Blue, Mars Black	Acrylic	<5	Strong
17	Clear Coating	–	Acrylic	10	Strong
16	Red/Blue/Black	Mars Black, Bone Black, Organic Red and/or Mars Red, Ultramarine Blue, Cobalt Blue	Polyvinyl Acetate	15	Weak
15	Black	Mars Black	Polyvinyl Acetate	5	Weak
14	Red	Mars Red and/or Black, Bone Black	Acrylic	10	Weak
13	Black	Bone Black, Mars Black, Ultramarine Blue	Polyvinyl Acetate	5	Weak
12	Red	Mars Red and/or Black, Ultramarine Blue, Titanium White	Acrylic	10	Weak
11	Green	Mars Black, Chromium Oxide Green	Acrylic	10	Weak
10	Clear Coating	–	Acrylic	<5	Strong
9	Black	Bone Black, Mars Black, Ultramarine Blue	Oil	10	None
8	Black	Bone Black, Mars Black, Ultramarine Blue	Oil	10	None
7	Black	Bone Black, Mars Black, Ultramarine Blue	Oil	10	None
6	Black	Bone Black, Mars Black, Ultramarine Blue	Oil	10	None
5	Red/Black	Bone Black, Mars Black, Organic Red and/or Mars Red, Ultramarine Blue	Oil	15	None
4	Black	Bone Black, Mars Black, Ultramarine Blue	Oil	10	None
3	Black	Bone Black, Mars Black, Ultramarine Blue	Oil	10	None
2	Black	Bone Black, Mars Black, Ultramarine Blue	Oil	15	None

Figures 15-16. FTIR Analysis and Table of Pigment Layer Compositions
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting.* Manchester, CT: RR Donnelley Andrews, 2008.

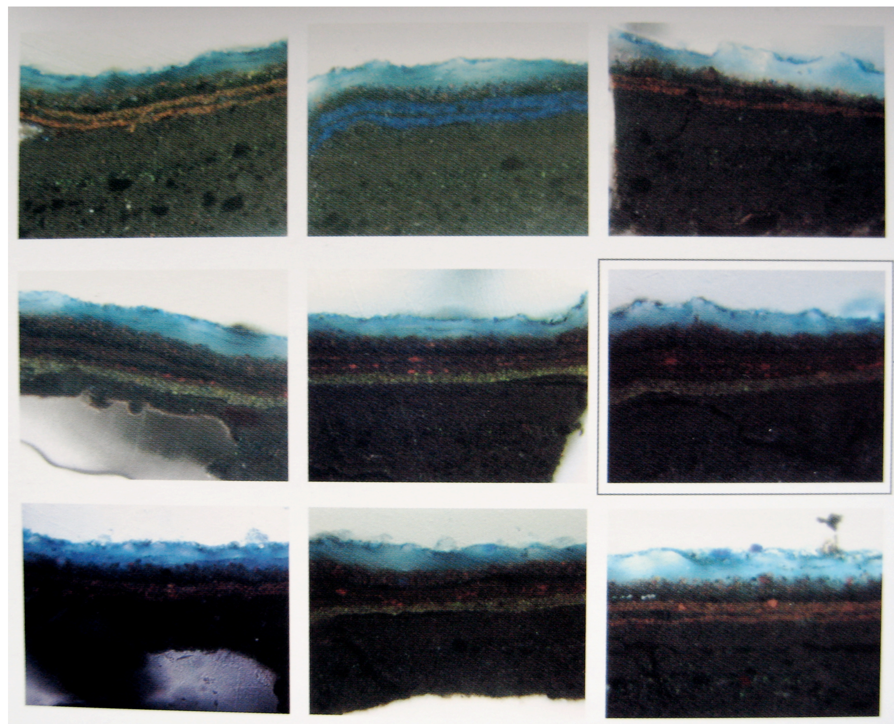


Figure 17. Paint layer stratigraphy.
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting.* Manchester, CT: RR Donnelley Andrews, 2008.

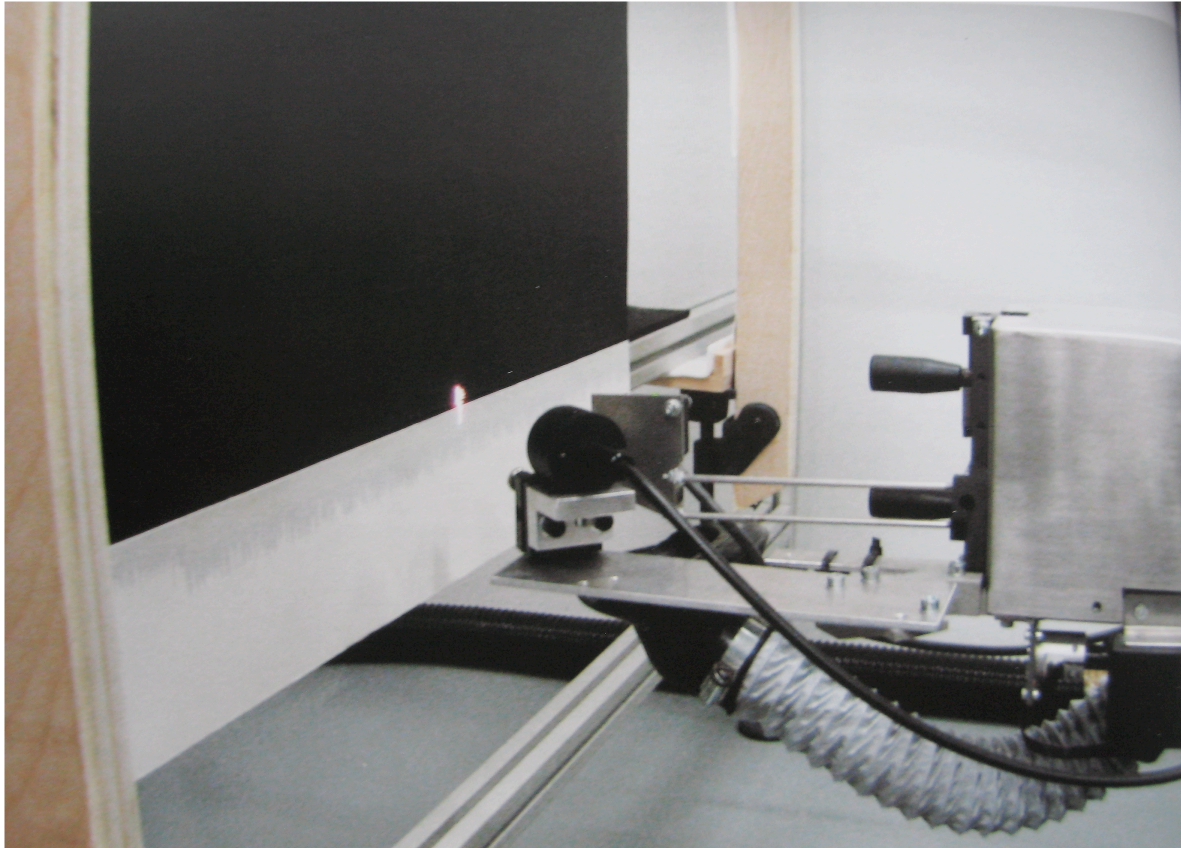


Figure 18. Laser cleaning of Reinhardt's *Black Painting, 1960-66* (1960-66)
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. Manchester, CT: RR Donnelley Andrews, 2008.

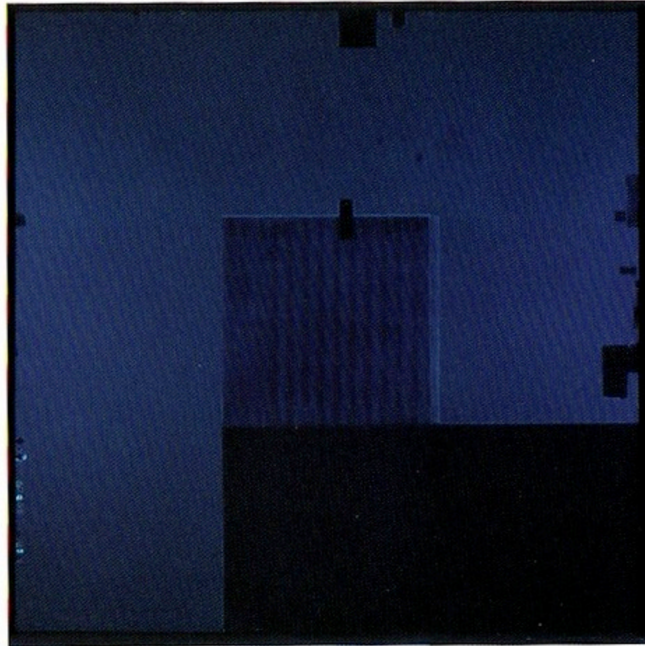


Figure 19. Reinhardt, *Black Painting, 1960-66* (1960-66)
Guggenheim Museum, New York, NY
Note: Image taken under UV light after 2000 restoration, see middle square for “tide-line” effect
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. Manchester, CT: RR Donnelley Andrews, 2008.

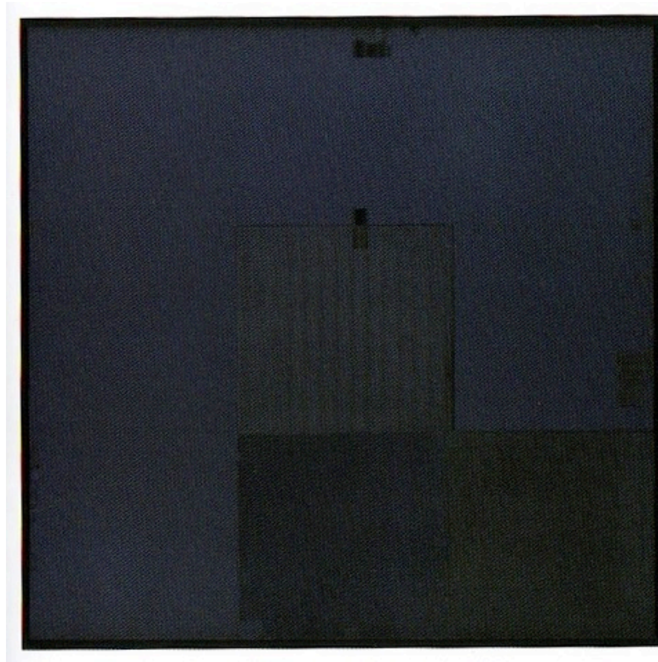


Figure 20. Reinhardt, *Black Painting, 1960-66* (1960-66)
Guggenheim Museum, New York, NY
Note: Image taken after 2000 restoration
Source: *Imageless: The Scientific Study and Experimental Treatment of an Ad Reinhardt Black Painting*. Manchester, CT: RR Donnelley Andrews, 2008.

Figure 21. Géricault, *Raft of the Medusa* (1818-1819)
Musée du Louvre, Paris, France
Source: www.louvre.fr

Figure 22. Detail of Géricault, *Raft of the Medusa* (1818-1819)
Musée du Louvre, Paris, France
Source: Taken June 2008, Musée du Louvre

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