

# Modern Authentication

An Exhibition

4.609: The Art Museum: History, Theory, Controversy

## *Modern Authentication*

### **Introduction**

Since the Romans imitated Greek sculptures, copying has been an ingrained aspect of art. These early replications were born out of a desire to disseminate and educate, as burgeoning artists even today rely on imitating to refine their technique (Lenain, 2012). But motivations began to change during the Renaissance, when demand for art increased and suddenly art became a commodity (Savage, 1963). Art created with a deliberate intent to deceive, hereafter termed forgeries, have infected the art market, with current estimates that up to 40% of art on the international market is fake (Holving, 1996).

Combating this rise in art forgery has led to the concurrent development of the field of authentication. At the most basic level, authentication requires identification of the materials used, the style they were used in, and effects of time on the art. The historians, curators, researchers, and art dealers who are tasked with this responsibility begin with empirical examination of the materials, techniques, and condition of a given piece of artwork to attribute it to a specific time, place, and artist (Savage, 1963). Often this is much more difficult than it sounds. Although contextual information such as provenance, sociopolitical history and context, or a strong understanding of art history and theory can be helpful, authenticators are increasingly relying on scientific techniques to identify forgeries (Aldrich, 2012).

This exhibition explores the parallel development of the arts of forgery and authentication. Beginning with contextualization and connoisseurship as a basis to assess authenticity, we then move on to more empirical and scientific analysis. Through the fifteen forgeries presented, each detailing a specific development in the techniques of either the forger or authenticator, this exhibit will call into question how forgeries have impacted the process and

technology behind art authentication. These authentication techniques are divided into three rooms, which each represent a specific question posed by authenticators: What materials were used? How were they used? And how has the art aged?

Historically, authentication techniques have always been one step behind the techniques of forgers, and for this reason many institutions and private collectors have lost millions of dollars (Dolice, 2001; Arnau, 1959). With the emergence of interest in scientific experimentation in the seventeenth century came the invention of techniques by intellectuals and alchemists to study material properties. Although these early experiments had limited tools and knowledge, integration of these scientific techniques with knowledge of art history provided a primitive model for authentication. Later scientific developments in the twentieth century further lifted the burden off the questionable accuracy of art connoisseurship and historical research (King, 1994). These technologies developed in the twentieth century brought the ability to both accurately date objects and analyze their material composition. With these two groundbreaking advances, the field of authentication has developed into the modern science it is today (Aldrigh, 2012; Keats, 2013).

The authentication teams of today's most prominent international museums wield an intimidating arsenal of tools to detect forgery. Modern authentication techniques have revealed that many works from the past two hundred years that had been accepted as authentic are indeed forgeries (Close Examination, National Gallery London). However, it is suspected that many forgeries continue to elude authentication attempts today (Wieseman, 2010; Sullivan, 2012; Radnoti, 1999; Keats, 2013). Indeed, this exhibit features specific works of art that are suspected to be forgeries, but for whom modern techniques are still not able to definitively prove whether they are or not. By examining the history of art authentication through forged works that eluded

and eventually changed the field, this exhibition calls into question whether it is possible for a forgery to deceive modern institutions.

Unfortunately, the advances brought by scientific techniques to the field of authentication are not without limit. Most often, authentication teams or individuals are limited by prohibitive costs or lack of access to necessary scientific equipment. Many techniques also require the isolation of a sample of material from objects in question, resulting in damage. Even the quantitative results produced by scientific analyses can be interpreted subjectively. Mistakes in equipment calibration, object sampling, or human analysis can lead to as flawed a determination of authenticity as the imperfect fields of art historical research and contextualization (Savage, 1963).

In the face of these limitations, authenticators of the twenty first century must possess the attributes of a good detective. A successful modern authenticator is not only an apt observer of details, and able to draw inferences upon physical and scientific examinations of an object, but is also an expert with a background of both historical and technical knowledge. Modern authenticators need not be specialists, but must know who the correct specialists are. The difference between a specialized scientist and an art authenticator is that the scientist will be able to answer the question, but only the specialist will know what question to ask (Kurz, 1948; Savage, 1963). Perhaps the most prominent example of such a multidisciplinary team is the Rembrandt Research Project. This Netherlandish group sought to revisit and revise the Rembrandt oeuvre “that in the course of time has become corrupted.” Although disbanded in 2011, their five volume *A Corpus of Rembrandt Paintings* was compiled through integration of art connoisseurship, historical research, and scientific analysis, and is considered the definitive authority by auction houses selling Rembrandt works (Bryun, 1982).

As you browse this exhibit see if you can become this detective. As you gain familiarity with the techniques used by modern authenticators, try to predict the correct questions to ask and how these questions can be answered. As you observe the mutual development of forgery and authentication, you will develop as a detector of forgeries in your own right. The objects presented herein will quickly move beyond the simple question of “What is a forgery?” and ask how forgeries have influenced authentication and vice versa. This exhibit ultimately suggests that forgeries have been a driving force behind authentication technology, but despite these technological advances, the prevalence of works with dubious authenticity suggest that modern authentication techniques are still insufficient to detect all forgeries.

## **Objects and Labels**

### *Room 1: Style*

Statue of a Kouros

Unknown, Greek, about 530 BC or modern forgery

Despite studying this sculpture for two years before finally purchasing it in 1985, the Paul Getty Museum in Malibu, California continues to face questions over its authenticity. To this day, despite tremendous advances in art authentication, neither art historians nor scientists have been able to completely answer questions of the kouros's authenticity. Many of these questions arise from connoisseurship of Greek sculpture, such as the fact that the marble used is an ancient marble from the Island of Thasos, but use of this specific type of marble is atypical of the attributed time period. Tool markings on the detailed contours of the young boy match typical markings from the archaic Greek time period, but the aging of the stone seems disingenuous and faked. It is also known that similar kouros statues, as well as other artifacts purchased at the same time from the same art dealer, are forgeries.

## Young Man and Woman in an Inn

Possibly: Frans Hals (1582-1666), 1623

Note the iconic FHALS monogram and 1623 date above the fireplace in the painting. Do you believe it? Modern authentication techniques are still not able to reach a consensus on the authenticity of this painting; even the title of this painting is debated, assigned names such as *Young Man and Woman in an Inn*, *Yonker Ramp and His Sweetheart*, or *The Prodigal Son* based off various museum catalogues and primary documents dating from Frans Hals's lifetime. Since 1910, this painting's authenticity has been debated and continues today. Most notably, art historian Seymour Slive accepted it as a genuine Hals based on its iconographical similarity to Han's oeuvre, and thus came head to head with scholar Claus Grimm, who insists that it is a later unknown forger's copy of previous works by Han.

## Etruscan Sarcophagus

Incorrect: Unknown, Sixth century BC

Correct: Pinellis workshop, 1863

Before the invent of modern scientific tools, the authentication of art relied entirely on the ability of connoisseurship to determine the stylistic congruity of a given piece of art. This *Etruscan Sarcophagus* was proven to be a fake using only contextual discern of style. Etruscan historians pointed out that nudity in art was unprecedented in sculptures from this time period, making the entirely nude man on the lid incredibly questionable. Contextualization also brought light to the fact that the woman beside the man is wearing underwear in the style of the nineteenth century, which is out of place in a sixth century BC sculpture. It is believed that this forgery is the work of the Pinellis factory, under the guidance of Marchese di Cavelli and his terracotta factory, from 1863. The British Museum finally removed this *Etruscan Sarcophagus* from its collection in 1935.

Portrait of a Woman

Incorrect: Francisco Goya (1746-1828), unknown

Correct: Unknown

The image you see is what an X-ray sees. While visible light will only illuminate the outermost layer of a painting, X-rays are used to detect earlier work present under the surface of a painting. Many legitimate paintings are done on top of an artist's own canvas, but in certain cases X-ray analysis reveals a second painting that is incongruous with the first, such as when an under painting shows people in 19<sup>th</sup> century clothing, when the actual painting is attributed to the seventeenth century. Such is the case of *Portrait of a Woman*, which was acquired by the Fogg Art Museum in 1943 through a Harvard alumnus. Goya expert FJ Sanchez-Canton and conservator Elizabeth Jones raised suspicion that it might be a forgery based on its modern surface and oily paint. X-rays revealed a second woman, who you see in the right half of this current painting, now hypothesized to be a Spanish provincial work of around 1790. X-ray diffraction analysis revealed zinc white paint in the over painting, which was not invented until after the death of Goya in 1828. Although material analysis is certainly helped, a thorough knowledge of art history and the context of Goya's works in the eighteenth century were necessary to prove this is not an authentic Goya.

## Woman in Yellow

Incorrect: Pablo Picasso (1881-1973), 1907

Correct: Mike Bidlo (1953-), 1987

Many art authenticators have raised concern over the increasing ease of forging contemporary art. Taken to the extreme, George Savage in his textbook *Forgeries, Fakes, and Reproductions* states that, “In a good deal of modern painting the element of craftsmanship is largely absent. Work of the kind is hardly to be taken seriously; neither, for that matter, are those who buy it ... An art which can be forged with practically no risk of detection is worthless.” Presented here is a second-rate forgery of *Woman in Yellow*, originally by Pablo Picasso, which demonstrates that at least some contemporary art retains enough of a stylistic identity to be distinguished from inauthentic forgery by connoisseurship alone. This forgery is quickly distinguishable; although the painting resembles the original, note its sterility and lack of manipulation of light and shadow, which is found in Picasso’s original. The forger, Mike Bidlo, has constructed a lucrative and controversial career of painting “genuine fakes” of renowned works of art. Nevertheless, individual styles that are near impossible for forgers to imitate with high fidelity persist, as evidenced in the works of Picasso.

## Amarna Princess

Incorrect: Unknown, 1350 BC

Correct: Shaun Greenhalgh (1961-), 2000s

Museums do not go out of their way to identify forgeries within their collection. Often times, these forgeries are only identified due to extraneous circumstances, as is the case with this statue, purported to be of the daughters of the Pharaoh Akhenaten and Queen Nefertiti, probable father and stepmother of Tutankhamun. The Bolton Museum purchased the statue in 2003, after consultation with the Christie's Auction House and the British Museum, who both confirmed its authenticity. The basis for this authentication was the provenance of the sculpture and its resemblance with a similar statue of an Egyptian princess in the Louvre. The authenticity of the *Amarna Princess* was not called into question again until March 2006, when Scotland Yard's Art and Antiquities Unit impounded the sculpture as part of an ongoing investigation of the Greenhalgh family. Shaun Greenhalgh and his father were caught selling a forged Assyrian frieze, using the same forged provenance they provided when selling the *Amarna Princess*. This ability to deceive even the largest art institutions and auction houses of today, using only provenance and stylistic contextualization nonetheless, demonstrates that despite advances in technology, forgers are still ahead of authenticators.

*Room 2: Materials*

The Madonna with the Iris

Incorrect: Albrecht Dürer (1471-1528), about 1508

Correct: Dürer's workshop, 1500-1750

Although the monogram and date to the left of the Virgin's head attribute this painting to Albrecht Dürer in 1508, scientific analysis of the materials used have demonstrated that both of these claims are false. In 1959, curator Michael Levey used contextual knowledge and connoisseurship of Dürer's works to raise concern of the painting's legitimacy. Levey was concerned that the painting combined multiple motifs from different Dürer paintings from different time periods in Dürer's career, such as the Iris. In 1996, infrared spectrograph revealed several odd findings regarding the underdrawn pencil sketch: the virgin and child were underdrawn, the iris was underdrawn but altered, there was a rose underdrawn to the right of the Virgin's head that was not included, and the wall to the left of virgin not underdrawn. These different approaches to the underdrawing and setting raised suspicion that more than one artist worked on the painting. Later cross-sectional and material analyses revealed that the overpaint varnish over the monogram (which dated the painting to 1508) had manila copal, which was only available in the 1750s, and the date itself was painted with lead tin yellow, which stopped being used in 1730s. Fourier transform IR microscopy (FTIR) and gas chromatography mass spectrometry (GCMS) revealed that the earliest varnish layer contained sandarac, which was mostly used in the sixteenth century. These findings suggest that the painting was painted by multiple artists inspired by Dürer, and was later retouched with varnish and a Dürer autograph and date in the early eighteenth century in an attempt to deceive buyers into believing it was an authentic Dürer.

## Buckingham Jars

Possibly: unknown, c. 1660

These jars were discovered in 1981 in the collections of Burghley House in Lincolnshire, and inside them a scrap of paper with the inscription “Duke of Buckinham’s China” sparked interest in the miniature vases. Porcelain was unfamiliar in the west during this time period (prior to 1683), so of principal concern was analysis of the jar’s composition. Material analysis was especially necessary to rule out the possibility that the jars were made of opacified glass, because enameling on glass was unheard of in the seventeenth century. X-ray fluorescence and X-ray diffraction performed by the British Museum Research Lab concluded that the jars were made of porcelain, and the glaze contained lead, suggesting the vases were not of oriental origin because lead was not used in China or Japan during this time period. Additionally, lack of the crystalline structure mullite on the vase lids suggested that they were not produced in the Far East. In 2007, scanning electron microscopy of the body paste and glaze revealed the presence of potassium, iron, lead, and calcium, which all indicated that the jars were made of hard-paste porcelain. These findings call into question the significance of the then-believed first instance of European production of hard-paste porcelain, attributed to Ehrenfried Walther von Tschirnhaus and Johann Friedrich Böttger in 1709. Are these vases evidence for European porcelain production that pre-dates the currently accepted theory by twenty-five years and in an entirely different country? Whatever your conviction, these jars and scientific analysis of their materials demonstrate the potential of modern authentication to alter accepted art historical knowledge.

## La Bella Principessa

Possibly: Leonardo da Vinci (1452-1519), 1495

Or: Unknown, 19<sup>th</sup> century

Modern authentication is still unable to conclusively determine whether this painting was done by Leonardo da Vinci, which would increase its value from \$21,850 to \$150 million. Chemical analysis of its pigments and vellum date these materials to between 1440 and 1650, which initially raised suspicion of its original attribution to an artist of the early 19<sup>th</sup> century German school. Leonardo da Vinci scholar Martin Kemp analyzed the painting's composition, iconography and pigments, and claimed in 2009 that it was an authentic Leonardo da Vinci portrait of a member the Sforza family. Kemp cited left-handed hatching present in the figure's details, multispectral imaging analysis that allowed for more detailed pigment analysis, and a fingerprint found in the upper left corner of the painting that resembled a fingerprint found on Leonardo's *St Jerome in the Vatican*. However, to this day the authentication of *La Bella Principessa* has not achieved consensus from the majority of Leonardo experts, and despite the material evidence generated by scientific examination, most experts remain unconvinced that this is sufficient to attribute the painting to the great master.

## Portrait Group

Incorrect: Italian, 15<sup>th</sup> century

Correct: Unknown, early 20<sup>th</sup> century

Time breeds innovation. Although suspicion over the legitimacy of this painting first arose in 1924, its inauthenticity was not officially recognized by the National Gallery London until 1996. Only through scientific developments in art authentication did suspicions over its accuracy gain sufficient evidence to declare it a forgery. This portrait was acquired by the National Gallery in 1923, and attributed to an unknown 15<sup>th</sup> century artist, possibly affiliated with Melozzo da Forlì (1438-1494). Perhaps it is a portrait of the Montefeltro family, as suggested by the armorial badge in the upper right. Following early suspicions of its authenticity in 1924, AH Buttery examined the painting by applying heat and a solvent, neither of which disturbed the varnish, leading him to claim its authenticity. But by 1951, curator Martin Davies once again raised doubts, stating that the aesthetic style appeared to be modern. In the 1960s, historian Stella Mary Newton raised questions over the painting's historical accuracy, concluding that the woman's hat was based off of a 1913 fashion trend. Art connoisseurship knowledge also brought light to the fact that the supposed fifteenth century painting had too much linearity and definition for its time period. Finally, tests done using contemporary scientific analysis after the investigation was reopened in 1996 conclusively demonstrated that this painting could not have been made in the fifteenth century: Cross-sectional analysis revealed that tinted glue and varnish were used to give the painting a brownish tonality, thereby aging it. Shellac was used create faux craquelure, resembling genuine aging, due to its ability to contract as it dries. Most convincingly, scanning electron microscope energy dispersive x ray (SEM-EDX) identified the pigments cobalt blue,

cadmium yellow, viridian, and chrome yellow, none of which were available before the 19<sup>th</sup> century.

*Room 3: Age*

Venice: Entrance to the Cannaregio

Possibly: Francesco Guardi (1712-1793), 18<sup>th</sup> century

Or: 19<sup>th</sup> century imitator

Modern pigment analysis is one of most conclusive tools employed to determine the age of a painting. In the eighteenth century, the popularity of Venetian view painters inspired an eruption of imitations that have seeped into collections throughout Europe as souvenirs from the Grand Tour. Consequently, this painting – initially attributed to Francesco Guardi – sparked investigation since its original purchase in 1879. Art historians and critics alike have argued that the detail in the sky and buildings are suggestive of a “lesser skill of another hand”. The figures in the foreground also lack Guardi’s “griffe endiablée”, or furious touch, a notorious aspect of Guardi’s more impressionistic brushwork. However, a 1955 pigment analysis claimed that this painting was definitely an imitation, after paint sampling of the foreground found the presence of Thénard’s blue, a man-made pigment discovered in 1804. However, a follow up pigment analysis in 2009 yielded more specific results. Sampling of the blue coat on the man in the group at the far left, and the dress of woman near the second group from them left, found the presence of the Prussian blue pigment mixed with lead white and earth pigments, which were indeed available before and during Guardi’s lifetime. Cross-sectional analysis of the blue jacket from the figure furthest left revealed the presence of a distinct surface layer, and elemental analysis by scanning electron microscope energy dispersive x ray (SEM-EDX) identified the pigment Thénard’s blue in this later surface layer. These modern findings suggest that the earlier pigment analysis is invalid, and there is no longer definitive evidence that this painting was made after 1804, although its authenticity still remains in question.

Edzard the Great, Count of East Friesland

Incorrect: Jacob Cornelisz van Oostanen (1470-1533), 1517

Correct: German, 18<sup>th</sup> century

The study perhaps most often employed to definitively date paintings is dendrochronology, or the study of wood and its ring patterns to date panels. Although not necessarily a malicious forgery, *Edward the Great, Count of East Friesland* and related dating provided insight into the history of this painting both in the aesthetic art world and historical sociopolitical contexts.

Although originally attributed to the Dutch painter Jacob Cornelisz van Oostanen and painted when Count Edzard travelled through the Netherlands in 1517, logistically it is more likely that Count Edzard was painted locally in Germany. In 1993, dendrochronological analysis of the wood panel's growth rings revealed that the earliest possible date of the painting was 1704.

Pigment analysis corroborated this dating, finding pigments from the greenish background that were only available since 1704. Other eighteenth century portraits of East Friesland counts have arisen, suggesting that the end of the Cirksena dynasty in 1744 triggered a wave of nationwide nostalgic sentiments, represented by these portraits that emerged in the eighteenth century.

The Virgin and Child with an Angel

Incorrect: Francesco Francia (1450-1517), 1490

Correct: Unknown, late 19<sup>th</sup> century

If it were not for an identical painting that went up for auction in 1955, this fake might still be hanging in the National Gallery London, which prized it as one of Francia's earliest known works. After being acquired by the National Gallery in 1924, *The Virgin and Child with an Angel* was touted as authentic without any question. When an identical painting surfaced, this immediately changed. In 1995, photomicrograph showed fake craquelure that had been painted on in order to make the painting appear older. This is especially noticeable on the child's right arm. Other photomicrographs showed graphite pencil around areas of detail, which was not common of Renaissance paintings, but used commonly in the 19<sup>th</sup> century. These graphite markings can even be seen with the naked eye, if one looks closely at the curls in the Angel's hair. These findings definitely pointed suspicion towards the National Gallery painting, but its inauthenticity was not confirmed until later developments in authentication technology. In 2009, X-rays revealed that wormholes in the wood backing had been filled with an unknown material, a common technique used to make paintings look older. Infrared reflectogram analysis revealed graphite pencil underdrawing that was incredibly detailed, which is not typical of Renaissance era paintings, while the Pittsburgh painting had a brush underdrawing, which was less detailed and not followed in the actual painting with absolute fidelity. High-pressure liquid chromatography (HPLC) analysis of the red curtain in the background found red lake and chrome yellow pigments, which weren't available until after 1818. Ultimately, this nineteenth century forger's downfall was his efforts to meet the need of making this 100-year-old painting seem 500 years old.

Madonna of the Veil

Incorrect: Sandro Botticelli (1445-1510), unknown

Correct: Umberto Giunti, 1920-1929

Only through advancements in scientific analysis of false aging was this painting, originally attributed to Sandro Botticelli, conclusively demonstrated to be the work of Umberto Giunti.

When this painting appeared on the art market in the 1930s, art critics and academics praised the work as an authentic masterpiece. However, conservation treatments in the 1940s revealed that the blue robe worn by the Madonna uses Prussian blue, a pigment only available after the eighteenth century. Magnification revealed the pigment grains to be fine and possibly machine-ground, uncharacteristic of fifteenth century pigments which had coarser grains. In 1994, energy dispersive X-ray analysis revealed the use of oxide green, a pigment that was not available until after 1862. Material analysis also revealed inconsistencies with Botticelli's oeuvre: X-rays revealed that the wooden panel was prepared uncharacteristically, and photomicrograph analysis of the Madonna's lips were painted with black, not Botticelli's characteristic madder lake pigment. Analysis also revealed that Umberto Giunti employed a number of techniques to falsely age the painting: surface craquelure and paint losses suggest intentional damage, worm holes in the panel bear stress fractures indicative of a mechanical drill, and an umber pigment was used to create discoloration in the green foliage behind the Madonna, mimicking an aging effect typical in fifteenth century painting.

Christ and the Disciples at Emmaus

Incorrect: Johannes Vermeer (1632-1675), unknown

Correct: Han van Meegeren (1889-1947), 1936

The impetus to investigate art for forgeries is often time nonexistent, and this painting would likely still be attributed to Johannes Vermeer if not for the coincidence of the arrest of its forger Han van Meegeren. Now one of the world's most infamous art forgers, van Meegeren is known to have forged hundreds of works attributed to Frans Hals, Pieter de Hooch, Gerard ter Borch, and Johannes Vermeer, some of which are still unknown, collectively costing more than \$30 million. In 1945 van Meegeren was arrested after *The Woman Taken in Adultery*, a work he had sold, was found in the possession of Reicheshmarschall Hermann Göring, and he was accused of collaborating with the Nazis, a crime punishable by death. Fearing his life, van Meegeren admitted to forging *The Woman Taken in Adultery*, along with other Vermeers including *Christ and the Disciples at Emmaus*. This confession, along with dating of the canvas using wood analysis such as annual ring count and wormholes, lead to the exposure of this forgery.

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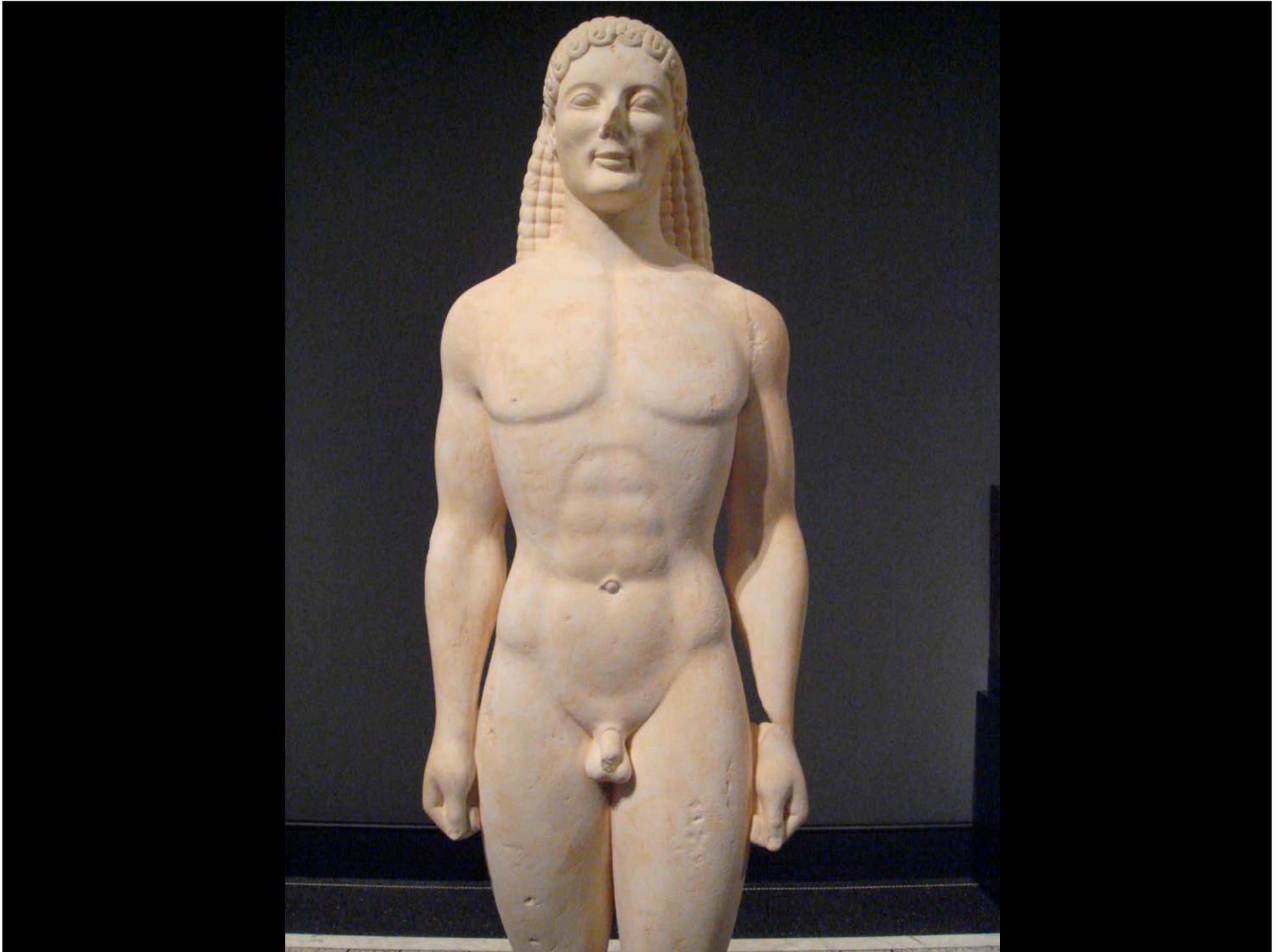
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# Modern Authentication

Room 1

Style











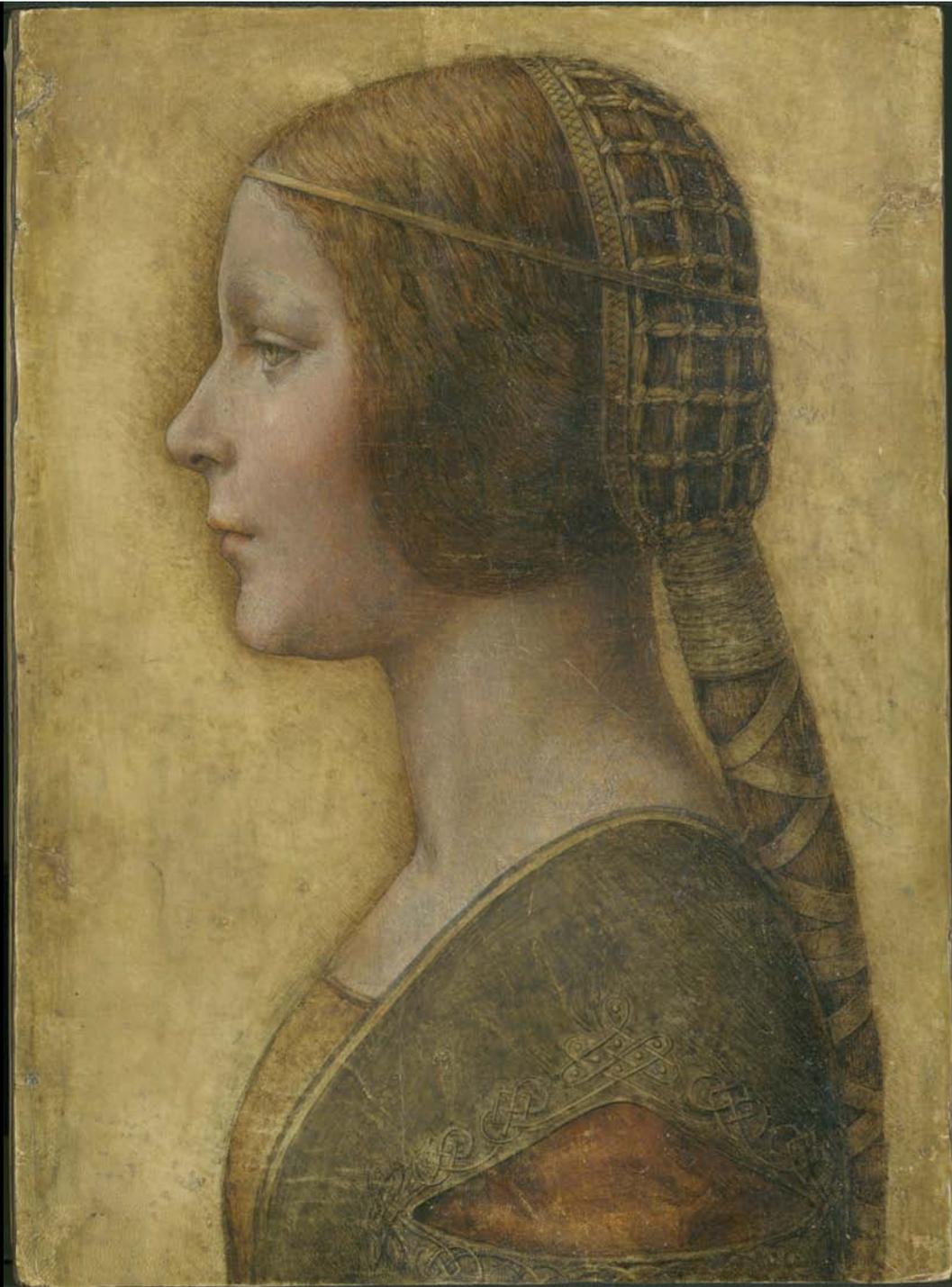


Room 2

Materials









Room 3

Age











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