



Topic
Fine Arts & Music

Subtopic
Visual Arts

Leonardo da Vinci and the Italian High Renaissance

Course Guidebook

Professor George R. Bent
Washington and Lee University



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A two-time holder of Fulbright Scholarships to Italy, Professor Bent received his B.A. from Oberlin College in 1985 and his Ph.D. in Art History from Stanford University in 1993. He cofounded Washington and Lee's interdisciplinary program in Medieval and Renaissance Studies in 1995, chaired it from 2000 to 2003, served as Associate Dean of the College from 2003 to 2006, and currently serves as chair of the Department of Art and Art History.

Professor Bent's early scholarly work focused on issues of artistic production, the function of liturgical images, and institutional patronage in early Renaissance Florence. He is the author of *Monastic Art in Lorenzo Monaco's Florence*, a book that addresses these subjects through an examination of panel paintings, manuscript illuminations, and religious rituals performed in the monastery of Santa Maria degli Angeli from 1300 to 1415.

Professor Bent's current research interests revolve around paintings produced for public spaces in Florence between 1250 and 1450, which have caused him to consider works such as Madonnas in street-corner tabernacles, frescoes of virtuous heroes in guildhalls, cult images that worked miracles

for common people, and images of political propaganda that decorated offices of state bureaucrats.

Professor Bent and his wife, Lorriann Olan, have three children, each of whom tolerates their father's obsession with the art and culture of the Italian Renaissance. ■

Table of Contents

INTRODUCTION

Professor Biography	i
Course Scope.....	1

LECTURE GUIDES

LECTURE 1

Introducing Leonardo da Vinci.....	4
------------------------------------	---

LECTURE 2

Who Was Leonardo? Facts and Fictions.....	12
---	----

LECTURE 3

Leonardo's Artistic Origins	20
-----------------------------------	----

LECTURE 4

From Apprentice to Partner	31
----------------------------------	----

LECTURE 5

<i>Annunciation</i> —Leonardo's First Commission.....	38
---	----

LECTURE 6

A New Kind of Portrait— <i>Ginevra de' Benci</i>	44
--	----

LECTURE 7

Leonardo's Early Madonnas	51
---------------------------------	----

LECTURE 8

Scandal, Reprieve, and the Penitent St. Jerome.....	58
---	----

LECTURE 9

Inventing Early Modern Classicism	65
---	----

LECTURE 10

Arrival in Milan— <i>Madonna of the Rocks</i>	74
---	----

Table of Contents

LECTURE 11

- Leonardo at Court—*Portrait of a Musician* 80

LECTURE 12

- Leonardo and the Ladies 88

LECTURE 13

- Threats to the Italian Renaissance—The 1490s 96

LECTURE 14

- Leonardo the Inventor and Engineer 105

LECTURE 15

- Vitruvian Man*, Perfection, and Architecture 112

LECTURE 16

- Leonardo the Military Scientist 121

LECTURE 17

- Leonardo and Flight 128

LECTURE 18

- Drawing Human Figures and Caricatures 133

LECTURE 19

- Colossus—The Sculpture for Ludovico Sforza 140

LECTURE 20

- The Making of *The Last Supper* 146

LECTURE 21

- The Meaning of *The Last Supper* 153

LECTURE 22

- Mantua, Isabella d'Este, and Venice 159

LECTURE 23

- Return to Florence—Sfumato and an Exhibition 164

Table of Contents

LECTURE 24

- Leonardo, Cesare Borgia, and Machiavelli.....170

LECTURE 25

- Michelangelo and Leonardo.....176

LECTURE 26

- Mona Lisa—La Gioconda*.....184

LECTURE 27

- Raphael and Leonardo

189

LECTURE 28

- Leonardo in Milan and Pope Julius II in Rome.....195

LECTURE 29

- The Anatomical Drawings—His Greatest Works?

203

LECTURE 30

- In Praise of Painting—Leonardo's Manifesto

210

LECTURE 31

- Leonardo and the Medici in Rome.....

217

LECTURE 32

- High Renaissance Art from Rome to Venice

223

LECTURE 33

- Last Years—Leonardo in France

231

LECTURE 34

- Renaissance Man and Man of the Renaissance.....

238

LECTURE 35

- The End of an Era

245

LECTURE 36

- The Legacies of Leonardo da Vinci

252

Table of Contents

SUPPLEMENTAL MATERIAL

Leonardo's Notebooks and the Main Codex Collections.....	260
Works Discussed.....	265
Timeline	309
Glossary	323
Biographical Notes	331
Bibliography.....	347

Leonardo da Vinci and the Italian High Renaissance

Scope:

Leonardo da Vinci is one of the most recognized figures in history: a master of art, science, and engineering, the consummate “Renaissance man” who excelled in a wide array of fields. He was regarded as one of his day’s most insightful mathematicians. He could cast figures in bronze. He understood warfare so well that rulers periodically sought his views on military strategy. He knew more about the physics of motion, energy, and flight than anyone else of his age. And he possessed a vision of the distant future that was just as prescient as it was daring.

Yet while he worked on projects ranging from new bridges to the diversion of rivers to war machines, Leonardo da Vinci also produced some of the most important—and most famous—artistic images of all time. Visitors flock to the Louvre to swarm around the small portrait of the *Mona Lisa*. Leonardo’s mural of *The Last Supper* was understood during his lifetime to be the pinnacle of contemporary painting. And his drawing of the *Vitruvian Man* has been reproduced in a variety of contexts to symbolize human potential and accomplishments, most recently on the Euro coin minted by the Italian government in celebration of its cultural patrimony.

This course examines the life and work of Leonardo da Vinci from all of these perspectives, and more. But the course also considers the context in which Leonardo da Vinci lived, the period from 1452 to 1519—dates that also can be said to bracket the period commonly known as the High Renaissance. This was a great age of intellectual advancement, as thinkers began to seek solutions that went beyond traditional wisdom passed down from the Middle Ages, or even from antiquity. This was an age of geographic exploration, as navigators boldly set out to test their hypotheses about the dimensions of our globe. This was an age of tremendous political instability and rapid consolidation, as European statesmen collected armies and then turned them loose against the vulnerable city-states of Italy. And it was an age of tremendous political intrigue, a time when the papacy managed to transform Rome from a decaying city into one of the world’s most magnificent—and, in the process, nearly realized the day’s ultimate dream

of reviving the Roman Empire of antiquity. This was the world that shaped Leonardo's thinking and actions—a world that was, in turn, also directly and profoundly influenced by Leonardo.

In this course, we will examine the 19 paintings that comprise Leonardo's surviving output as a painter—paintings we are certain are his, thanks to archival evidence and art-historical consensus based on stylistic grounds. In our analysis of paintings like *The Last Supper*, *The Adoration of the Magi*, and the *Mona Lisa*, we address the issues and ideas that Leonardo wished to convey in his art. Thanks to drawings by Leonardo and by others, we can also consider lost pictures—like *Leda and the Swan* and the *Battle of Anghiari*—which demonstrate Leonardo's desire to experiment with both subject matter and artistic technique, sometimes with disastrous consequences. We will also look at several paintings by followers that have at various times been attributed to Leonardo himself.

Leonardo's truly exceptional output as a draftsman will be a common thread throughout this course. Leonardo was a member of the first generation of early modern artists to use paper as a tool for exploration and experimentation, and the sheer volume of his drawings and notations can overwhelm when considered in their entirety. While considering only a small subset of his entire output, we will focus on understanding his drawings both as independent works of art and as thought pieces used to work out scientific and technical problems. The drawings subjects' range across many fields, including physics, engineering, architecture, and anatomy—all of them produced by one of the world's first truly modern scientists.

Leonardo's unpublished writings will also receive our consideration at important moments in this course. We will hear his words of self-promotion to the ruler of Milan; his musings about mechanics, aviation, and hydraulics; and his extraordinary observations of the human body. And we will hear Leonardo celebrate the underappreciated glories of the painterly profession, as well as his profoundly felt belief that painters should be considered intellectuals—superior even to poets or sculptors.

The course moves chronologically through Leonardo's career, beginning with an overview of his life and work, following him from the village of Vinci

to Florence to Milan—all the way to his last years in France. But we will also stop periodically to consider his interests and innovations thematically. We will meet the power brokers whose decisions affected his movements and his actions, and we will examine the events of the late 15th and early 16th centuries that, directly or indirectly, shaped Leonardo's own opinions and visions of what the future might hold. For Leonardo da Vinci earned his fame not only because of his truly exceptional gifts as an artist, but also because of his ability to foresee the things that people would value and need, and how they might live their lives, hundreds of years in the future. ■

Introducing Leonardo da Vinci

Lecture 1

Leonardo da Vinci is more than a historical figure; he is a cultural icon, swathed in myth and meaning as well as mystery. Therefore, before we can examine his work and its implications, we must look at the facts of his life: the works that can be positively attributed to him; what he wrote and what his contemporaries wrote about him; and something of the political and social context of the period in which he lived, a period known as the High Renaissance.

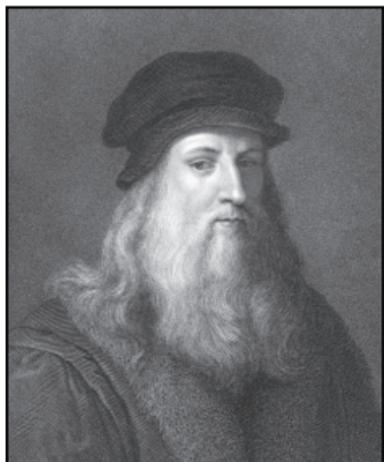
Why Do We Study Leonardo?

- **Leonardo da Vinci** was brilliant—a genius, even—so brilliant he has come to embody all the best attributes of the period we call the **High Renaissance**.
- He was both enormously prolific and surprisingly deliberate; although trained as a painter, that was the field where he produced the least. Still, every major artistic project he tackled either looked at an old subject in new ways or introduced a brand new subject.
 - In the field of sculpture, we have drawings for two monumental projects Leonardo took on while living in Milan. The tumult of the High Renaissance prevented them from being cast, but they would have been the largest and most challenging works in bronze ever rendered.
 - He was a prolific draftsman. He drew landscapes of great splendor and aimed to capture the natural world as realistically as possible. He also drew designs for machines to harness the power of water and make the existing work of human beings a little easier.

- He imagined devices for human flight, and although he never realized that fantasy, he used mathematics to create the first maps from a true bird's-eye view.
- He drew hundreds of figures, and his knowledge of anatomy and mathematical proportion led him to capture the human figure in ways that offer new insight into the human condition. He mapped the inside of the body, too.

Leonardo's World

- The High Renaissance did not just appear, fully formed; rather, it was a series of social, political, and cultural shifts stretching from about 1200 to 1525.
- In religion, Saint Francis of Assisi began preaching in vernacular Italian in the early 1200s; but it was not until the 1300s when Dante wrote *The Divine Comedy* in Italian that the vernacular displaced Latin in high literature.
- In economics, manufacturing boomed in the mid-1200s, but in politics, cities waited another 50 years before they turned to republican forms of government. Humanists like Petrarch only revived the study of ancient writers such as Cicero, Livy, and Vitruvius in the mid-1300s.
- The **Renaissance** in art began in the early 15th century. Some artists quoted Roman forms; others experimented with new concepts in mathematics and optics to represent space in three dimensions.



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To most of us, Leonardo da Vinci is the High Renaissance.

- In architecture, Filippo Brunelleschi rejected the Gothic style and strove to emulate and surpass the structural achievements of the ancient Pantheon in Rome in his design for the dome of the Duomo—Florence’s cathedral.
- Leonardo grew to adulthood in an artistic and cultural climate that celebrated these changes. For the duration of his career, he would value, above all else, innovation and discovery.

Leonardo’s Early Life

- Leonardo was born on April 15, 1452. His father was a man of common birth, and therefore his family was identified by the name of its hometown—the little village of Vinci, some 22 miles west of Florence. This is why we refer to him as Leonardo, his only given name at birth.
- We can loosely divide Leonardo’s career into three stages. Leonardo spent his adolescence and early adulthood in and around Florence from the later 1460s until 1482. Florence was the center of developments we associate with the Renaissance.
- The first painting where Leonardo’s hand may be recognized is the communal work *Baptism of Christ*. He painted one of the angels using the newly developed oil-based paints. Compared to the egg tempera used by the other artists, oil takes a long time to dry and allowed Leonardo to paint slowly, carefully, and deliberately.
- In his portrait *Ginevra de’ Benci*, Leonardo reinterpreted the representation of women, emphasizing the intelligence and agency of the sitter in ways previously found only in portraits of men. His pictures of Madonnas were almost always fresh and unusual as well.
- Social and political historians debate about when exactly the High Renaissance began, but virtually everyone agrees that High Renaissance art began with the work of Leonardo da Vinci—with his unfinished work from 1481, *The Adoration of the Magi*.

- Leonardo experimented with a new type of composition that we now call the classical. The key feature is a core set of figures arranged in a triangular, or pyramidal, grouping.
- During the High Renaissance, the greatest minds of the day were consciously trying to reinvent the way people thought about art, science, and religion. Leonardo's own artistic and scientific breakthroughs often defined this period in profoundly important ways.

The Milanese Years

- Leonardo's 17-year stay in Milan was the second major stage in his career, and it exposed him to influences, and threats, from Northern Europe that would directly change the course of history.
- From 1482 to 1499, Leonardo spent much of his time in and around the Castello Sforzesco as court painter and engineer for an autocratic ruler named Ludovico Sforza.
- Beginning in this period, Leonardo did much less painting and much more engineering and inventing, but he managed to do some painting, including *The Madonna of the Rocks* and *The Last Supper*. By the end of this period, he would be known as the greatest living painter in the world.
- In Milan, Leonardo worked out some of the world's first designs for automated vehicles. He worked on a wide array of military machines, from weapons of horrifying destruction to ways to protect infantrymen.
- Leonardo produced drawings that were the most accomplished and abundant of the age. He was a natural brainstormer who made voracious use of paper, which was a relatively new medium in Europe.

- His drawings varied from quick sketches to carefully shaded studies to specific and layered works of tremendous quality. Some, called cartoons, were large-scale, completely finished drawings that served as mock-ups for full-blown paintings.
- Leonardo's approach to painting was even more experimental. Rather than traditional fresco, he experimented with oil paints on a dry wall, or secco painting, for *The Last Supper*. The technique was a failure, which partly explains why the image we have today is in such poor condition.

The Mature Artist and Scientist

- A year after *The Last Supper* was completed, Leonardo's career with Ludovico Sforza was ended by an invasion, the first in a series. The 1500s were far less stable than the 1400s had been. Leonardo was on the move for the rest of his life.
- We tend to subdivide the wanderings of the last 19 years of his life—the third broad stage—into four periods: a return to Florence that lasted until 1506; a return to Milan lasting until 1513; a three-year stint in Rome; and, finally, three-year stay in France.
- Leonardo is best known during the 1500s for his paintings and scientific drawings. All of his later paintings show both a continued artistic development and a desire to apply lessons he had taught himself through his own scientific experiments.
- Leonardo blurred the contours of figures, dissolved objects in the deep background, and created a hazy atmosphere. This technique, called sfumato (meaning smokiness), was based on his observations of vision and how moisture in the air alters our perception of objects in the distance.
- The study of anatomy consumed a large part of his attention. He studied everything from vision to the pulmonary system to the human fetus and drew it all—expertly. Art made Leonardo such a good scientist, and science made Leonardo such a great artist.

- Leonardo continued to give special attention to women. Michelangelo had already reinvigorated the classical tradition of male sculpture, but there had never been anything like Leonardo's experiment with the then-taboo portrayal of the eroticized nude female.
- Leonardo's crowning artistic masterpiece is the painting known in English as the *Mona Lisa* and in Italian as *La Gioconda*. Here, Leonardo combined every technique he ever learned, continuing to rework it and add small details for the rest of his life.
- In 1513, his wandering took him to Rome, the new center of the High Renaissance, which was increasingly carried forward by Raphael and Michelangelo.
- Raphael had recently completed his fresco *The School of Athens* for the Vatican Palace, immortalizing the thinkers and artists then working for the papacy as the greatest thinkers and artists of Greek antiquity. Leonardo was immortalized as Plato, the central, driving force of the era.
- In 1516, Leonardo moved to the Loire Valley and spent the last years of his life as first painter, engineer, and architect to the king of France. His influence on the French court was unmistakable and vastly accelerated the dissemination of the Italian High Renaissance far beyond Italy itself.

Leonardo's Surviving Works

- Of the paintings we will consider most closely in this course, most are today in Italy—three in Florence, three in Milan, and one in Vatican City. Five are in France, all at the Louvre. Two paintings are in Russia and two in Great Britain. One painting is in Poland, one in Germany, and one in the United States.

- For 50 years after Leonardo's death, most of his drawings and notes were kept in Milan by an assistant, Francesco Melzi. The papers began to be sold off to private collectors at the end of the 1500s. In the 17th century, a sculptor named Pompeo Leoni dedicated himself to forming a coherent collection of Leonardo's remaining papers.
- Most of Leonardo's papers are now found in several collections: Milan's Codex Atlanticus contains many of Leonardo's drawings and notes for machines; the Royal Collection at Windsor Castle in England houses a number of artistic images; and the Accademia Museum in Venice owns the *Vitruvian Man*.
- One collection of technical manuscripts went to the National Library in Madrid and was lost in the depths of that library for two centuries, until the uncatalogued boxes were rediscovered in 1966.
- When Napoleon invaded Northern Italy in 1796, he ordered his troops to steal a dozen manuscripts from Milan. These became what we now call the Paris Manuscripts.
- One manuscript without a permanent home is the Codex Leicester, a book of scientific drawings. It was purchased by Bill and Melinda Gates in 1994 and is exhibited in a different location each year.
- These collections of drawings confirm what his paintings suggest: that Leonardo was utterly crucial for the development of the High Renaissance. The era and the man overlap not only in time but in significance. He has influenced us as well—not only how we think about the entire period, but also how we think and how we live our lives today.

Important Terms

High Renaissance: A historical and cultural era that extended from the middle of the 15th century through the first quarter of the 16th century. This period of innovation and exploration combined references to the lessons of ancient writers and the independent discoveries of contemporary thinkers and artists.

Renaissance: The period of Western history loosely bracketed by the 13th and 16th centuries and characterized by an overt and intentional appropriation of ideas, themes, and images from the ancient cultures of Greece and Rome. The age featured gradual and then rapid shifts in political systems, manufacturing, social hierarchies, literature, scientific inquiry, and artistic production.

Name to Know

da Vinci, Leonardo (1452–1519): The quintessential Renaissance man, Leonardo's innovations in painting, architecture, engineering, anatomy, and aerodynamics revolutionized the fields of art and science during and after his lifetime. His travels and professional missions took him from Florence to Milan, Rome, and France, during which time he was able to influence a host of artists, patrons, and thinkers. Among his most famous works are *The Last Supper*, *Mona Lisa*, and *Vitruvian Man*.

Suggested Reading

Clark, *Leonardo da Vinci: An Account of His Development as an Artist*.

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*.

Landrus, *Leonardo da Vinci: The Genius, His Work, and the Renaissance*.

Zöllner and Nathan, *Leonardo da Vinci: The Complete Paintings and Drawings*.

Who Was Leonardo? Facts and Fictions

Lecture 2

Everything we know about Leonardo comes from a combination of written sources: what Leonardo had to say about himself, what his contemporaries had to say about him and his works, and what his biographers (most notably Giorgio Vasari) believed to be true about him. While Vasari's account is by far the most detailed, it is also the most fanciful, sometimes making up incidents out of whole cloth to convey allegorically aspects of Leonardo's personality or working methods.

Sorting Fact and Fiction

- Much of what we think we know about Leonardo da Vinci comes to us in the form of speculation, fed by legends and fictions. Let's examine some of the most common beliefs.
 - Leonardo was illegitimate. True. He was the bastard child of a **notary** and a servant girl. This situation influenced some of his career moves by limiting his social status.
 - Leonardo was left-handed. True. We can tell this by the tilt of his pen and by the direction of the cross-hatchings in his drawings and paintings. This is also a hint as to which areas he produced in pictures painted by committee in the workshop of Andrea del Verrocchio, his master.
 - Leonardo wrote backwards for the sake of secrecy. True and false. He did write backwards, but we are not entirely sure why. Mirror writing is childishly easy to recognize and decipher, and Leonardo was writing backwards long before he had anything to be secretive about. He probably wrote this way to keep his sleeves from dragging in wet ink or to stave off boredom.

- Leonardo was aloof. True and false. We have no evidence that he had romantic liaisons with anyone, ever, but he had many friends, associates, and patrons, and he treated at least one of his assistants like a son. Whatever the reality, he kept that part of his life hidden from public view.
- Leonardo was a shameless self-promoter. True, but not in a way that was unusual for his day. He wrote to potential patrons, he hired out his services, and he worked for people on opposite sides of the fence on more than one occasion. He was not professionally loyal to anyone.
- *Mona Lisa* is either a self-portrait or a portrait of a male assistant. False. While the sitter's identity is not certain, *Mona Lisa* conforms to Leonardo's time-tested approach to female portraiture, and her features conform to images of women that Leonardo and his contemporaries captured in portrait after portrait.
- *The Last Supper* reveals Leonardo's personal religious sentiments, indicates his opposition to the papacy, and includes hidden messages of sedition and rebellion. False on all counts. The items in the painting that lead some



Far from being full of shocking secret messages, Leonardo's *Last Supper* draws on mainstream, traditional Christianity for its imagery and themes.

to create conspiracy theories are actually the most traditional features of the image.

- Leonardo was anti-Christian. This one we are not sure about. He certainly did not think much of human beings, and his suspicions of the church hierarchy ran deep. He occasionally wrote of the importance of one's soul, and he went to great lengths to ensure his own Christian burial, but on broader matters of theology or spirituality he remained largely silent.
- King François I of France was so fond of Leonardo that he rushed to the artist's side and wept at his death. False. The king was miles away, and while he was probably upset that his most famous courtier was dead, the rest of the story is speculation and fiction.

Vasari's *Lives of the Artists*

- The myth of Leonardo was not constructed during his lifetime; we know of no stories or biographies written before his death in 1519. We have bits and pieces that others wrote about him in letters, but they tell us more about Leonardo's work and less about Leonardo the person.
- The most important posthumous biography of Leonardo was written by the 16th-century painter, architect, and courtier **Giorgio Vasari**. Born in 1511, Vasari was only eight years old when Leonardo died. By the end of his life, Vasari was a key member of the Medici court and could count popes, princes, and dukes among his patrons.
- In the 1540s, Vasari wrote a systematic history of art now known as *The Lives of the Artists*. He dug through documents, chased down little-known images, and described important works in a massive, encyclopedic record of everything made in Italy between about 1280 and his own day.

- Vasari also added anecdotes, personal opinions, and some pretty wild speculations, some based on longstanding legends and others invented out of thin air.
- Vasari organized his work chronologically and by artist. He started with Cimabue in the late 1200s and made his way up to the then contemporary Michelangelo.
- The book is divided into three parts. The first goes up to the 14th century as a backdrop to the innovations of the Renaissance, with Giotto as the main figure. Part Two introduces the Renaissance in the 15th century, and Brunelleschi, Ghiberti, Donatello, and Masaccio duel for hero status.
- Part Three covers what we now call the High Renaissance. Michelangelo stands at the end of this arc as the final summation of what has come before, but Leonardo stands at the very beginning, ushering in a new era of art.

Vasari's Leonardo

- Vasari begins his treatment of Leonardo by writing

The mistakes of the previous generation were clearly demonstrated by the works of Leonardo da Vinci. ... Besides his bold and powerful design and his extremely subtle imitation of all the details of Nature, exactly as they are, his work displayed a good understanding of rule, better order, correct proportions, perfect design, and divine grace.

- Although Vasari gives us a lot of accurate information on Leonardo, the text is deceptive as well. He was writing to please the Medici family, and he was a friend of Michelangelo, who disliked and envied Leonardo.

- Moreover, Vasari did not know Leonardo personally or have access to his sketchbooks and notes. And when Vasari did not know something, he made things up—a lot.
- Vasari plays freely with facts in his biography of Leonardo, without regard to chronology or motive. Vasari tries to give us a sense of Leonardo’s personality through anecdotes that are more entertaining and illustrative than factual.
- Vasari’s stories, although made up, let us know that Leonardo was quick-witted and mischievous; that he worked slowly and methodically; that he was unafraid to defend himself and his work; and that he drew from live models and often worked outdoors in nature—a highly unusual practice in the 1400s. All of these things are confirmed in archival accounts of Leonardo’s life, but Vasari’s stories are more vivid.
- Vasari’s text contains that nugget about King François I rushing to Leonardo’s deathbed. The story suggests a deep bond between courtier and king that would have been unheard of in the period. We now know the story is false, but to Vasari, the bigger truths are more important than the pesky details.

A Turbulent Childhood

- The one phase of Leonardo’s life that Vasari avoided entirely was the artist’s origins. For these details, we rely on archival evidence and a little bit of deductive logic.
- Leonardo was born on April 15, 1452, near the village of Vinci, about 22 miles northwest of Florence. Vinci lies between Florence and the port city of Pisa on the west coast of Italy.
- Leonardo’s mother, Caterina, was a servant girl, the poor daughter of a farmer. She and Leonardo’s father were unmarried when Leonardo was conceived.

- Leonardo's father was a person of some standing. His name was Piero, and he earned his living as a professional notary—a position that earned him the honorific title of "Ser." He was well-educated and quite successful, taking on work not only in the village but in Florence.
- Bastardy was not terribly uncommon in this age, but it did mean that Leonardo was, by law, ineligible to inherit his father's estate or to advance to political office. This realization may have sparked an ambition in Leonardo, for he knew as a youngster that he would have to make it entirely on his own.
- Perhaps because of his outsider status, the rest of Leonardo's early life is almost completely unknown to us. We know he did not stay in his mother's home for very long; by 1457 he was living with Ser Piero and his 16-year-old stepmother, Albiera degli Amadori.
- Something seems to have been amiss in this household, for according to tax records, he was quickly placed in the custody of his paternal grandfather, Antonio, where he lived for seven years. During this time, he learned to read, write, and calculate.
- In 1464, Antonio died, and the 12-year-old boy moved back into his father's home. A year or two later, Albiera died childless, and Ser Piero promptly married a second 16-year-old girl—Francesca Lanfredini.
- Normally in this period, 12-year-old Italian boys who were intellectually gifted would go to a secondary school to learn Latin, Greek, and advanced mathematics with an eye toward a career in theology, law, or medicine. As a bastard, this option was not open to Leonardo.
- Leonardo had to learn a trade through traditional apprenticeship. This required him to leave home and move into a master's workshop. Where, when, and what Leonardo's initial apprenticeship was remain unclear.

Comparing the Sources

- Our most important written sources for the life of Leonardo, therefore, come in two forms. The more accurate are original documents written during Leonardo's lifetime, which tend to be dry, terse, and sparse. The less accurate but sometimes more revealing are the character studies compiled by biographers based on documents, legends, and the personalities of Leonardo's patrons.
- Neither one of these sources can usefully stand alone. Take them together, and a three-dimensional figure begins to emerge.
- A third and far more important source of information about Leonardo are the actual works—artistic and scientific—that he produced during his 50-year career.

Important Term

notary: A member of the legal profession during the Renaissance, usually educated in Latin, primarily called on to negotiate and write contracts.

Name to Know

Vasari, Giorgio (1511–1574): Prolific painter, architect, and historian who worked for the Medici family in Florence during the 1550s and 1560s. He helped remodel the Palazzo della Signoria for the new duke, Cosimo I de' Medici, and painted a number of pictures for the family, including the *Battle of Scannagallo*, which may have covered over Leonardo's mural of the *Battle of Anghiari*. Vasari is best known for his encyclopedic treatment of contemporary art, called *The Lives of the Artists*, which includes some of the earliest biographies of Leonardo, Raphael, and Michelangelo. The first edition appeared in 1550, and the second (corrected) version was published in 1568.

Suggested Reading

Farago, ed., *Leonardo da Vinci: Selected Scholarship*.

Turner, *Inventing Leonardo*.

Vasari, *The Lives of the Artists*.

Leonardo's Artistic Origins

Lecture 3

Much of Leonardo's early work was deeply indebted to the traditions of 15th-century Florentine art, which he learned in the workshop of his master, Andrea del Verrocchio. The vibrant period of artistic achievement in the generation before Leonardo included Masaccio, who perfected linear perspective, and Donatello, who revived classical naturalism. Florentine workshop culture and the system of patronage also helped the young Leonardo to grow and thrive as an artist.

Florence in Leonardo's Youth

- If anything, we should be impressed that we know as much about Leonardo as we do, for it would not have been unusual for him to be ignored or, worse, abandoned at the time of his birth.
- Leonardo seems to have looked back on his childhood without regrets. He used the moniker Vinci throughout his career, and some of his paintings even included the motif of a plant that was a pun on Vinci.
- By 1465, at just the time Leonardo was reaching the normal age of apprenticeship, Ser Piero was enjoying quite a bit of professional success. In 1469—when Leonardo was 17—Ser Piero moved to Florence. Leonardo may have come with Ser Piero or may have already been there.



Leonardo's home town of Vinci, nestled in the Tuscan countryside.

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- Florence was the center of a big, bustling, sovereign state with an independent government, constitution, currency, military, and commercial center. The population hovered around 60,000—a bit bigger than London or Rome but about a third the size of Milan, Venice, or Paris.
- Florence's baptistery and cathedral, called the **Duomo**, comprised the spiritual center of the city and played a role in its artistic revival. The baptistery held the bronze reliefs by **Lorenzo Ghiberti** known as the Gates of Paradise, and the extraordinary, double-shelled, self-supporting **cupola** of the Duomo was the innovative vision of **Filippo Brunelleschi**.
- To the east lay the large Franciscan church of Santa Croce in the heart of the wool district. It was also the place where artists' workshops could be found. There, on the via del Agnolo, was the workshop of the sculptor **Andrea del Verrocchio**, with whom Leonardo would work for over a decade.
- To the north stood the Church of Santissima Annunziata, an important center of culture and religious devotion. Leonardo would come to know it well; he would be granted his own personal workspace there in 1501.
- To the west were the Church of San Lorenzo and the Medici palace. We are fairly sure Leonardo spent some time in the palace as an aide to Lorenzo the Magnificent and participated in a work that was installed in San Lorenzo within a few years of his arrival in Florence.
- South of the baptistery and Duomo was the **Piazza della Signoria**—marked by the governmental palace and the enormous Loggia dei Lanzi—which served as the political center of the city. The palace would later, briefly, house one of Leonardo's most imaginative paintings.

- The Bargello—the center of law enforcement—was just behind the Piazza della Signoria. Here the quasi-police force was located, the jail cells were kept, and criminals were executed. Leonardo would come to know this building all too well.
- One of Florence's key geographic landmarks is the River Arno, which bisects the city and was spanned by four bridges in Leonardo's day. The river drove the weavers' looms, provided the water for dyeing, and irrigated surrounding farmland. It also occupied Leonardo's thoughts.

Florentine Politics and the Medici Family

- Since the late 13th century, Florence had been an autonomous republic, but within this government lay many festering pockets of factionalism. One of the great faction leaders of the early Renaissance was a banker named **Cosimo de' Medici**.
- When his power became too great, his enemies arrested him in 1433 on trumped up charges of treason and exiled him. But he had an army of allies inside the city and returned to Florence the next year, surrounded by mobs of followers who arrested and either executed or expelled his enemies.
- For the next 30 years, until his death in 1464, Cosimo and his allies ran Florence in all but name. They had their favorites elected to key posts, swayed the opinions of important officials, and kept public opinion in their favor, all without Cosimo holding office.
- Cosimo was considered by many to be the de facto duke of Florence and came to be known as the father of the fatherland. He passed his political legacy on to his son, **Piero de' Medici**, who governed the city in the same manner as Cosimo from 1464 to 1469. Piero passed his responsibilities on to his two sons, Giuliano and Lorenzo the Magnificent.

- When Leonardo's father moved to Florence in 1469, he had already established a professional reputation there and could count the Medici as clients. Some scholars speculate that it was then that Leonardo came to join the workshop of Andrea del Verrocchio.
- This chronology raises several problems. Seventeen would have been awfully late for Leonardo to start his profession, so he must have received training elsewhere first, and we know he was not in school because he complained of his own lack of Latin. This suggests that Leonardo began his apprenticeship, with Verrocchio or someone, earlier than 1469.

Verrocchio's Workshop

- By 1465, Andrea del Verrocchio already enjoyed great popularity and patronage. He was considered one of Florence's most gifted artists. Among Verrocchio's most dedicated clients were members of the Medici family.
- Verrocchio's *Putto and Dolphin*, commissioned in 1470 or so for the Medici villa outside the city limits, shows his great talent as a sculptor. This bronze figure of a **putto** has a naturalistic form, and its aesthetic appeal is heightened by its symbolic power.
- Verrocchio was able to make these impressive sculptures, in part, because he had a large workshop full of assistants. Among his pupils at the time of Leonardo's apprenticeship were the painters **Perugino** (who would be the teacher of Raphael), **Lorenzo di Credi**, Sandro Botticelli, and **Domenico Ghirlandaio** (the future teacher of Michelangelo).
- Often they did most—if not all—of the painting attributed to Verrocchio, who preferred to focus on sculpture. The apprentices' task was to mimic a master's style to the point where it became difficult to determine who made the painting.

- Leonardo had to jostle for Verrocchio's attentions in an extremely competitive environment. All apprentices took drawing lessons from Verrocchio, learning to make figures, to replicate gestures and expressions, to think about proportions, to create shading, and to conceive of compositions.
- He also had to learn to mix pigments from scratch, study the physical properties of colors, and learn how to apply them. He had to learn how to prepare painting surfaces as well, including wood panels and plaster walls.

Earlier Florentine Masters

- Beginning with **Giotto**, a Florentine of the early 1300s, these practical lessons and techniques had formed the standard professional curriculum for all early modern artists in Italy.
- Giotto's *Ognissanti Madonna* from about 1310 is a nice example of work by an early Italian Renaissance master: bodies as volumetric masses modeled by highlights and shadows; divine figures tower over human ones; characters recede into depth, but not with mathematical perspective; faces are individualized, which was fresh and new.
- Among Giotto's greatest gifts to painting was his remarkable attention to details of the natural world. For Leonardo, Giotto's strengths lay in his natural ability and his understanding that representation of the natural world required direct observation.
- **Masaccio** was as important to painting in the 15th century as Giotto was to the 14th. Like Leonardo, Masaccio was from Tuscany, the son of a notary, and a prodigy. He moved to Florence in 1421, at the age of 20.
- Masaccio's career was cut short by the bubonic plague in 1428. But in those seven years, Masaccio changed the way artists and audiences approached the painted image.

- His most famous works were a series of frescoes from the life of Saint Peter, produced in 1425 for the Church of Santa Maria del Carmine in Florence. The image called *Tribute Money* is a particularly good example of naturalism and his mastery of orthogonal perspective, or **linear perspective**—the earliest employment of this system in the history of Western painting.
- Masaccio also understood light and modeling. Highlights articulate the folds of draperies, and a suggestion of natural light casts long shadows. The naturalistic background, Roman tunics, and left-to-right storytelling all had an impact on Leonardo's early studies.
- Perhaps the most important study piece available to Leonardo and his peers was Masaccio's *Holy Trinity* in the Florentine church of Santa Maria Novella. The figures form a triangular structure, and the architectural lines of the Roman chapel create perfect linear perspective.
- This work was utterly revolutionary when it was created in 1427. Within 15 years, it had altered the way painters all across Italy approached their works. When Leonardo wrote his own history of art, he jumped directly from Giotto to Masaccio, skipping 100 years in between.
- Many other masters were living and working in Leonardo's Florence and clearly had an influence on him. From **Fra Filippo Lippi**, for example, Leonardo learned about soft and subtle facial features and **atmospheric perspective**.
- Sculptors, including his master Verrocchio, made deep impressions on Leonardo. The most innovative artist of the entire early Renaissance was the sculptor **Donatello**, whose naturalistic and youthful *David* demonstrated the importance of capturing the tiniest details of anatomy and the appearance of objects to the naked eye.

Leon Battista Alberti's *On Painting*

- Another key figure in this milieu was the humanist thinker and architect **Leon Battista Alberti**, who was one of the first to articulate the ideal of the universal man (what we now call a **Renaissance man**).
- Alberti was born in 1404 into a Florentine family that supported the Medici through Giacomo's exile. Like Leonardo, Alberti was illegitimate; unlike Leonardo, his family's wealth allowed him to bypass some of the usual social restrictions. He was educated as a classicist, a legal scholar, and a philosopher.
- Alberti turned his attention to the visual arts and crafted the first modern theory of art in his 1436 book *Della Pittura*, or *On Painting*. It demanded a thorough understanding of human proportions, linear perspective, and the range of all human emotions. By 1450, Alberti's approach to art was being taught in even the most traditional workshops in Italy.
- Alberti died in 1472, just as Leonardo was graduating from Verrocchio's workshop and thinking about his own future. His death marked for those of Leonardo's generation the end of an era.
- Leonardo may have seen Alberti as a role model: Here was a man—a bastard child made good—who valued what was once considered a mere craft as enlivening the human spirit, a conveyor of grand ideas, and a reflection of a culture's history. Before long, Alberti's example would begin to shape the direction of Leonardo's professional life.

Important Terms

atmospheric perspective: The effect of deep space in a landscape painting, created by diminution of scale and softened contour line and by giving a bluish-green tint to distant objects. This technique imitates what our eyes perceive when looking at a landscape, which results from water and dust particles suspended in the atmosphere. Also called aerial perspective.

cupola: A dome.

duomo: The Italian word for a cathedral; when capitalized, refers to the cathedral of Florence.

linear perspective: The system of creating the illusion of three-dimensional space on a flat surface that was first known in ancient Rome and was redeveloped in the early 15th century in Florence. The architect Filippo Brunelleschi is generally credited with its reinvention.

piazza: Italian word for a city square, usually bracketed by public buildings.

putto (pl. **putti**): Small nude boys, sometimes winged, seen in both religious and secular Renaissance painting and sculpture.

Renaissance man: A phrase coined after the Renaissance, used to describe a person who demonstrates superior skill and talent in a number of different and unrelated fields. Frequently used to reference Leonardo da Vinci's mastery of the areas of engineering, hydraulics, aerodynamics, anatomy, painting, music, and sculpture. During the Renaissance itself, the expression used by writers such as Leon Battista Alberti and influential for Leonardo da Vinci was “universal man” (*uomo universale*).

Names to Know

Alberti, Leon Battista (1404–1472): Humanist writer, architect, and social commentator. Alberti became interested in the visual arts during a visit to Florence. His subsequent writings—*On Painting*, *On Sculpture*, and *Ten Books on Architecture*—codified new rules that came to represent a new style of artistic production that we now refer to as Renaissance.

Brunelleschi, Filippo (1377–1446): Goldsmith who achieved fame as an architect, sculptor, and artistic theoretician. His design of the cupola of the Florentine cathedral was considered the pinnacle of early modern architectural design during the latter half of the 15th century, and he has been widely credited with perfecting the use of linear perspective in the painterly arts.

di Credi, Lorenzo (1459–1537): Florentine painter and colleague of Leonardo da Vinci from the workshop of Andrea del Verrocchio who was noted for his intimate depictions of the Madonna.

Donatello (1386–1466): Perhaps the most inventive and influential artist of the early Renaissance, Donatello's sculptures repeatedly redefined the medium. Active in Florence and Padua, his bronze equestrian monument of *Gattamelata* was the first of its kind since antiquity. His marble relief *St. George and the Dragon* and his bronze relief *The Banquet of Herod* are among the earliest surviving examples of linear perspective on a two-dimensional surface. His appropriation of ancient motifs and subtle naturalistic elements helped create the standard by which all sculptures would be judged until the time of Michelangelo Buonarroti.

Ghiberti, Lorenzo (c. 1378–1455): A contemporary of Filippo Brunelleschi and Donatello, with whom he competed repeatedly, Ghiberti produced two sets of bronze reliefs for the doors of the Florentine Baptistery, the second of which (1430–1452) was later dubbed by Michelangelo *The Gates of Paradise*.

Ghirlandaio, Domenico (1449–1494): Painter who trained with Andrea del Verrocchio in Florence and was a colleague of Leonardo da Vinci during the 1460s and 1470s. He was known for his mastery of Madonna forms and his adherence to traditional modes of painting. He helped teach his student Michelangelo the fresco technique during the production of a series of paintings called *The Life of the Virgin Mary* for the Florentine church of Santa Maria Novella in 1488.

Giotto (a.k.a. **Giotto di Bondone**; 1266–1337): Giotto's origins are largely unknown, but it appears that he made his reputation in Rome during the 1290s as a fresco painter. His murals in the Arena Chapel of Padua (1304–1306) and his paintings in Florence (1310–1325), including the *Ognissanti Madonna*, ushered into European painting a naturalistic style that emphasized the careful use of human proportions, figural details, and rational representations of depth.

Lippi, Fra Filippo (c. 1406–1469): Carmelite friar who continued the early Renaissance explorations and experiments of Masaccio. Among his best-known works are *Annunciation of the Virgin* in San Lorenzo and *Madonna and Child with Angels* in the Uffizi Gallery (which, according to tradition, celebrates the birth of Filippino Lippi to Lucrezia Buti, the nun to whom Fra Filippo was married in secret).

Masaccio (a.k.a. **Tommaso di ser Giovanni**; 1401–1428): The most important and influential painter of the early Renaissance. Masaccio employed the lessons of Giotto and Donatello in his monumental fresco paintings and literally invented early modern painting in Florence. His best known pictures—which were copied repeatedly by generations of artists—are *The Life of Saint Peter* in Santa Maria del Carmine (1425) and *The Trinity* in Santa Maria Novella (1427).

Medici, Cosimo de' (1389–1464): Banker by training but politician by inclination, before his exile in 1433, Cosimo opposed the policies of the Florentine government and was punished for his views and tactics. After his return to power in 1434, he became the de facto ruler of the city, manipulating the electoral process and orchestrating public policy from behind the scenes—all to the benefit of the city, which enjoyed an age of peace and prosperity during his reign.

Medici, Piero de' (1416–1469) The son of Cosimo the Elder and the father of Lorenzo the Magnificent, Piero the Gouty governed Florence for five years after his father's death in 1464.

Perugino (a.k.a. **Pietro Vanucci**; 1446–1523): A native of the city of Perugia and an accomplished artist who worked in Perugia, Florence, and Rome during his highly successful career. Among his students was the painter Raphael.

Verrocchio, Andrea del (c. 1435–1488): Exceptionally gifted sculptor and painter who operated one of Florence's largest and most successful artistic workshops during the 1460s and 1470s. Among his students were Perugino, Botticelli, and Ghirlandaio, and he went into a brief partnership with his most famous protégé—Leonardo da Vinci. Verrocchio is best known for *The Incredulity of Saint Thomas* for the Orsanmichele in Florence, *Putto with Dolphin* in the Palazzo della Signoria, and *The Monument of Bartolommeo Colleoni* that was cast posthumously and installed outside the Venetian church of Santissimi Giovanni e Paolo in 1496.

Suggested Reading

Alberti, *On Painting*.

Cennini, *The Craftsman's Handbook*.

Cole, *The Renaissance Artist at Work*.

Hartt and Wilkins, *History of Italian Renaissance Art*.

From Apprentice to Partner

Lecture 4

Workshop practices were changing rapidly in the late 15th century from an almost factory-like atmosphere to one that was open to change and innovation. This was due in part to new or more widely available technologies like oil paint and paper. But much of what is recognizably unique in Leonardo's work stems from his own personality—his willingness to innovate, his meticulous care with his compositions, and his attention to the natural world. His early commercial success can also be traced to his unique business arrangement with his former master.

The Paper Revolution and Other Changes

- Until the mid-15th century, master artists kept on hand a sketchbook full of figures, scenes, and objects from which they could choose items to be added to larger compositions—essentially **pattern books**. Experimentation by apprentices was frowned on.
- This suggests two things: First, drawings were not works of art in and of themselves but tricks of the trade that professionals kept close to the vest. Second, there were few such books in the first place, because paper was a rare commodity.
- Until the late 1450s, most writers and painters preferred more durable (and more expensive) **parchment** to paper. Europeans had known about paper since the end of the 13th century, and mills in Spain and Italy had produced it, but it was expensive because the mills were few.
- The invention of movable type and the printing press by **Johannes Gutenberg** in the mid-1450s led to a surge in demand for paper because parchment could not be easily run through a press, and there was a limited supply of sheep to slaughter for parchment.

- It is no coincidence that drawing as an independent art form came into vogue at this time, when artists realized they could experiment with their ideas on this cheap surface.
- It is also no coincidence that both the subjects and compositions of paintings changed with greater frequency and rapidity after about 1465; it was no longer a massive risk to try something new when you could experiment on paper first.
- Leonardo was one of these early users of paper, and he seems to have recognized and appreciated its potential like no one else before him. Many of his preliminary sketches were unusable, but by working through his issues on paper, he came up with viable solutions.
- This was also true of Leonardo's peers in the 1460s and 1470s. There was a gradual relaxation of the old rules and standards, which had dictated a slavish copying of a master's style within the confines of a workshop.
- In paint, too, things were changing just when Leonardo began his apprenticeship. Traditionally, Italian painters used egg tempera, which consisted of mineral pigments, water, and egg yolk as a binding agent.
- Egg yolk dries very quickly and affixes to a surface like Krazy Glue. That means that a detailed preliminary drawing is a key part of the painting process. You need to know exactly what you are doing before you apply the paint.
- Because of the minerals they used and the mortar and pestle required to grind the pigments, painters were part of Florence's powerful Guild of Doctors and Apothecaries. The guild was one of six major trade associations and had a good deal of political clout.

- The guild had as its patron saint Saint Luke the Evangelist—a doctor by training who, according to legend, painted the only actual portrait of the Virgin Mary. It was thought that all successive pictures of Mary were based on Luke's template.

Life in the Workshops

- Leonardo and his fellow apprentices in Verrocchio's workshop lived under the same roof; they ate, slept, argued, fought, and tormented each other constantly and rather mercilessly.
- Apprentices also had a certain closeness: Apprentices often honed their artistic skills by drawing portraits of each other, but hazing of younger boys at the hands of older ones was both common and brutal.
- By the age of 18 or so, apprentices were given the chance to complete works on their own. Often these were done under the supervision of the master. If successful, the young painter would be allowed to enter the guild, as well as the local confraternity of artists.
- Since Verrocchio had a collection of talented young apprentices and preferred to focus his attention on sculpture, we may say with some certainty that many, if not most paintings attributed to Verrocchio were probably designed and executed by his assistants.

Oil Paint Arrives in Italy

- Right around 1470, a new medium was introduced to Italy: paint that used linseed **oil** as a binding agent, rather than water and egg yolk. That provided artists with some options they had never had before.
- Oil paint can be applied in very thin, translucent glazes that can be layered, darkening the color gradually and making subtle distinctions between one area of an image and the next. The paint can also be applied as great big globs of pigment that darken a surface thoroughly.



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Unlike the egg-based tempera used by Leonardo's contemporaries, oil paint allowed him to paint with deliberation and care—and to start an artistic revolution.

- Oil dries very slowly, which allows artists to paint slowly, knowing that they can return to an area days later to rework it with a brush—spreading it thinly, moving it around, even taking it off entirely.
- Oil compositions do not require as much prep time because the painter can alter his work in mid-production as problems arise. Thus, preparatory drawing is not quite as important to an oil painter, although if you cannot draw well, you cannot paint well either.
- Oil was not terribly popular when it first arrived in Florence in the early 1470s. Florentine painters were a conservative bunch. It is thus noteworthy that, in a controlled environment like a 15th-century workshop, Verrocchio allowed one of his apprentices to experiment with this new medium.

Seeing Leonardo's Hand

- As a member of Verrocchio's workshop, Leonardo would have been required to master and imitate Verrocchio's style so that no one would notice that the master had not actually painted the picture. The importance of a seamless group effort can be best seen in *Baptism of Christ*, produced in Verrocchio's workshop in 1472.

- The picture was commissioned, probably as an **altarpiece**, by the Church of San Salvi, an 11th-century monastery east of Florence. It was probably based on drawings for a sculpture that Verrocchio was then producing called *The Incredulity of St. Thomas*.
- The most important features for our purposes are the two kneeling angels to the far left and the background, where a lovely and fantastical landscape unfolds in the distance.
- The background departs dramatically from the rather rigid central section of the painting, which seems to have been painted by Verrocchio. We are not entirely sure who painted the first angel.
- The second angel bends elegantly, naturally at the knee, foot, and waist. The gentle modeling of its clothes and the highlights in its hair reveal the artist's understanding of the light source. Its facial features are delicate, the skin is soft, and the eyes and lips truly beautiful.
- The angel is a figure of uncommon quality, the likes of which we simply do not see in European art at any moment prior to this one. And unlike the other figures in the picture, this angel was painted with oil pigments.
- This delicate handling of forms continues in the background. The brown terrain of the desert wilderness is edged in subtle gradations of color, which lighten toward the middle ground and distance.
- Rocks and mountains turn from brown to blue to white, as they appear in nature. This technique is called **sfumato**, or smokiness, referring to the dissolving quality of objects in the distance, but it can also refer to any line or edge that seems blurred.
- Art historians universally agree that the kneeling angel, the middle ground, and the background were all produced by Leonardo. In fact, Vasari's fanciful biography tells us that Verrocchio walked into the studio, inspected Leonardo's work on this painting, and threw down his own brushes, refusing to paint ever again.

- It seems more likely that Verrocchio leapt with glee as he realized he had a 20-year-old assistant who was skilled enough to take over the painterly side of his business, which would allow Verrocchio to focus entirely on bronze sculpture for the rest of his life.

An Unusual Partnership Forms

- For whatever reason, *Baptism of Christ* remained unfinished for years after Leonardo's contributions. The monks received their painting from Verrocchio's studio sometime around 1485, long after Leonardo had finished his portion of the project.
- The painting did serve as Leonardo's coming-out party. The angel demonstrated his abilities as the most gifted painter among a group of distinguished peers and made Leonardo the leading member of the leading workshop in the leading artistic city in Italy.
- In 1472, Leonardo applied for and was accepted into the confraternity of painters in Florence, called the Company of Saint Luke (which was distinct from the Guild of Doctors and Apothecaries). Leonardo was now considered an independent master in his own right.
- Around this time, Verrocchio invited Leonardo to extend his employment in the workshop after his apprenticeship ended. Normal practice would be for Leonardo to open his own studio.
- The partnership was a brilliant business move. Verrocchio handled sculpture and Leonardo did the paintings. Leonardo could rely on Verrocchio's established reputation, while Verrocchio could grow rich from painterly projects he did not have to participate in.

Important Terms

altarpiece: An image—usually a painting or a sculpture—placed on an altar facing the priest and congregation. Often covered by curtains or shutters and revealed during the Mass.

oil: A medium, such as linseed oil or walnut oil, in which pigments are suspended while they dry. Because pigments in oil do not dry rapidly, they can be applied freely over a wide area, and because they are translucent rather than opaque, they create effects of depth and luminosity. When dry, they are solid films. The Renaissance development of oil paint as a medium can be traced to the Netherlands in the early 15th century, and it became the dominant medium from the 16th century onward.

parchment: A writing surface made from dried and treated animal skins. Also known as vellum.

pattern book: A bound book of drawn compositions and figures that could be reused whenever patrons sought particular images. Apprentices and assistants were taught to copy them, and those who could replicate the master's style were the most celebrated members of the workshop. Pattern books gradually went out of style near the end of the 15th century.

sfumato: An Italian word meaning “smoky”; the method of painting subtle gradations of light and dark, especially in modeling the human figure, developed by Leonardo da Vinci.

Name to Know

Gutenberg, Johannes (1398–1468): A blacksmith by trade who focused his energies on creating a printing press that could produce multiple copies of texts through the employment of reusable, movable type. His perfection of this process led to the artistic medium of printmaking, provided a communications revolution for thinkers and poets, and caused an increased demand for paper that completely changed the way writers and artists approached their respective subjects.

Suggested Reading

Brown, *Leonardo da Vinci: Origins of a Genius*, chaps. 1–3.

Clark, *Leonardo da Vinci: An Account of his Development as an Artist*, chap. 1.

Nicholl, *Leonardo da Vinci: Flights of the Mind*, pts. 1–2.

Annunciation—Leonardo’s First Commission

Lecture 5

Baptism of Christ signaled Leonardo’s ability to produce painted images of extraordinary quality and elevated him from apprentice to master status. In this lecture, we encounter his first work as a lead painter in Verrocchio’s workshop, the *Annunciation*. We see how it combines what Leonardo had learned from his master, what he had learned from the work of other Renaissance artists, and ideas that were uniquely his own. We also see how his unusual partnership with Verrocchio both helped and hindered his burgeoning career.

Tradition and Innovation

- Verrocchio had taught Leonardo some profoundly important lessons: To work slowly and methodically; to rework problem areas extensively; to relinquish works only when he was satisfied; and not to bend to pressure from patrons.
- Some of Leonardo’s habits were all his own, however. On August 5, 1473, for example, he went out into the Tuscan countryside and produced a drawing of the landscape before him.
- This does not seem remarkable to us today, but this is a very 19th-century notion. In Leonardo’s time, painters habitually relied on their imaginations to create a “perfect” environment free from the clutter and “errors” of nature.
- We might have in this drawing an instance of an artist testing his hand’s ability to reproduce what his eye saw. Accuracy mattered to Leonardo from the very beginning, and this dated drawing tells us that the artist was developing a uniquely innovative approach to his profession.

The Medici Tomb Monument

- At the same time that *Baptism of Christ* was being produced in his workshop, Verrocchio was handling an important commission: a tomb monument for the Church of San Lorenzo in Florence to commemorate the life of Piero di Cosimo de' Medici.
- The monument was commissioned by Piero's sons, Giuliano and Lorenzo the Magnificent. We are not sure of the level of interaction they had with the sculptor and his assistants, but it does indicate a connection with the Medici very early in Leonardo's career.
- The monument is an extraordinary object, made of rare, expensive **porphyry** marble carved in an egg-and-dart pattern, a style and material recalling the royalty of ancient Rome. Bronze legs morph into palm branches and laurel wreaths; the top evolves into swags of fruit and a cornucopia.
- It has recently been suggested that Leonardo was responsible for the realistic bronze tortoises at the base of the monument. He was probably involved in designing the laurel wreaths and details of the flora and fauna, which display a keen interest in the natural world that Verrocchio never shared.

Leonardo's *Annunciation*

- Leonardo stayed with Verrocchio's workshop long after his apprenticeship ended. This unusual arrangement raised some eyebrows, but whatever their personal relationship may have been, their professional one was a stroke of brilliance.



Cathedral of San Lorenzo houses the Medici tombs.

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- Leonardo, thanks in part to Verrocchio's reputation, received his first commission as a master painter quite quickly. In 1486, this painting was listed in an inventory of a small, rural Tuscan monastery called San Bartolomeo a Monte Oliveto. It is currently in the Uffizi Gallery in Florence.
- Keep in mind, Leonardo did not sign this work, no documents tell us about the commission, nor do any legends surround it. We do not know where it was originally placed or what it was intended for. We do not know who funded its completion.
- If San Bartolomeo was its original home, this helps us understand some of Leonardo's artistic choices. The monastery was just outside Florence, in the Tuscan hills that were Leonardo's childhood home. It was under renovation around the time the work was painted.
- The horizontal shape allowed Leonardo to experiment with grand vistas and wide expanses of space. The Virgin Mary sits on the patio of a well-appointed rural villa. She wears a red dress and a cascading blue cloak.
- Before her is the Archangel Gabriel, who genuflects and blesses Mary with his right hand. In his left he holds a bouquet of white lilies, a symbol of Mary representing both purity and sorrow.
- Mary has been interrupted while reading in her private garden. Presumably, the book is the Bible, open to Isaiah 7:14: "Therefore the Lord himself will give you a sign: The virgin will conceive and give birth to a son, and will call him Immanuel."
- A partitioned wall reveals a winding path through cypress trees indigenous to Italy. In the deep background are craggy hills and looming mountains, the latter dissolving into nothingness.

***Annunciation* Preparatory Work**

- It is an original and unusual composition, but not without precedents that Leonardo knew and quoted. But Leonardo also quoted himself in the softness of Gabriel's garments, the highlights and shadows, and the rich colors and textures of oil paints on poplar wood.
- We know Leonardo made many preparatory drawings for his paintings. There are a few we would like to connect to the *Annunciation*. More remarkable, however, is the striking similarity between the lectern in the painting and Verrocchio's Medici tomb monument.
- The mountains, river, and hills are also reminiscent of the *Baptism of Christ* landscape. Leonardo may have had a pattern book containing these features. The landscape sketch mentioned at the beginning of this lecture may also have been a preparatory drawing.
- Elements of contemporary architectural theory and design made their way into this picture, too. The rusticated stones of the walls echo those of contemporary palazzi in Florence.
- The mathematical theory behind the linear perspective seen here was articulated a generation before Alberti, who in turn may have been inspired by Alberti's role model, the architect Filippo Brunelleschi.

Leonardo's New Reputation

- This *Annunciation* is a stunning picture, but it was not created from whole cloth. Leonardo depended on his predecessors, his mentor, and projects he had already completed, following a tradition of self-quotation and artistic plagiarism common to artists of the Italian Renaissance.
- Still, this picture marks a decided departure from everything that had come before it. There was simply no one else in Europe who could paint this picture quite this way.

- Yet because of his youth and his recent partnership with Verrocchio, there is a very real chance that the picture was actually billed as a painting by the older, more established, senior workshop artist—a common practice.
- Those who wanted or needed to know the true authorship of the picture would have been immediately aware of young Leonardo's talents. Not long after the *Annunciation*'s completion, Leonardo took on a new assignment to produce a now-lost *Virgin and Child with Saints*, the first of a string of Madonna paintings that he produced during the 1470s.
- Verrocchio and Leonardo now had the potential for a partnership of unprecedented popularity in Florence, but at this vital moment, their great Achilles heel became glaringly clear. They became routinely bogged down in an environment of discussion, debate, recalculation, and indecision.
- Verrocchio, Leonardo, and their assistants were almost too innovative for their own good, as the abundance of creative options seems to have been almost debilitating. The backlog of projects grew, and potential clients sought more efficient artists to produce their projects.
- Leonardo would face this precise problem throughout much of his career as he wrestled with complicated commissions and impatient patrons. Speed and dependability mattered, and these were the two things that neither Leonardo nor Verrocchio possessed.

Important Term

porphyry: A rare and expensive colored stone used for special sculptural or architectural projects.

Suggested Reading

Brown, “The Profile of a Youth and Leonardo’s *Annunciation*.”

———. *Leonardo da Vinci: Origins of a Genius*, chap. 4.

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*, chap. 1.

A New Kind of Portrait—*Ginevra de' Benci*

Lecture 6

If Leonardo's approaches to art were grounded so firmly in the soil of the early Renaissance, how can we consider him fresh, novel, and unique? Some of the answer lies in his groundbreaking approach to portraiture, particularly his interest in the depiction of women in an otherwise misogynistic world. The touchstone work in this case is his 1474 portrait of the celebrated Florentine woman Ginevra de' Benci.

The Ginevra de' Benci Portrait

- We do not get a sense of Leonardo's originality in painting until the mid-1470s, and then only in paintings produced for private viewers. If it is originality we are looking for, it is in Leonardo's portraits we will find it.
- Leonardo's first truly groundbreaking achievement was *Ginevra de' Benci*, a portrait of a Florentine woman produced sometime around 1474 and now in Washington DC's National Gallery of Art. It is the earliest surviving indication that Leonardo was an original, thoughtful iconoclast.
- The piece is double sided. Ginevra's likeness is on one side; a laurel wreath that frames a piece of parchment bearing the words "*Virtutem forma decorat*" is on the other.
- Originally rectangular, at some point the panel was cut down to its current size, not quite 15" square. The subject may have once held a bouquet of flowers.
- The woman gazes at the viewer. She is outdoors; behind her are a stream, a field, rooftops, steeples, and hills. Her head is framed by a juniper bush. She wears a brown dress with a loosened lace collar, buttoned at the neckline. A thin veil covers her shoulders, falls loosely down her forehead, and covers her temples.

- The picture is painted in oils, a telltale sign of Leonardo's work. The thin glazes allowed him to produce subtle shifts in color and to re-create a soft light that glances off the figure's head and shoulder and focuses us on her delicate features.
- Fingerprints found in sections of the painting suggest that Leonardo not only used a brush and/or a palette knife but his bare hands to move the paint around.

Portraiture as a Genre

- The genre of pure portraiture had been enormously popular in Roman times in the form of sculptural busts. Normally, portraits were made of statesmen, thinkers, or people of wealth and influence.
- Artists worked hard to follow the actual features of the person. Ancient portrait busts show a remarkable sensitivity to the optical realities of the human face and are arguably early psychological examinations of the subjects.
- Interest in physical and psychological features of sitters did not last into the next era, dying out in the 4th century A.D. and staying dead for about 1,000 years.
- Medieval depictions of actual people tended to be symbolic images of power, combined with allegorical figures that accentuate that power. They are not portraits the way we think of them but descriptions of the offices those people held.
- As late as 1400, most depictions of people were in this guise, although Giotto, sometime around 1300, painted Cardinal Jacopo Stefaneschi, whom Giotto knew personally, displaying his actual physical features and personal interests.
- Giotto's painting is still an allegorical scene, however; it was only in the 15th century that artists returned to producing veristic representations of actual people celebrated for their own qualities.

- Pure portraiture revived not in Italy but in Northern Europe—Flanders in particular—where artists were trained in miniature painting.
- Flemish painters were interested in light intense juxtaposition between light and dark in a style known as **tenebrism**. The textures and the anomalies of life take center stage. Italian painting of this period focused on big-picture ideas and was far more idealized.
- Pure portraiture became popular in Italy only later in the 15th century, probably as a direct result of what started to trickle out of Northern Europe in the 1420s and 1430s. Even then, it was on a modest scale and mostly featured male sitters shown in profile, perhaps emulating coins or sculptural reliefs of ancient generals and emperors.
- By mid-century, men commissioned portraits of themselves in three-quarter view, allowing them to look at us. This pose also gives us a glimpse inside the hearts and minds of the sitters. They appear to us as real people with distinctive thoughts, personalities, and characteristics.
- **Antonello da Messina**—a Sicilian artist who had been to Northern Europe to learn oil painting—was probably the best portraitist in Italy in the early 1470s. Among his other techniques, he loved the three-quarter pose.

Portraits of Women

- Women did not receive the same kind of treatment from artists that men did. They remained in profile in portraits long after men began to be shown in three-quarter poses, and these portraits laced the psychological intensity we see in male sitters.
- Female sitters were on display. They were shown as wealthy, propertied, and valuable. They were either for sale (that is, available to marry), or they showed the viewer what the buyer—the husband—had recently purchased.

- Many of these portraits were **dowry** pictures. Others were commissioned to commemorate an engagement or, less frequently, a marriage or the birth of a child. That said, the sitters rarely look happy about having their portraits painted. Marriage was not a romantic institution or one in which the woman had much say.

What Makes *Ginevra* Unique

- Leonardo's portrait reveals some of the features we expect in 15th-century women's portraits. The sitter is of marriageable age—that is, adolescent—and does not look particularly happy about her lot.
- There is a possibility that Leonardo was not painting this portrait from life. Right around the time this was produced, Verrocchio created a bust of a young woman that bears a resemblance to the portrait. The painting may have been an exercise in the difference between the two media.
- We are left with several questions that have consumed students of the picture for a long time: Who was the sitter, who wanted her depicted like this, and why? It turns out that Leonardo has defied conventions to tell us a great deal about this particular person.
- Leonardo gives us hints to her identity—rare in portraits of men, doubly so in portraits of women in the 15th century. The juniper bush is the first one. The word for juniper in Italian is “*ginevra*,” which was also a popular first name for women at the time.
- Vasari tells us that Leonardo painted a portrait of **Ginevra de' Benci**. Two other 16th-century writers saw this portrait and praised the artist's skill.

Who Was Ginevra?

- We know that in 1473, the 16-year-old Ginevra, daughter of an extremely wealthy and powerful patrician, was betrothed. Her intended was a widower named Luigi Niccolini, a 32-year-old man from a more humble family.

- Ginevra had an unhappy marriage and died in 1520, impoverished and sickly, but in life she was a vibrant, articulate, literate, and publicly celebrated woman. At the time this image was painted, she was about to burst onto the Florentine cultural scene as one of the most respected people of her day.
- In 1475, a Venetian ambassador named **Bernardo Bembo** visited Florence, where he met Ginevra and declared her his muse, his platonic love, and his intellectual inspiration.
- No fewer than 11 poems were written in the ensuing years by three of the greatest humanist thinkers in the court of Lorenzo the Magnificent celebrating the chaste relationship between Bembo and Ginevra.
- This relationship helps us understand the Latin motto on the picture's back: *Virtutem forma decorat* means “beauty adorns virtue.”
- Features of the painting suggest that Leonardo saw in Ginevra the same qualities as Bembo and the rest of Florence did. She does not wear finery. She is not on display or in an ostentatious palace. The landscape behind her is not a symbol of her family's possessions but a way of comparing her beauty to the natural world.
- Most importantly, her three-quarter pose, which until this point had been reserved for men, tells us that this woman is more than just a pretty face or piece of property: She is capable and intelligent, just like a man.
- Recent radiographic examination of the motto has revealed that it is a revision. It originally read *Virtus et honor*—the motto of Bernardo Bembo.

How Did the Portrait Come to Be?

- The picture's origins are unknown, but here is one theory: Perhaps the picture was commissioned by the father of Ginevra de'Benci in 1473 to commemorate his daughter's betrothal.
- The picture somehow was given to Bembo—by Ginevra, her father, or her husband—who had his own motto painted on it.
- Later, when Bembo returned to Venice, the motto used to describe her in the poems written in Lorenzo the Magnificent's court was painted over that of the departed ambassador.
- Whatever the case, Leonardo willingly and boldly broke with convention—and not just the artistic convention—in this portrait. Ginevra is shown as a complete human, with individualized features and an intellectual presence.
- We might speculate that Leonardo was usually comfortable in the company of women. He was not afraid to show them in unconventional ways, and he could convince them that they were not committing terrible acts of social rebellion by having themselves depicted in new formats.
- His ability to paint portraits of living female sitters in such an innovative way informed his interpretation of the more traditional female icon of Christian art, the Virgin Mary.

Important Terms

dowry: A fixed gift—usually property, cash holdings, and/or textiles—that accompanied brides as they left their parents' homes and entered into the marital union with their husbands.

tenebrism: An intense and dramatic juxtaposition of light and dark colors on a painted surface.

Names to Know

Bembo, Bernardo (1433–1519): Venetian aristocrat and diplomat who travelled to Florence in 1475 and witnessed the famous tournament in which Giuliano de' Medici conquered the field. He is also reputed to have met Ginevra de' Benci there and initiated a platonic relationship that was recognized in Leonardo's portrait of her.

Benci, Ginevra de' (c. 1458–1520): The wife of Luigi di Bernardo Niccolini and the presumptive muse of the Venetian diplomat Bernardo Bembo, she was the subject of humanistic poems and a painting by Leonardo da Vinci in the 1470s.

da Messina, Antonello (c. 1430–1479): Sicilian painter who traveled widely during his professional career. Active in Naples, Venice, and probably France or Flanders, Antonello perfected the use of oil pigments in his paintings and helped teach artists in Italy how to employ them.

Suggested Reading

Brown, Leonardo da Vinci: *Origins of a Genius*.

Fletcher, “Bernardo Bembo and Leonardo’s Portrait of Ginevra de’ Benci.”

Garrard, “Leonardo da Vinci: Female Portraits, Female Nature.”

Simons, “Women in Frames.”

Leonardo's Early Madonnas

Lecture 7

Throughout Leonardo's career, he showed an uncanny ability to take a time-tested (and even rather stale) formula and invest it with new energy. One such formula was the Madonna painting, revered throughout the 14th and 15th centuries but formulaic in the extreme until Leonardo got a hold of it. Through two such paintings, *Madonna of the Carnation* and the *Benois Madonna*, we can see Leonardo's evolving approach to this subject in terms of both technique and symbolism.

Leonardo as a Young Master

- Leonardo's *Ginevra de' Benci*, *Annunciation*, and a commission to produce the never-completed *Virgin Mary with Saints* remind us of the popularity of Verrocchio's workshop during the 1470s and Leonardo's contribution to it.
- Leonardo was incredibly innovative, even at this early stage in his career.
 - He was already experimenting with the possibilities of oil paints.
 - He had invented a new way to depict the natural landscape, moving beyond linear perspective to atmospheric perspective—imitating the way the eye works in the natural world.
 - His figures had a grace and elegance that suggested nobility, a suggestion that was highly desirable in High Renaissance Florence.
 - All these features were organized with incomparable compositional clarity.

- What is puzzling is that more works were not coming out of Verrocchio and Leonardo's workshop. Leonardo's artistic career was hobbled by his limited productivity. He completed fewer than 20 paintings in his 45 years as a master painter.
- From 1472 to 1482, when he left Florence, Leonardo averaged about one painting completed per year—a low but respectable rate by the standards of the 15th century.
- Pictures took a long time to complete because artists had to coordinate with patrons, carpenters, apothecary shops, apprentices, and the institutions where paintings would be installed. Leonardo also produced a mountain of drawings in anticipation of each work.
- Leonardo was not terribly picky about the commissions he took, which was normal for a working artist of the day. A common commission for any artist was a Madonna painting—an image of Mary and Christ.

The Renaissance Madonna

- Images of the Virgin and Child could be found in almost every imaginable place in the Renaissance urban landscape. Altarpieces were the most common, particularly during the 1200s and 1300s.
- A notable example of this type is Giotto's *Virgin Enthroned* for Florence's Church of the Ognissanti, painted around 1310. The seven-foot-tall panel contains over a dozen figures, each with individuated faces, believable draperies, and proper proportions.
- Madonna altarpieces were packed with symbolism that pertained to their location: Wafer and chalice, for example, as Christ's body and blood. Mary came to be a symbol of the church—the vessel that carried the Eucharist.

- Wealthy lay donors soon brought Madonnas out of the churches and into other public and private spaces. They appeared in street-corner tabernacles, above guildhall doorways, in civil servants' offices, and finally in homes.
- It became something of a status symbol to own a painting by a well-known artist. In the late 1400s, a few wealthy art lovers began collecting art for its own merit, rather than for a specific purpose or to celebrate an event or person.

Domestic Madonnas

- The type of painting usually commissioned by individual buyers was the Madonna. They tended to be small and therefore affordable. To their owners, they symbolized personal piety, maternal love, and domestic joy.
- One popular placement for personal Madonnas was the bedchamber. In this context, they were thought to help with conception: During intercourse, women were urged to fix their gazes on Mary, while men were told to look at pictures of John the Baptist, which would transfer these saints' attributes to a girl or boy child, respectively.
- The early domestic Madonna painting followed a standard format: They are roughly two or three feet tall. Mary is young, beautiful, and usually wearing blue—painted with expensive ultramarine pigment. Christ is a fleshy, chubby infant or toddler, in line with contemporary theology that emphasized his humanity. Mary and Christ caress each other in gestures of familial intimacy.
- By Leonardo's time, artists were beginning to experiment with this format in important ways. More and more effort was made to individuate the figures' faces and to humanize the Virgin and Child, although they are still fairly complacent, posed, and serious minded.

Leonardo's First Madonna Painting

- Sometime between 1473 and 1476, Leonardo painted a small domestic Madonna for a private patron. We do not know the name of the commissioner; in fact, it may have been a readymade—the sort of painting workshops kept on hand as a sample or for quick sale. It is today called *Madonna of the Carnation*.
- Too small to be an altarpiece at only 24" × 18", the style of the composition is called monumental because it fills the entire panel. Mary stands in a palace. Outside is a spectacular mountain vista. Mary has an ornate hairdo and a blue dress with a red blouse.
- Mary holds Christ with her right hand while giving him a carnation with her left. Christ, who sits on a pillow perched on a window ledge, is a fat little baby who reaches toward his mother in a pose of pure infant joy.
- A vase of flowers balances the composition to the right; the pillow before them is adorned with crystal balls on the fringe, which some believe are a reference to the Medici family crest. This picture wound up in the hands of Pope Clement VII, a descendent of Giuliano de' Medici, in the late 1520s.
- Although parts of the painting follow formula, Leonardo also departs from it. His modeling of faces is extremely effective. Christ's body is a naturalistic interpretation of an actual infant. Mary stands in a believable space and is more queenly than a humble handmaiden of the Lord.
- It is also clear that Leonardo was a product of his workshop. Mary's face seems derived from a drawing done in Verrocchio's studio, most likely by Perugino. Mary's fingers and the way Christ reaches for Mary are also found in other work out of Verrocchio's shop.

- What is distinctly different is the background. The vast landscape no longer signifies wealth or status. It is a scientific examination of the natural world—specifically, of how haze in the atmosphere affects how the eye perceives distance.
- The picture has been criticized by art specialists. Its sculptural qualities suggest to some a certain rigidity or awkwardness that indicates unease with the subject matter.
- There could be several reasons for this: To the best of our knowledge, Leonardo had never painted a private Madonna before. As a new master, he may have felt constrained by the rules of Verrocchio's workshop. A Freudian might point to Leonardo's own inexperience with motherly love.

The Later Madonna Commissions

- Leonardo had opportunities to try his hand at other interpretations of this particular scene. He made notes about two commissions for private Madonnas in January 1478, although he did not identify his clients by name.
- One was never completed, and we do not know why. The other one was probably the *Benois Madonna*, named after its 19th-century Russian owner, which is now in the Hermitage Collection of St. Petersburg.
- Leonardo took his time with the picture, working up variations of the composition, first as sketches and then in more finished preparatory drawings. One, called the London drawing, shows Christ and Mary facing each other in three-quarter poses, similar to the finished painting.



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The Benois Madonna is charmingly intimate.

- The *Benois Madonna* measures 19.5" × 13". Building on the medieval notion that Mary was a teenager when she delivered Jesus, Leonardo paints us a picture of a giggling, happy young woman playing with her child.
- Christ's face and head have been constructed as a variant of that found in the *Madonna of the Carnation*. The accurately pudgy thighs, knees, calves, and ankles are unequaled in pictures of infants painted by anyone else in Renaissance Florence. At 26 years old, Leonardo was already deeply immersed in observational studies of the human form.
- A flower and oval brooch occupy the direct center of the picture, just as they did in *Madonna of the Carnation*, but now the flower is framed by the figures' hands, focusing our attention on it.
- What will become a true calling card of Leonardo paintings is here as well: a very dark background that spotlights the figures in the foreground, like actors on a stage.
- The picture is obviously unfinished: The window has been left incomplete, and there is no landscape within it, a rarity among Leonardo's nonportraits.
- There is a joy to this picture we do not see anywhere else in the art of the 15th century, one that runs counter to contemporary approaches to high-brow religious thought.
- Leonardo would continue to experiment with his ideas for Madonna pictures long after stopping work on the *Benois Madonna*. Sometime around 1480, he produced a double-sided sheet of studies that he never executed in paint but informed his approaches to the subject later on.

- Leonardo became quite interested in the combination of Mary, the Christ child, and an animal. He seemed to be drawing a parallel between the care and concern shown by mothers for their infants and the love children have for their pets.
- *Madonna with the Cat* shows us one of these ideas in paint. The concept of Mary holding Jesus, and Jesus holding a creature from nature struck him as meaningful, even though the use of a cat defied iconographic precedents. We would expect a bird, which symbolized the soul, or a lamb, which symbolized sacrifice.

Suggested Reading

Brown, *Leonardo da Vinci: Origins of a Genius*, chaps. 6–7.

Clark, *Leonardo da Vinci: An Account of his Development as an Artist*, chap. 1.

Colvin, “A Note on the Benois Madonna of Leonardo da Vinci.”

Scandal, Reprieve, and the Penitent St. Jerome

Lecture 8

The decade of the 1470s was particularly stormy for Leonardo, as controversy over his personal life threatened to ruin his professional career almost before it began. This lecture addresses the anonymous accusations of immorality levied against Leonardo—what may have been behind them as well as some possible reasons why they were dropped—and considers their impact on his later work.

The Dark Side of Leonardo's Fame

- By 1475, Leonardo's colleagues in the Confraternity of St. Luke knew what he was producing, and they clearly admired his works. This is saying something, for the group of artists working in the city of Florence during the 1470s was among the most talented the city had ever seen.
- The artist Lorenzo di Credi— younger than Leonardo by about seven years but a fine painter in his own right—was particularly influenced by Leonardo. His *Annunciation* outright stole from Leonardo's—and that was not the only painting of his which does so.
- Leonardo was influencing the artistic choices made by his peers, albeit subtle choices that revolved around compositional issues, details, and physiognomic features. Leonardo was not preaching a philosophical or theoretical movement just yet.
- Leonardo's meteoric rise was not untroubled. Others in Florence were envious of his success, and on the night of April 9, 1476, Leonardo was anonymously denounced to the **Ufficiali di Notte**—or Guardians of the Night—the morality police of the Florentine state.
- The Ufficiali di Notte cast a particular eye on two vices: unregulated (or freelance) prostitution and homosexuality among adults. Sodomy was a felony that carried the penalty of exile or death.

- The accusation against Leonardo included both sodomy and consorting with an unlicensed prostitute—a young man named Jacopo Saltarelli. Saltarelli was said to have offered sex for money to “several dozen people,” few of whom were identified by name. Leonardo was also accused of carrying on a sexual relationship with Verrocchio.
- The charges were initially thrown out of court due to lack of evidence, but on June 7, the charges were repeated—again, anonymously—and this time apparently the denunciation came with some form of proof.
- The Ufficiali di Notte pursued the matter, and Leonardo was arrested, detained, and jailed for the duration of the investigation, which appears to have lasted several weeks.

Sex and Love in 15th-Century Florence

- To understand these charges, we must consider their context. Florence’s city fathers were sensitive about the issue of homosexuality, for the city had a reputation for high finance, fancy clothing, fine art, and homosexuality—not necessarily in that order.
- All across Europe, acts of sodomy were known euphemistically as “the Florentine arts.” The city fathers began to fear that Florence might be attacked because other cities thought its citizens were effeminate.
- Adolescent male homosexuality was actually quite common in Western culture at this time, due largely to the socioeconomic conditions of marriage and the apprenticeship system.
 - Men rarely entered into marriage contracts until they had reached a certain level of professional and financial security—about the age of 30—whereas the women they married were in their teens.

- Therefore, 16- and 17-year-old boys had no female companions their own age. By the time these boys hit puberty, the girls they had grown up with had already married much older men.
- Layered onto this physiognomic problem were their living conditions. Teenage boys spent 24 hours a day, every day, in each other's company in the workshops, living as well as working together. Thus it was not at all uncommon for a teenage male to have his earliest sexual experience with other teenage boys.
- The Ufficiali di Notte turned a blind eye to homosexual teenage indiscretions. It was only when men were independent and ready for marriage that acts of sodomy were seen as a problem.

Was Leonardo Guilty?

- Leonardo's denunciation is problematic. He was not fully independent in 1476 and had made no attempts to open his own workshop. He was 24 years old, right between youth and adulthood. He was not a troublemaker, had no police record, and certainly did not force his attentions on Salterelli.
- Added into the mix is our own hazy understanding of the situation. We do not know the nature of the relationship between Salterelli and Leonardo, the number of times the two had been together, or whether Leonardo was flaunting their trysts.
- We must also ask why Leonardo's accuser was anonymous, why so few of Salterelli's other clients were called out by name, and why Verrocchio was brought into this mess yet not jailed.
- The whole incident smacks of pettiness and acrimony, and more than one scholar has wondered whether the accusations were pure fabrication meant to ruin Leonardo professionally and personally.

- Out of nowhere, and with no explanation whatsoever, Leonardo was exonerated and released from prison—and to this day we do not know why. Speculation abounds: Was the evidence lacking? Was Leonardo's reputation too important to the city? Did Lorenzo the Magnificent intervene for the sake of Leonardo or, perhaps, for one of the unnamed accused with even closer ties to the Medici?
- Whatever the explanation for Leonardo's release, the already introspective nature of his character now became even more secretive, and he never wrote about the episode after he left his prison cell.
- Still, it is not clear that Leonardo learned his lesson from the experience. It still took him over a year to leave the home and workshop of Verrocchio. Either the two had no romantic relationship at all, and thus nothing to hide, or they did not care who knew. Either way, Leonardo was playing with fire.

Was Leonardo Gay?

- Leonardo's arrest on charges of sodomy have caused many—maybe even most—specialists to conclude that Leonardo was gay, which in turn has caused some to wonder whether we can see vestiges of Leonardo's sexual orientation in his art.
- Some point to specific images of the male form as particularly eroticized, such as the sensual figures found in the Windsor Castle drawings and the painting of John the Baptist now in the Louvre.
- This approach to artistic analysis has been applied to the works of other artists, like Donatello and Caravaggio. The former had been charged with sodomy as well and the latter was rumored to have frequented male prostitutes.
- Other scholars reject the reading of figures as autobiographical references, particularly for Leonardo. Leonardo treats women and children just as lovingly as he treats his male subjects, and his manner of showing the male nude was conventional for the time.

- Leonardo's handling of male subjects was consistent with his general approach to painted figures: to infuse all of them with an air of grace and elegance. Looking at the only militaristic picture Leonardo ever painted, the *Battle of Anghiari*, all sweetness and beauty of his male figures vanishes in the chaos of battle.

Leonardo after the Denunciation

- Leonardo left Verrocchio's workshop at the end of 1477 and became a truly independent artist. The commissions came—first the two Madonnas we already examined, and later one of the more haunting images of Leonardo's career, the penitent *St. Jerome*.
- Despite his prolific note taking and sketch making, about half of Leonardo's paintings left absolutely no trace of who commissioned them, and the same is true of this image.
- A tantalizing painting, only halfway prepared, the subject was a 4th-century hermit and scholar best known for translating the Bible into Latin. Although a cardinal, in fact—Jerome was celebrated for his austerity, abstinence, and fervent attention to the Passion of Christ.
- Jerome spent years in the Egyptian desert, naked and begging forgiveness for his long list of sins. His icon, the lion, came to represent not only the dangers of his self-imposed exile but the courage he showed in the face of deprivation.
- The picture is fairly large, 41" × 30"—too large for a domestic painting—and the date of its production is unknown. It was first noted in the will of the 19th-century Swiss painter Angelica Kauffman and is now in the Vatican's collections.
- Jerome was a common subject in the 15th century, particularly for monastic communities, who saw him as a role model. Leonardo's picture borrows from the traditional Jerome format.
- Jerome sits on a rock, his neck and body strained. He gazes at a crucifix and touches his chest in self-accusation and piety. In his left

hand is a rock he is about to smash against his own breast. The lion coils around him with its mouth open, roaring either in admiration or intimidation. In the background are a rocky desert, choppy seas, and a mystical mountainous landscape we recognize as Leonardo's.

- What we have here is not really a painting but an **underdrawing**. A series of washes and sketches have been applied, with the figure worked up in some areas and left completely blank in others.
- This picture gives us some insight into Leonardo's customary painterly practices. He painted the backgrounds first before dealing with the figures in the foreground.
- The saint's body, while suggesting a tenebristic treatment, has received very little attention from the painter. The lion has only been sketched out; it, too, would have been spotlighted, emerging from the darkness.
- This would not have been a colorful picture in the end: Aside from flesh tones, the blue background turning to white, and maybe a flower or two in the foreground, it would have consisted of tonal browns, oranges, beiges, and reds.
- If we are inclined toward biographical readings of an artist's work, we can make a few guesses about the provenance of this picture based on the events of Leonardo's life. But due to the time and expense involved, a picture of this size and magnitude was probably not something the artist initiated on his own but commissioned by a patron.



**Though a scholar as well,
Saint Jerome was often
portrayed in ascetic scenes.**

- Most scholars want to date this picture to the last years of the 1470s, maybe even as late as 1480 or 1481. Leonardo had been denounced, publicly humiliated, and had moved out of Verrocchio's workshop.
- Saint Jerome's anguish and self-condemnation might hint at a penitent Leonardo working through this difficult time in his life. The lion—in Italian, *leone*—makes a personal connection between the saint and the artist.
- Is he begging God for forgiveness? His later writings suggest agnosticism, so perhaps not. Does he seek forgiveness from a friend? Unlikely, as they would not have seen this painting. Is he punishing himself for behaving recklessly, putting himself and his friends at risk? That seems more likely.

Important Terms

Ufficiali di Notte: The Guardians of the Night, Renaissance Florence's vice squad, charged with prosecuting cases of sexual misconduct—usually defined as acts of prostitution or sodomy.

underdrawing: A charcoal or chalk sketch on the penultimate coat of plaster laid on a wall before the final fresco coat was placed over it.

Suggested Reading

Freud, *Leonardo da Vinci and a Memory of his Childhood*.

Rocke, *Forbidden Friendships*.

Schapiro, “Leonardo and Freud: An Art-Historical Study.”

Syson, “Body and Soul: Saint Jerome in Penitence.”

Syson and Billinge, “Leonardo da Vinci’s Use of Underdrawing.”

Inventing Early Modern Classicism

Lecture 9

Leonardo's personal connections in Florence—through his father and through the Medici family—led to important commissions, but Leonardo's clients were not always happy with his work. The artist's drawn-out processes were one factor; another was his adoption of a Northern European approach to naturalism that shunned artificial perfection and uniformity in favor of realism, however ugly or uncomfortable. By the early 1480s, Leonardo was important enough to Florence to be sent as Lorenzo de' Medici's ambassador to the Milanese court, with fateful consequences.

Leonardo's *Adoration of the Magi*

- There is obviously a lot to admire about Leonardo, but one of the things we do not discuss much is his resiliency. Time and again, he seemed to be on the ropes but rebounded and was even able to improve his station in life.
- In addition to whomever saved him from the Salterelli scandal, another figure in Florentine society in Leonardo's corner was his father, Ser Piero. Most importantly, he acted something like an agent.
- In 1479, Ser Piero helped execute the will of one of his clients, a saddle maker who bequeathed a portion of his estate to a small monastery called San Donato a Scopeto that lay just outside the walls of Florence.
- The will specified two things of importance: first, that the money be used to fund the production of an altarpiece for the monastic church, and second, that a dowry be provided for the saddle maker's granddaughter.

- Ser Piero used his position to obtain a portion of the saddle maker's property for Leonardo to manage, with the understanding some of the profits from it would transfer back to the granddaughter, and to get Leonardo the altarpiece commission.
- Leonardo ultimately reneged on both responsibilities. In the summer of 1481, Leonardo surrendered responsibility for the granddaughter's protection. Then in September, he received an initial payment for the altarpiece, but he never received payment for the final product.
- The painting in question is utterly engrossing but clearly unfinished. Called *Adoration of the Magi*, it is 97" × 98" and currently resides in the Uffizi Gallery. Even in this state, it tells us everything we need to know about Leonardo's growth as an artist up to this moment and everything we need to know about the period to follow.
- At the core is a triangular group formed by Mary and Christ. This kind of centralized, pyramidal format is known as a **classical composition** and is found frequently in paintings produced during the High Renaissance—a calling card for those who followed Leonardo's example.
- Mary, the lynchpin of the composition, is still, almost a void within the dark rock that surrounds her, a clear indication that Leonardo intended to spotlight her body.
- The bald Christ child, a now familiar motif in Leonardo's repertoire, is chubby and cherubic but also cognizant of his status as the Son of Man. He accepts the gift from a kneeling magus and blesses the kings.
- The youngest magus to the far left strikes the same pose as the angel in Verrocchio's *Baptism of Christ* that Leonardo had painted in 1472. Each figure surrounding the core group bears a specific expression or gesture of response. They are individuals but share a collective psychological state.

- These witnesses emerge from the rock but are mostly incomplete. Deep shadows cover faces and draperies, again telling us that Leonardo intended for this to be a highly tenebristic composition.
- The middle ground has been almost entirely obliterated by the rock, but we do see a gradual recession of space to the left, where a dilapidated structure provides **orthogonal lines**.
- Punctuating the composition are the horses ridden by the royal procession: Perfect alignment here would have been *too* perfect; the central tree has intentionally been placed off-center to avoid the semblance of unnaturalism. In the right corner are more trademark Leonardo landscape features.

Preparatory Sketches for the *Adoration*

- Leonardo produced a number of preparatory sketches for this painting. The first, now in Paris, contains the core grouping, but its composition is too jumbled and the buildings detract from the main action in the foreground.
- In the Uffizi sketch, Leonardo separates the building and equestrian units as discrete entities. He then reduces the size of the figures and the setting.
- Leonardo also experimented with different hand gestures and positions; the Windsor Castle drawing shows us Leonardo's practice sessions as he works on these most expressive parts of the human body.
- One of the most striking features of Leonardo's handling of this scene is his adherence to traditional forms and his willingness to embrace new ideas. He follows Botticelli's earlier *Adoration of the Magi* by emphasizing architecture, the core triangle, and using central figures who preside over the others. But he adds individuality to the figures and their features.

Leonardo's Naturalism

- Leonardo's figures are real, weathered, gritty, unkempt, and powerfully ugly. This enhances the pure beauty of the holy couple and allows Leonardo to explore his understanding of nature and naturalism, which is quite different from that of his peers.
- Leonardo was interested in the Northern European approach that celebrated individuality and difference—the things that make each object and each person unique and special. He was not interested in the things that made us similar but rather in the things that made us distinctive.
- **Petrus Christus**'s *Portrait of a Carthusian* (1446) goes to great lengths to show us the anomalies of life—the subject's haircut, robe, and whiskers, and the wonderful fly as a *momento mori*. Ironically, because of the figure's differences, he is someone just like us.
- **Hugo van der Goes**'s enormous triptych, the *Portinari Altarpiece*, made for a Florentine family living in Bruges, shows the family in all their detailed uniqueness, and each of the three shepherds is an individual as well—young, mature, and aged, seemingly based on a living, breathing model, imperfect in a way that would never have appeared in a Florentine painting of the day.
- The *Polinari Altarpiece* came to Florence in 1483; it is possible that the Flemish interest in details and the realities of the natural world had trickled down to Leonardo before that date. He had already adopted the Flemish use of oil pigments, for example. Flemish painter **Rogier van der Weyden** had studied in Italy in 1450 and was one possible source for Leonardo's knowledge.
- Leonardo never completed this painting. Some have speculated that his patrons fired him for his tardiness, or perhaps because they did not like the Flemish route he was taking. The commission was turned over to Domenico Ghirlandaio, who also failed to complete the painting. The project finally landed in the hands of **Filippino Lippi**, the son of Fra Filippo Lippi.

Leonardo and the Medici

- In 1481, Leonardo was sent on a temporary diplomatic mission to the powerful city-state of Milan by **Lorenzo di Piero de' Medici**, better known as Lorenzo the Magnificent. The purpose of this visit has never been determined.
- It is hard to pinpoint the origins or the quality of the connection between Leonardo and Lorenzo the Magnificent. We have seen several possible points of connection between them already, and an anonymous chronicler tells us Leonardo was living in the Medici palace in 1478, working in the nearby monastery of San Marco.
- The Medici had controlled Florentine politics and policies since 1434. Lorenzo came to power in 1469, at the age of 20, along with his younger brother, **Giuliano di Piero de' Medici**.
- Lorenzo was more cerebral, more culturally sensitive, and less interested in chivalry and military affairs than Giuliano. He was consumed by philosophy and art, and he gathered a court of thinkers that included some of the great minds of the day.
- But Lorenzo made serious—even fatal—mistakes as well. He allowed the city to get involved in an ill-fated war with the Vatican under Pope Sixtus IV. In 1478, the Medici were forced to sue for peace.



Lorenzo de' Medici, the epitome of a Renaissance prince.

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- On Easter of that year, while they were praying in the Duomo, Giuliano was assassinated, while Lorenzo barely escaped. It did not take long for Lorenzo to learn the names of those who had killed his brother, and he rounded up the conspirators—led by members of the Pazzi family—jailed them, and executed them for their crime.
- Some have speculated that Lorenzo was party to the plot. Many more have argued that the plot was either hatched or approved by Pope Sixtus IV.
- Leonardo was present in Florence during this near coup d'etat and was soon asked to commemorate the event for posterity by the communal government—which probably means by Lorenzo.
- In the summer of 1479, Leonardo drew one of the conspirators as he swung from the gallows outside the Bargello. The sketch is pretty clearly taken from life—or in this case, from death.
- In his customary backward scrawl, Leonardo noted the subject of his drawing, oddly focusing his comments on the prisoner's robes. Some argue that this indicates Leonardo's growing aloofness and inability to feel, others argue that these are standard notes for a preparatory sketch.
- Paintings of such events would have been entirely natural for the period. Images of criminals placed on the walls of the executioner's palace were known as *pittura infamante*. They were thought to be a sort of deterrent, shaming not only the criminal but humiliating their families for generations to come.
- The final project never came to pass; Lorenzo was beginning to understand that local artists could be used as key instruments of Florentine foreign policy. At the conclusion of the war with Pope Sixtus IV, he sent to Rome a group of his most talented painters, including Sandro Botticelli, to decorate a new papal chapel now known as the Sistine Chapel.

- The frescoes on the side walls painted by these artists were considered among the finest works of art in Rome right up until 1508. In that year, another Florentine artist, Michelangelo Buonarroti, painted frescoes on the ceiling that overshadowed the work done by Botticelli and his colleagues.
- That use in 1480 of artists as quasi-diplomats may well have been the inspiration for Lorenzo's decision to send Leonardo on a different kind of diplomatic mission to Milan the following year, a trip that would change the course of his career.

Important Terms

classical composition: A triangular or pyramidal approach to artistic compositional design that emphasizes balance.

orthogonal lines: Diagonal lines drawn or painted on a two-dimensional surface that illusionistically extend into space, appearing to converge at a single point (the vanishing point) and giving the effect of a measurable three-dimensional space in linear perspective. Also used in relief sculpture.

pittura infamante: Italian term for pictures of the executed painted on the sides of prisons and government buildings. These images were part of the punishment meted out for particularly heinous crimes of high treason and murder.

triptych: An altarpiece or other devotional image made up of three painted or carved panels. The wings are usually smaller than the center panel and are sometimes hinged for closing.

Names to Know

Christus, Petrus (c. 1420–1476): Northern painter active in Bruges who was deeply influenced by the works of Robert Campin and Jan van Eyck. His *Portrait of a Carthusian* (1446) in New York's Metropolitan Museum of Art displays his understanding of oil paint and his interest in tenebrism.

Goes, Hugo van der (c. 1440–1482): Flemish painter who was commissioned by Tommaso Portinari, the director of a branch office of the Medici bank in Flanders, to paint an enormous triptych now known as *The Portinari Altarpiece* (1476; installed 1483) for the Florentine hospital church of Santa Maria Nuova.

Lippi, Filippino (1457/8–1504): The son of the mendicant painter Fra Filippo Lippi, Filippino was a successful painter in his own right. Among his best-known works are frescoes in the Brancacci Chapel in the Florentine church of Santa Maria del Carmine, scenes from the *Life of Saint Philip* in Santa Maria Novella, and the altarpiece *Adoration of the Magi*, which ultimately replaced the version that Leonardo had intended to install in the church of San Donato a Scopeto (but then abandoned) in 1481.

Medici, Giuliano di Piero de' (1453–1478): The second son of Piero de' Medici and the grandson of Cosimo the Elder, Giuliano governed the city of Florence, together with his brother Lorenzo, from 1469 until his assassination in 1478.

Medici, Lorenzo di Piero de' (a.k.a. **Lorenzo the Magnificent**; 1449–1492): The first son of Piero de' Medici and the grandson of Cosimo the Elder, Lorenzo was known just as much for his interest in the arts and letters as he was a political ruler. In addition to governing the city for the duration of his adult life, Lorenzo created around himself one of Italy's most prominent courts of thinkers and writers. Included in his entourage were the philosophers Giovanni Pico della Mirandola and Marsilio Ficino and the artists Sandro Botticelli, Michelangelo Buonarroti, and Leonardo da Vinci.

Weyden, Rogier van der (c. 1400–1464): A Flemish painter of enormous skill who trained with Robert Campin and perfected the Northern European approach to early Renaissance painting that employed heavy shadows mixed with rich colors. He traveled to Italy in 1450 and lived for a time in Florence, thus helping introduce the traditions of his homeland to artists and audiences south of the Alps.

Suggested Reading

- Clark, *Leonardo da Vinci: An Account of his Development as an Artist*, chap. 2.
- Hills, “Leonardo and Flemish Painting.”
- Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*, chap. 1.
- Stites, *The Sublimations of Leonardo da Vinci*, chap. 8.

Arrival in Milan—*Madonna of the Rocks*

Lecture 10

The first time Leonardo came to Milan, he came as a Florentine diplomat. The second time he came, he came as the newest member of the duke of Milan's court. One of his tasks was to create a monumental sculpture—part of a public relations campaign to shore up the legitimacy of the duke's rule. Meanwhile, he took on commissions for other clients, including the *Madonna of the Rocks*, which despite its beauty failed to satisfy Leonardo's clients.

Leonardo Goes to Milan

- The exact nature of Leonardo's mission to Milan in 1481 remains unclear. Legend has it that he was entrusted to deliver a gift of a solid silver lyre from Lorenzo the Magnificent to Milan's newly installed usurper, a man named **Ludovico Sforza**.
- Leonardo was considered one of the most talented performers on the lyre in all of Italy. We now believe that at least part of his mission was to play the sumptuous instrument and impress the court with the virtuosity of the Florentines.
- In a sense, this was Leonardo's first opportunity to prove himself as more than just a talented painter. The diplomatic mission was evidently so positive on both sides that, within months, Leonardo again left Florence for Milan—this time for good.
- Lorenzo the Magnificent was something of a patron for artists, and he might have recommended one of his favorites to cement ties with a new ally. But we also have an unusual kind of letter, signed by Leonardo, in which the artist appeals to Ludovico Sforza for gainful employment—and not as a court painter.

Ludovico Sforza's Plans for a Monument

- We are now fairly certain that Leonardo did not approach Ludovico Sforza cold. It appears that Ludovico was in correspondence with Lorenzo about securing the services of a sculptor to produce a bronze equestrian monument of colossal proportions that would reinforce his legitimacy.
- Ludovico was inspired by two older works of art. The first we now call the Monument of Marcus Aurelius, created around 180 C.E. The horse and rider stand more than four meters tall. The emperor's size makes him seem larger than life and more powerful than the strongest horse in the Roman Empire.
- The statue was cast in bronze, and its execution was more than expensive; it was a technical nightmare that no one bothered to replicate until the mid-15th century.
- In 1453, Donatello took up the challenge and installed a striking bronze sculpture outside the pilgrimage church of Sant'Antonio in Padua. The horse and rider commemorated the military accomplishments of a Venetian mercenary named Erasmo di Narni, also known as Gattamelata.
- The person Ludovico wanted for his monument was Verrocchio, the unequaled expert in bronze casting at the time. But Verrocchio was casting an equestrian monument for the city of Venice dedicated to a knight named **Bartolomeo Colleoni**. It now stands outside the Church of Santi Giovanni e Paolo.
- Since Verrocchio was unavailable to Ludovico in the early 1480s, the next best thing to hiring the master was hiring his greatest apprentice: Leonardo. Leonardo was probably eager to move on from a city that contained some enemies.

- Leonardo's letter emphasizes that he knows how to make weapons, war machines, impregnable defenses, and siege-busting countermeasures. He also says that he can make the large bronze sculpture that Ludovico craves. Leonardo mentions his skill as a painter only in passing.
- Although Leonardo may have been stretching the truth a bit in this letter, his strategy worked. By 1482 or early 1483, Leonardo was a member of Ludovico Sforza's court.

Renaissance Milan

- Milan was quite different from Florence. It had a population of about 150,000, more than double that of Florence, making it one of Europe's largest cities. Situated in the Po Valley in northern Italy, it was the gateway between Northern Europe and the Italian Peninsula.
- Founded perhaps as early as 600 B.C.E. and conquered by the Romans in 222 B.C.E., its location made it strategically lucrative, and it changed hands constantly during the Middle Ages, finally gaining sovereignty at the end of the 12th century.
- At the close of the 14th century, the city was under the control of the despotic Visconti family. The last Visconti died without an heir in 1447, setting off a scramble for succession. The eventual victor was the husband of an illegitimate daughter of the last Visconti, a knight named **Francesco Sforza**.
- Francesco Sforza spent a couple of years cobbling together both an alliance of foreign supporters and Milanese followers to secure his claim. Among those allies were the city of Florence and Cosimo de' Medici.
- Francesco was succeeded by his son, **Galeazzo Maria Sforza**, who governed for 10 years with an iron fist. In 1476, he was assassinated by three of his own court officials, and rule fell to his seven-year-old son, **Giangaleazzo Sforza**.

- The boy's mother tried to serve as regent, but she was outmaneuvered by her brother-in-law, Ludovico Sforza. Ludovico became regent in 1480 and duke in 1494 when his nephew mysteriously died—either from syphilis or from poison.
- Ludovico was not as crude as his older brothers. He had a more rounded humanist education and understood the importance of the people's welfare for a healthy economy. In other words, Ludovico Sforza had all the makings of a Renaissance prince.

Leonardo's *Madonna of the Rocks*

- One of the perks of working for Ludovico was that Leonardo was able to accept commissions from other patrons as long as they did not interfere with his day job. One such commission was with a confraternity called the Oratory of the Immaculate Conception.
- The confraternity contracted with Leonardo and two other artists to create a three-part altarpiece for the Church of San Francesco Grande. Leonardo was to produce the central picture on the theme of the Immaculate Conception—the sinless conception of the Virgin Mary by her mother, Saint Anne.
- True to form, Leonardo never completed this commission, but we believe it was the painting now found in the Louvre and called the *Madonna of the Rocks*.
- Mary kneels in the midst of a darkened landscape, before a grotto, embracing a kneeling child John the Baptist, who presses his hands together while gazing at a second infant. The second child, Christ, sits on the ground and elevates two fingers of his right hand in blessing toward John.
- Behind Christ kneels a fourth figure, an angel who looks back at us while pointing toward John. Mary's left hand hovers over the angel's finger, which also means it is rounded over Christ's head.

- Mary is youthful, dressed in a garment colored with lapis lazuli. She does not tend to Christ but John the Baptist—imbued with the Holy Spirit but not fully cognizant of what he confronts.
- The angel may be Gabriel, who announced to Mary her conception of Christ, or Uriel, reputed to have looked after John the Baptist. The angel looks at us and points to John the Baptist because he wants us to emulate his piety.
- The mystical landscape may symbolize the immaculate qualities of Mary and her sinlessness. Tenebristic effects permeate the entire picture. Classical composition appears in force, but Leonardo also implies that this frozen moment is about to break.

The History of the *Madonna*

- For some reason, the picture Leonardo produced failed to satisfy the confraternity, and they rejected it. This triggered a legal battle between the artist, who claimed he had fulfilled the contract, and the patrons, who demanded a new picture.
- No one is sure what happened to this picture next. Ludovico Sforza may have purchased it from Leonardo and presented it as a gift to Holy Roman Emperor Maximilian I on the occasion of his wedding to Ludovico's niece, Bianca, in 1494, but it essentially disappears until 1625, when it emerges in the collection of the French government.

Names to Know

Colleoni, Bartolomeo (1400–1475): Knight, mercenary soldier, and military leader who fought alternately for the Milanese and the Venetians. Colleoni's will stipulated that a monument to him be erected in the city of Venice. Andrea del Verrocchio was commissioned to produce the equestrian statue in his honor, and the finished product was installed in 1496.

Sforza, Francesco (1401–1466): Italian knight, mercenary soldier, and husband of Biana Maria Visconti. When his brother-in-law—Filippo Maria Visconti, duke of Milan—died without a male heir, Francesco claimed the throne. After a four-year war to determine the rightful ruler, Francesco was installed as the autocrat of Milan. His sons—Galeazzo Maria and Ludovico—forever worried that their father’s method of attaining power was illegitimate, thus stained their own regimes.

Sforza, Galeazzo Maria (1444–1476): Known primarily for his cruelty, Galeazzo Maria Sforza inherited the throne of Milan from his father, Francesco, in 1466. His reputation as a bully, extortionist, and rapist helped forge an alliance of his enemies, and he was assassinated by members of his own court in 1476.

Sforza, Giangaleazzo (1469–1494): The legitimate and rightful heir to the throne of Milan after the assassination of his father, Galeazzo Maria, Giangaleazzo was outmaneuvered by his uncle, Ludovico, for control of Milan. He died at the age of 25, perhaps from poison.

Sforza, Ludovico (1452–1508): Leonardo’s patron from 1482 to 1499, Ludovico Sforza came to power by wresting control from his sister-in-law, who was acting as regent on behalf of her infant son (who had inherited the throne of Milan after the assassination of Galeazzo Maria Sforza in 1476). Ludovico served—without official title—as the ruler of the city until Maximilian I made him duke of Milan in 1494. Ludovico was chased from Milan by a French army in 1499 and, after a brief return to the city the next year, was captured and imprisoned by them.

Suggested Reading

Nicholl, *Leonardo da Vinci: Flights of the Mind*, pt. 4.

Shearman, “Leonardo’s Colour and Chiaroscuro.”

Stites, *The Sublimations of Leonardo da Vinci*, chap. 10.

Leonardo at Court—*Portrait of a Musician*

Lecture 11

Leonardo may have been a breath of fresh air at the Milanese court. His work was admired by many of the city's elite, as well as its duke. In this lecture, we will examine how the Italian elite lived during the High Renaissance and how that affected the life of an artist like Leonardo, as well as some of the works that Leonardo painted for his patron and for others at this time. We will also see how he began to influence Milanese art the old-fashioned way—by taking on apprentices.

Leonardo's Reception in Milan

- Leonardo's early works in Milan must have come as something of a shock to the local cultured elite. Northern Italian painting was heavily influenced by traditions forged in Milan, Bergamo, and Venice, which differed dramatically from the approach of Leonardo.
- Works produced in Milan in the 1470s and 1480s depended on balanced compositions that extended from a core axis. These painters took the interest in symmetry to the extreme.
- Leonardo preferred to hide elements from his audience until they were ready to be shown, and he was not afraid to make his viewers work a little to see the secrets he had planted in his paintings.
- Leonardo's pictures have an air of sophistication and drama that no one else could replicate, thanks to his employment of oil paint and his deep appreciation for the power of tenebrism.
- As he settled into the court of Ludovico Sforza and started to make friends and influence other artists, Leonardo did seem to reinvent himself a little and step out of the traditional Florentine mind-set.

- For the rest of the 1480s, Leonardo's productivity would slow down. He would average about one painting every two years, although he always had more than one work in progress at a time.
- Leonardo routinely found himself juggling a wide range of unrelated projects, which made it difficult for him to concentrate on his art. His use of oil paints contributed to his deliberate style, encouraging experimentation with the possibilities and limitations of this new medium.
- One of the requirements for a successful career as a **courtier** was the ability to socialize. Despite his modern reputation for aloofness, Leonardo actually seems to have done this quite well.
- Leonardo initially set his sights on setting up a workshop. He hired a small group of assistants to help him with his various projects and even took on a couple of apprentices. Therefore, not every work attributed to Leonardo during his stay in Milan was done by him alone.

Leonardo's *Portrait of a Musician*

- The process of setting up his workshop and getting to know his colleagues at court merge in the painting known as *Portrait of a Musician*, which is quite small at roughly 18" × 13" and painted in oil on walnut, rather than the usual poplar. It currently resides in the Pinacoteca Ambrosiana in Milan.
- Leonardo adopts a Flemish style and approach to portraiture here. The figure is located in a completely darkened space, illuminated only by brilliant light. He wears a simple yet elegant fur-trimmed garment and the red hat of a scholar. He holds in his right hand a small parchment containing notes on a staff and the nearly illegible inscription, "CANT. ANG."

- The painting reminds us somewhat of *Ginevra de' Benci*: the twist of the body, the inclusion of the torso all the way down to the abdomen, and the iconographic reference to the sitter's identity. Just as familiar are the tremendously accurate details he includes, like the delicate fingers, the carefully painted musical notations, and the delicately painted facial features.
- Despite its many overt Leonardo-like qualities, most scholars believe this picture was a collaborative effort. Leonardo was responsible for the face, hair, and hand. His assistants were in charge of costume, background, and parchment, and one named Giovanni Antonio Boltraffio was responsible for most of that. This might explain the rigid pose of the figure and the unusually flat quality of the fabric.
- The image of the sitter has no specific marks to indicate his precise identity, but specialists have identified two candidates: The first is Atalante Migliorotti, one of Leonardo's own assistants reputed to have been one of the finest musicians of the day.
- The second and more likely sitter is a Milanese composer named Franchino Gaffurio. Gaffurio was named the conductor of the choir in the Milanese Cathedral in 1484. He was also a friend of Leonardo. Among Gaffurio's earliest works was a liturgical piece entitled “Angelicum ac divinum opus,” which conforms to the faint letters appearing on the parchment: “CANT. ANG.” may be seen as an abbreviation for *cantor angelicum*, or “singer of the Angelicum.”

The Royal Courts of Renaissance Italy

- Ludovico Sforza was like most of the other noble autocrats who governed the city-states of the Italian Peninsula, and his court was like their courts. Naples had a large and vibrant court, with connections to Spain and France. The papal court in Rome was growing in power and prestige in the late 15th century, and by the early 16th it could claim prominence in Italy.

- Smaller cities like Mantua, Ferrara, and Urbino were similarly governed by dukes, who had been awarded their territories by either the Holy Roman Empire or the papacy. The courtly culture that Leonardo entered was quite different from republican Florence, despite the presence and influence of the princely Medici family.
- Courtly life revolved around the singular figure of the duke—powerful, educated, pulled in multiple directions, and often only one or two poor decisions away from total annihilation. A duke usually had a soldier's mentality and thus sought quarters that afforded him the ability to keep horses, ride them across his estates, and hunt game. He was attended by hundreds of servants, advisors, mistresses, salaried employees, and scholars collectively referred to as courtiers.
- The courtiers' duties were—in this order—to make the duke happy; to preserve (or improve) their own status; and to secure the vitality of the duchy at home and abroad, including the maintenance of the armed forces. They also designed and staged displays of opulence befitting a head of state—jousts, processions, and ritual performances of humility and benevolence.
- Courtiers promoted the power and magnificence of the prince through verse, music, art, or architecture. In Milan, this included building and maintaining the remarkable Castello Sforzesco. Leonardo's drawing of it from the mid-1480s gives us a sense of its dimensions and character.
- Courtiers made sure the population was fed enough to keep them happy. They made sure that insurrection and treachery were kept at bay. They prepared for the next generation of rulers and tried to secure the royal lineage.

- Many of us today have a perception of a royal court as a center of decadence, frivolity, and waste. Some of them fell into precisely this category, but the High Renaissance court was a much leaner outfit than the Rococo monstrosity that brought down monarchies in Europe at the end of the 18th century.
- Courts were places of learning, too—15th-century think tanks where scholars convened to produce learned works in honor of their patron. Universities in this period tended to focus on theology, law, and medicine and were deeply conservative. Truly innovative scholars were not found at universities but at a court.
- When Leonardo applied to come to Milan, he was not only looking for work; he was also trying to elbow his way into the company of some of the world's most learned scholars.
- Such a large community required large living quarters, so Italian dukes often lived in a palatial setting outside the capital cities. It was also safer to live some distance from the rabble. Ludovico's palace was connected to a massive monastery in the town of Pavia, about 20 miles outside Milan.
- Whether at the country estate or at Castello Sforzesco in Milan, Leonardo was also placed within a well-defined social structure that was designed to prevent its members from advancing beyond a predetermined station.
- As an artist, Leonardo would be placed squarely among the craftsmen and manual laborers. This may explain why his letter downplayed his training as an artist and emphasized his skills as an engineer, inventor, and statesman, which would elevate his rank.

Leonardo at Castello Sforzesco

- Leonardo was in part responsible for providing decorations for the Sforza family. In this vein, sometime in the 1480s, Leonardo and his handful of assistants were put to work decorating the walls and ceiling of the Sala delle Asse—or Room of the Wooden Panels—in the Castello Sforzesco.
- Surprisingly, the finished work is nothing more than a painted forest of trees, limbs, leaves, and vines—decorative work that may have been executed not by the master’s hand but by an apprentice.
- Despite its apparent mundane quality, there is some symbolic import here: The plants painted on the ceiling are mulberry bushes, which in Italian are known as moro bushes—not coincidentally the nickname of Ludovico Sforzo—Il Moro. The mulberry tree may well refer to a genealogical tree.
- Sometime during Leonardo’s stay there—probably during the very early 1480s—Leonardo was also involved in the design and production of a small work known as the *Litta Madonna*. Only 17" × 13", it was surely a private devotional image.
- The picture was, for hundreds of years, owned by the Litta family of Northern Italy, who claimed to have acquired it from the Sforza. When Tsar Alexander II purchased it in 1865, the image was delicately transferred from its original wood support to a canvas one, which is now in the Hermitage Museum of St. Petersburg.
- This type of Madonna had been extremely popular during the late 1300s and early 1400s, but was waning by the time Leonardo painted it. It shows Mary at her most humble moment—exposing herself to feed her child. These were traditionally called Madonnas of Humility.
- Mary is shown in our now-familiar Leonardesque palace. She turns her body to her right and lowers her head lovingly, watching her baby nurse. Her red gown has been split for this purpose and avoids exposing too much flesh.

- Mary's hair, while braided, has been hidden by tenebristic shadows. Her garment is elegant but subdued; the gold lining is visible only as a hem. This is a more assured Mary than we have seen Leonardo paint before, both in demeanor and in stylistic handling. Christ retains some bulk but is somewhat leaner than in Leonardo's previous paintings. The contours of his head are less puffy, and his forehead is framed by curls.
- The draperies and flesh tones of both figures are beautifully modeled by the dramatic lighting. Two lunette windows provide access to a distant mountain range, beautiful blue skies, and puffy white clouds. But the landscape is not as majestic as those of his earlier Madonnas and does not steal the scene.
- Some art historians have placed this picture earlier in Leonardo's career, pointing to preliminary drawings from around 1481, before he departed Florence. Other specialists look at the awkwardly positioned legs of Christ, the shape and features of his head, the slightly unnaturalistic position of the right breast on Mary's chest, and the ornamental hairpiece that has been added to the more austere drawing and surmise that this is a Milanese work, perhaps even a collaborative effort.
- The *Litta Madonna* may well have been inspired by Leonardo—and probably designed by him—but it was actually painted by his Milanese assistant, Giovanni Antonio Boltraffio, dating this picture to the mid-1480s.
- What does this tell us? First of all, Leonardo was getting commissions, large and small, in Milan soon after his arrival there in 1482. This suggests that Leonardo was making friends with colleagues at court and collaborating with other artists.
- The kinds of works Leonardo produced in the 1480s reveal that his clients were well-to-do, cultured, and adventurous. By hiring Leonardo, they were trusting a newcomer to produce images that cost a lot of money.

- Leonardo gradually altered the standing perceptions that his contemporaries held about artists and craftsmen. He picked his clients and his projects with care and always had projects on hand that allowed him to do something a little different. For a mind as curious as Leonardo's, that was worth more than his stipend.

Important Term

courtier: A member of a noble or royal court, often employed as an advisor, entertainer, or thinker paid to publish scholarly works while in the service of an enlightened patron.

Suggested Reading

Cole, *Virtue and Magnificence*.

Syson, “The Musician in Milan: A Quiet Revolution.”

Leonardo and the Ladies

Lecture 12

Due to the nature of women's lives before the 19th and 20th centuries, their stories are often marginalized in history. Leonardo was an unusual artist in his day for the care and attention he gave to female portrait subjects, treating them with the same care, respect, and interest as he treated men—and the sitters seemed to return that respect in kind. In this lecture, we examine two portraits of women tied to Ludovico Sforza's court and what we can learn about the women, and Leonardo, from them.

***La belle ferronniere*—The Portrait Gazes Back**

- All too often, when discussing courtly life in Europe's most important political and cultural centers, we focus attention on the men who worked there and the princes who were their patrons. Rarely do we think about the women at court—even the queens and duchesses.
- Leonardo, on the contrary, painted portraits of women and produced pictures for their bedrooms, and he did so in ways that make him sympathetic to their lot in life and to the aspirations and dreams that they may have had.
- This ability to communicate and work with the women in his world netted Leonardo some results that are to this day considered some of the very finest personality studies ever produced.
- During Leonardo's first few years in Milan, the entire genre of portraiture in Italy was altered irrevocably. This first indication of this change is the portrait known as *La belle ferronniere*, which is often translated as *The Iron-Monger's Beautiful Daughter* (or *Wife*).

- The sitter, beautifully attired in a crimson gown embroidered with silk, angles her body to her right, in profile, yet she turns her head to face us. She sits behind a ledge that partitions our world from hers, playing on the idea of a painting as a window into a space. Her confrontational gaze is one of the most penetrating in the history of early modern portraiture: The sitter does the looking; the viewers feel the burden of being watched.
- The setting is nondescript, save for the marble ledge, suggesting the sitter's elevated status. The woman is spotlit in a sea of darkness, allowing us to focus on her face, her costume, and arguably her thoughts.

Who Is *La belle ferronniere*?

- We know nothing about the identity of the sitter, the date of the picture's production, or for certain that Leonardo was the portrait's author. The traditional English translation of the French title implies we are looking at a woman of common birth who caught the attention of a wealthy patron.
- However, the word *ferronniere* could also refer to the slender strap that holds the woman's hair in place, an ornament that was particularly popular in Milan at the time of Ludovico Sforza's reign. This suggests that the sitter was a stylish member of court. Most scholars gravitate toward the latter interpretation.
- Her specific identity is more difficult to discern. The painter has given us no clues, but Ludovico Sforza, if he was the patron of this picture, would not pay good money for the depiction of just anyone.
- Could she be Ludovico's wife, **Beatrice d'Este**? Other pictures of Beatrice do not compare to the features of this woman. This leads scholars to believe this sitter was one of Ludovico's mistresses, of whom we know three by name:
 - Bernardino de Corradis, who bore Ludovico a daughter named Bianca Giovanna in 1482;

- A 16-year-old girl named **Cecilia Gallerani**, who replaced Bernardino in the late 1480s and bore his son Cesare; and
- Lucrezia Crivelli, about whom we know very little.
- Based on stylistic grounds, the picture was not produced during the period when Bernardino enjoyed Ludovico's affections. The sitter also cannot be Cecilia, whom Leonardo captured in a different picture.
- It could be Lucrezia. Confirming this suggestion are three poems written at court in praise of a picture of Lucrezia by Leonardo, each written in the late 1490s—just about the time this portrait was probably painted.

Women in Renaissance Italy

- Women played an important role at Ludovico's court, although by today's standards it was decidedly limited, limiting, and even humiliating. We occasionally find records of women in Renaissance Italy receiving a humanistic education, training in their father's workshops, or participating in matters of state, but these are anomalies.
- Women who did work for a living in Renaissance Italy often focused their energies on a fairly set group of professions: sewing, weaving, childcare, and domestic servitude among legitimate enterprises; thievery and prostitution in the underworld. A woman of nearly any class was expected to care for the home of her husband.
- Courtly women were spared some domestic duties, although certainly not all of them. They did not engage in manual labor but did participate in childrearing, maintenance of living quarters, and on occasion the crafting of policies composed by their husbands.

The Women of Ludovico's Court

- Beatrice d'Este was probably not politically influential. She was betrothed to Ludovico in 1480, when she was five years old, and she married him—sight unseen—in 1491. When she died in 1497 at only 22, she was known for her interest in clothes and parties, although recent scholarship has suggested that Beatrice was growing into her role as duchess when she passed away.
- It did not take Beatrice long to discover that her husband had not only been living with a string of mistresses but was still seeing his most recent lover despite their marriage. This was Cecilia Gallerani, and she was a formidable rival.
- Within a few months of this discovery, Beatrice forced Ludovico to marry Cecilia to a local count named Bergamino. Bergamino received a massive cash payment and an enormous palace along with his bride.
- Cecilia was the daughter of a Milanese courtier, and she had been promised in marriage to a local nobleman at the age of six. This betrothal didn't last; in 1487, as a 14-year-old, Cecilia sued to annul her union for undisclosed but apparently compelling reasons. Within two years, Cecilia was sharing Ludovico's bed.
- Cecilia was well educated in Latin, she was a poet of some skill, and she was a young woman of pronounced physical beauty. She likely appealed to Ludovico not only for her appearance but her intellect. The two seem to have been quite close and their attachment to one another genuine and faithful.

The Woman with the Ermine

- As with the portrait of Lucrezia Crivelli, we know that Ludovico hired Leonardo to produce this portrait of Cecilia because members of Ludovico's court knew the painting and wrote about it in verse.

- The poem by **Bernardo Bellicioni** notes the artist's interest in nature and also recognizes that paintings, like poems, live a life that outlasts those of their producers.
- In this small painting, only about 21 inches tall, the subject is depicted in half-length. She emerges from darkness, with highlights illuminating her torso and head. Leonardo has avoided the static solution of a pure profile or directly frontal position; instead, she twists her torso at an angle that allows us to see both shoulders, her bared neck, her modest costume, and her elegant presentation.
- With curved fingers, the sitter strokes the back of a small, white ermine, a symbol of chastity and good faith. The Greek word for ermine is *galé*, so the creature is also a pun on Cecilia's surname, Gallerani.
- Assuming the sitter is Cecilia and the painting was commissioned by Ludovico, we have a **terminus post quem**: Cecilia became Ludovico's mistress in 1489. If Bellicioni's poem refers directly to this painting, we also know Leonardo painted it before 1492.
- Some scholars speculate the painting dates to sometime between September 1490, when Cecilia and Ludovico learned that she was carrying a child, and March 1491, when Cecilia would have begun to show telltale signs of pregnancy that do not appear in the image. It is inviting to think of the ermine in Cecilia's arms as a surrogate for the expected infant.



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Cecilia Gallerani is now the assumed sitter of *The Woman with the Ermine*.

Mutual Respect

- *The Woman with the Ermine* has something of a history. In April 1498, **Isabella d'Este**, the erudite sister of the now deceased Beatrice Sforza and duchess of Mantua in her own right, wrote to Cecilia Gallerani.
- Isabella d'Este was one of the most prescient art aficionados of the day. In her letter, she asked Cecilia to borrow the portrait of her by Leonardo for a short period. Isabella wanted to inspect its quality through a comparison with works by the contemporary master Giovanni Bellini.
- Cecilia agreed but added rather humbly, “I would send it with greater pleasure if it were more like me. But your highness must not think that this is due to any defect in the master himself … I have since changed completely.”
- Isabella d'Este received the loan, inspected it, and returned the picture to Cecilia the next month. We believe it never left the owner's possession for the rest of her life.
- These stories, pictures, and poems about leading women in the courtly communities of Renaissance Italy tell us a lot about their cultures and Leonardo's place within them.
- Although he never wrote about relationships with women, he clearly knew and respected those at the Sforza court and worked hard to capture their physical beauty and personal sensibility. Leonardo treated his female subjects with precisely the same deference he showed his male sitters.
- Leonardo knew the most powerful and influential women in the court of Milan, earned their trust as he painted them, and became so well respected by them that they traded his pictures back and forth. He treated women well, and they returned the favor by elevating him to the ranks of genius before he had reached his 50th birthday.

Important Term

terminus post quem: Latin term meaning “completed after this date.”

Names to Know

Bellincioni, Bernardo (1452–1492): Poet and humanist favored by both Lorenzo de’ Medici and Ludovico Sforza. Bellincioni wrote plays and sonnets for the entertainment and edification of the Milanese court. Leonardo designed stage sets for his theatrical pieces, and Bellincioni mentioned Leonardo by name in his poems.

d’Este, Beatrice (1475–1497): Beatrice was the daughter of Ercole d’Este, the duke of Ferrara, and the sister of Isabella d’Este. In 1491 she was married to Ludovico Sforza and spent the rest of her short life learning the ways of courtly life in Milan.

d’Este, Isabella (1474–1539): One of the day’s greatest art connoisseurs and collectors, Isabella d’Este was the daughter of the prince of Ferrara and the wife of Francesco Gonzaga, the duke of Mantua. She was noted for her literary eloquence and her avid love of painting, and she went to great lengths to procure works from the day’s most important artists. Well-educated and articulate, she also went on diplomatic missions of great sensitivity and counted as friends and confidants some of Europe’s most important political and intellectual figures.

Gallerani, Cecilia (1473–1536): The aristocratic mistress of Ludovico Sforza during the late 1480s and early 1490s. The subject of Leonardo’s *Woman with the Ermine*, Cecilia was Ludovico’s favored consort even after his marriage to Beatrice d’Este in 1491, and she bore him a child in 1491. Under pressure from Beatrice, Cecilia was later married to a local count and left the Sforza court permanently.

Suggested Reading

Grabski and Walek, eds, *Leonardo da Vinci (1452–1519): Lady with an Ermine*.

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*, chaps. 2–3.

Syson, “Beauty and Love: Leonardo’s Portraits of Women.”

Threats to the Italian Renaissance—The 1490s

Lecture 13

The 1490s was one of the most tumultuous and exciting decades in modern history. Europeans learned of the existence of two new continents, endured the excesses of the Borgia papacy, learned of the political appetites of the new French nation state, and grappled with the apocalyptic fears of the year 1500. To understand Milanese life—and Leonardo's work—in this exciting decade, we must also understand European life as a whole.

A Decade of Change

- The 1490s was central in the career of Leonardo da Vinci. It was a decade of astonishing creativity for him across an enormous number of fields. But it was also one of the most exciting and tumultuous decades in the history of early modern Italy.
- France and the Holy Roman Empire expanded their territorial possessions within Europe; Portugal and Spain were racing across the seas to acquire new colonial footholds. No comparable consolidation of power emerged within Italy, however.
- On the peninsula, the papacy almost destroyed itself due to unprecedeted acts of corruption, pettiness, and political stupidity. And the Italian vortex of it all—geographically, strategically, and (for a brief time) culturally—was Milan.

The Holy Roman Empire

- In the 15th century, the Holy Roman Empire was a confederation of independent German and Austrian principalities led by a prince known as the German elector. This leader, from 1452 to 1493, was Frederick III.

- Frederick consolidated territories held by his relatives in Austria and acquired parts of France and all of the Netherlands through the marriage of his eldest son, **Maximilian I**, to Mary of Burgundy in 1477. Their marriage was happy but short lived; Mary died in a riding accident in 1482.
- Mary's passing coincided with Frederick's decision to share the governance of the empire with Maximilian. Maximilian proved his worth and was given the honorary title of king of Romans in 1486.
- On Frederick's death, Maximilian inherited an empire that included not only Austria, southern Germany, the Netherlands, and Burgundy but also small sections of Italy. In 1494, Maximilian looked to solidify his position south of the Alps by means of marriage to Bianca Sforza, a niece of Ludovico Sforza. This marriage would later provide Maximilian and his heir with a legitimate claim to Milan.
- In return for his niece's hand, Ludovico received Maximilian's official recognition as duke of Milan—a position Ludovico had held for over a decade without the title.
- Around this time, Maximilian met Leonardo and received one of his paintings as a gift from Ludovico—perhaps a *Madonna*.
- Ludovico celebrated his new legitimacy by commissioning tombs for the Sforza family in a new church designed in part by Donato Bramante. The church would soon be decorated with *The Last Supper*.

The Rise of France

- No power figure in the modern era has ever been able to reign without rivals, and since the early Middle Ages, Germany's traditional rival has been France. Such was the case in the late 15th century.

- The ruler of France in 1490 was King **Charles VIII**. Born in 1470, Charles had acquired the crown as a teenager in 1483 and quietly worked with his advisors to acquire territories through marriage to Anne of Brittany in 1491. With the exception of Burgundy, Charles controlled most of what we now consider France.
- Charles recognized that the Maximilian was poised to encircle him to the south. But he also knew that few other Italian princes wished Maximilian to be perched on their soil.
- Due to some obscure family ties, Charles had a vague claim to Naples, then officially under the control of a Spanish Duke named Alfonso II. But Alfonso was feuding with the pope, **Alexander VI**, and with Ludovico Sforza.
- Charles got Ludovico and Alexander—who were not fond of each other—to jointly invite French forces onto Italian soil to take Naples from Alfonso. But each of them also secretly hoped that Charles would find a way to destroy the other.
- Charles turned out to be much more than Ludovico or the pope had bargained for. His 25,000 troops made their way to Florence, briefly besieged the city, and inspired an uprising that resulted in the ousting of its Medici ruler—the son of Lorenzo the Magnificent, Piero de' Medici.
- Florence, the traditional center of the Renaissance, would fall under a dark shadow for the next three years under **Fra Girolamo Savonarola**, a Dominican friar who sought to stamp out corruption by condemning the literary and artistic achievements of the Renaissance.
- The French continued south, and Alexander became alarmed, for he realized that Charles was in cahoots with Milan and was now making a beeline for Rome. Charles's troops swept into Rome, forced Alexander into hiding, and claimed the city as a French territory. They then moved on to Naples and ousted Alfonso.

The League of Venice and French Reprisals

- With the delicate balance of power in Italy in shambles, Alexander began what would become papal policy over the next 60 years. He formed a league of ambitious rivals to expel a foreign invader from Italian soil.
- Called the League of Venice, the group included the Republic of Venice, Maximilian's Germanic principalities, Ludovico Sforza's Duchy of Milan, and recently unified Spain. The league pushed Charles out of Naples in 1495, and the French beat a hasty retreat home.
- Charles's bitterness would be amplified in his successor, **Louis XII**, who came to power in 1498, especially since Louis had ancestral ties to the dukes of Milan that the Sforza had ousted.
- Louis invaded Milan in 1499. Ludovico was forced to flee the city, and many of his courtiers followed him into exile. But Leonardo, who had completed *The Last Supper* just the previous year in 1498, left Milan a few weeks after French forces occupied it.
- For the next several years, Leonardo would make his way across northern Italy, meeting with various princes and politicians who were interested in picking his brain and profiting from his expertise in multiple fields.
- As for Ludovico, his allies turned on him, and he was forced to plot his return from exile in the court of Maximilian using mercenaries, without the aid of his former Italian allies.
- Louis continued down the Italian Riviera as far as Genoa. Ultimately, he failed to reach Naples and failed to hold most of his conquests. He did retain Milan, despite Ludovico's brief return in 1500. Ludovico was forced into exile permanently and died inside a French dungeon, miserably, in 1508.

The Borgia Papacy

- The papacy itself was also contributing to Italian instability in more ways than one. Alexander VI was pope from 1492 to 1503. He was one of the most corrupt and villainous creatures in European history. Born in Spain in 1431 with the name Rodrigo Llancol, he is better known by his mother's surname, which he used in his adult life—Borgia.
- His uncle Alfonso was elected Pope Calixtus III in 1455. Through this patronage, Rodrigo rose through the ranks of the church hierarchy and served five different popes across three decades in a variety of administrative capacities. This brought him extraordinary wealth and tremendous power.
- A notoriously insatiable sexual animal, Rodrigo sired no fewer than seven children with various mistresses. Four were with a courtesan named Vannozza dei Cattani, including two whose names are synonymous with reprobation—**Lucrezia** and **Cesare Borgia**.
- Alexander plundered the papal treasury, sold favors to the highest bidders, and opened the borders of Italy to rapacious foreign powers. He extorted and blackmailed the wealthiest families in Rome—who might be considered potential enemies—using his son Cesare as his main enforcer.
- Memories of Alexander's papal entitlement would become a trigger for the Protestant Reformation. Alexander's foreign alliances also opened a Pandora's box in Italy: France, Austria, and Spain had learned how to divide and conquer the Italian Peninsula.
- Alexander died of a fever in 1503. Cesare spent the last years of his father's papal reign rampaging through the eastern coast of Italy in an effort to win a dukedom. One of his employees at this time was Leonardo.

The New World

- Spain benefitted from Alexander's papacy but paid little attention to Italy during this decade. Instead, Spain expanded the European rivalry to the sea.
- Spain and Portugal had realized that the fall of Constantinople in 1453 had made it harder to access trade routes to the Middle East and beyond via land. Thus both increased their efforts to open trade routes to India and beyond via the sea during the latter half of the century.
- These were expensive ventures in terms of both equipment and expertise. The voyage via the African coast was long, and the ships—called **caravels**—were poorly designed, nearly rudderless, and utterly unnavigable.
- After falling behind the Portuguese, the Spanish monarchs Ferdinand and Isabella agreed to fund a proposal to sail westward across the Atlantic to India made by an Italian navigator named Cristoforo Colombo, or **Christopher Columbus**. Columbus based his idea on the work of a Florentine mapmaker named Paolo Toscanelli.
- Columbus, of course, succeeded, and news of his expedition captured the imagination of Europeans, as well as sparking the 15th-century equivalent of the space race. Spain and Portugal quickly announced that their investments in navigation and exploration gave them claims to these newly discovered lands.



Columbus's arrival in the New World was revolutionary for the Old World as well.

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Leonardo's New World

- All of this affected Leonardo, shaping his view of the world and the decisions he made at critical moments in his career. Because he sold his services to military men, anything that affected the balance of power in Europe so profoundly would have an effect on his choices.
- Many of the people at the forefront of these changes were either direct or indirect patrons of Leonardo's work: the Medici, the Sforza, and the Borgia certainly, possibly the Holy Roman Emperors, and in later years the French monarchs.
- Leonardo could not have been immune to the extraordinary news of the discovery of the New World. It was the biggest bombshell of the era, and it altered the foreign and domestic policies of every major political power in the continent.
- As usual, Leonardo failed to write his personal reflections on the events of the day. But it is reasonable to assume that the voyages of Columbus and other explorers would have confirmed in Leonardo's mind everything that he suspected about the endlessness of human intellectual possibility. Leonardo's most adventurous period of experimentation began now, with the discovery of a New World abroad, combined with unprecedented threats at home.

Important Term

caravel: A sailing vessel used by navigators and explorers in the 15th century.

Names to Know

Alexander VI (a.k.a. **Rodrigo Borgia**; 1431–1503): Pope and son of Spanish nobility. Alexander was the nephew of Pope Calixtus III and rose through the ecclesiastical hierarchy as a cleric and administrator in Rome. Notoriously ambitious and prone to prodigious (and lecherous) vices, Rodrigo bribed and bullied his way to the papal throne in 1492. He extorted and embezzled funds to support his insatiable appetites, funded his children's rapacious military exploits in eastern Italy during the late 1490s and early 1500s, and

shortsightedly invited both French and Spanish troops onto Italian soil to undermine his political enemies. To this day, Alexander VI is considered among the most corrupt figures in modern European history.

Borgia, Cesare (1475–1507): Known during his lifetime as “the wickedest man in Italy,” Cesare Borgia was made a cardinal by his father, Rodrigo Borgia (Pope Alexander VI), when he was only 18 years old. He resigned that office in 1498 to pursue political and military ventures and, with his father’s blessing and assistance, attempted to conquer lands in eastern Italy and create a duchy for himself. His reputation for duplicity, brutality, and murder earned him the fear and respect of his contemporaries, including Machiavelli and Leonardo da Vinci. He was expelled from Italy by his father’s successor, Pope Julius II, and died on the battlefield outside Viana, Spain, in 1507.

Borgia, Lucrezia (1480–1519): Daughter of Rodrigo Borgia (Pope Alexander VI), Lucrezia carried a reputation for wantonness and promiscuity that has lasted to this day. She was married to a string of Italian princes and was the mistress of Francesco Gonzaga, who was the duke of Mantua and the husband of Isabella d’Este. She is known to have given birth to at least eight children, although a number of others born out of wedlock have also been assigned to her.

Charles VIII (1470–1498): French king of the Valois dynasty who led a military campaign into Italy in 1494 to dislodge Naples from Spanish hands. He succeeded briefly but was forced to retreat back across the Alps by an alliance of European powers that feared the balance of power had tilted too heavily in France’s favor.

Columbus, Christopher (1451–1506): Genoese navigator who sought the support of a variety of European powers as he considered a new route to India. He found favor in the Spanish court of Ferdinand and Isabella, and in 1492 he led the first of four voyages that resulted in his accidental landing on islands in the Caribbean Sea.

Louis XII (1462–1515): A French king of the Valois-Orleans family and distant cousin of Charles VIII, Louis XII took control of France in 1498 after Charles died from a brain hemorrhage caused by a fall at a tennis match—and after Charles’s wife, Anne, agreed to marry Louis in an act of political unification. In 1499, Louis invaded Italy and conquered Milan, which resulted in the expulsion of Ludovico Sforza and the departure of Leonardo da Vinci.

Maximilian I (1459–1519): Holy Roman Emperor of the Hapsburg dynasty, Maximilian was the son of Frederick III and in 1493 inherited his father’s title as Holy Roman Emperor. In 1494 he married Bianca Sforza, Ludovico Sforza’s niece, which gave Maximilian and his descendants a claim to Milanese territories in later years. Although not known for his accomplishments on the battlefield, Maximilian was a gifted and savvy politician who expanded the territories of the Holy Roman Empire. When he died, his grandson Charles V was able to transform the power and wealth that Maximilian had accumulated into the largest and most potent international force of the early modern period.

Suggested Reading

Burke, *The Italian Renaissance*.

Martines, *Power and Imagination*, chaps. 12–14.

Phillips and Phillips, *The Worlds of Christopher Columbus*.

Leonardo the Inventor and Engineer

Lecture 14

Leonardo was more than simply one of the greatest painters of his generation—as if that were not enough. He was also a brilliant and innovative engineer. In this lecture, we will look at one category of his many scientific explorations: the mechanical devices he designed, many of them military in purpose. The drawings in the Codex Atlanticus reveal that Leonardo was able to conceive, draw, and build unprecedented machines, making him the first engineering genius of the modern age.

Creating the Codices

- Giorgio Vasari's biography of Leonardo focuses on the artist's accomplishments as a painter. Likewise, we have spent much of our time studying the artistic aspects of Leonardo's life, but these are only one facet of his overall output as a thinker and a creator.
- Leonardo's official title at Ludovico Sforza's court was "painter and engineer," and he was expected to assist in a wide range of other projects, from military inventions to civil engineering. During this period, he produced an enormous number of scientific and technical drawings, now gathered in the Codex Atlanticus.
- More than 7,000 pages of Leonardo's notes and drawings survive, and scholars estimate that this treasure trove represents only about one-third to one-quarter of what his assistants found in his studio when Leonardo died in 1519.
- From his Florentine days, Leonardo experimented with ideas and themes on individual sheets of paper, making notes in the backward writing meant to prevent his sleeve from dragging across the wet ink. But he did not record or file his ideas in any orderly way. It is not uncommon to see three or four or five apparently unrelated ideas crammed onto a single sheet of paper.

- At Leonardo's death, his papers and manuscripts were collected by his assistants, sometimes formed into notebooks that were later broken up and reassembled. The Codex Atlanticus, our main focus in this lecture, was created by the Milanese sculptor Pompeo Leoni (1533–1608) from a number of Leonardo's notebooks.

Draftsman and Engineer

- Leonardo's other papers are scattered around the world. Many of these manuscripts have been around for centuries, and scholars have pored over them to tease out all the secrets they may contain. But once in awhile a new one surfaces, as in 1966 when over 700 pages were discovered in the archives of the Biblioteca Nacional in Madrid.
- One portion of this find, known as Madrid Codex I, includes a draft treatise about machines, what we would today call theoretical and applied mechanics. Its drawings touch on topics like creating power through wheel-and-pinion systems and clock mechanisms.
- Leonardo was intrigued by the specific features of individual mechanisms, but he was consumed by the bigger, broader conceptual principles that governed the way all machines functioned.
- Leonardo tended to work on undated pages whose original order has been lost, so it is difficult to form a chronology of his ideas, but we can detect a fascination with some basic forms and objects. The wheel is chief among them; water and wind frequently occupy his thoughts. The challenge of generating power to provide motion haunted him for decades.
- Without his unequaled skill as a draftsman and observer of the natural world, none of Leonardo's concepts or experiments could have been understood by his readers. Today, we can understand his ideas even without his notes thanks to the accuracy of his drawings.

- Centuries before the advent of the camera, one slight error in the representation of a cog in this wheel, or in the veins and arteries of this internal organ, could significantly alter the conclusions Leonardo or anyone else using his drawings might arrive at. Few today can draw what they see as precisely as Leonardo could.
- One who recognized relationship between art and science, as well as the importance of Leonardo's artistic skill in his science, was Galileo. In one of his early dialogues, Galileo complained about the state of science in his own day, the 17th century, referring to those who "enjoy all the precepts of da Vinci, and yet are utterly incapable of drawing even a stool."

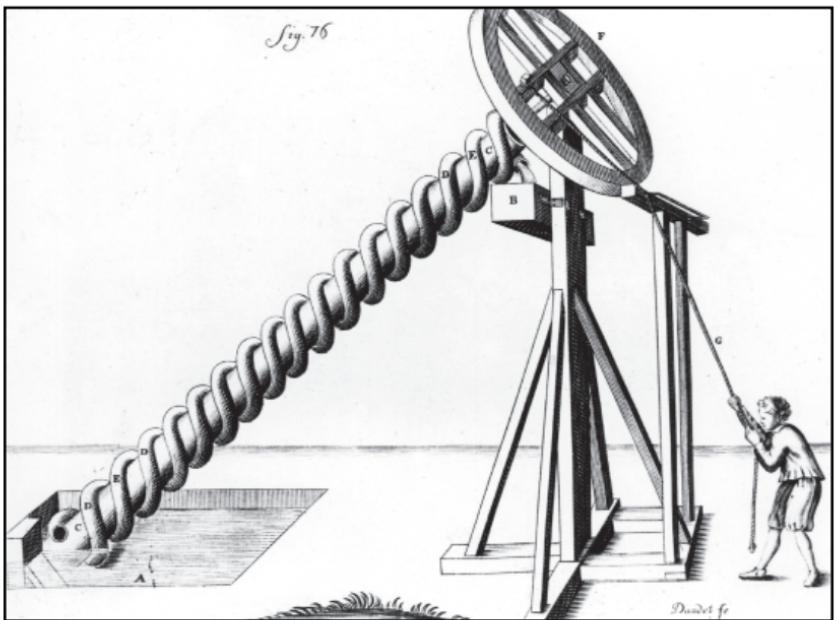
Power and Motion

- Hydraulics, motion, and power were among the topics Leonardo considered, and he made a number of experimental drawings on the subject of harnessing that power. Leonardo annotated some of these drawings, although the verbal descriptions are sometimes clunky.
- One of his wheel and pinion machines was a bridge crane that could lift a drawbridge with wheels turned by enormous cog-edged screws. A machine to raise columns during construction projects was rendered in a similar way. Like many of his ideas, the column raiser was crafted in stages, with each iteration expanding on the earlier ones.
- Leonardo felt that the cog-and-pinion instrument had possibilities for a variety of different uses: a machine to thread screws, a mechanical loom, a needle grinder, and many others.
- Finding ways to generate power for machines like this became something of an obsession for him. This led to such designs as the self-propelled cart. Three wheels support a square frame; springs push and pull the limbs in the front, which crank the axle below.

- The cart was intended for use in theatrical productions to move scenery or props. One of Leonardo's roles at the Sforza court included periodic stints as a set designer, and specialists believe that this cart may have been used in the 1480s and 1490s.

Wheels and Water

- Leonardo was deeply interested in applying his ideas to benefit his patrons. In particular, he believed that getting objects to move like animals would make life simpler, nobler, and more fruitful.
- One of the most interesting intersections of concept and application was his design for a machine that can gauge the velocity of objects—an early speedometer. His machine comprised a series of markers with multiple rotating axes, each one fitted with gearwheels and teeth, spools and spindles. An object's speed could be calculated by the time it took to travel between markers.
- Leonardo devised a similar system for calculating distances traveled—an early odometer. It used the same basic principles as his speedometer.
- Wheels figured prominently in a number of his other designs, too. He designed a wheel-and-screw system to draw water from wells and convey it into homes, a system that would improve both urban and rural sanitation.
- Leonardo designed no fewer than seven machines that might be able to lift water. Some employ gears and wheels, others bellows and pumps, still others levers, and one an **Archimedean screw**. It was not unusual for Leonardo to take multiple approaches to the construction of a single machine.
- The control of water is vital to any society. During the political turbulence of the Renaissance, it was particularly important: Create a constant, dependable supply and you could sustain a massive city indefinitely, even under seige. Cut it off, and you can bring a city to its knees within days.



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Leonardo experimented with Archimedean screws in many of his machines, particularly those designed to move water and soil.

- Aquatic transportation was another vital concern in the Renaissance world, and Leonardo was briefly interested in the problems caused by river beds and canals that were too shallow for boats to pass through or dock in, especially when loaded with cargo.
- Pages from the Codex Atlanticus contain a design for machines to dredge river beds. One is a digging machine fixed between two canoes, or pontoons. Another is a wheel equipped with trowels that can move water out of a flooded region or excavate mud from the sea. The trowels are drawn on the right-hand side of the page, showing how Leonardo liked to break down his machines into their constituent parts.

Did Leonardo's Machines Work?

- We are not sure how many of Leonardo's designs were built during his lifetime. There is no record of most of them having left the drafting table, and no built examples of them survive. However, we have a number of comments from an Italian priest named Giovanni Mazenta, who lived a century after Leonardo, about Leonardo's dredging machines and canal locks and gates being put into use in Milan.
- In recent years, a number of people have built and tested machines based on Leonardo's designs. A number of them work, including the mechanical cart and the column lifter. Most of them do not, either because of their great weight or because the technology to power them did not exist in Leonardo's day.
- Although Leonardo was in Ludovico Sforza's employ when he designed these machines, whether or not Ludovico understood their potential is a matter for debate. Ludovico surely understood Leonardo's importance as an artist, but it seems unlikely that anyone quite grasped the depth of Leonardo's insatiable curiosity.
- Leonardo never tells us the purpose behind his drawings, beyond the obvious. He may have been trying to prove his worth to the duke, to enhance his reputation among his fellow scholars at court, or to support his periodically dire requests for an increased salary.
- Perhaps he was simply feeding his own curiosity. We do not know whether he even showed these ideas to his patron. They may simply have been flights of fancy. Many of the technical drawings from the Milan period became the groundwork for even larger projects that Leonardo took on after his departure from Milan.
- One of his more overlooked qualities that these drawings suggest is Leonardo's utter tenacity. When one idea or approach hit a dead end, he always found a detour. Failure and rejection never bothered him much.

Important Term

Archimedean screw: A large screw that, when turned, pulls both liquids and solids up and out of the ground.

Suggested Reading

Cianchi, Vezzosi, and Stoppato, *Leonardo's Machines*.

Pedretti, *The Codex Atlanticus of Leonardo da Vinci*.

Zammattio, "The Mechanics of Water and Stone."

Vitruvian Man, Perfection, and Architecture

Lecture 15

Leonardo's *Vitruvian Man* is among the most recognizable images in all of Western art. It also neatly summarizes Leonardo's understanding of two scientific disciplines: anatomy and architecture. Building on the work of the ancient Roman architect Vitruvius, Leonardo's observations of the human form influenced his ideas about architectural proportion, and Leonardo's ideas on architecture, like his ideas on painting, had a powerful influence on his contemporaries. Nowhere was this more the case than in Donato Bramante's design for St. Peter's Basilica in Rome.

Leonardo Meets Vitruvius

- Sometime around 1490, Leonardo examined an ancient text written by the Roman architect **Vitruvius** in the time of Emperor Augustus. Vitruvius compiled the principles used in his day to design buildings in meaningful, stable, and aesthetically powerful ways.
- Leonardo took some notes as he read, paying particular attention to Vitruvius's observations on the proportions of the human body:

The measurements of man in nature are distributed in the following manner: A palm is four fingers, a foot is four palms, a cubit is six palms, four cubits make a man's height, a pace is four cubits, a man is 24 palms, and these measurements are in his buildings.

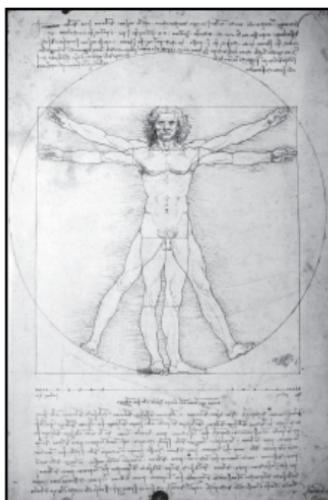
- After sketching out a drawing to show how the human form can be represented according to basic laws of proportions, Leonardo continues

If you open your legs enough that your head is lowered by one-fourteenth of your height and raise your hands enough that your extended fingers touch the line of the top of your head, know that the center of the extended limbs will be the navel, and the space between the legs will be an equilateral triangle.

- He then proceeds to record a long list of measurements and proportions. The figure placed between these two paragraphs is known by many names, among them the *Vitruvian Man*.
- At face value, this drawing shows Leonardo grappling with Vitruvius's rules of proportion. But Leonardo also frames the figure inside a circle and a square—and again the inspiration comes from Vitruvius: The human body is compared to the two “perfect” geometric shapes that serve as the fundamental forms of the natural world and, by extension, the foundation of Roman architecture.

Vitruvian Man—Where Heaven Meets Earth

- The circle was considered perfect because it had neither a beginning nor an end; to Christians, it had the added symbolic meaning of the eternal life. The square represented perfect earthly balance and symmetry, a reference to God’s desire to construct a similarly balanced world.
- In the *Vitruvian Man*, Leonardo references the perfection of these shapes, but he makes one crucial observation that his predecessors did not: He moves the center of the circle higher than the center of the square. This adjustment was needed because the center of your body moves lower as your legs move farther apart.
- The way Leonardo superimposes the shapes is especially profound. Leonardo regarded the human body as a microcosm of the universe as a whole, and the two figures show the heavenly sphere and the earthly square united through humankind. Notice that the circle, being the heavenly domain, is raised above the square.



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Vitruvian Man combines architecture and anatomy.

- This drawing has come to symbolize humanity at our most basic and our most sophisticated. But as we can see from Leonardo's notes on Vitruvius, it is also about architecture. Human proportions not only give us practical units of measurement; they also relate the circle to the square. Leonardo is working out his ideas about perfection, both for the human body as an artistic form and architecture as a reflection of human potential.

Leonardo and Mathematics

- After creating the *Vitruvian Man* in 1490, Leonardo began to produce drawings that showed how this theory of perfection might be used for actual architectural projects that were under discussion in the Sforza court.
- Leonardo's entry into the world of architecture was through the world of theatrical set design. He created vistas that looked like they were receding into the deep distance, when in fact they were produced on flat or nearly flat surfaces, which depended on his understanding of perspective.
- Leonardo's interest in perspective and mathematics probably began during his days in Florence, but deepened during his time in Milan, when he provided illustrations of geometric shapes for a book called *De divina proportione*, written by a fellow Sforza courtier named **Luca Pacioli**.
- The “divine proportion” of the book’s title is what we today call the golden ratio, or phi (ϕ), equal to roughly 1.618:1. This describes several artistically significant shapes, including the golden triangle and golden rectangle.
- The golden triangle is an isosceles triangle with either 72 degree angles at the base and a 36 degree angle at the apex or 36 degrees angles at the base and a 108 degree angle at the apex. This triangle was also the core shape of Leonardo’s classical compositions.

- The golden rectangle is defined as a rectangle whose area is equal to a square plus another golden rectangle. Whether in the frame for a painting or in a pyramidal composition, the ratio of 1.618:1 was thought to be visually perfect.
- The drawings in Leonardo's notebooks reveal his interest in calculating the distance between objects mathematically, without using the crutch of orthogonals. They also show us how Leonardo was inclined to apply calculations of distance to other fields of inquiry.
- One drawing uses mathematical equations and points on a triangle to chart the way the eye interprets objects as viewed from a fixed point and calculate their positions in relation to the self and other objects. The laws of perspective led Leonardo to think about how the eye worked and how light and shadow influenced the way we interpret what we see.

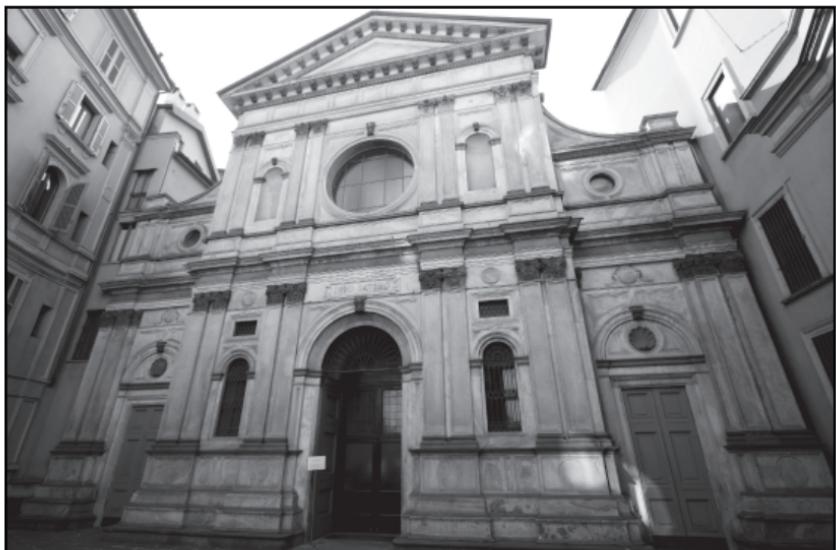
Leonardo the Architect

- Architecture occupied a good portion of Leonardo's 17 years as a Sforza courtier. In 1485, after a Milanese plague, Leonardo drew up plans for an ideal city that would have improved hygiene, reduced overcrowding, and diminished the effects of rampant contagion.
- He created a catalog of Renaissance church designs. He worked on a model for adding a dome to the **Cathedral** of Milan. He was an advisor during the rebuilding of the Cathedral at Pavia. He drew plans for palaces, fortresses, and colosseums.
- Most of Leonardo's architectural drawings were schematic and focused on general principles. He was a theoretician as much as a practitioner, and he liked to spend time considering the “what ifs” and “why nots,” playing with circles and squares in pursuit of an architectural representation of perfection.

- Leonardo's approach can be seen in plans for two separate but related church designs that have a square plan. In each case, the box at the building's center supports a large dome, while smaller half domes, or exedrae, act as buttresses to support the main cupola.
- These designs are based on a traditional medieval **basilica** church, but with one crucial difference. Leonardo understands the **crossing** as the core of the church because that is where Mass was performed. Therefore, the crossing is not rectilinear but a perfect square.

Leonardo and Bramante

- Ludovico Sforza—as ruler of Italy's wealthiest duchy—wanted and needed to mark his territory with new and innovative buildings. Accordingly, he had several architects at court. One of them was a man from Urbino named **Donato Bramante**.
- In the 1470s, Bramante was responsible for the Church of Santa Maria presso San Satiro, a church built in a confined space that abutted a road in the center of Milan. Its design harkens back to antiquity while simultaneously displaying an advanced understanding of perspective and optical illusion.
- Leonardo admired Bramante's work, and the two artists came to work together on some of Ludovico's architectural and cultural projects. One of these, we believe, was the redesign of the Church of Santa Maria delle Grazie.
- The church is designed according to Leonardo's circle-in-a-square composition. Right angles dominate the design and support half-domes at the edges. It has rounded lunette arches, circular oculi, and Roman coffers, according to ancient formal aesthetic conventions.
- A drawing by Leonardo dated to about 1488 in one of the Paris manuscripts appears to be a model for this church. It is perhaps no coincidence that, a few years later, Leonardo would come to paint one of his most celebrated works on its walls. This drawing may be evidence of Leonardo and Bramante in collaboration on this building.



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Donato Bramante's work on the Church of Santa Maria presso San Satiro deeply impressed Ludovico Sforza and made Bramante's career.

- Leonardo's influence on Bramante was deep and long lasting. In 1501, just after both Leonardo and Bramante were forced to flee the French invasion of Milan, Bramante began working in Rome on a small chapel inside a Franciscan monastery called San Pietro in Montorio, also known as the Tempietto. Bramante designed it as a perfect circle, and many elements of its design match a drawing of Leonardo's dating to 1485–1488.
- In 1504, Bramante received a summons from Pope **Julius II** and was commissioned to reconstruct the early Christian church of St. Peter's, which dated to the reign of Constantine the Great. Julius wanted a modern facility inspired by **Neoplatonic** ideas and modern architectural principles.

- Bramante designed this new church not in the traditional **cruciform** layout with a long **nave** but with a **Greek cross** footprint, with four arms of perfectly equal sizes meeting at a circular center—Leonardo’s central plan, but now with a square exterior, a round crossing, and domes placed at strategically important areas.
- Leonardo clearly had an indirect influence on the design for the new St. Peter’s; in fact, his influence may have been more direct. One oddly shaped and undated piece of paper among Leonardo’s drawings contains a small church floor plan on the left side of the page that is remarkably close to the final design Bramante chose for his cathedral.
- It is impossible to say whether or how these ideas were communicated between the two architects, but we can say that Bramante and Leonardo were kindred spirits who shared a philosophy about buildings, spirituality, and the concepts that joined them.

Important Terms

basilica: Any church that has a longitudinal nave flanked by side aisles and terminating in a domed area called an apse. Originally the name for an ancient Roman public building with the same ground plan.

cathedral: From the Latin *cathedra* (“throne”), a church where a bishop has his diocese and official seat.

crossing: The juncture in a church where the nave meets the transept.

cruciform: An architectural term used to describe a church designed in the shape of a cross, formed by a long nave and a shorter, perpendicular transept.

Greek cross: An architectural term for a church plan where each of the four arms of the building is of the same length and width.

nave: The central aisle of a basilican church, extending from the entrance to the chancel.

Neoplatonism: A system that attempted to reconcile the ancient philosophy of Plato and Plotinus with the teachings of Christianity. Developed in Alexandria and other Greek centers in the 3rd century A.D. and revived during the Italian Renaissance.

Names to Know

Bramante, Donato (1444–1514): Painter who made his mark as an architect. Born near Urbino, he worked in Milan during the 1470s, 1480s, and 1490s, where he met and collaborated with Leonardo da Vinci, and then worked in Rome for Pope Julius II, who hired him to design the new cathedral of Saint Peter. Bramante was responsible for the Tempietto and Palazzo Belvedere in Rome.

Julius II (a.k.a. **Giuliano della Rovere**; 1443–1513): Elected pope in 1503, Julius II served in that capacity for a decade. He worked to expel foreign armies from Italian soil and to organize a confederation of states loyal to the pope as a common leader. He also organized one of the most grandiose (and expensive) urban renewal projects in history and brought to Rome three of the day’s greatest artists—Bramante, Michelangelo, and Raphael—to rebuild and redecorate the city.

Pacioli, Luca (1447–1517): Mathematician from Pavia who befriended Leonardo da Vinci late in the artist’s tenure as a courtier in the Sforza court.

Vitruvius (c. 75 B.C.E.–c. 15 B.C.E.): Soldier and engineer in the Roman legions best known for his treatise *De architectura* (*On Architecture*), which articulates the building practices and design theories of antiquity. Vitruvius’s lessons formed the foundation of architectural study during the 15th century, informed Leon Battista Alberti’s approach to Renaissance architecture, and inspired Leonardo’s drawing known as the *Vitruvian Man*.

Suggested Reading

Maiorino, *Leonardo da Vinci: The Daedalian Mythmaker*, chap. 8.

Pedretti, *Leonardo Architect*.

Wittkower, *Architectural Principles in the Age of Humanism*.

Leonardo the Military Scientist

Lecture 16

Leonardo's most important task as a member of the Milanese court, at least from Ludovico's point of view, was to act as the duke's military technician, and his imaginative approaches to defensive technologies are among history's most important innovations. His inventions included a giant crossbow, the tank, and the submarine. Yet as far as we can tell, none of these inventions was ever built, much less employed in battle.

Leonardo the Military Engineer

- On the basis of his writings, Leonardo seems a true intellectual more interested in the life of the mind and human potential than in violence, greed, or power. His paintings evoke the basic power of human goodness and employed a style of sweetness and sensitivity.
- All of this makes it difficult for some to reconcile the brutal and barbaric weapons he designed during his employment with Ludovico Sforza. But we need to remember that both artist and patron were under no illusions about the duties of any courtier, Leonardo included.
- Leonardo's letter of employment list his artistic accomplishments as an afterthought and instead emphasize his engineering skills, including his ability to

[build] strong but light bridges, extremely easy to carry, by means of which you will be able to pursue or if necessary flee an enemy; ... dry up the water of the moats; ... [destroy] every rock or other fortress; ... [design a mortar] most convenient and easy to carry; ... use paths and secret underground tunnels, dug without noise and following tortuous routes; ... make covered vehicles, safe and unassailable, which will penetrate enemy ranks with their artillery and destroy the most powerful troops; ... make large bombards, mortars, and fire-throwing engines; ... make catapults, mangonels, trabocchi; ... [and make] machines for both attack and defense.

- In the Milanese court of 1482, these pronouncements were taken very seriously. Ludovico had good cause to fear enemies within Milan and even within his own court. His brother had been assassinated by his own advisors in 1476, and Ludovico had usurped power from his own infant nephew.

Late 15th-Century Warfare

- Despite our insistence on referring to the 15th century as the Renaissance, daily life in this period was still quite medieval. Diets had not changed much; marriage arrangements and dowries were the same; and educational norms were not different from the preceding age.
- Military tactics, with one important exception, were also grounded in traditions that had been handed down for centuries. Few regions of Europe did not endure some conflict during the 15th century, from small skirmishes to engagements of thousands of troops.
- Most of the armies in this period comprised professional mercenary soldiers. Their services were in high demand, but they were also unpredictable and had no particular loyalties to their employer, only to his gold.
- Fighting styles were still essentially medieval. Infantrymen fought in charges with swords and shields and defended in shoulder-to-shoulder ranks with lances. Knights owned their own horses, and the occasional cavalry attack could break an enemy's line. Battles were chaotic, as depicted in **Paolo Uccello**'s painting *Battle of San Romano* from mid-century.
- Technological advances were modest in this period; the weapons used by most combatants for much of the 15th century were the same as those used in the 12th.



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Paolo Uccello's *Battle of San Romano* offers some idea of what medieval and early Renaissance warfare really looked like.

The Art and Science of the Siege

- Sieges were quite common, and cities were designed with defensive fortifications. If you had a numerical advantage, you might meet an enemy in the field; otherwise, you would more likely withdraw into your town and wait them out. Once the city gates were closed, the population was fairly well protected.
- The aggressor wanted to end this kind of conflict as quickly as possible because the longer he was encamped outside the walls, the harder it was to feed his men, maintain discipline, and fend off disease. Moreover, every day lying in wait was another day paying mercenary soldiers for doing next to nothing.
- City defenses typically consisted of thick stone walls, sometimes surrounded by moats or deep trenches. Some cities had concentric circles of inner defenses that had to be breached one at a time, with stunning losses for the enemy.

- One of Leonardo's earliest projects as a military specialist involved the features of the Castello Sforzesco. Leonardo drew the castle's tower and wall around 1485, concentrating on the fortifications at the corners—which were essential points of firepower—and the position of defenders inside.
- Usually, armies would make a number of frontal assaults on a city, using ladders to surmount the walls. Archers were stationed on the tops of the walls to rain arrows down on their opponents at short range. However, in 1415, English troops at Agincourt used a long-range bow that propelled them farther and faster and more accurately than ever before, and thus was born long-range missile warfare.
- From that point forward, military tactics revolved around finding ways to defeat an army before it could retreat into a city or finding ways to breach the walls of a walled city, rather than climb them. This required heavy equipment, such as catapults that hurled boulders into the walls or firepots and diseased and decaying animal corpses over them.

Gunpowder Arrives in Europe

- One of the great changes in military technology in this period was the adoption of powder-powered guns. Gunpowder had been used in China since the 12th century and was used by the Ottoman Turks in the mid-15th century.
- Early cannon fired nonexplosive projectiles directly at walls and were designed to replace catapults, albeit with longer range and greater force. Mortars, on the other hand, were used to lob shells over tall structures rather than through them, and these often contained antipersonnel explosives.
- Around this time, **harquebus** was designed for use by infantrymen. This early firearm was largely defensive. It was large, extremely heavy, and basically stationary. An infantryman would balance the harquebus on a post and fire it toward oncoming soldiers but rarely carried one through a battlefield as an offensive weapon.

- Although effective for the era, the harquebus was heavy, inconvenient, and spectacularly inaccurate. Eventually, it was developed into the more accurate, more easily carried **blunderbuss**.
- Leonardo's designs for siege-busting machines included ingenious portable bridges set on huge wooden wheels that could be constructed in the field if a forest were nearby. They were designed with covers to defend soldiers from arrows during their approach to a walled city.

Leonardo's Offensive Weapons

- Leonardo's offensive designs are among the most celebrated and influential creations of his career. Were they not so grotesquely diabolical, we might marvel at their beauty.
- Among the most frightening was the human scythe, a horse-driven vehicle equipped with a set of rotating blades that cut down opponents at the knees. The challenge for Leonardo was placing the blades far enough away from the horse and rider so they were not themselves chopped to pieces.
- The scythe's disadvantages were several. Whoever drove the machine would be an immediate target for every enemy soldier; it would be difficult to find any mercenary willing to drive it. It would also be a horrible weapon to let fall into enemy hands in the chaos of battle.
- On the same page as the human scythe, Leonardo conceived a human-powered covered cart powered by cranks churned by soldiers crouching inside a squat in the wooden casing—in other words, a tank. Inside the cart was an array of blunderbusses, pointing in different directions that could be loaded and fired from inside the vehicle.

- Leonardo understood that effectiveness on the field would one day depend not on muscle but on the ability to fire rapidly from a great distance and began to design rudimentary automatic weapons. One machine has cogs that fire multiple arrows, yet could be operated by a single soldier. He expanded on this idea with a weapon featuring 16 guns on a rotating platform.
- Leonardo redesigned contemporary weapons on a massive scale, such as a giant crossbow and an enormous catapult. Both of them threatened to launch, faster and farther than ever before, massive ordnance.
- Leonardo worked on the concept of an unsinkable ship, devising a double-shelled keel that would resist ramming and cannon shot. The exterior keel took the brunt of the damage, but the internal one kept the ship afloat. He even designed a submarine for brief sorties.
- All of Leonardo's designs had serious but similar problems. Most of them, while fascinating from an engineering perspective, would have been prohibitively expensive to make, and the training required to operate them would have necessitated a standing army.
- Another great obstacle was the lack of a compact power source that so many of his inventions, military and otherwise, required. The human body cannot generate enough power to make his inventions move they way Leonardo needed them to. Some of his weapons were too big, and others were too dangerous for their operators. As far as we know, none were ever built or used.
- Yet Leonardo's military vision was remarkably prescient. He anticipated long-range artillery, the tank, the machine gun, and portable bridges. He saw the future of war not mere decades but centuries after his time.

Important Terms

blunderbuss: A small cannon derived from the harquebus.

harquebus: A firearm used by infantrymen standing in a fixed position.

Name to Know

Uccello, Paolo (1397–1475): Early practitioner of linear perspective and the painter of three battle scenes produced in the mid-15th century—each of which illustrates the *Battle of San Romano*—now in Paris, London, and Florence.

Suggested Reading

Dibner, “Machines and Weaponry.”

Klein, *Leonardo’s Legacy*.

Maiorino, *Leonardo da Vinci: The Daedalian Mythmaker*, chap. 6.

Leonardo and Flight

Lecture 17

Intrigued by the possibilities of human flight, Leonardo became obsessed with physics of air and wind and the mechanics of avian anatomy. As with all of his pursuits, Leonardo approached flight with dogged determination, working and reworking ideas from many angles. His inventions and experiments were among the earliest serious attempts to propel a human being through the air, and many of his solutions, although hampered by the lack of a practical power source, were later adopted by 19th-century inventors.

Nature plus Imagination

- Leonardo's muse was not a human being. He had no Beatrice, no Laura, no Ginevra de' Benci. Nature itself led Leonardo in nearly every single project he laid his hands on, and at the heart of everything he produced were his extraordinary observational powers.
- Leonardo began every project with a series of related questions: What is the problem in need of solution? What is being made right now to address that problem? How can the current solution be improved on? What are the pros and cons of new designs, and how can I improve on my own designs to eliminate the cons?
- There are clear signs of deep pragmatism even in some of his more unusual drawings, but Leonardo balanced that pragmatism with exceptional vision. He had the capacity not only to ask what was possible but what could be possible. This breadth of vision led him to imagine the possibility of human flight.

Ornithopter—The Bird Vehicle

- Many of Leonardo's engineering innovations were rooted in some manmade precedents; this was not the case for his exploration of flight. He worked on this problem without the help of precedent, and he made extraordinary progress all by himself.

- Military necessity drove Leonardo's initial studies of flight. His earliest notes on the subject involve plans for air reconnaissance—gathering information about the enemy's position on a battlefield from above.
- One of his early sketches places the operator into what is essentially a backpack with wings. His feet are placed on pedals that beat the wings up and down.
- Leonardo considered the power source that gives birds the ability to fly, the great mass of muscle and sinew in their chests that are proportionately so much more powerful than those of a human. He noted by comparison, "Man is also possessed of a greater amount of strength in his legs than is required by his weight."
- Unfortunately, Leonardo found that transferring human leg power to his **ornithopter**'s wings would not be enough. The issue of strength, power, speed, and weight, in addition to aerodynamics, drove Leonardo to go back to his drawing board repeatedly.

Leonardo's Aerodynamics

- Not only did Leonardo study the physical qualities of birds and their actions; he also began to study the behavior of air as a bird cut through it. At first, he thought of air as an invisible cushion. This led to an iteration of the ornithopter that seems to be a simple glider.
- Another of Leonardo's ideas was a parachute, although not a portable kind we have today. His consisted of four wooden beams with a pyramid of cloth over the flyer's head. Leonardo remarks on its weight in his notes.
- Leonardo argues that, despite the parachute's weight, air will resist attempts to push against it, whether the object in question is trying to rise or fall. A plummeting item, if designed to catch the air against which it pushes, will enjoy a pocket of resistance that will carry the user softly downward.

- Leonardo also acknowledges that this item would be at the mercy of the wind without some type of control system. He therefore cuts a hole in the very apex of the pyramid. This accelerates the descent somewhat, but it also allows the user to direct the parachute by tugging and pulling on the ropes below, thus changing the flow of air through the hole.
- Leonardo knew that merely gliding from a high point to a lower one had few practical purposes, particularly if the terrain did not cooperate. A useful flying machine had to lift off the ground and continue its path even in the face of unfortunate wind currents.

The Problem of Power

- From his bird studies, Leonardo knew that the challenge was the relationship of weight to power—namely, reducing the weight of the vehicle while increasing the operator's power. Thus, he began to break the problem down into separate parts.
- Leonardo produced a drawing of an individual wing, modeled on a bird's wing, with light wooden supports replicating bones; canvas supplanting skin; and pulleys, springs, and hinges acting as muscles and tendons. The wings are flapped just like a bird's through a combination of arm strength and leg power, which increases the power quotient.
- Leonardo had discussions with physicists about the properties of air and wind. Gradually, he came to realize that air and wind were not just pockets of pressure. He saw that the air itself could be harnessed to work with a flying object to help it go in a desired direction.
- Later designs feature fewer support shafts in the wing, which lessens its weight. This reduces the amount of power needed, but Leonardo was still trying to figure out how to make the wings move properly, and he still did not have an adequate power source.

- Leonardo finally realized that he was stuck in a vicious circle: The weight of a pilot was too great for the power generated by pulleys and levers of such a small size, but the larger the size of the machine, the more power he needed to get the machine off the ground.
- He finally concluded that human legs alone could not generate the needed power, which led him to experiment with the design of drive shafts. One drawing includes a half dish with a crank shaft inside it. Cranks operate pulleys, which in turn move the large arms up and down, which in turn operate the wings.
- Now the problem is scale: There is a person standing in the middle of that crank shaft. How is he supposed to occupy the same space as these pulleys and not throw his weight in such a way as to toss the machine off balance?
- Once again, the power-to-weight circle haunts Leonardo. The more power you amass, the heavier the driving mechanism becomes, and the more power you need, which means you need to add a heavier driving mechanism for that power, which means you need more power, and so on.

From Leonardo to the Wright Brothers

- The one bright spot in this dance is that Leonardo was developing what we would now refer to as modern scientific inquiry. Through this system of inquiry, Leonardo knew that the missing link was the power source. He played with various ideas over the years, including a threaded screw system that was a forerunner of the helicopter.
- In 1505, about five years after his departure from Milan, Leonardo began to compose his so-called *Treatise on Flight*. Remarkably, hundreds of years after Leonardo's groundbreaking work, practically nothing was done to expand on his ideas.

- During the 19th century, Leonardo's notebooks began to be published, and by century's end inventors were returning to Leonardo's Renaissance ideas. In 1895, a German inventor named Otto Lilienthal came up with a glider based on Leonardo's designs, but it was the oil-based combustion engine that finally gave life to Leonardo's vision.
- When Orville Wright boarded his flying machine near Kitty Hawk, North Carolina, on October 10, 1902, he used a system not unlike the one devised by Leonardo. But Orville and his brother Wilbur had motorized propellers that could generate enough power and speed to get all this weight off the ground.
- Just conceiving of human flight at that particular time in history required Leonardo to make a leap of imagination of remarkable proportions. His intricate examination of birds in flight showed a remarkable ability to look to the skies for answers, and many of his ideas found a place in our modern world.



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Otto Lilienthal's early glider,
based on Leonardo's work.

Important Term

ornithopter: Literally “bird vehicle,” the name given by Leonardo to his earliest flying machines.

Suggested Reading

Duke, *The Saga of Flight*.

Klein, *Leonardo's Legacy*, chap. 4.

Letze and Buchsteiner, *Leonardo da Vinci: Scientist, Inventor, Artist*.

Suh, ed. *Leonardo's Notebooks*.

Drawing Human Figures and Caricatures

Lecture 18

Drawing, as an art form in and of itself, did not exist in Europe before paper became widely available in the late 15th century. But even in this new era, Leonardo's approach to the craft was unique. Most of Leonardo's contemporaries used drawing strictly to prepare their compositions. Leonardo was the first artist to use drawing as a means of studying the human form, capturing gesture, and imitating nature. This practice was an extension of his belief that painting was not a mere craft but an art of high ideas.

Drawing at the Turn of the 15th Century

- Leonardo was a truly great draftsman. He knew how to draw quickly in a way that conveyed a depth of knowledge or an intimate understanding of the human condition that few in his day could match. He could draw slowly, carefully, lovingly, too, with such accuracy that his sketches could be used as teaching tools.
- In a very real sense, one of Leonardo's greatest contributions to the vast history of art was the way he changed our view of drawing as an art form. Although they possess neither the colors of a painting nor the volume of a sculpture nor the grandeur of a building, drawings cannot be overlooked as we consider the development of the High Renaissance in Italy in general, and the development of Leonardo as an artist and thinker in particular.
- A painting, sculpture, or a building is incredibly complicated. What we see is the finished product, but that finished product accounts for only a fraction of the time and thought and energy that went into its execution. The real sweat is in the creative process.

- Up until the second half of the 1400s, most artists relied on pattern books to bear the weight of the creative process. Due to the scarcity of paper before then, artists rarely felt comfortable experimenting with compositions. This changed with the introduction of the printing press, which made paper both more prevalent and more affordable.
- By the turn of the 16th century, artists and audiences were beginning to value drawings as works of art in and of themselves. Not only was this unheard of before Leonardo's day, but artists rarely held on to their preliminary sketches, due to a mixture of paranoia and pride.
- In the 15th century, artists also had a very different relationship to publicity than in our era. Today, they aim to grab the public's attention as much as possible; in that era, they cultivated an air of mystery and secrecy around their art, which meant guarding their preparatory work and pattern books.

Leonardo's Approach to Drawing

- Although traditionally trained, Leonardo's drawings are different from his peers in terms of their dexterity. Some of his earliest work shows how much he already understood of the craft. In a single drawing, he attempts to capture the contours of a body under a garment, the folds of that garment, and how light informs the folds and the body underneath.
- Leonardo liked to consider figures from a sculptural perspective, which is probably indicative of his years in the workshop of Verrocchio. His head studies show a remarkable volume and understanding of mass.
- Leonardo understood, maybe better than anyone else of his era, that the vast amount of paper readily available to him could be used as a plaything. He used paper relentlessly and without care for cost or clutter, brainstorming endlessly and without regard for early failures.

- This was Leonardo's strength: He would work out a painting only after he was utterly convinced that he had exhausted all of the available possibilities. On the other hand, it was also a weakness. As Vasari tells us in his narration of the painting of *The Last Supper*, Leonardo could get stuck in considering all the possibilities.
- Drawings were instructive exercises for Leonardo. Drawing a head in a squared box, for example, probably had two purposes: to help him understand the proportions of the human head and face and to help him transfer the head into a painting in proper proportion to the other figures.
- Drawings also helped Leonardo work out tricky areas of landscape or objects for his paintings. One study shows a perspectival grid for *The Adoration of the Magi*, although it is not quite the same in the final product. Leonardo felt no obligation to stick to a drawing if it did not work correctly when painting was underway.
- Second and third edits of the first idea helped him cultivate an initial thought. These edited versions were often developed into newer, fresher, or sometimes altogether different organisms in the fourth and the seventh and the twelfth ones.



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Leonardo drew a figure over and over until he was satisfied with it.

Leonardo's Theory on Drawing

- Leonardo had very particular theoretical approaches to drawing that he believed all painters should follow. These theories were at odds with the conventional wisdom and practices of his day.
- Many of Leonardo's contemporaries were still in the habit of producing perfect works presentable to clients and peers, no matter the forum or purpose. They tended to think even preliminary drawings had to be finished products.
- Leonardo acknowledged a time and a place for this sort of finished drawing, and he did his fair share of detailed preparatory studies for large paintings. But even finished drawings, for Leonardo, represented opportunities for experimentation, and they gave him a chance to work out figural groupings with an eye toward new solutions to old problems.
- Leonardo saw that meticulous renderings on paper were an impediment to the creative process, especially for artists unable to release themselves from yesterday's sketches. He feared that these traditions prevented painters from rising above the status of craftsmen to the level of the true artist.
- Leonardo repeatedly jotted down ideas, quickly sketched limbs and torsos and heads and hands to provide relationships between figures and their body parts. He was thus able to give a sense of energy and motion through gestures and physical reactions to situations. He introduced a psychological presence to figures engaged either in ecstasy or in crisis, and he did so as much through the positioning of bodies as he did through facial expressions.
- In this sketch for *The Adoration of the Magi*, Leonardo shows a subtlety with his pen that helps him emphasize the mood that he wants to convey. What makes these figures so remarkable is not the emotion they show, but rather the depth of the emotion they show.

- Drawings helped Leonardo understand the character of his figures, but note that his drawings contain neither perfectly rendered figures nor nearly completed forms. They are sketches, outlines, and thought experiments.
- These are not the traditional figure studies being made by his contemporaries, nor is he working up a specific area of a specific painting. Instead, he is examining humanity so he can understand how a thought or a feeling can be conveyed through a pose, a gesture, or a slight alteration of a facial expression.
- Leonardo believed that the appearance of the image was only the start of a painting. He tried to imbue his figures with thoughts, and he used drawings as his entry into each and every subject that he tackled. This concept was driven by Leonardo's growing belief that the craft of painting was not a manual labor but a means of conveying ideas.
- Leonardo was always keen to think about his work in relation to other art forms. Poems, he said, are not written in a single draft, and paintings cannot be created this way either. The two art forms are equal, Leonardo argued, both in their nobility and in their degree of difficulty.
- Leonardo recommended that painters, like poets, rough out their ideas recklessly at first. Gradually, they can work their ideas up, bit by bit, section by section, until they make a whole unit in which all the parts work independently and together.

Leonardo's Theories in Practice

- As we have seen, Leonardo could be both utterly tenacious in his pursuit of a solution and totally flexible in the solution he chose. One drawing would lead to another, like the two Madonna with cat drawings he produced in the late 1470s, which led to other ideas for the same project.

- Around 1510, some 30 years after he made these drawings, he transformed the idea into the *Saint Anne Madonna*, where the cat was replaced by a lamb.
- We have already encountered one major issue caused by Leonardo's experimental nature: He was rarely satisfied with his work. But in an unexpected way, Leonardo's love of drawing helped him move beyond the boundaries of art that had long been placed before painters working in Italy.
- Leonardo habitually drew people in the streets, from life—a genuine oddity at that time, when art was a private affair. By the mid-1470s, Leonardo was allowing his imagination to run wild, and sometimes these fancies caused him to match beauty with decrepitude in the not unfamiliar comparison of youth versus seniority. At other times, the grotesque occupied his attention.
- Gradually, perhaps unintentionally, Leonardo invented the **caricature**. His subjects could be anyone. More often than not, Leonardo's commentaries about his subjects are infused with comedy.
- These drawings are quite sophisticated, but they were not intended as preparatory drawings for any other work. These were drawings he made for himself—flights of fancy or inside jokes shared with friends or associates in the workshop. None of them, we are sure, was intended for public consideration.
- Ernst Gombrich, one of the giants of art history, once wrote that Leonardo could not possibly have conceived of a distinction between art and science—that he understood each to merge effortlessly and completely into the other. And the only way for anyone in the late 15th century to understand principles of biology, motion, engineering, physics, and anatomy was by drawing faithfully that which was seen by the naked eye.

- Leonardo's studies, experiments, and inventions, without exception, were born of two beliefs: first, that the study of nature was fundamental to understanding all things, and second, that good drawings were the building blocks of all thought, artistic and technical. Drawing, therefore, was the means by which Leonardo understood the world.

Important Term

caricature: An exaggerated facial study, often comical in intent.

Suggested Reading

Gombrich, "Leonardo da Vinci's Method of Analysis and Permutation: The Grotesque Heads."

Maiorino, *Leonardo da Vinci: The Daedalian Mythmaker*, chap. 9.

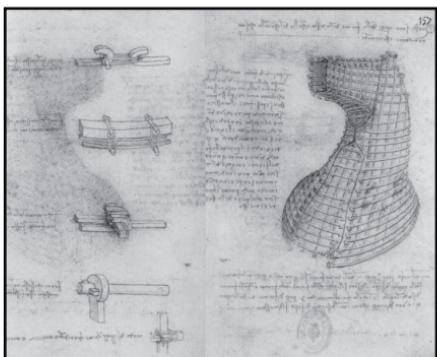
Colossus—The Sculpture for Ludovico Sforza

Lecture 19

Leonardo was not trained as a sculptor, but he was trained by a sculptor, and that was good enough for Ludovico Sforza, who wanted a bronze equestrian monument erected in Milan to help legitimize his family's rule. Leonardo's design was incredibly ambitious and, unsurprisingly, went through numerous iterations, but in the end, it was not Leonardo's perfectionism but political upheaval that doomed the project to failure.

Ludovico's Dream of a Monument

- The letter Leonardo wrote to Ludovico Sforza to promote his own skills ended with a boast about his skills as a sculptor in "marble, bronze, and clay." He added, "Moreover, a bronze horse could be made that will be to the immortal glory and eternal honor of the lord your father of blessed memory and of the illustrious house of Sforza."
- Most scholars believe the letter we currently have is a copy, since the handwriting is not Leonardo's. Some believe it was written well after Leonardo's arrival at court, maybe as late as 1485, and was more like a contract between Leonardo and Ludovico crafted to spell out the tasks that Leonardo was expected to execute in return for his stipend.



Although Sforza's monument never came to pass, the sketches survive.

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- The fact that the letter ends with a reference to sculpture in general, and to a large bronze horse in particular, should signal to us the importance of these aspects of Leonardo's job. This statue may have been the single most important thing that Ludovico wanted Leonardo to do.
- Ludovico was anxious to create an **equestrian monument** even before Leonardo arrived on the scene. He appears to have inherited the idea from his brother, Galeazzo, who in 1472 had made inquiries about the availability of a local sculptor to create the likeness of his father, Francesco, astride a horse.
- Ludovico revived the idea almost as soon as he took control of Milan. The monument was the sort of thing that could help legitimize the Sforza reign. Indeed, Ludovico believed it was a symbol he quite literally could not live without.
- Leonardo was not a complete neophyte when it came to three-dimensional art, thanks to his experience in Verrocchio's workshop. But it was more than a bit presumptuous for Leonardo to claim that this work had prepared him to cast a monument that would make all others before it pale by comparison.
- In the 1480s, Ludovico still held the official title of Regent of Milan. He believed that the monument, as a symbol, would confirm his hold on the city, yet he understood that a monument to himself would be unacceptable self-aggrandizement. Ludovico also could not feature his violent brother Galeazzo for obvious reasons.
- Thus, Ludovico settled on featuring his father, Francesco, who had earned the respect of his peers and enemies during his reign. Most people acknowledged that Francesco had stabilized the city-state after a period of crisis.

- Even after hiring Leonardo, Ludovico was not confident that he was up to the challenge. A letter written in 1489 by the Florentine ambassador to Lorenzo the Magnificent tells us that the Milanese court was filled with concern over Leonardo's ability to complete the project as designed.
- Lorenzo the Magnificent appears to have suggested **Antonio Pollaiuolo**, a Florentine sculptor of note, as an alternative to Leonardo. In 1489, Pollaiuolo submitted his vision to Ludovico.
- Leonardo was in jeopardy of losing this commission, but by this time, he had some significant connections at court, and he managed to outmaneuver Pollaiuolo. By 1490, Ludovico approved Leonardo's plans to move ahead with the project.

The Technical Challenge

- Casting a life-size horse and rider in bronze was spectacularly complicated. Just because Donatello had managed to do it once in the 15th century did not mean it was included in every apprentice's training.
- Among the artistic concerns Leonardo had to address were the size and appearance of the figures; who would see the figures, from what distance, and from what angles; and how could the figures' weight be distributed evenly, yet still show movement and vibrancy?
- Leonardo also faced many technical challenges, such as how to obtain the expensive and precious bronze; how many pieces to cast the piece in and how to assemble them; whether to cast them as solid or hollow figures and, if hollow, how to fill the mold properly; where to find the space, equipment, and assistants to cast such a large piece; and how to move such a large but delicate piece from the foundry to its final destination.
- In this age of innovation, Leonardo also knew that he would not be able to get away with copying what sculptors had done before him. Donatello's *Gattamelata* had set a standard; Verrocchio was set on surpassing Donatello. Leonardo's task was to outshine them both.

- His first idea was to approximate Verrocchio's idea of a man and beast; the earliest drawings show a sophisticated composition that emphasizes motion, action, and violent energy. The rider—Francesco Sforza—struggles with his horse in much the same way that Man battles Nature, implying that the Sforza family has the skill to tame it.
- Leonardo realized that to outdo his master, he had to go beyond mere compositional ingenuity. He decided to make his statue both bigger and more lifelike than his predecessors' and tripled its size. The 8-foot-tall horse would now be a 24-foot-tall horse.
- This decision forced Leonardo to compromise elsewhere: He would have to eliminate the rider altogether because it would require too much bronze. The horse alone would weigh about 60 tons.
- Leonardo planned to make the most life-like, naturally faithful horse ever sculpted. He bought and studied books about horses and their anatomy, about the history of the horse from antiquity to the present, and about the characteristics and qualities of various kinds of horses.
- He spent the better part of a year in these studies. Following this, he ventured into Ludovico's stables to draw stallions from life. In the end, Leonardo settled on a traditional posture for the horse, striding forward on three legs with the front left hoof elevated.
- Leonardo was faced with the most daunting part of the project—how to cast it. This time-honored but complicated process, known as **cire perdu** (or lost wax), required
 - caking an actual size, fully detailed clay model of the sculpture;
 - creating separate molds for each piece to be cast;
 - caking a consistent layer of wax, roughly an inch thick, all the way around the clay model;

- 45
- adding a second clay layer on top of the hardened wax and carving channels into it;
 - burying the whole model and pouring tons of molten bronze into it, liquefying the wax, which flows away;
 - unearthing the model, chipping off the outer clay shell, and digging out the inner clay shell;
 - finally, pulling the bronze pieces out of the earth, smoothing and polishing it, and loading it onto a cart to be taken to its final destination.
- Cire perdu had never been attempted on this scale before, but Ludovico approved Leonardo's project, and Leonardo began the inner model in 1492 or early 1493. Ludovico ordered the purchase of 75 tons of bronze for the project.

What Became of Leonardo's Colossus?

- The clay model was finished and installed in 1493 in time for the marriage of Ludovico's niece to the Holy Roman Emperor. Leonardo had the horse erected inside the Milan Cathedral, where the wedding took place.
- Through this marriage, Ludovico secured the emperor's support as the legitimate ruler of Milan, and the sculpture symbolized that triumph. It was, in many ways, the very apex of his reign. And then, everything fell apart.
- Recall that Ludovico had invited the French army into Italy to destroy the Kingdom of Naples, only to have the French king turn on him. He had to divert the 75 tons of bronze designated for the equestrian monument to make cannons to fight the French. The monument would never be cast.

- The French were expelled from Italy in 1495, but they returned in 1499 under the command of a new king. They quickly seized Milan and held it. Leonardo was there to witness it all. He may also have been there to witness the destruction of his clay colossus at the hands of the French army, who used it for target practice, but of his reaction, we have no record whatsoever.

Important Terms

cire perdue: In French, literally “lost wax”; a technique used to cast figures in bronze. A clay mold is covered with wax, which is in turn encased in a shell. Molten bronze is poured between the shell and the mold, replacing the wax, which melts and drips out from between the two surfaces. The shell is then chipped away and the mold dug out from the hardened bronze encasement.

equestrian monument: A large-scale sculpture of a horse and rider.

Name to Know

Pollaiuolo, Antonio (1433–1498): Prominent sculptor, painter, draftsman, and printmaker, Pollaiuolo and his brother Piero operated one of Florence’s largest artistic workshops. He designed the sculptural tomb monument for Pope Sixtus IV and painted the influential altarpiece of *The Martyrdom of Saint Sebastian*, now in London.

Suggested Reading

Ahl, *Leonardo a Vinci's Sforza Monumental Horse*.

Brugnoli, “The Sculptor.”

Radke, *Leonardo da Vinci and the Art of Sculpture*.

The Making of *The Last Supper*

Lecture 20

The *Last Supper* is not only one of Leonardo's most famous works; in many ways, it is the epitome of Italian High Renaissance painting. Leonardo took a traditional theme, combined it with the best techniques of the day, and added his own unique innovations to create a work that astounded his peers and continues to awe viewers today. Unfortunately, Leonardo's choice of medium is the painting's single flaw, leading to its rapid deterioration.

The Greatest Painting of the Italian Renaissance

- Leonardo's *The Last Supper* was the culminating artistic achievement of the entire 15th century. It simultaneously summarized every innovative principle of the period and added new elements that Leonardo realized all quality works of art must contain. It is fair to call it the most coherent expression of the High Renaissance as a cultural period.
- In this lecture, we will address how the picture came to be—why and how it was made, which directly affected both the audience's viewing experience when it was finished in 1498 and the way we see it today.
- One reason for its importance lies in Leonardo's perfect compositional choices. It is naturally balanced, bordering on symmetrical. The focal point is the figure of Christ, who extends his arms to the sides, forming the triangle of a classical composition.
- To Christ's left are six disciples, who sit and rise in two groups of three, each with features and poses that distinguish him from his counterparts. A similar approach has been taken to those on the other side of the table.

- The figures are seated in a long, rectangular room with three windows on the back wall that look out over a distant, mountainous landscape. The image's orthogonal lines converge on a vanishing point on the forehead of Christ.

The Last Supper Tradition

- The painting began with the ambitions of Ludovico Sforza and his quest to establish the legitimacy of his rule. One of his projects in the 1490s was the renovation of a Dominican monastic complex called Santa Maria della Grazie, which had been built under his father's patronage a few decades before.
- Ludovico chose Donato Bramante to lead the renovation. Leonardo and Bramante had already developed a close working relationship, and most believe the two were collaborating unofficially on this project.
- As a monastic institution, Santa Maria della Grazie was a large and expansive complex. Part of Bramante's charge was to repair and alter not only the church, which was to house the Sforza family tombs, but portions of the monastic cloister and dependencies.
- The monastery's decorations needed to be updated along with its architecture. So in 1494 or 1495, Ludovico commissioned Leonardo to paint at least two of the walls in the monks' **refectory**.
- The Last Supper was a tried and true image for such settings at that time, although not all Last Suppers looked alike. Medieval and early Renaissance representations generally replicated the dining habits of the viewers for whom they were produced.
- By Leonardo's day, refectory Last Suppers had developed a particular tradition. **Taddeo Gaddi**, who painted his version for Santa Croce around 1355, established the template: a linear structure, with figures stretched out behind the table like actors on a stage. The figures are individuated and face the viewer.

- The scene depicts the specific moment when Judas takes his bread and reveals himself as a traitor. Judas is also placed on the other side of the table from the disciples to emphasize his otherness.
- About 100 years later, **Andrea del Castagno** painted a Last Supper for the refectory of the Florentine nunnery of Sant'Apollonia. In many ways, it follows Gaddi's lead, but armed with a knowledge of linear perspective, the painter also created the illusion that this image was another room, adjacent to the refectory.
- Domenico Ghirlandaio understood the sense of intimacy Andrea del Castagno had created and employed the same kind of composition in his 1480 version of the Last Supper for the Dominicans at the Florentine convent of San Marco. He also cuts the table back toward us at the ends, added windows at the back, and placed natural elements in the background to expand the illusion.
- All of this was meant to make communal dining more engaging from a spiritual perspective by merging the Last Supper's setting with the real setting of the refectory. Therefore, to use this formula effectively, Leonardo had to consider the setting in which his painting would appear.

Leonardo's Choices

- Leonardo's first decision was to elevate his picture so that it could be seen over the monks' heads, even from the back of the refectory. He also chose to pare his composition down to bare essentials and to paint his figures as large as possible for the benefit of those at the back. Building on the precedents, Leonardo also planned on an illusionistic extension of the refectory.
- Per his usual practice, he created a slew of preparatory drawings. If we include the life drawings Leonardo drew in Milan's streets and later used in this work, we can safely estimate that the number of sketches he produced for this single painting was well into the hundreds by the time it was done.

- Even in the earliest drawings, Leonardo's composition placed Christ at the heart of the group, surrounded by apostles who were easily distinguished from one another, both by physical appearance and by posture and gesture, which reveal each man's psychological state.
- Leonardo's perspectival system did not create the illusion of a second room; rather, it created the illusion that the painting was part of the same room. Leonardo extended the stringcourse, or horizontal roofline of the refectory's cornice, along the side walls that lead toward his picture.
- A number of his early designs for the project have survived and often appear alongside or even embedded in drawings and notes about completely unrelated works. This reminds us that, although he was engaged in producing this complicated painting, Leonardo was simultaneously working on all sorts of other projects, too.
- Studies of human physiognomy come into play; the figures' faces have proportions and properties that follow Leonardo's idealized concept of the human head. The furrowed brow, deep frown, and right hand of the disciple thought to be Saint Peter convey enormous psychological depth.



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**Many intricate early sketches for
The Last Supper have survived.**

- When he settled on the features of each of his figures, Leonardo worked up his drawings into nearly finished form so that he knew exactly what he wanted them to look like in the final painting. His final drawing for Jesus, which Vasari tells us he struggled with, is a magnificent and unprecedented experiment in the human psychology of Christ and is one of the most beautiful drawings Leonardo ever produced.
- One of the things Leonardo had to think about was how his picture would look inside a darkened refectory, illuminated only by natural sunlight—which varied according to season and the time of day—and by candles, which flickered continuously. Leonardo knew that the best way to paint a dramatic scene was to employ tenebrism.
- It should come as no surprise that Leonardo yearned to employ oil paints in this picture. But the traditional method for **mural** painting was **fresco**, which employed **egg tempera** on wet plaster to make the color a permanent part of the wall. This required a painter to work quickly, and there was no going back to rework an area once it dried.
- Leonardo had never worked in egg tempera, and he hated to be rushed, so ironically, he was ill-suited for this project. But this also explains why Leonardo chose to experiment with a different painting technique.
- Leonardo's idea was to combine a layer of tempera with layers of oil pigment applied to dry plaster. He believed that the oils would replace the sealing quality of the wet plaster, and that his two sets of pigments would allow him to paint at his preferred pace while retaining the appearance of a true fresco. This experiment was destined to go wrong, as we shall see.
- Leonardo began painting sometime in 1496 and worked through all of 1497. The painting was finished by early 1498. Word got out about Leonardo's achievement almost as soon as the scaffolding came down. The fame of the image soon spread throughout Italy.

- Word quickly spread from there to Northern Europe, and then all the way to the Middle East, where the Sultans of Turkey learned of it and referred to it by name in documents written in 1502. *The Last Supper* became a standard, iconic image almost as soon as it was finished, and its popularity and power have never waned since.

Important Terms

egg tempera: Water-based painting medium in which ground colors are suspended in egg yolk. It is characterized by a gleaming surface, decorative flatness, and durability. The principal paint medium before the Cinquecento.

fresco: Italian for “fresh,” the technique of painting in wet plaster on a wall. If the color becomes part of the plaster wall, the painting is a true fresco (*buon fresco*).

mural: A generic term for a painting on a wall. The term often used to distinguish the image from a true fresco painting.

refectory: The dining hall in a convent or monastery.

Names to Know

Castagno, Andrea del (c. 1419–1457): Florentine fresco painter who worked for a variety of patrons, including the nuns in the convent of Sant’Apollonia, where his *Last Supper* demonstrated how linear perspective could be employed on a horizontal surface to great effect.

Gaddi, Taddeo (c. 1300–1366): A disciple of Giotto, Taddeo Gaddi painted frescoes and altarpieces primarily in Florence from 1328 until 1360. Among his best-known works are the cycle called *The Life of the Virgin* in the Baroncelli Chapel of Santa Croce (1328–1330) and the *Tree of Life and Last Supper* in the refectory of the same complex (c. 1355).

Suggested Reading

Barcilon and Marani, *Leonardo: The Last Supper*.

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*, chap. 3.

Ladwein, *Leonardo da Vinci, The Last Supper: A Cosmic Drama and an Act of Redemption*.

The Meaning of *The Last Supper*

Lecture 21

Popular conspiracies to the contrary, some of *The Last Supper*'s most remarkable features are its most traditional, from its composition to its symbolism. Leonardo's work is a masterpiece because of his mastery of the human form, which allows him to portray his figures' psychology through expression and gesture, as well as the wealth of details he packed into this seemingly static image that condense the entire Passion narrative into a single moment.

***The Last Supper* in Its Original Context**

- What has made Leonardo's mural such an icon of Western art? Although a forward-looking painting, *The Last Supper* can only be understood within the tradition of image-making and narrative painting that gave birth to it.
- Consider the refectory environment in which it was placed: Monastic refectories were large, rectangular rooms with tables arranged in a ring parallel to the walls. Diners all sat outside the ring, facing toward the center of the room, while the tables were served and cleared from inside the ring.
- Monastic diners usually ate in silence. Sometimes, they might listen to one of their brethren reading from the scriptures or to announcements from the head table, but they did not chat or even whisper among themselves.
- Paintings of the Last Supper were considered to refer directly to concepts of leadership and obedience. Members of these communities would connect the image of Christ and his disciples to the actual prior, abbot, or abbess of their community and his or her lieutenants, who were usually positioned directly beneath the painting.

- Images of the Last Supper were, first and foremost, understood as illustrations of the most important scriptural passages from the Gospels. Like most Last Suppers, Leonardo's picture adheres quite strictly to these texts.

The Textual References

- Leonardo places his 13 characters in the setting described in the Gospels, the upper room of a public inn. Daylight dwindles, casting his figures into deep relief, indicating that the time is near sunset. Christ occupies the heart of the composition, with his head placed in the middle of a triple window that probably refers to the Trinity.
- At first glance, this seems to be an early moment in the narrative. Christ points to a wine glass with his right hand and bread with his left—the symbols of Christ's own body and blood. This is the moment when Christ teaches his followers about the **Eucharist**.
- However, the dramatic gestures and expressions of shock on the faces of Christ's disciples are not appropriate responses to this ephemeral theological concept. They are reacting to something else entirely—the second phase of the narrative that Leonardo illustrates.
- On either side of Christ are two sets of six disciples—or rather, four sets of three disciples, grouped as mini-units within the larger context. The physical and emotional actions of each group forms a crescendo from left to right, from a subdued reaction to an explosion of physical energy.
- At the core sits Jesus, isolated from the others by gaps that Leonardo has placed there to emphasize the great gulf that separates the Son of God from mortals. Christ's face reveals little; he is dejected and quiet, but we cannot tell from his lips whether he breathes a word of his inner knowledge to his company.

- According to the Gospels, immediately after the Eucharistic lesson, Christ announces, “One of you will betray me.” The disciples respond with mild surprise, then disbelief, then shock, and finally horror—just as the figures do from left to right across the picture plane.
 - The trio of figures at the far left, the Bartholomew group, are quite subdued. All three figures show concern, but their bodies convey little physical animation.
 - The second trio, the Judas group, contains Judas, Peter, and John the Evangelist. Peter holds a knife, both appropriate for a dinner scene and an emblem of an act of violence in his near future. John—shown sleeping in one preparatory drawing—seems sleepy; here he leans toward Peter, in a moment described in John’s Gospel, when Peter asks him, “Tell us who it is of whom [Jesus] speaks.” Judas, unusually on the same side of the table as Christ, reaches with his left hand for a chunk of bread. In his right he holds a small bag containing the 30 pieces of silver. The interweave of these figures’ bodies gives them more energy than the Bartholomew group, but not coincidentally, they form another triangle.
 - The third trio, called the Thomas group, includes a visually riveting collection of disciples in postures of shock and distress, along with another reference to the future: Thomas’s finger, which he will later use to inspect the resurrected Christ’s wound.
 - The fourth and final trio, the Matthew group, is the most physically dramatic. They no longer look at Jesus because they have already seen his prediction confirmed. Their reaction has as much to do with Judas’s reaching for the bread as it does with what Christ has said.
- What we have, then, is a single painting that is more than just a single painting; it forces viewers to use their memories and deductive skills to piece together fragments of the story and reconstruct a vast and sweeping narrative.

- There was a long history of this sort of image in Italian art. One very popular example was the Man of Sorrows-type painting. **Lorenzo Monaco's** *Man of Sorrows*, from 1404, manages to allude to the chalice of the Last Supper, the 30 pieces of silver, the arrest of Christ, Peter's denial of Christ, the scourge used to beat Jesus, Pilate washing his hands, the cross, Longinus's lance, the tongs that pulled the nails out of Christ's body, the mourning Mary and John, and the resurrection in a single painting.
- Missing from Leonardo's *The Last Supper* as a sequential narrative of the Passion is the Crucifixion itself. This is one major reason to conclude that the commission for the opposite wall was for a painting of the Crucifixion, which would complement and complete this image.

The Legacy of *The Last Supper*

- Images all have lives of their own. They grow and change and do things and have things done to them, and sometimes the life that the image leads after its completion is just as interesting as the message that the image bears. This is one of those cases.
- Leonardo's painting was an immediate sensation. Only a few months after its completion, it was the subject of an engraving by Giovanni di Pietro da Birago, who distributed his reproduction all across the Italian Peninsula.
- The form became quite popular as the 16th century progressed and as champions of Leonardo tried to employ his lessons. Marco da Oggiono, for example, painted a close copy on canvas, and **Andrea del Sarto** painted a Last Supper mural in the Florentine church of San Salvi that is a clear homage.
- Despite its popularity, the mural began to frustrate its admirers quite soon after its completion. Leonardo's experiment in technique had gone horribly awry. The topcoats of oil first started to bubble, and then to blister. The egg underneath was pulled by the weight of the oil glazes, and the picture started to crack from underneath.

- By 1517, chroniclers were praising Leonardo's great invention but lamenting its horrible condition. By 1547, they were calling it ruined, and when Vasari wrote his second edition of *Lives of the Artists* in 1568, he described *The Last Supper* as "a spot on the wall."
- In 1652, a doorway was cut into the wall, just where Christ's feet had been. That was soon bricked up again, but all that pounding caused even more damage. Two projects in the 18th century attempted to repair the damage and stabilize the colors, but both of those did more harm than good.
- When French troops invaded Milan and occupied it in 1796, soldiers threw rocks at the mural and climbed up ladders to scratch out the eyes of the disciples. Twenty years later, attempts were made to detach the painting from the wall and move it to safety, but the process was botched. Central sections of the painting were badly damaged, and chunks of wall and paint were glued back in place.
- The closest the painting came to complete ruination occurred in August of 1943, when an Allied bomb struck the refectory and almost destroyed the building. *The Last Supper* survived because its caretakers had jammed sandbags up against it for just this reason.
- By the 1970s, *The Last Supper* was understandably in horrible condition, and most specialists believed that there was less paint on the wall applied by Leonardo than there was paint applied by the legion of restorers who had tried to fix it.
- In 1978, an extensive conservation project was undertaken, and in 1999, the restoration was complete, revealing a brightness and vividness that had been unseen for generations—but it also unflinchingly allowed bare spots to remain bare.

Important Term

Eucharist: The sacrament of the Lord's Supper, celebrated in the Mass.

Names to Know

Lorenzo Monaco (c. 1372–1424): Monk who left his cloister at Santa Maria degli Angeli in Florence to pursue a career as a lay painter. Among his most important works were panels of *The Coronation of the Virgin* (1414) and *The Man of Sorrows (Vir Dolorum)* (1404)—both in Florence today.

Sarto, Andrea del (1486–1530): Follower of Raphael and Leonardo who worked in the classical idiom, primarily in Florence. His best-known work is *The Madonna of the Harpies* (1517).

Suggested Reading

Barclon and Marani, *Leonardo: The Last Supper*.

Heydenreich, *Leonardo: The Last Supper*.

Steinberg, *Leonardo's Incessant Last Supper*.

Mantua, Isabella d'Este, and Venice

Lecture 22

When Milan fell to the French in 1499, Leonardo's association with Ludovico Sforza ended. For the next eight years, he was constantly on the move, but his first stop was the city of Mantua. Mantua's ruling family, the Gonzaga, was known for its cultural sophistication, and the family's leading light was its duchess, Isabella d'Este, who had long admired Leonardo's work. Leonardo's stay in Mantua was brief, but marks an important period of artistic and personal transition in his life.

The Fall of Ludovico Sforza

- *The Last Supper* became famous very quickly, and it confirmed for those in the know that Leonardo was the greatest living artist of his day. Although he must have had a list of projects awaiting him in the wake of this success, Leonardo was no doubt gearing up to paint the second wall of the refectory next.
- Meanwhile, King Charles VIII of France had died in 1498 without a male heir. To settle the succession, his widow, Anne of Brittany, married his cousin, the Duc d'Orleans. This king took the name Louis XII and embarked on a campaign to retake Milan from Ludovico Sforza.
- Louis's troops met little resistance, and Ludovico fled the city in October of 1499, retreating to the town of Novara. He hired Swiss mercenary troops and made one last attempt to retake the city in the winter of 1500, but Louis's troops were also Swiss, and Ludovico's troops betrayed him rather than fight their own countrymen. Ludovico died in French captivity in 1508.

Departure from Milan

- There were aspects of life as courtier that irritated Leonardo, yet he also likely appreciated the freedom to work as an intellectual free agent under certain conditions, switching loyalties to another leader almost at will. In this sense, it is rather surprising that Leonardo neither fled Milan for greener pastures nor followed Ludovico to Novara when the French arrived.
- Some sources indicate that the French were impressed with Leonardo and interested in keeping him around. It has even been suggested an offer was dangled before Leonardo almost as soon as Louis entered the city. However, the soldiers' destruction of the clay colossus could not have gone well with him.
- In mid-December of 1499, Leonardo sent the significant sum of 600 florins to the hospital of Santa Maria Nuova in Florence for safekeeping—the equivalent of a few years' salary for a courtier. Within a few days, he packed his bags and left Milan.
- Travel was not a simple proposition. Although unmarried, Leonardo was responsible for the well-being of an assistant named Gian Giacomo Caprotti da Oreno, or **Salai** ("the little devil"). He was a notorious mischief-maker but skilled with the pen and brush. He understood his master's interests and eccentricities, and he was utterly, unshakably loyal.
- Luca Pacioli, the Milanese mathematician that Leonardo had befriended at court, was also part of Leonardo's entourage because they were finishing a book together. So, too, were countless drawings for Leonardo's unfinished projects—15 years worth. That said, an enormous chunk of Leonardo's life was also left behind.

Arrival in Mantua

- The group's first stop was the small, remote, and relatively poor sovereign duchy of Mantua, ruled by a member of the Gonzaga family. It lay between Milan to the north and Florence to the south.

- The Gonzaga boasted one of the finest collections of paintings, medallions, and manuscripts in Italy. They also patronized a brilliant young painter named Andrea Mantegna, who captured his patrons in portraits as figures of exquisite taste, high fashion, and cultural superiority.
- In 1500, the duke of Mantua was Francesco Gonzaga. He was married to a woman of tremendous intellect and cultural sensitivity named Isabella d'Este who, as we have seen, was well aware of Leonardo's talents. The daughter of the duke of Ferrara, Isabella was learned, erudite, and one of Europe's most dedicated and skilled art collectors.
- A portrait of Isabella, painted by the Venetian artist Titian in the 1530s, captures her appearance at a much younger age—and an idealized appearance at that—in the style of Leonardo's portrait of Cecilia Gallerani that Isabella so admired.
- Isabella was a logical person for Leonardo to call on when he was forced to flee Milan. She was the sister of Beatrice d'Este, Ludovico's late wife, and already a fan of Leonardo's work. This incident is a prime example of Leonardo's distinctive associations with the women of Ludovico's court.
- Leonardo, by now, also had quite a reputation; he was the High Renaissance equivalent of a rock star. Popular artists had attracted the attention of major patrons in the past, but Leonardo was not only skilled in the arts; he was head-and-shoulders above everyone in the arts and sciences, and a cult of personality began to circulate about him.

Leonardo and Isabella

- Soon after Leonardo arrived—we are not sure when—Isabella asked Leonardo to paint her portrait. Leonardo, contrary to his own rule of quick and effortless preparatory sketching, produced a remarkably refined and finished drawing of the duchess in profile.

- Leonardo has draped her in fashionable clothes, with a low but not untoward neckline. Her hair is carefully arranged to reveal her neck. She holds her head up with an air of dignity. She appears as a leader at court, despite being shown in old-fashioned profile.
- Perhaps Leonardo felt that the profile was Isabella's most attractive angle, or perhaps this was only one of an intended series of preparatory sketches, or perhaps this pose was Isabella's choice and not Leonardo's. Perhaps it was a combination of some or all of these things.
- Leonardo did not take this drawing with him when he left Mantua, however, which implies that it was not preparatory work. We might then surmise that the drawing was so finished because Leonardo never intended to linger in Mantua and knew he would not have time to paint Isabella from life, yet he wanted this important collector to own a display-worthy work.

From Mantua to Venice

- Leonardo left Mantua in March 1500 and set off north for the city of Venice. It has been suggested that his intent was to print the book he and Luca Pacioli had been working on, since Venice was home to Italy's most advanced and active publishing houses. Alternatively, Leonardo may have had official business in Venice, for his arrival was met with great fanfare by the government.
- The Republic of Venice quickly employed Leonardo as a military consultant. Within weeks of his arrival, he produced a white paper warning that the Turks' best approach to the city would be over land, across the River Isonzo, and urging the construction of defenses there. It appears they followed his advice.
- It may have been during his six-week stay in Venice that Leonardo dreamed up a diving apparatus—another one of his quick but brilliant concepts that, as far as we know, was never put to use.

- Leonardo's time in Venice was short before he packed up and headed south once more. He left no traces of his contacts, no hints of commissions, and no preparatory drawings that suggest he was trying to find work there. This venture seems to have been intentionally brief.

Name to Know

Salai (a.k.a. **Gian Giacomo Caprotti da Oreno**; 1480–1524): Salai, or “the little devil,” was Leonardo’s assistant and colleague for 30 years. In 1519, he inherited from Leonardo *Mona Lisa*, *Saint Anne Madonna*, *John the Baptist*, and the now-lost *Leda and the Swan*, all of which passed into the hands of his sisters on his death. They, in turn, sold the pictures to King François I of France.

Suggested Reading

Clark, *Leonardo da Vinci: An Account of His Development as an Artist*.

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*.

Return to Florence—Sfumato and an Exhibition

Lecture 23

Leonardo's Second Florentine period—although that may be a misnomer—was among the most productive of his career. It also marked an important departure in his painting style, where he abandoned tenebrism and embraced sfumato completely. Leonardo was now so admired that he could almost do no wrong in the eyes of his patrons or the public. Other artists deferred to him, and the public came to see one of his preparatory drawings on display—an unheard-of event in the 16th century.

The Second Florentine Period

- Leonardo da Vinci reinvented himself a number of times during his 50-year career as a painter. Each phase of his professional life brought with it significant changes in the way he produced images for public audiences.
- When we take a wide-angle view of Leonardo's painterly output, we can point to moments when Leonardo took deliberate steps to breathe new life into his works. In Florence, *St. Jerome* and *The Adoration of the Magi* mark a significant leap from his earliest style; In Milan, his tenebristic portraits depart from *Adoration*, then *The Last Supper* presents a more sophisticated handling of form and content than anything that had come before it.
- The success of *The Last Supper* and that approach were abandoned almost immediately when he returned to Florence in 1500 and began working on inventive easel paintings like *Madonna of the Yarnwinder*. Thus the last great transformative phase of his career occurred during a period of great upheaval in his life.

- Between 1500 and 1508, Leonardo was rarely in one place longer than 12 months at a time, traveling from great city to great city all over the Italian Peninsula. We often call this Leonardo's Second Florentine Period, but it could just as easily be called Leonardo's Nomadic Period.
- Some of this movement was due to Leonardo's own choices. But he was also in very high demand by some of Europe's most powerful people, and when those sorts of players called on him to drop whatever he was doing to join them, he had little choice but to acquiesce.
- All this travel should have taken a physical toll on Leonardo, but oddly enough he was incredibly productive throughout all of it. He produced three beautiful Madonnas; a massive fresco; military plans for at least three sovereign states; two sensual figures of strikingly originality; books on painting, flight, and anatomy; the first one-man exhibition in modern history; the foundations of modern medical science; and the most famous painting of all time.
- We know a surprising amount about Leonardo's wanderings. Some information has come down to us in the form of legend and hearsay, but some appears in chronicles, letters, and official statements. It seems his fame was such that people preserved documents that referred to him.
- Leonardo was not oblivious to all this attention, but he did not let it affect his work. He continued to produce good works for his patrons in a reasonably timely fashion and accepted commissions from common people.

Isabella d'Este and *Madonna of the Yarnwinder*

- Leonardo arrived in Florence in May and quickly settled into a new life in his old home. By the summer, he had secured a position as an architectural advisor to a local church and to sketch a villa on the outskirts of Florence so that Francesco could build a duplicate one near Mantua.



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Florence welcomed its famous son back in 1500, but Leonardo was never truly able to settle there again.

- Leonardo set up a studio in the venerable church of Santissima Annunziata, near the Duomo. Vasari tells us that this workspace was already in use by Filippino Lippi, who happily surrendered it to his more famous colleague.
- Another indicator of his success and notoriety was the continued interest of Isabella d'Este. Impatient for her promised portrait (her husband had, rashly and without her permission, given away the sketch), she wrote to a Florentine friend, a cleric named Fra Pietro, asking him to negotiate with Leonardo for a change in their contract. She would now accept a Madonna in place of her portrait.
- Fra Pietro reported back to her twice within 11 days about Leonardo's doings. In the first letter, Pietro said Leonardo had almost completed a preparatory cartoon of Saint Anne, the Virgin, Christ, and a lamb. This was good news for Isabella, but the bad news was that Leonardo was now distracted by his studies of geometry and mathematics.

- In his second letter, Pietro said he had finally spoken with Leonardo and had communicated Isabella's wishes. Leonardo wanted to "immediately make the portrait" of Isabella, if only he could "detach himself from his obligation to the King of France without dishonor."
- Fra Pietro went on to describe the picture that Leonardo was then painting for his French patron, a Madonna to be given to Louis XII's secretary of state, Florimond Robertet. That painting is now known as *Madonna of the Yarnwinder*.
- Standing only 19.5" × 14", this intimate portrayal of the Holy Family is one of the most important paintings not only in Leonardo's career but in the art of the Florentine High Renaissance. Here we have a young Mary in a seated contrapposto and a chubby human Christ, their bodies forming a pyramidal composition. Christ gazes at the yarnwinder, which is an upside-down cross, a reminder of what is to come. In the background are the beautiful landscape features we have come to expect from Leonardo.
- What is innovative is how this painting brings together Leonardo's interests in light, optics, movement, and dramatic narrative all at once and points us in the direction his art will take for the rest of his life. After years of tenebrism, Leonardo now turned to a more subtle approach to light. His figures are seated in a natural landscape, brilliantly illuminated by the shining sun. Hard outlines have been replaced by fuzzy intersections of colors that dissolve, one into the next. Shadows still cover their limbs, but the distinction between illuminated and shaded areas is no longer cut and dried.
- These effects are a development of the sfumato technique Leonardo had periodically experimented with during his youth, which could only be captured through oil paints, not egg tempera.
- This painterly effect corresponded to an optical effect Leonardo had studied for much of his adult life: that human beings can rarely distinguish the outlines of objects positioned at even a modest distance from the eye.

- Sfumato creates a naturalistic effect that gives specific items, and the overall composition, a quality we recognize from our daily experience. Sfumato brought Leonardo closer than anyone before him replicating not the world itself but the viewer's experience of the natural world.

The Second and Third Florentine Madonnas

- As Leonardo worked on *Madonna of the Yarnwinder*, he set up a second easel next to this painting to produce a second version—not a copy but an additional interpretation of the same image.
- Now known as the *Lansdowne Madonna*, it has more distinct outlines, less covert shadows, and a higher vantage point. The vast sea in the background is replaced by a mountain range.
- There are three views on why Leonardo painted this second image. He may have simply made it for quick sale; he may have made it in case *Yarnwinder* was too innovative for Monsieur Robertet's tastes; or it may have been for Isabella d'Este, in place of the promised portrait.
- The first option is probably the best explanation. Monsieur Robertet liked the *Madonna of the Yarnwinder*, and Leonardo kept the second version to do with as he pleased. There is evidence that it was noticed by other painters working in Florence, including Raphael di Sanzio, and its influence can be seen in their works.
- There may have been a second source from which Raphael drew: The cartoon that Fra Pietro mentioned in his letter to Isabella d'Este. The one described by Fra Pietro has disappeared, but we have a sketch related to it, and Leonardo reproduced this composition a number of times during his career.

- In this classical composition, Anne, the mother of Mary, occupies the central position. Mary sits on Anne's lap with her legs extending in one arm of the pyramid. Christ is in Mary's arms in what is called the swimming Christ pose. He looks down at John the Baptist, who forms the right edge of the classical triangle. The interacting figures are modeled by deep shadows and bright white chalk highlights.
- Leonardo's drawing may have been seen by many artists and viewers in Florence in a remarkable setting. According to Vasari, when Leonardo had finished it, he put it on display in Santissima Annunziata for the public. For two days, Vasari says, the drawing was visited and admired by "men and women, young and old, as if they were going to a solemn festival."
- Exhibiting one's works outside their finished setting was unheard of at this time. Moreover, we have no precedents for an artist presenting a drawing as a finished work of art, suitable for public consumption.
- Vasari cannot be trusted completely, but if this tale is true, then Leonardo's public showcase is one of the earliest examples of a modern art exhibition. We can surmise that Raphael saw it and was influenced by it.
- An exhibition also suggests that Leonardo not only recognized the importance of works as art objects in and of themselves but that he wanted the general public to recognize them, too.

Suggested Reading

Bell, "Sfumato and Acuity Perspective."

Kemp, ed., *Leonardo da Vinci. The Mystery of the Madonna of the Yarnwinder.*

Nathan, "Some Drawing Practices of Leonardo da Vinci."

Wasserman, "The Dating and Patronage of Leonardo's Burlington House Cartoon."

Leonardo, Cesare Borgia, and Machiavelli

Lecture 24

Finding little paid work in Florence, Leonardo took work as a courtier to Cesare Borgia in 1502. As Cesare's chief architect and engineer, he advised on everything from border defense to the customs of the French court. He used his mathematical and inventing skills to create some of the most accurate city maps heretofore known. Leonardo also met and collaborated with another of the era's most famous figures while in Cesare's employ and for a time thereafter: Niccolò Machiavelli.

The Political Landscape of 1502

- Sometime in 1502, Leonardo made an interesting drawing in red chalk of a single figure displayed in three different poses. The drawing looks to be the kind of multiple-view sketch that painters and sculptors liked to do in anticipation of a larger project.
- The figure is bearded and gruff; the hair on his head and the whiskers on his chin form brackets on either side of his face—and create a fierce appearance, but what is most interesting is the figure's identity: He is Cesare Borgia, known in his day as the wickedest man in Italy. Leonardo not only knew him well but worked for him.
- When Leonardo arrived in Florence in May 1500, he was an old man by Renaissance standards, nearing the end of his career and returning to his roots to spread his wisdom. To some, he was a symbol of the establishment who needed to be outdone, outshone, and then put out to pasture.
- However, Leonardo still needed a paycheck, not to mention stimulating projects and to prove his worth. His return to Florence had not been a triumph: He had garnered zero official commissions from the Florentine government or any other institution in the city by 1502, and so he went looking for work as a professional courtier.

- At this time, Alexander VI was still pope, making the Borgia among Italy's most powerful families. Isabella d'Este wrote many diplomatic letters, trying to secure the borders of Mantua and negotiating with both Alexander's allies in Italy and the French in Milan to preserve its independence. By far, the biggest threat to any Italian state in this period was Cesare Borgia.

Leonardo and the Wickedest Man in Italy

- Cesare Borgia was reviled for his cunning, ruthlessness, and cruelty, but he was also unusually crafty, fiercely loyal to his men, and reputedly one of Europe's most charismatic and charming leaders. As the son of the pope, he had family connections that gave him entry into any court in Christendom. He was also one of the wealthiest men in Italy, thanks to his family's estate, his willingness to commit extortion, and his father's deep pockets.
- To be fair, Cesare Borgia was extremely well educated and by the age of 17 had proven himself so capable that his father could elevate him to the position of cardinal. Cesare used this rank, however, to carry out threats, tortures, and assassinations on his father's behalf and, in 1498, renounced his position and the wealth it brought with it to seek out a dukedom.
- Cesare set out to gobble up cities and towns on the eastern side of the Italian Peninsula just north of Rome, an area called the Romagna. His ultimate goal was to conquer the rest of Italy, too.
- It might seem strange that Leonardo—who valued virtue, honor, and dignity—would approach a man like Cesare Borgia, but Leonardo also had a brilliant military mind, was down on his luck, and had experience working with political potentates, irrespective of their virtues. It was not such an unusual move.
- Cesare hired Leonardo on the spot, and it wasn't long before he began referring to his prize employee as General Leonardo. Others may have been put off by Cesare, but Leonardo was not, at least at first.

- Leonardo joined Cesare in the early summer of 1502, just after Cesare had taken the city of Urbino from the Montefeltro family, who had ruled there for more than two centuries. Cesare then set out to scout and plan attacks on Imola and Piombino, secure the defenses of towns he had conquered but not yet fortified, and prepare to defend his gains against the French. Leonardo could help in all three areas.
- Leonardo's experiences in Milan made him, in Cesare's eyes, an expert on French affairs, so he was asked to advise Cesare on mores, customs, and personalities at the French court, which Cesare would use on his diplomatic mission to Milan in August 1502.
- Just as important was Leonardo's great experience as a military engineer. He was immediately set to the task of fortifying defenses in Cesare's border towns.
- Yet another benefit was Leonardo's understanding of geography, geology, and geometry, which gave him the tools he needed to survey new territories and gain vital environmental intelligence about the towns Cesare wished to annex.
- Leonardo toured Cesare's encampments and towns, which he and his assistants sketched with an eye toward improvement. In short order, his suggestions were put into place, which must have pleased Leonardo, who was more accustomed to having his ideas ignored by Ludovico Sforza.
- Leonardo also drew one of the most precisely crafted aerial views of any given location known to contemporary eyes—a bird's eye view without the bird—of the city of Imola. He used a surveying disc mounted at a central vantage point to measure the radial angles of major features of the city, coordinated with distances carefully measured with a device Leonardo invented, called a **hodometer**.

Leonardo and Machiavelli

- In October 1502, Niccolò Machiavelli arrived in Imola as an emissary of Florence. Like everyone else, the Florentines wanted to dissuade Cesare from looking their way. Unlike most others, Machiavelli found much to admire in Cesare, though he later critiqued Cesare's flaws as well.
- Machiavelli met Leonardo as well and saw with his own eyes the things Leonardo could do. The two appear to have formed a relationship grounded in mutual respect and admiration.
- Within a few months, their respective connections with Cesare evaporated. By January 1503, both had left Cesare's court and returned to Florence—Machiavelli as a diplomat and strategist, Leonardo as a military engineer.
- The new republican government of Florence had begun a war of conquest against its long-time rival—the neighboring city of Pisa. Leonardo and Machiavelli convinced the government that they had the technical know-how to redirect the Arno River at key points in its course in a way that would cause it to bypass Pisa altogether, starving the city into submission.



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The Arno River is the life blood of Florence, and it inspired many of Leonardo's most ambitious engineering projects.

- Leonardo began drawing maps of the Arno River, looking for places to alter its course as well as thinking about how the river wanted to move through the terrain. Thanks to his work with hydraulics in Milan, Leonardo knew that water was not as controllable as many believed.
- In Milan, he had devised massive water-moving and canal-digging machines; now, he had the chance to use them. In 1503 and again in 1504, 2,000 Florentine laborers were employed to dig trenches in and around the Arno River, literally carving out a new river bed.
- The plan failed in the end. The new bed only filled with water during the rainy season; when the season was over, all the water drained back into the original route.
- The project was called off, but Leonardo did not despair. He used this failed attempt to divert the Arno as a catalyst for another project that had a better chance of success: designing a canal to bypass the twists and turns of the Arno, giving Florence a navigable route for large cargo ships to reach the Mediterranean Sea.
- If Leonardo's earlier folly had not happened, there was a chance the government might have built the canal. But the city of Florence commissioned him for a quite different project—an enormous fresco that would put his artistic talents to good use instead.

Important Term

hodometer: A device used to measure distances traveled by foot. Leonardo's design for one resembled a wheelbarrow.

Name to Know

Machiavelli, Niccolò (1469–1527): Government official and political theorist. Machiavelli took on a number of diplomatic posts as a representative of the new Florentine republic during the early years of the 1500s. During this time he met and collaborated with Leonardo da Vinci on a number of projects. He was arrested when the Medici returned to take control of Florence in 1513 and wrote his political treatise *The Prince* and a number of plays during a self-imposed exile.

Suggested Reading

Heydenreich, “The Military Architect.”

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*.

Masters, *Fortune is a River*.

Strathern, *The Artist, the Philosopher, and the Warrior*.

Michelangelo and Leonardo

Lecture 25

If Leonardo has any rival in the history of Renaissance art, it is Michelangelo, who was the young upstart to Leonardo's old sage when they met in Florence at the turn of the 16th century. Although they never got along, Michelangelo's work shows both profound influence—and profound departure—from that of Leonardo, particularly when we look at the former's sculpture *Pieta* and the drawing for the fresco *Battle of Cascina*.

The New Republic of Florence

- Although Leonardo is generally considered the artistic founder of the High Renaissance in Italy, there is one person whom contemporaries and later generations have thought might be the greater artist: **Michelangelo Buonarrotti**. In the first decade of the 1500s, the city of Florence contrived for these two masters to compete with each other in a tremendous project of unusual design.
- The Florence of 1500 was quite different from the one Leonardo had left in 1482. Lorenzo the Magnificent had died in 1492, and his arrogant son, Piero, was roundly despised by those he governed. When the French army threatened Florence in 1494, its citizens rose up against the young Medici prince and forced him into exile.
- Piero was replaced by a cleric named **Fra Girolamo Savonarola**, who set up a republican government with himself at its head. Savonarola was a reactionary who openly condemned the corruption of the Borgia papacy and the Neoplatonic culture supported by Lorenzo the Magnificent.
- It took four years for more moderate voices to rise up against Savonarola, but in 1498 they succeeded, and he was executed on charges of treason. Florence turned to a purer form of Republicanism, but with some serious growing pains.

- With no princely family around to make executive decisions and fund major projects, these burdens fell on the tailors, doctors, and wool merchants of the city, who had no training or experience in politics or economics.

Michelangelo's Early Years

- Leonardo's hopes for an official commission when he returned to Florence in 1500 did not come to pass at first, either because the government did not know what to do with him, felt they could not afford him, or decided to commit their resources to Michelangelo Buonarroti.
- In 1501, the government commissioned the 26-year-old sculptor to create a statue of the biblical King David. They had already secured a block of marble and another sculptor for the project, but that contract had fallen through after the sculptor determined that the block was too flawed to withstand the punishment of hammer and chisel. This was precisely the kind of challenge that Michelangelo relished.
- Michelangelo, like Leonardo, was an adopted son of Florence. Trained in the workshop of Domenico Ghirlandaio, he had made a name for himself during the late 1480s as a precociously talented prodigy.
- If we believe his biographers—Vasari being one of them—Michelangelo was brought under Medici patronage in 1490 as a 15-year-old apprentice. Like many others, he had to leave Florence in 1494 when Fra Savonarola came to power; the city simply wasn't safe for him.
- Michelangelo went first to Bologna, then Rome, at which time he caught the attention of local art collectors. By 1497, Michelangelo's reputation was great enough that he was commissioned to sculpt the *Pieta* for a chapel in Old St. Peter's.

- The *Pieta* shows us how Michelangelo was indebted to the classical movement Leonardo had helped invent. An enormous effigy of the Virgin Mary holding a diminutive adult Christ, who has just been detached from the cross and placed in her arms in preparation for burial, the two figures form a pyramidal composition.

Michelangelo and Leonardo

- His return to Florence as a famous and opinionated artist in 1501 caused something of a stir. Leonardo's presence kept him on his best behavior at first, and the pair stayed at arm's length. We have no record of them cooperating or exchanging ideas.
- They did not have to deal with each other during the summer and autumn of 1502, when Leonardo was working for Cesare Borgia. But when Leonardo returned in the winter of 1503, the tension between them intensified.
- A document records a bizarre and petty public argument between them. Leonardo and a group of his colleagues were sitting together in the Piazza della Signoria, talking about **Dante**'s poetry. Leonardo was not a classically educated man, and as he fumbled for something to say, he noticed Michelangelo walking past. Leonardo admitted he could not speak intelligently on the subject but suggested that Michelangelo—who was known as a leading expert on Dante—might be able to educate them.
- For some reason, Michelangelo took offense to this remark and called Leonardo a “failed old fool” who “never finish[ed] anything.” The remark must have stung Leonardo because there was some truth to it, and the two appear to have had little or no direct contact with each other afterward.
- At some point during his stay in Florence, Michelangelo took a crack at the Saint Anne, Virgin, and Christ figural grouping that Leonardo had made famous. But ever the sculptor, Michelangelo turned the figures, considering them from an angle that not even Leonardo had imagined.

Michelangelo's *David*

- In 1504, Michelangelo enjoyed his own one-man show, although not as intentional as Leonardo's. Originally, *David* was supposed to be installed 60 feet off the ground on the exterior of the Florentine Cathedral. But when the figure was unveiled, it was clear that such a remarkable work deserved to be seen by the public at close range.
- The statue was moved to the façade of the Palazzo della Signoria, where it was placed on a pedestal and considered a symbol of the Florentine state—an underdog willing to take on all challengers courageously, violently, and successfully.
- The figure is nude, in keeping with the biblical description of David's confrontation with Goliath. He stands in a perfect contrapposto, turning his head to the left to size up the giant. This emphasizes the latent power of the rock about to be hurled from his sling.
- The proportions of the figure, its striking musculature, and its intense gaze have no equal in the annals of Western art. Leonardo knew and admired *David*. He drew it, probably soon after its installation.



Michelangelo's *David* was instantly recognized as a masterpiece.

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The Salone dei Cinquecento Murals

- Leonardo and Michelangelo might have avoided each other completely if not for one project that not only brought them together but put them into competition. In October 1503, Florence's governor, **Piero Soderini**, commissioned Leonardo to paint a mural in the Palazzo della Signoria called the Salone dei Cinquecento, or the Big Room of the 500.
- Leonardo's work is no longer visible. Some scholars claim it fell apart not long after Leonardo took the scaffolding down; others think it lasted until the mid-16th century. But thanks to Leonardo's preparatory drawings and copies made by others, we know more or less what it looked like.
- The space was absolutely enormous. The fresco that now occupies the space, produced by Vasari in 1565, measures 50' × 50'. By comparison, Leonardo's largest previous painting, *The Last Supper*, measures 15' × 28'.
- The picture by necessity would have to be a mural painted on plaster, but Leonardo hated the traditional fresco technique. The subject matter—a battle scene, namely the Battle of Anghiari, in which the Florentines had defeated Milan in 1440—was also unfamiliar for him. Finally, he was required to work rapidly; his contract demanded that paint had to be applied to the wall within 15 months of the signing.
- Leonardo settled on depicting the moment when the Florentine army captured the Milanese flag. He worked out a wide range of compositions very quickly, focusing primarily on the selection of his moment, the relationships between specific figures, and broad gestures and expressions of individual characters, combining the physical freneticism of combat with the drama of the historical narrative while focusing on individual soldiers and their personal struggles.

- Leonardo decided to employ a technique called **encaustic**. Popular in antiquity, it had fallen out of favor by the 16th century due to the extremely sensitive nature of the process. The pigments are mixed with piping hot wax, which serves as the binding agent. While the wax is hot, one can paint somewhat leisurely, but once the pigments are on the surface, they are pretty well fixed there.
- In September 1504, Michelangelo was commissioned to paint a picture on the other half of the same wall, to the left of Leonardo's *Battle of Anghiari*. His drawing was dedicated to a similar regional conflict, the Battle of Cascina, fought against Pisa in 1364.
- Having the advantage of seeing Leonardo's initial work, Michelangelo focused on themes of motion, terror, confusion, and rage, all conveyed through an expressive and descriptive gestural body language. But unlike Leonardo, Michelangelo's figures twist and turn in unusual poses, reach out to each other awkwardly, and respond to this call to arms in excessive ways. It is Michelangelo telling us that Nature must be respected and can be improved on by the skilled and imaginative artist.
- Michelangelo's **cartoon** for the painting was 20' high by 60' long, but before he could start on the fresco, he was called to Rome by Pope Julius II. The drawing was left behind in Florence, and it became an artistic sensation, passed around from artist to artist for years. Individual figures were cut out of the drawing for art students to study and copy. By 1600, the entire cartoon had disintegrated due to mishandling and overuse; all that is left are copies and copies of copies.
- In January 1505—more or less on schedule—Leonardo began applying his encaustic pigments to his half of the wall. We do not know how much of the painting he finished; only a portion was copied by his contemporaries, which suggests that either it was never completed or that it disintegrated quickly, like *The Last Supper*.

- Nonetheless, the picture was impressive and instantly celebrated. A number of artists brought brushes, easels, and pigments into the room to copy it; a number of others obtained and copied the cartoon.
- As for the picture itself, nothing remains. The encaustic method could not withstand the atmospheric conditions of hot and humid Florence, and by the mid-16th century, Leonardo's wall was covered over by a new one, on which Vasari was hired to paint a fresco in 1563.

Important Terms

cartoon: From the Italian *cartone* (“cardboard”), a full-size preparatory drawing from which a design is transferred to a surface for painting.

encaustic: A painterly process whereby pigments are mixed with melted wax and applied to a dry surface.

Names to Know

Alighieri, Dante (1265–1322): Florentine thinker, poet, politician, and social critic. Dante wrote theologically driven love poetry and treatises on modern government but found himself on the wrong side of a civil war in Florence and was exiled from his homeland in 1301. During his itinerant years as persona non grata, Dante penned the most important work of literature of the early modern period, *The Divine Comedy*, which was the very first work of literature written in Italian.

Buonarroti, Michelangelo (1475–1564): One of the most prolific artists of all time, who revolutionized the world of the visual arts through his drawings, paintings, sculptures, and architectural works—primarily in Florence and Rome. Among Michelangelo's most famous and influential projects were the frescoes for the Sistine Chapel, the sculptures for the Tomb of Julius II, and his designs for the New Sacristy in the Church of San Lorenzo, Florence.

Savonarola, Fra Girolamo (1452–1498): Fiery preacher who opposed the humanistic interests of Lorenzo de' Medici and led the reactionary movement against the family in the 1490s. He organized bonfires of the vanities, in which common people burned the material possessions they were ashamed to own. He led the Florentine government from 1494 until 1498, when moderates overthrew him and burned him at the stake in the middle of the Piazza della Signoria.

Soderini, Piero (1450–1522): Gifted politician and a favorite of Lorenzo de' Medici, after Lorenzo's death in 1492 and the execution of Fra Savonarola in 1498, Soderini helped organize and then presided over the new republican government of Florence until its fall at the hands of the Medici during the coup d'état of 1512. Soderini worked with both Leonardo and Michelangelo during the project to paint murals in the Salone dei 500 of the Palazzo della Signoria from 1503 to 1505.

Suggested Reading

Farago, “Leonardo’s *Battle of Anghiari*.”

Gould, “Leonardo’s Great Battle-Piece.”

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*.

Travers Newton and Spencer, “On the Location of Leonardo’s *Battle of Anghiari*.”

Wallace, “Michelangelo In and Out of Florence Between 1400 and 1508.”

Mona Lisa—La Gioconda

Lecture 26

Few paintings in the world are as famous as Leonardo's *Mona Lisa* (in Italian, *La Gioconda*), but despite its notoriety, many mysteries swirl around its origins and meaning. The majority of scholars now identify the sitter as Elisabetta Giacanda, the wife of a Florentine silk merchant, but why did Leonardo paint her, when and how he did, and why is the image so captivating? The answers lie, in part, in Leonardo's studies of optics, anatomy, and engineering.

The Most Famous Painting in the World

- When we encounter an old friend, do we dwell on past experiences or move forward toward seeing one another with fresh eyes, to experiencing anew what made that particular acquaintance so intriguing in the first place? This is the great challenge facing us whenever we look at the *Mona Lisa* or, as it is known in Italian, *La Gioconda*.
- Your visual memory of the painting is probably quite vivid, but what do you know about the conditions of its production? Have you ever wondered about the sitter's identity, who the patron was, or what the inspiration for the artist might have been?
- All of this leads to perhaps the most important questions: Why is the *Mona Lisa* so famous, so important, and so notable? Why should we care about this painting, its appearance, and its history?
- Quite a modestly sized painting at only 21" × 30", it is painted on a poplar wood panel, which Leonardo favored during his Florentine years. The woman sits in a three-quarter pose, and her body forms a classical pyramid composition. She wears a dark, velvety gown with ruffled sleeves that catch the light and reveal its fine fabric. A translucent veil is cast nonchalantly over her left shoulder, thanks to an expert application of thin oil glazes.

- She sits on a porch with balustrade. Hidden columns indicate this is a well-appointed villa. The elevated balcony overlooks a wilderness of rivers and alps; we see bridges but no people.
- The painterliness of the picture is readily apparent—its colors merge softly, so imperceptibly that we do not even notice the tiny brush strokes.

Who Is the *Mona Lisa*?

- Documents about the painting’s commission, production, and ownership do not exist until the last days of Leonardo’s life, when he was revising his will and putting his affairs in order, and even those snippets do not tell us much. Yet more details about the life of the sitter seem to come out with each passing year.
- Six years after Leonardo’s death, in 1525, Leonardo’s assistant Salai wrote about the things he had inherited from his master, including a portrait he calls *La Ioconda*, or the happy, jocular one. Salai’s language makes it sound like the picture had always been called this.
- The painting continues to be called *La Ioconda* from the time it passes from his possession to his sisters, and from them to King François I of France who gives it a French translation, *La Gioconde*, the title it bears in the Louvre today.
- The earliest reference we have to the painting comes from Antonio de’ Beatis, who visited Leonardo’s studio in France in 1517. He described a picture of “a certain Florentine lady” that had been placed there for the pleasure of visitors and was being painted at the pleasure of Duke Giuliano de’ Medici, Leonardo’s patron between 1513 and 1516.
- Based mostly on these two sources, specialists have pieced together a speculative history of the painting.

- In 1503, Leonardo took on a commission to paint **Elisabetta Gherardini Gioconda**, the pregnant wife of Francesco di Bartolomeo di Zanobi del Giocondo. Giocondo was a wealthy Florentine silk merchant with good political connections; Elisabetta was of old aristocratic stock. Her family called her Lisa; others called her by the feminine form of her husband's family name—La Gioconda.
- Francesco Giocondo's personal, entrepreneurial, and political skills caught the attention of others. By 1515, he was on the payroll of the Medici family at precisely the time they were making their move to destroy the republican government and restore Medici rule.
- Lisa was not nearly as interested in politics as her husband and lived a life that avoided comment by her peers. We have no record of her movements, interests, concerns, illnesses, hobbies, fears, or pleasures until 1538 or 1539, when Francesco died, perhaps of plague.
- With her husband's passing, Lisa moved into a nunnery called Sant'Orsola, where one of her daughters resided. She lived at least another four years, until 1542, and may even have lived until 1551—the records are not conclusive.
- Features of the painting also hint at the sitter's identity. She is a woman of means; we know this because the setting is a summer estate, and those were owned by members of the aristocracy in 16th-century Italy. The villa overlooks a vast, untarnished landscape, telling us that the sitter is the guardian of that terrain.
- This analysis raises three problems however: Why would Leonardo accept a commission from a local merchant when he had obligations to both the Florentine government and Isabella d'Este? What about Antonio de' Beatis's claim that the patron was Giuliano de' Medici, not Francesco Giocondo? Also, if the de' Beatis letter and the style

of the painting date it to the 1510s, could the commission really date to 1503?

- Some have suggested that *Mona Lisa* was Leonardo's attempt to fulfill his promise to Isabella d'Este. The woman portrayed looks nothing like her, however, even accounting for flattery and lost preparatory drawings.
- *Mona Lisa* is one of the most unusual and innovative portraits of the entire Italian Renaissance, which should not surprise us from Leonardo. He deviates from his 15th-century work by softening all the outlines and contours. The blurred edges create a subtle tremor.
- Leonardo's interest in how our eye perceives objects has led him to this intense sfumato. He had long believed that air around was not what everyone thought it was; rather, he knew that particles in the air directly influenced the appearance of sunlight, which in turn affected what the sunlight illuminated.
- This conceptual approach to the relationship between air, light, and objects caused Leonardo to paint in ways that challenged traditional Florentine methods. Leonardo's 16th-century art is all about motion and energy, and not always of the gestural kind. It can be subtle, infinitesimal, a fleeting glimpse or expression.
- This motion and energy can be contained in the minute muscles of the face. The famous smile of the *Mona Lisa* is a case study to show how the muscles in the face move and or what the human eye perceives when they do.

Sfumato versus Tenebrism

- Why did Leonardo decide to deviate from the tenebristic style of portraiture that he had employed in Milan? The first and most obvious reason is his study of the natural world. Painting his sitter against a black background was a good way to satisfy a poet, but painting his sitter within a thriving yet sublime landscape was the way to satisfy the naturalist.

- Perhaps Leonardo was following his Florentine predecessors from the mid-15th century, like Fra Filippo Lippi or Piero della Francesca. These artists placed their sitters in elevated settings that allow them to describe a natural backdrop from above, looking out and over a vast distance. If *Mona Lisa* is a Florentine woman, as Antonio de' Beatis says, then it would make sense for Leonardo to paint her in the local idiom.
- Leonardo was deeply engaged in some pretty detailed and intricate environmental engineering in the early 16th century. The waterways in the background of the *Mona Lisa* speak to Leonardo's desire to address the movement of rivers by placing man's mark on them in the form of a bridge.
- Leonardo also simply loved the natural world and wanted to capture it in all its glories. In painting, that meant finding excuses to depict the natural world whenever possible because painters were not asked to produce pure landscape pictures for another 100 years or so.

Name to Know

Gioconda, Elisabetta Gherardini (1479–1542/51): Traditionally recognized as the sitter of Leonardo's *Mona Lisa* (known as *La Gioconda* in Italian), she was the wife of a political figure named Francesco and was buried in the Florentine nunnery of Sant'Orsola.

Suggested Reading

Greenstein, “Leonardo, *Mona Lisa*, and *La Gioconda*.”

Mariotti, *Mona Lisa*.

Pallanti, *Mona Lisa Revealed*.

Raphael and Leonardo

Lecture 27

While Leonardo and Michelangelo were carrying on their silent Florentine feud, a young man from Urbino came to town to make a name for himself. This painter, only 20 years old, quickly adopted Leonardo's style and principles and was so successful that he came to be known first as an artistic hack and then as one of the greatest and most influential painters in Western history. He was Raphael, and thanks in part to Leonardo's teachings, he would shortly be summoned to Rome to be part of that city's great artistic revival.

Raphael Chooses Sides

- For perhaps two years, Florence hosted three of Western history's greatest artists at the same time: Michelangelo, **Raphael**, and Leonardo. At 20 years of age, Raphael was a young upstart but, unlike Michelangelo before him, was eager to learn and more eager to please.
- The project that most directly facilitated this remarkable artistic convergence was the Salone dei Cinquecento between 1503 and 1505. Artists in Florence were presented with a choice: The meticulous naturalism and science of Leonardo versus the emotional and angst-ridden sculptural style of Michelangelo.
- The choice was not difficult for Raphael. He chose Leonardo, and his reasons seem obvious. Leonardo's adherence to the laws of nature, his tendencies to clarify subject matter, and his ability to tell a coherent story spoke to Raphael's inner artist. On a more personal level, Leonardo was the greatest artistic courtier of his generation, maybe of all time. Raphael, too, was destined for life as a courtier.
- Born in 1483, Raphael grew up in Urbino, where his father served as court painter to Duke Federigo de Montefeltro. Raphael spent a good amount of time inside the ducal palace and was taught at an early age about the rules and games of courtly life.

- In the mid-1490s, his father arranged for him to apprentice with Piero Perugino. Raphael learned the rules of painting as devised by Leonardo and his contemporaries, with an emphasis on the importance of good draftsmanship.
- There is an extremely good chance that Raphael traveled a good deal to see the works of other artists, including Leonardo, and Leonardo may have met Raphael when he was serving Cesare Borgia after Cesare had taken Urbino.
- While no documents support a relationship between Raphael and Leonardo, we have visual evidence of Raphael's leanings. The clearest indicators are Raphael's portraits produced in Florence, especially those commissioned to commemorate the marriage of Maddalena and Agnolo Doni in 1507.
- Maddalena and Agnolo are shown at half length, with their torsos twisting in a seated contrapposto and three-quarter gaze. Behind each of them appears a brilliant, naturalistic landscape. Although the sfumato is not apparent here, the composition otherwise strikes one as decidedly Leonardesque.
- Raphael's *Lady with the Unicorn* shows a similar approach: the twist of the body, the frontal gaze, and the deep landscape in the background. Just as the *Mona Lisa* originally contained a column running along the edge of its frame, so did this painting.



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Raphael was a devoted follower of Leonardo's style.

Leonardo's *Leda*

- Two other works by Leonardo made a strong impression on Raphael: Sometime between 1505 and 1508, Leonardo began preparing sketches for *Leda and the Swan*—a moment from Greek mythology and an overtly erotic picture, particularly for that day.
- Leda is shown in full frontal nudity, with thrusting hips and a contrapposto pose. She looks out at us knowingly, maybe even invitingly. The swan swings his neck and beak up toward her. The forms are sinuous and supple. To emphasize the point, children emerge from eggs: Castor and Pollux, Helen and Clytemnestra. The painting was completed at some point before he left Florence for Milan in 1508.
- We have become increasingly numb to the depiction of the nude female form, but in the early 16th century, such depictions were likely thought of as highly charged erotica, particularly when shown in the context of a pagan story about seduction. Leonardo was not the first to show female nudity, but earlier Renaissance depictions tended to use this image as a metaphor for concepts like purity or as part of a creation story.
- In December 1499, only four months before Leonardo and Luca Pacioli went to Venice, an openly pornographic poem was produced anonymously in Venice, probably by a Dominican friar named Francesco Colonna. Called *The Fight for Love in the Dream of Poliphili*, it recounts a wild vision by a girl of that name and was accompanied by a number of erotic and fetishistic prints.
- The book was a best seller. Even if Leonardo did not read it, he surely knew of the illustrations. Leonardo was more subtle and legitimized his erotic painting by grounding it in a story from pagan mythology. Yet the raw sensuality reminds us that Leonardo was human and perhaps more aware of the emotional side of nature than some critics have wanted to see in him.

- The original painting traveled with Leonardo for the last years of his life, went north to France with him, and ultimately landed in the hands of King François I of France, whereupon sometime in the 17th century, it disappeared.
- *Leda* was famous in its own day—so much so that Raphael copied the drawing, unknown painters did the same with Leonardo's finished product, and it was considered the most valuable of all of Leonardo's pictures when he died in 1519. Leonardo's contemporaries saw it as an opening salvo in what could become the rapidly emerging genre of erotic painting.

Leonardo's Madonnas and Raphael's Copies

- The most influential Leonardo painting of this period for younger artists like Raphael was completed around 1508. Like *Leda*, it seems to have had no patron, no predetermined setting, and no particular function. This *Saint Anne Madonna* was based on the sketch we saw earlier, the one Vasari tells us he put on display for the public.
- Like in a preparatory sketch, we see the familiar classical composition forming a family tree, with each generation emanating from the legs, or womb, of the predecessor. Mary tries to hold Christ back, but he squiggles out of her reach toward John the Baptist and his destiny.
- This cartoon builds on an idea that Leonardo had wanted to pursue for 30 years: the concept of motherly love, the infuriating independence of children, danger, self-sacrifice, and tenderness.
- The popularity of Madonna paintings had never been higher in the city of Florence. *Madonna of the Goldfinch* by Raphael, now in the Uffizi Gallery, shows his understanding of classical composition: Mary creates that solid core in the center. She reaches down to caress Christ, who strikes an elegant contrapposto pose while stroking a Goldfinch held by the John the Baptist, which symbolizes the soul. The landscape transitions from green to blue to white,

as a picture by Leonardo might, although not with the same use of sfumato.

- People bought small Madonnas for their homes at a pretty crisp rate at this time, and Raphael's popularity grew by accommodating their needs—adding all the requisite figures: Mary, Christ, and John the Baptist.
- Once in a while, he would try something unusual, as he did with *Madonna of the Meadow*. Mary is shown on a stool, and Christ is squeezed between her arms. Symbolically, this composition may allude to a birthing stool and childbirth. It may have been meant to comfort a woman who was pregnant for the first time, for childbirth was, by far, the number one cause of death among adult women.
- Between 1505 and 1508, Raphael churned out handfuls of Madonnas, most of them of modest, unintimidating sizes, like the *Louvre Madonna* and *Madonna of the Pinks*, all along Leonardo's model. But with the sole exception of that one-man show in 1501, the only way Raphael could have seen Leonardo's drawings was to have visited his workshop.
- The fact that Raphael blatantly borrowed from Leonardo and Leonardo let him indicates a couple of things: Leonardo was not particularly interested in churning out Madonnas or in a formal partnership with a younger painter. However, while the borrower showed proper deference and respect to the one whose ideas he was borrowing, the creator did not insist on recognition.

The End of an Era

- Then, just as abruptly as this remarkable confluence of artistic synergy emerged, it was broken, or at least reconfigured. In 1503, Julius II came to the papal throne and embarked on a bold plan to revitalize Rome.
- He began calling the greatest artists and architects of the day to the city. First, in 1504, he called Bramante to the papal court. Next, in

1505, came the call for Michelangelo. Then, in 1508, Julius called for Raphael.

- Leonardo never received a similar call, for by then he was committed to a different master on the opposite end of Italy, back in Milan—the king of France.
- When Raphael came to the papal court, Michelangelo interpreted this as a threat to his prominence, for here was a Leonardo protégée in his midst.

Name to Know

Raphael (a.k.a. **Raffaello Sanzio** or **Raffaello Santi**; 1483–1520): Enormously talented painter and deft courtier who earned a reputation for artistic elegance and diplomatic skill during his years in Florence and Rome. A member of Julius II's entourage of artists from 1508 to 1513, Raphael painted frescoes in the Vatican (*The School of Athens*, 1512), portraits of his papal patrons (*Julius II*, 1512; *Leo X*, 1516), and altarpieces for Roman churches (*The Transfiguration of Christ*, 1518), before his sudden death at the age of 37.

Suggested Reading

Allison, “Antique Sources of Leonardo’s *Leda*.”

Brown, “Raphael, Leonardo, and Perugino: Fame and Fortune.”

Hochstetler Meyer, “Leonardo’s Hypothetical Painting of *Leda and the Swan*.”

Leonardo in Milan and Pope Julius II in Rome

Lecture 28

The French were eager to welcome Leonardo back to Milan in 1506, and they found a way to make his temporary move permanent by 1508. During this time, Leonardo completed a second version of *Madonna of the Rocks*, as well as some other intriguing religious images. Meanwhile in Rome, Pope Julius II was trying to change the way the world viewed the church and the papacy through a grand artistic program that Leonardo did not participate in—directly.

Return to Milan

- In 1506, the city of Milan was still in French hands under a highly competent and successful governor named **Charles d'Amboise**. He recognized the opportunity to get his hands on the one artist who could rival the stable of painters and sculptors being collected by Pope Julius II, thanks to a legal proceeding.
- On April 27, 1506, an independent arbitrator concluded his evaluation of a longstanding dispute between Leonardo and the Confraternity of the Immaculate Conception over the *Madonna of the Rocks*, painted back in 1483. The arbitrator sided with the patrons and decreed the painting had never been finished.
- Leonardo was now obligated to complete the terms of his contract with the confraternity. In May 1506, Leonardo arrived in Milan while Charles d'Amboise and the Florentine government argued over the length of time he was to remain because the *Battle of Anghiari* was not finished yet.
- In August 1506, Charles d'Amboise was forced to write a letter to Florence, asking them to extend their loan of Leonardo. King Louis XII got into the act as well in January 1507, stating that he expected Leonardo to produce a number of small paintings for him, depending on Louis's whims and desires. By July, Louis was

writing letters about “our dear and good friend Leonardo da Vinci, our painter and engineer,” suggesting that Leonardo was now a French courtier.

The Second *Madonna of the Rocks*

- Even in that era of enhanced individuality and artistic originality, no artist could work alone. Leonardo reached out to an artist involved in the first *Madonna of the Rocks* to complete the second: **Ambrogio de Predis**, who had painted the side panels of the original triptych more than 20 years earlier.
- With Ambrogio doing most of the work, they finished the painting that is now referred to as the *London Madonna of the Rocks*, due to its current location in the National Gallery. In this new version, there is an emphasis on illumination. The light is more evenly laid. The landscape emerges clearly. The figures are identifiable by iconographic attributes.
- The figures seem bigger and more monumental—perhaps because the panel is a bit smaller than the original. It seems more like a picture of the Holy Family in a landscape than a landscape containing the Holy Family.
- After two years, the painting was not complete, and it never would be, although Ambrogio managed to get it installed at the end of that year, thus closing the book on this litigious commission.

The Confrontational *John the Baptist*

- Leonardo did not spend all of this period exclusively in Milan. He spent time in Florence in the winter of 1507 at the hospital of Santa Maria Nuova performing scientific work. He also traveled to and from Florence in the spring and summer of 1507 to deal with a legal matter pertaining to his father’s estate, but in early 1508, Leonardo left Florence for good.

- Around 1509, Leonardo became occupied with an unusual picture that has been a bit of a problem for a lot of art historians over the years. It is a chest-high picture of a male youth, arm extended and pointing to the sky, emerging out of darkness. Sfumato returns as well; there are practically no lines anywhere.
- The figure, identified as John the Baptist, is entirely frontal and addresses us directly. His position recalls his first meeting with Christ as an adult, during Christ's baptism: John sees the dove of the Holy Spirit over Christ's head and says, "Behold the Lamb of God." Remarkably, John's position in this painting addresses the viewer as Jesus.
- Leonardo experimented with this concept before, maybe as early as 1506, in a study of the angel of the Annunciation, which is today in Windsor Castle. Gabriel lifts an arm to the skies, telling us that he brings a message from God. The study puts the viewer in the position of Mary.
- This John the Baptist also reverts to tenebrism for the first time in more than 10 years—the tenebrism that had dominated Leonardo's first Milanese period. Perhaps when Leonardo is in Milan, he adopts the Northern European style of dramatic portraiture, but when he is in Florence, he adopts the natural landscape backgrounds in the southern, Florentine style.
- Leonardo strives to achieve a personal connection between the viewer and the image, with a religious link binding the two together. But this personal connection almost seems to invite the bypassing of intermediaries—like priests and church officials—to achieve personal redemption from heavenly figures. It invites us to wonder whether the move northward is affecting not only his approach to painting, but also his approach to the church.

Meanwhile in Rome

- Pope Julius II was quickly becoming the most important patron of the European High Renaissance. He was busily transforming the city of Rome into a magnificent showpiece.
- Rome's complete refurbishment was carried out by a string of popes—Sixtus IV, Innocent VIII, Alexander VI, Pius III, Julius II, and Leonardo X—and Leonardo never worked directly with any of them, but their interests and actions affected him both directly and indirectly.
- Julius was the most ambitious of these pontiffs. His given name was Giuliano della Rovere, and he was one of the most extraordinary men to ever hold the office. During his nine-year reign, he did more than any other single figure of the period to return the Italian Peninsula to the glory days of the Roman Empire.
- Born in 1453, Giuliano was educated in the ways of the church by his uncle, Francesco della Rovere, who became Pope Sixtus IV. As pope, one of his first acts was to appoint the 18-year-old Giuliano to a bishopric in France, and Giuliano soon joined the papal court of his uncle as a cardinal.
- When he came to the papal throne, Julius embarked on a series of audacious goals. First among these was to return Italy to the Italians and to revive the glory of the Roman Empire, with himself, the pope, as the new emperor. To do this, a number of things had to be accomplished:
 - Destroy Cesare Borgia and conquer his lands in the name of the pope.
 - Expel the French from Milan and the Spanish from Naples and install in their places leaders sympathetic to Julius.
 - Push Venice back to its former borders and destroy her ability to wage war in Italy.

- Vivify the city of Rome as a fitting cultural and political center.
- Celebrate Julius the key figure of it all in any and every way possible.
- Julius needed three things in abundance to accomplish these goals: Soldiers, artisans, and money. So Julius engaged in one of the grandest schemes of simony and the sale of indulgences in the history of the papacy. He then called on Europe's greatest artistic talents to rebuild and redecorate his city.
- Finally, he cobbled together alliances that won a string of victories for him. His need for outside assistance caused him to play fast and free with a number of different devils: the king of France, the Holy Roman Emperor, Ferdinand of Spain, Henry VIII of England, Florence, Milan, and Venice, each of whom agreed to fight each other in various forms and combinations.
- This system gave Julius a series of temporary gains, but in the long run all he did was keep the door open for foreign troops to stay in Italy.

Leonardo's Accidental Revenge

- One thing Julius did succeed at was rebuilding Rome. The first member of his all-star team was Donato Bramante, the architect. He was called to work on the single most important architectural project of the entire High Renaissance, the new St. Peter's Basilica.
- The most important church in western Christendom, it was built in the 4th century and was now 1,200 years old. So the old one was torn down, section by section, with its ancient and medieval artistic masterpieces smashed to bits or removed and installed in other buildings.
- Bramante looked back to designs he had forged in collaboration with Leonardo to create a centrally planned church inspired by Leonardo's Neoplatonic understanding of architectural symbolism.

- In April 1506, the first stone was laid for this dynamic new structure—smaller in scale than Julius had initially envisioned, but much more innovative and modern than the traditional cruciform plan that everyone expected.
- This became a problem for the second all-star to join his team, Michelangelo, who was absolutely apoplectic when he learned of Bramante's design. Michelangelo had a design for Julius's tomb—a full three stories high, with 40 larger-than-life-size figures adorning them.
- When it became clear that Bramante's centrally planned church would not have enough room to fit this free-standing mausoleum, Julius had no choice but to put Michelangelo on hold and instead turn his attention to a different project: the painting of the ceiling of a free-standing chapel in the Vatican that Julius's uncle, Sixtus IV, had built in 1478.
- From 1508 to 1512, Michelangelo bitterly set his energies on painting one of the most famous frescoes in the world. He produced extraordinary figures for this unbelievably complicated fresco cycle, including the one painting that rivals the *Mona Lisa* as the most easily recognizable image in Western history, the *Creation of Adam*.



Michelangelo's *Creation of Adam* was a diversion for Michelangelo.

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Raphael in Rome

- The third great artist to join this team was Raphael, who was put to work painting a series of frescoes in a set of rooms called the **Stanze**, built by Alexander VI as papal offices.
- One of this series is *The School of Athens*, which documents the rise of intellectual humanism across Italy in the early 16th century and the actual works produced in the Vatican at the time this picture was produced in 1512.
- The painting is a fantasy of an ideal Renaissance court. The building, with its steps, large piers, and unfinished dome, is clearly the interior of St. Peter's. Aristotle and Plato descend the steps at the center of the composition. Many believe that the model for Plato's face was Leonardo. They are flanked by at least 19 different ancient scholars—including Euclid, Socrates, Pythagoras, Epicurus, and Boethius.
- Down below, literally an afterthought to Raphael, who only included it late in the project, is Michelangelo: alone, aloof, and brooding. Absent from this interpretation of a modern-day court cast in the guise of a Greek symposium is Julius himself, who would have been present in person.

Important Term

Stanze: From the Italian word for “rooms,” the rooms built in the Vatican Palace during the pontificate of Alexander VI and decorated by Raphael and his followers between 1509 and 1524.

Names to Know

d'Amboise, Charles (1473–1511): Military leader and skilled diplomat who served in the French royal court and was appointed governor of Milan after the occupation of Northern Italy by the forces of Louis XII in 1499. As head of state, Charles acted as patron and protector of Leonardo da Vinci from 1506 to 1511.

Predis, Ambrogio de' (c. 1455–c. 1508): Milanese painter and colleague of Leonardo's in the 1480s who continued to work with and for Leonardo into the 16th century. The two artists collaborated on both versions of *The Madonna of the Rocks* (Paris and London).

Suggested Reading

Hollingsworth, *Patronage in Renaissance Italy*, pt. 4.

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*, chap. 5.

Verdon, “Pagans in the Church.”

Zwijnenberg, “*St. John the Baptist* and the Essence of Painting.”

The Anatomical Drawings—His Greatest Works?

Lecture 29

Leonardo's notebooks contain multiple descriptions, drawings, and definitions of the human body, and his understanding of blood circulation was centuries ahead of its time. He obtained the knowledge to make these drawings through dissection—a rare and dangerous practice in Europe in the 16th century. Through this pioneering work, Leonardo can be considered, in many ways, one of the fathers of modern medicine.

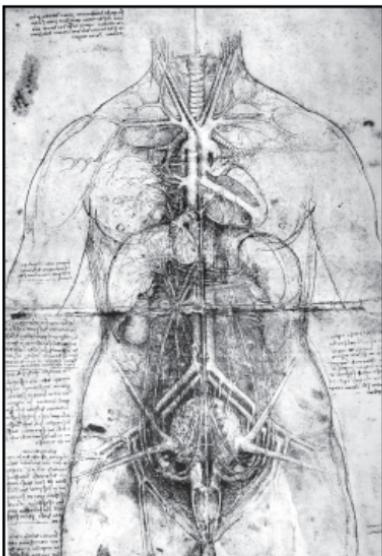
The Rarity of Autopsy in the 16th Century

- At the end of 1507, Leonardo returned to Florence for a few months to address some legal matters. While there, he devoted a great deal of his attention to a subject that had never been developed in quite the way he thought it should. He took some valiant risks as he did it and confronted many intellectual taboos.
- Leonardo tells us about his interest in anatomical studies in one of his notes dated to January 1508. He was spending much of his time reading books in the Florentine hospital of Santa Maria Nuova, where he also met an elderly man who caught his interest:

An old man, a few hours from his death, told me that he had lived a hundred years, and that he felt nothing wrong with his body other than weakness. And thus while sitting upon a bed in the hospital of Santa Maria Nuova in Florence, without any movement or other sign of any mishap, he passed out of this life. And I made an [autopsy] of him in order to see the cause of so sweet a death.

- This was not the first time Leonardo had ever cut into a human being. He regarded this autopsy as a scientific investigation, yet his notes indicate empathy and personal loss at the old man's death, all of which make Leonardo seem a very modern kind of physician.

- Dissections were rare in European Christian societies of the day, although not unheard of. A few manuscript illuminations show physicians performing dissections and assistants and clerics in attendance. One such image was painted in 1483 to document a medical lecture delivered by a professor in Pavia, the town not far from Milan where Ludovico Sforza made his country home. It is possible Leonardo attended such proceedings there.
- In the image, note that none of the attendees take notes or otherwise record their observations, implying that anatomical drawings before the work of Leonardo were rare.
- Medieval medicine was symptom and tradition based. Advances in medical knowledge were tightly restricted by the refusal of some religious leaders to allow for the dissection of human beings—particularly Christians. Medieval Christianity held that, at the impending Second Coming, dead souls would be restored to their bodies; thus their bodies must remain intact.
- Surgical work also presented problems in a society with no real refrigeration or concept of germ theory. Corpses fouled so quickly that members of the medical community refused to deal with them. Their lack of experience meant that, even if they did try to perform autopsies, they did not know what to do or what to look for.



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Leonardo's anatomical drawings were unprecedented in their level of detail and could only have been achieved with the use of dissection.

- Moreover, the scientific method had not been invented; therefore, which meant that any research on human subjects was truly a fly-by-night operation. if medieval researchers did venture into the body, none of them were prepared to record their findings with any kind of order or accuracy.

Leonardo's Art Meets Leonardo's Science

- A medical treatise from about 1345 by Milanese physician and scholar Guy of Pavia demonstrates why Leonardo's unique talents made him such an effective medical researcher. Guy describes the dissection of the thorax, but the accompanying illustrations seem merely decorative; they would be no use in replicating the procedure or studying anatomy.
- In short, scientists were not artists, and artists were not scientists—until Leonardo—and no one who understood as Leonardo did how a well-executed image can convey information so much more efficiently and effectively than words.
- Second, it is impossible for anyone to learn about everything one needs to know about the human body through studying cadavers, especially under 16th-century conditions. There is too much information, and too few dissections. An artist can capture this information to be studied at leisure.
- We think Leonardo conducted some 30 dissections himself. In his notes toward a possible anatomy treatise, he claimed that mastery of the human anatomy would require someone to perform 18 dissections, with six major topics examined three times and from three different views: once from the front, once from the side, and once from the back.
- This work was dangerous: Not only was Leonardo unknowingly exposing himself to bacteria; many still believed this kind of scientific research was in violation of church law and therefore punishable in the harshest terms imaginable.

- Leonardo was examining—and maybe even dissecting—corpses at least as early as about 1488 in Milan. His earliest drawings are in the Windsor Castle collections and show us primarily what Leonardo did not know.
- The issues that consumed Leonardo's attention in 1488 were the cardiovascular system and the human head. Leonardo produced a drawing of those organs contained within an outline of the human figure, but the drawing has nothing to do with direct observation.

Leonardo's Head Studies

- Leonardo's 1488 studies look at the human skull from two vantage points: The frontal view is a double drawing and focuses on teeth. The right side shows us a perfectly aligned dental arrangement and the left shows us a decayed skull with the mouth bashed in. Four teeth are drawn independently on the left. As with his mechanical drawings, he is showing the smaller parts of the bigger machine.
- The side view shows the relation of the spinal cord to the head. In the drawing above it, Leonardo gauges the circumference of the skull, which allows him to think about the size of the brain and how it sits inside the head. He notes the sunken cheekbones, the recessed eye sockets, and the way the jawline cuts under the mouth at nearly 90 degrees.
- Some scholars have reconsidered *St. Jerome*, wondering whether that painting should be dated later than 1480—that is, coming after the anatomical studies of skulls Leonardo conducted in 1488. However, human bones were displayed in hospitals, churches, and even architectural structures. Whether the studies or the painting came first, the two can be seen as closely related variations on a common exploration.
- We can also look at his portraits from the first Milanese period in the same way. If we consider the head of *La belle ferroniere* from the 1490s in the context of Leonardo's anatomical studies, we notice immediately its sophisticated handling of facial bone structure compared with *Ginevra de' Benci* from the 1470s.

- Leonardo wanted to know how the eye worked, and he theorized about its functions in part so he could paint pictures that would appeal more thoroughly to the human soul. He started to cut into human heads with the intention of learning what the eye was connected to and how images were transferred into the mind.
- Leonardo also came to recognize that the process by which our brains understand things in our field of vision was exactly the opposite of conventional wisdom of the day: Light, he realized, enters the brain through the eye. In the 15th century, medical expertise held that the human eye projected light onto an object.

Leonardo's Studies in Reproduction

- Leonardo's drawing fearlessly explored the act of procreation. In 1493, he drew a cross-section of a couple in the act of conception, with the internal reproductive organs sketched in. In style, they resemble his caricatures, and the pair grin at each other, conveying emotional pleasure.
- At just about the time he was working on a painting for the possibly pregnant Lisa Giocondo, he drew a human fetus; the human female anatomy; and the human male anatomy with veins and muscles added in a three-dimensional model of what happens during intercourse. The proportions of each object have been pristinely calculated so that we see how they appear in relation to others.
- Leonardo adds a little note: "Woman desires that the size of the male member to be as large as possible, while man wishes the opposite of the genital organ of the woman." Leonardo wasn't just drawing anatomy; he was also dealing with the joy of sex.

Treatise on Anatomy

- All of Leonardo's anatomical drawings are masterpieces of draftsmanship. Most of them appear to have been for his own personal edification, not for publication or general consumption.

- Some may have been intended for a treatise on anatomy that he never published. He pioneered the practice of looking at an organ or structure from four different directions and a cross-section.
- Another clue is a drawing of a woman's body that has been pierced to be reproduced through the **pouncing** technique. This implies that at least some of his drawings were distributed for educational purposes.
- The kind of work Leonardo had to do to make these drawings, even in the sanitized laboratories of modern scientific institutions, is not for everyone. He likely had to do the work of cutting, cleaning, and drawing all by himself. He wrote about the challenges facing the medical scientist who might consider conducting these kinds of experiments:

Even if you love this activity, you may be hindered by your weak stomach; ... by fear of being at night in the company of these bodies, torn to pieces and skinned and frightening to look at. And if this doesn't hinder you, you may lack the drawing skill suitable for such representation. Or if you manage the drawing, you may lack the perspective. And if that isn't so, you may fail the arrangement of the geometrical representation or the reckoning of the strength and power of the muscles. Or you may fall short of patience, and thus you will not be diligent. Whether or not I have succumbed to these things you can judge.

- We see in these drawings Leonardo at his most humble, his most reverent, his most introspective, and his most eloquent, but also at his most detail-minded and observant.
- Leonardo invented the cornerstone of modern medical science as we know it, but the only way he could have done this was through his rare combination of talents—as an artist, an engineer, and a scientist.

Important Term

pouncing: A process whereby chalk dust is placed inside a cheesecloth sack and lightly patted against a drawing that has been pinpricked along its contours and laid on top of the surface to be painted. The dust pushes through the pinpricks, forming an exact copy of the original drawing on the new surface. 29

Suggested Reading

Cianchi, *Leonardo: Anatomy*.

Keele and Roberts, *Leonardo da Vinci: Anatomical Drawings from the Royal Library, Windsor Castle*.

In Praise of Painting—Leonardo’s Manifesto

Lecture 30

After one last (unsuccessful) crack at sculpture at the start of the 16th century, Leonardo turned his back on the art form for good. This seems appropriate, given his thoughts on the matter as recorded in his notes that came to be called the *Treatise on Painting*, as well as his *paragone* (or public defense) of painting as the highest art form. Both of these sets of arguments profoundly influenced the painters of the following generations.

Leonardo the Author

- Leonardo planned many publications during his lifetime—treatises on anatomy, bird flight, mechanics, and hydrodynamics—and he published a treatise on geometry with Luca Pacioli. Leonardo almost seemed to be groping toward the creation of a personal encyclopedia.
- The only treatise Leonardo brought close to completion himself was a sort of manifesto, the *Treatise on Painting*. Leonardo never organized this material into a treatise, and his range of topics goes far beyond what we would normally think of as painting. But it unquestionably lays down specific ideas about what matters in painting and what painters ought and need to know to do things the right way.

The Trivulzio Tomb

- Leonardo made a second foray into sculpture around 1509 or 1510 for a **condottiere** named **Giovanni Trivulzio**. Trivulzio had begun his career under Ludovico Sforza during the 1480s, then in 1488 went to work for better wages in the Spanish court of Alfonso of Naples.
- A true mercenary, he joined the French in 1494. When Charles VIII and his troops entered Naples, Trivulzio lured Alfonso into his camp, and then deposed his former employer. Next, Trivulzio turned against Ludovico Sforza. By 1504, he was a wealthy man

and designated 4,000 ducats for the design and production of a massive equestrian monument to be installed in a burial chapel that was to be built for him in a church in Milan called San Nazaro.

- In 1510, Leonardo submitted his invoice to Trivulzio, including the cost for marble, metal, clay, **armatures**, assistants, laborers, and his own salary, the total coming in at just over 3,000 ducats.
- From what we can tell from Leonardo's preliminary sketches, the ensemble would have been something of a pastiche of earlier projects he had either seen or done for himself. The base, made of marble, would be freestanding, containing a niche holding Trivulzio's effigy, as was the custom.
- Lashed to each of the niche's columns were full-length male nudes, struggling against their chains to break free—perhaps a reference to Trivulzio's conquests. The figures of the bound prisoners compare quite closely to some of those produced by Michelangelo for Pope Julius II's tomb.
- The focal point was the equestrian monument on top. Leonardo looked to best his old master, Verrocchio, in his monument of Bartolommeo Colleoni. The horse here rears up on its hind legs, improving on Verrocchio's three-legged horse. The rider seems ready to take off into the air. Below him cowers another of the vanquished, stomped under the beastly power of the stallion ridden by the merciless warrior.
- At some point, someone intimately familiar with the plan—maybe even Leonardo himself—produced a small bronze statuette of the rearing horse and rider. This is precisely the kind of preparatory **maquette** an artist might produce for a patron.
- But at this point, the project came to a halt. Charles d'Amboise, Milan's French governor, did not trust Trivulzio, with good reason, and would not allow Trivulzio to immortalize himself as a hero of Milan.

- In fact, when Charles d'Amboise died in 1511, Trivulzio briefly took command of the city. The project did not resume, however; Trivulzio's attention and money were focused elsewhere. Leonardo would never have an opportunity to return to this work.

The *Treatise on Painting*

- For about 10 years, Leonardo wrote down his thoughts about painting on sheets of paper, which were then filed away and kept private throughout his life. They numbered in the hundreds by the time he was finished with them.
- Leonardo's so-called *Treatise on Painting* was never published during his lifetime and was never seen by the general public for well over 100 years after his death. The various sheets were compiled after his death by his disciple, **Francesco Melzi**, and organized into discrete sections. Melzi then transcribed all the notes into a new manuscript of about a thousand passages.
- According to an estimate by the scholar Martin Kemp, only about one-fourth of the transcribed passages have themselves survived in Leonardo's hand; the rest we have only because of Melzi's manuscript, which is held today at the Vatican library and called the *Codex Urbinas*.
- Melzi passed the manuscript along to those select few painters he trusted with the information. That manuscript was again copied by hand and passed around within the artistic community but was still a well-guarded document. Finally, in 1651, an abbreviated version was published simultaneously in French and Italian as the *Treatise on Painting*.
- Leonardo says in his Introduction,

I know well that, not being a man of letters, it will appear to some presumptuous people that they can reasonably belabor me with the allegation that I am a man without learning. But they do not grasp that my concerns are better handled through experience rather

than bookishness. Though I might not know, like them, how to cite from the authors, I will cite something far more worthy, quoting experience, mistress of their masters. I say that anyone who argues on the basis of ancient authorities does not exploit his insight, but rather his memory.

- In other words, Leonardo believes the only way learn is by doing something yourself and, through trial and error, getting it right. This flies in the face of early Renaissance humanism, which relied heavily on the authority of ancient texts. Leonardo favored a more modern, scientific approach to art and the natural world.
- Leonardo spends lots of time talking about the science of optics and light, in particular how people receive images through the eye. He knew he alone possessed information about sight that painters had to know.
- He also wrote about perspective and distance, which were not new subjects in the 16th century. But Leonardo supplemented Alberti's well-known equations with his own geometrical studies and knowledge of atmospheric and aerial perspective.
- Leonardo's study of nature also helped him articulate his distinctive interest in the interplay of light and shadows, known in Italian as **chiaroscuro**. Unlike earlier theorists, who had argued that figures and objects are naturally illuminated but then obscured by shadows, Leonardo believed that all things exist in a sea of darkness and are revealed only when light strikes them.
- When his notes were passed around beginning perhaps around 1530, Leonardo's ideas fell into the hands of artists like **Carlo Urbino**, who produced a number of drawings based on what they were reading. These sketches help tell us that Leonardo's ideas were getting around and that artists were testing his ideas.

The *Paragone* of Painting

- Leonardo wanted to convey a view of painting as a form of knowledge about all other subjects. He imparted to painters his observations on the human body—including sections on proportions, emotions, gestures, movement, and distribution of weight. His abilities as a musician meant that he could write about harmonies from intellectual experience.
- Leonardo da Vinci, the Renaissance man, was telling his readers that they, too, had to be Renaissance men. In fact, Leonardo was saying not only that art would benefit from greater knowledge, but also that art would itself contribute to the increase of knowledge. We know from Leonardo's own work on anatomy and other subjects that the visual arts were central to his own achievements in science.
- He argued that, “He who despises painting loves neither philosophy nor nature.” This kind of sharp discourse comparing, even ranking, one art against another was known in Italian as a *paragone*. This sort of argument mattered a great deal in the Renaissance environment of intense artistic and academic competition.
- Debates were held on these matters with some frequency during the 15th and 16th centuries, usually in the presence of important judges. Leonardo took part in at least one of these debates, on February 9, 1498.
- And at that time, painting had no assigned place in relation to the seven classical liberal arts—grammar, rhetoric, logic, arithmetic, geometry, music, and astronomy. Leonardo wanted to change that.
- The first *paragone* in Leonardo's *Treatise on Painting* involves a comparison between painting and poetry. Leonardo goes to great lengths to demonstrate the shortcomings of verse; poetry, he argues, tries to show with words what only the eyes can properly understand.

- Leonardo then talks about the eye and how it works; he talks about how our senses interpret the world around us. Then he makes an effort to elevate painting to a status equal to that of poetry and philosophy: “Painting represents the works of nature … with greater truth and certitude than do words and letters.”
- Painters have leverage here: “Painting immediately presents to you the demonstrations which its maker has intended and gives as much pleasure to the greatest of senses as anything created by nature.” By contrast, poetry takes a long time to grasp.
- He has good things to say about music, which is perhaps not surprising, given his own gifts in this field. But in the end he argues that music, which appeals to the ear and is performed by the mouth, is the lesser sister to the more noble art that serves the eye.
- He rather surprisingly decides to take aim against the sister arts of sculpture and architecture. Most of his argument lies in his belief that their practitioners are too bound by their ties to manual labor to escape the label of craftsmen. It is hard not to read these remarks as a reflection of his own disappointments—or a dig at Michelangelo.
- But his most damning critique of sculpture is that it is not a very intellectual medium: Spatial definition arises from the nature of the medium and not from the artifice of the maker.
- Leonardo never published his collection of thoughts on painting. Had he ever published a book, we can feel free to imagine he might have revised his language, as much as he revised and perfected his visual ideas.

Important Terms

armature: A wooden model of a sculpture that an artist covers in clay.

chiaroscuro: Italian word meaning “light-dark”; refers to the dramatic or theatrical contrast of light and dark in painting.

condottiere: A mercenary general.

maquette: A small-scale preparatory sculpture for a larger monument, usually created to garner a patron's approval before moving ahead with a project.

paragone: An Italian word meaning “debate” or “discourse”; a popular form of intellectual inquiry in the Renaissance, in which the author or speaker demonstrated the virtues of one particular theme or concept by comparing it favorably to another.

Names to Know

Melzi, Francesco (c. 1491–1570): A painter of noble birth, Melzi joined the studio of Leonardo as a teenager and became a trusted member of the inner circle for the rest of Leonardo’s life. Melzi inherited Leonardo’s notes and writings and maintained them carefully until his own death.

Trivulzio, Giovanni (c. 1440–1518): Aristocrat, mercenary soldier, military commander, and political leader. Eager to establish a legacy for himself, he briefly engaged Leonardo da Vinci to produce designs for an equestrian monument in his honor. The project was dropped when Trivulzio took control of Milan in 1511 and focused his energies on matters of state.

Suggested Reading

Clark, *The Drawings of Leonardo da Vinci in the Collection of her Majesty the Queen at Windsor Castle*.

Kemp, ed., *Leonardo on Painting*.

Radke, *Leonardo da Vinci and the Art of Sculpture*.

Leonardo and the Medici in Rome

Lecture 31

Leonardo came under Medici patronage once again when Giovanni de' Medici became Pope Leo X and his brother, Giuliano de' Medici, became the ruler of Florence. Nominally attached to the Florentine court but living in Rome, Leonardo spent his time in the Vatican doing mostly as he pleased, more ornament than advisor, and finally began to paint a subject that had long occupied his imagination: the *Saint Anne Madonna*.

The Final Departure from Milan

- Charles d'Amboise died in 1511, and Giovanni Trivulzio stepped into the breach. Sensing weakness, Pope Julius II attacked the city and, by July 1512, had installed a new ruler, Massimiliano Sforza.
- As a former courtier of both d'Amboise and Trivulzio, Leonardo disliked this turn of events and left Milan with an entourage that included Salai, his new apprentice Francesco Melzi, and two others.
- Leonardo was more relaxed about this journey than previous ones, perhaps because his reputation now preceded him and finding a new home would not be difficult. The group first journeyed northeast to the small town of Vapprio d'Adda, to a villa owned by Melzi's parents.
- Melzi's decision to apprentice to Leonardo speaks to the newfound status of the visual arts, and visual artists, during the early modern period. It would have been almost unthinkable only 20 years earlier for an aristocrat like Melzi to pursue a career in painting.
- During their stay, Leonardo produced a couple of drawings of the estate with an eye toward improvements and additions, but otherwise, it appears that the group was just biding its time before moving on to Florence.

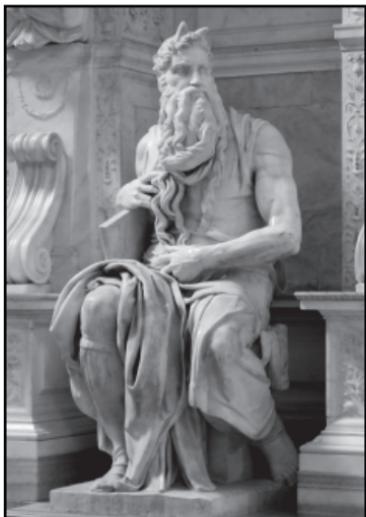
The Return of the Medici

- **Giuliano di Lorenzo de' Medici**, the son of Lorenzo the Magnificent, was a highly regarded poet, humanist, and dilettante known for his unusual interest in the lives of women and an interest in defining a feminine ideal.
- Giuliano was not only a son of the wealthy Medici family; on the death of Pope Julius II in 1513, his brother, Giovanni de Medici, became Pope **Leonardo X**. Thus he was supremely well connected.
- The Medici had retaken Florence in 1512 and installed Giuliano as its ruler, thanks in part to help from internal Medici allies, including Francesco Giocando. Florence would remain in Medici hands for another 200 years, until 1737, when the family line finally died out. This batch of Medici were unlike the 15th-century gang, however. Giuliano was more interested in power, wealth, and prestige than diplomacy, benevolence, and charity.
- At some point in 1513, Leonardo became Giuliano's courtier, but he did not move back to Florence. Rather, Leonardo was to live in Rome, where Giuliano actually spent most of his time. Rooms in the Vatican's Belvedere Palace were prepared for his use, which Leonardo was working in by July 1514.

Leonardo in Rome

- Giuliano de' Medici was head of the papal militia, so Leonardo once again became a military engineer. He designed improvements for the port of Civitavecchia and drew up plans to drain the mosquito-infested marshes that lay south of Rome. Leonardo might have assisted the elderly Bramante with his work on St. Peter's, but there is no evidence to support or refute this idea.
- Raphael was in Rome as well and probably endorsed the addition of Leonardo to the papal court. Raphael, the silver-tongued courtier, became a favorite among his new Medici patrons. Leonardo was now the visitor and Raphael was the established power broker in the city.

- The one person in Rome who could not have been happy about Leonardo's arrival was Michelangelo. He had detached himself from Pope Leonardo X's court to concentrate on Julius II's tomb, and around 1515 he completed two figures for it: *The Dying Slave* and *Moses*.
 - *The Dying Slave* aligns with Michelangelo's earlier declarations that artists were obliged to experiment with the natural order, from the accentuated contrapposto pose, the elongated torso, and the overly delicate hands.
 - In *Moses*, Michelangelo added a physical power to convey the psychological intensity of the narrative moment: Moses grasps the two tablets of the Ten Commandments and rises up to address his followers, whom he has discovered worshiping a golden calf.



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Michelangelo's *Moses* tomb monument for Julius II.

- We have no evidence that Giuliano gave Leonardo any artistic projects to work on whatsoever. Scholars have tended to see Leonardo as an advisor to the artists and philosophers in the papal court, but we have no evidence to suggest he played this role, either.
- We know from his sketchbooks that he designed costumes and temporary architectural structures for Medici parties and theatrical productions. We also know that he continued his medical dissections, under the nose of ecclesiastical authorities, focused more intensely than ever on the human fetus, the female reproductive system, and the spinal cord.

- Sometime in 1514, a research assistant was assigned to Leonardo by someone in the papal court. This assistant began telling his superiors that Leonardo's anatomical studies were diabolical—literally the work of the devil. Leonardo brought his anatomical studies to a halt shortly thereafter.

Return of the *Saint Anne Madonna*

- Leonardo directed his energies toward at least one painting while in Rome, and maybe as many as three simultaneously. One was the painted version of the *Saint Anne Madonna*. Leonardo may not have had an owner or an audience in mind; rather, it may have been an experiment for the *Treatise on Painting*—allowing him to work out his ideas in practice while describing them in words.
- The cartoon from 1508 focuses on the combination of Saint Anne, Mary, Christ, and John the Baptist. Some of the painting's features are absolutely identical to the cartoon. However, in the painting Mary bends at the waist and crosses over the torso of her mother. She reaches down with both arms to clutch her child and pull him back into her arms. John has been replaced by a lamb, whom Jesus grips by the ears. He throws one leg over its back, as if riding a horse.
- Although the facial expressions of the women are still peaceful, and while Christ's return glance seems to be a cheerful one, the presence of the lamb indicates an ominous theme. The lamb was understood to be a sacrificial animal, a symbol of Christ's sacrifice as the Lamb of God. Leonardo tells us that Christ knew and embraced his fate from the moment of his birth.
- The painting is a sophisticated theological statement that makes clear what early Madonna paintings from the 1300s and 1400s had only alluded to: that images of Mary and the Christ child were intended to be a little sad.
- Leonardo took his time with this painting, and it was in his possession right up until his death in 1519. Significant areas have not been finished. This adds to the suggestion that it was a personal exercise.

More on the *Mona Lisa* Mystery

- Recall that Antonio de Beatis wrote in 1517 that Leonardo was working on paintings of “a Florentine woman … and one of the Madonna and Child, who take positions in the lap of Saint Anne.” The latter is the *Saint Anne Madonna* we have just examined, and the former is the *Mona Lisa*.
- The relationship between Giuliano de’ Medici and the Giocando family may have been a close one. Francesco Giocando helped restore the Medici to Florence, and he was on the Medici payroll for many years thereafter.
- Were the families close enough, as de Beatis suggested in his letter, might Giuliano de’ Medici commissioned a portrait of Lisa Giacondo himself? Perhaps the clue lies in Giuliano’s personality. Giuliano was a poet, and the subject of many of his poems was the virtue of women. Leonardo had a track record of capturing the essence of women in portraits.
- This web of connections tie in nicely with some of the stylistic choices Leonardo made in the *Mona Lisa*, which point toward a period of execution in the 1510s rather than the decade before, such as the advanced state of the sfumato.

Leonardo Leaves Rome

- In Rome, Leonardo enjoyed a new level of artistic freedom. He had no major obligations or responsibilities, nor any pressing deadlines, nor any distasteful genuflections to pompous patrons.
- On the other hand, sometime later, Leonardo wrote, “The Medici made me, and the Medici destroyed me.” Lorenzo the Magnificent, of course, gave him his earliest opportunities. But the second half of that statement is cryptic indeed, as Giuliano (and by proxy Pope Leonardo) would be his last Medici employer.

- It could have been because his pursuit of anatomical studies was forced to a halt, or perhaps it was because in 1516, when Giuliano de' Medici died unexpectedly no one in the papal court made an attempt to retain his services.

Names to Know

Leonardo X (a.k.a. Giovanni de' Medici; 1475–1521): The second son of Lorenzo the Magnificent; he succeeded Julius II to the papal throne in 1513. Whereas Julius II initiated a systematic program of “revenue enhancements” to help pay for the rebuilding of Rome during his pontificate, Leo expanded on these approaches to cover the expenses of his personal art collection and parties.

Medici, Giuliano di Lorenzo de' (1479–1516): The third son of Lorenzo di Piero de' Medici (a.k.a. Lorenzo the Magnificent), Giuliano was one of the leaders of the coup d'état that reinstated his family as the governors of Florence in 1512. One of the characters in Baldassare Castiglione's *Book of the Courtier* and the person to whom Machiavelli's *The Prince* was originally dedicated, Giuliano was both a poet and a diplomat. He spent much of his time in Rome at the side of his brother, Pope Leonardo X, and was the patron of Leonardo da Vinci from 1513 to 1516.

Suggested Reading

Budny, “The Sequence of Leonardo’s Sketches for *The Virgin and Child with Saint Anne and Saint John the Baptist*.”

Partridge, *Renaissance Rome*.

High Renaissance Art from Rome to Venice

Lecture 32

During the 1510s, a new generation of painters, sculptors, and architects adopted and disseminated this classical style that we now refer to as High Renaissance, which was largely Leonardo's creation. These included other Florentine artists like Raphael, but they also included the breakout artists of the Venetian Renaissance, like Giovanni Bellini, Giorgione, and Titian, who were the first painters to bring naturalism to an artistic tradition heavily influenced by the Byzantine world.

Leonardo's Artistic Principles

- Leonardo's artistic legacy in Italy was felt from Rome to Venice. Even in cities he only visited briefly, he changed the way art was seen and valued forever. The ideas and concepts that Leonardo embraced became popular among an entire generation of skilled and innovative artists.
- A few things mattered deeply to Leonardo when it came to painting: that compositions were focused and balanced; that figures were properly proportioned; that their motions and gestures were believable; that natural forms and objects were emphasized; that perspective was correct; and that grace and elegance dominated the whole image.
- Leonardo had many imitators. These painters generally tried too hard to copy both the style and the substance of his work and captured neither very well.
- Sometimes entire compositions were lifted by Leonardo's admirers, but usually these quotations added some features that made them, at the very least, interesting to viewers.

- What is particularly interesting is that Leonardo was able to influence so many artists in so many different Italian artistic centers. One place that was unusually keen to borrow Leonardo's ideas was Venice, where he had visited briefly in 1500.

Venetian Art in the Early 16th Century

- Venice had a long and complicated history as both the westernmost city of the Byzantine Empire and the easternmost outpost of the Italian culture.
- Venice had a longstanding tradition of mercantile ingenuity, territorial ambitions, and lots and lots of money, but until the very end of the 15th century, its art had been tightly bound up with medieval Byzantine traditions.
- A couple of decades after the fall of Constantinople in 1453, Venetian painters and audiences finally became comfortable naturalistic representations in art. The painter who did the most to bring this about was **Giovanni Bellini**.
- Bellini was admirably prolific during his career, which was from the early 1460s until his death in 1516. His *Madonna of the Meadow*, from about 1500, provides a nice example of his mature work. It uses a pyramidal composition, sfumato, and an elegance of forms and gestures. Bellini had the ability to paint lovingly, carefully, and slowly by using oil glazes, as Leonardo had.
- Venetians could not take the same approach to their art as their Florentine colleagues. Frescos did not hold together well in the salty air of the lagoon, and pictures on wood panels tended to warp within mere years of completion. So by 1500, Venetian painters had become adept at employing oil paints on canvas.

- This also meant that Venetian artists were often less interested in drawing figures on their canvases because pencils tend to jump around on uneven surfaces. Venetian painters made their preparatory drawings in sketchbooks but then translated them a little more freely onto canvas. Hence in Venetian painting of the High Renaissance, we tend to see a looser handling of paint and an emphasis on color and brushstroke over detail.

Giorgione and Titian—Rebel Sons

- Among the very best Venetian painters during Leonardo's lifetime was a young and highly enigmatic artist known today as **Giorgione**. His meteoric rise to prominence was matched only by his sharp and inexplicable departure from the art world sometime around 1510 when the so-called *Dresden Venus* was completed.
- Giorgione was active from the late 1490s, and it is no small matter that one of Leonardo's stops in 1500 was in Venice. In Giorgione's paintings, we can see quotations from Leonardo's precedents. *The Old Woman*, complete with disheveled hair, plain dress, and beleaguered face, is utterly inconceivable without Leonardo's caricatures.
- Giorgione's painting of a woman in the guise of Laura, the muse of the 14th-century poet **Francesco Petrarch**, captures the figure in the same three-quarter pose as Leonardo's *Ginevra de' Benci*, gives her a similar facial expression, and employs a deep tenebrism to soften the contours of his figure. Giorgione combines the best elements of Leonardo's Florentine and Milanese styles.
- The softness of Giorgione's was also employed by an even more accomplished painter named **Titian**, who was Giorgione's contemporary and perhaps his partner at the end of Giorgione's life. They borrowed heavily from each other (and from Leonardo)—so much so that art historians often have a hard time deciding which one of them painted which pictures.

- *The Concert in the Open Air* has been attributed to both Giorgione and Titian, separately and as a joint production. We see Leonardo's influence in the central core of the composition and the attention to the details of the natural world. There is also an undeniably erotic component to the picture that recalls Leonardo's *Leda*.
- Titian's debts to Leonardo sometimes appear in more subtle ways. One of his earliest paintings, made for a Venetian official in 1514, is an allegory called *Sacred and Profane Love*. Titian emphasizes the nude female form, using the same twisting pose from *Leda* and the *Concert*. The landscape has the atmospheric haze of Leonardo's earliest works from Florence. The figures incline their bodies toward each other in a way reminiscent of Leonardo's *Annunciation*, and between them is positioned a marble object—not a lectern this time, but a fountain.
- Titian seemed uncomfortable relying on formula, and his entire career, which lasted until 1576, can be interpreted as a massive trajectory of innovation and change. Among his most important inventions was the **figure-eight composition**, which he developed at about the same time that Raphael was working on something similar in Rome.
- Titian's altarpiece for the Franciscan church of Santa Maria Gloriosa dei Frari in Venice is a large lunette-shaped picture that depicts the Assumption. Mary rises toward Heaven, surrounded by apostles, who marvel at her ascent. As she moves, Mary begins to twist, forming a midair contrapposto. Her arms are slightly elevated, and their alignment leads us through and around the composition.
- Whether by coincidence or because he had been influenced by Titian, Raphael used the same compositional idea in his *Transfiguration of Christ*, which was largely painted in 1516 but completed after Raphael's death in 1520 by an assistant named **Giulio Romano**.

- In this moment from the Bible, Jesus levitates and begins to speak to apparitions of the Old Testament patriarchs Moses and Elijah, much to the surprise of Peter, John, and James, who cower beneath him. Christ's outstretched arms lead the eye around the image.
- Both of these artists embraced Leonardo's decree for balance and clarity, but they also experimented with ways to reduce the rigidity of Leonardo's classical pyramid. They injected movement, energy, and physicality in ways that not even Leonardo had foreseen.
- They also were not replicating something viewers already knew from personal experiences but attempting to excite the soul and elevate the mind by showing viewers things they had never dreamed possible.

Raphael and Andrea del Sarto—Obedient Students

- Raphael's approach to painting solidified Leonardo's theories of art in the most successful way. He became an accomplished and highly sought-after portrait painter who knew how to capture the essence of his fellow courtiers with neither flattery nor fiction.
- Raphael's religious pictures were equally peaceful. His *Sistine Madonna* is both dependent on Leonardo's rules for painting and a departure from his preferred approach. The composition is balanced, with Mary and Christ at the core, but Raphael omitted both the evocative atmospheric qualities and all references to a landscape because the scene takes place in Heaven.
- One artist generally considered a tremendous advocate of the High Renaissance style was **Andrea del Sarto**, who worked in Florence during the 1510s and 1520s. He was a follower of Raphael and, by extension, Leonardo.

- *The Madonna of the Harpies*, an altarpiece painted for a Florentine convent in 1517, contains a balanced composition through an elevated core. The figures' poses, movements, and gestures, while highly elegant, are not strained or unnatural. The painter uses light expertly, models his figures in a naturalistic way, and he creates a believable space. His *Last Supper* for the Church of San Salvi is similar but not identical to Leonardo's version.



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Andrea del Sarto's *Madonna of the Harpies* shows Leonardo's influence.

- The demands that Leonardo placed on artists came in a variety of formats, but none of those came from his actual writings, which were kept closely guarded in his studio until well after his death. Mostly, these ideas were conveyed by Leonardo through the paintings themselves.
- Later, when successive generations of painters began to move in a different direction than was being charted by Raphael and Titian, it was Leonardo that they used as their foil.

Important Term

figure-eight composition: Created simultaneously by Raphael and Titian, a compositional pattern that causes the eye to move in a circular interweave across a picture's design.

Names to Know

Bellini, Giovanni (c. 1430–1516): Painter and son of another important artist, Jacopo Bellini, Giovanni pioneered the oil technique in Venice through his depictions of Madonnas and landscapes. He was the master of Titian and influenced Giorgione with his subtle forms and balanced compositions.

Giorgione (a.k.a. **Giorgio da Castelfranco**; c. 1476/8–1510): The extraordinary career of this talented Venetian artist was mysteriously cut short in 1510, yet his allegorical pictures remain among the period's most innovative and influential paintings, and his employment of oil paint was rivaled only by that of his master, Giovanni Bellini, and his colleague Titian.

Petrarch, Francesco (1304–1374): Bibliophile, poet, and philosopher, and one of the founders of early modern humanism. A keen student of ancient Roman history, Petrarch helped revive the study of antique Latin during the 14th century.

Romano, Giulio (1499–1546): Painter and printmaker of great creativity and ingenuity who trained with Raphael and spent his youth assisting his master on the frescoes painted inside the Vatican Stanze. Romano left Rome after Raphael's death and spent 10 years designing and decorating the Palazzo del Te in Mantua.

Sarto, Andrea del (1486–1530): Follower of Raphael and Leonardo who worked in the classical idiom, primarily in Florence. His best-known work is *The Madonna of the Harpies* (1517).

Titian (a.k.a. **Tiziano Vecellio**; c. 1488/90–1576): Along with Giorgione, Titian is widely regarded as the greatest of all Venetian painters. After completing his studies with Giovanni Bellini around 1510, he went on to produce a series of highly influential oil paintings on canvas, including the *Assumption of the Virgin* for the church of the Frari, the *Venus of Urbino* in the Uffizi Gallery, and a series of portraits of Holy Roman Emperor Charles V.

Suggested Reading

Farago, “‘Three ducats in Venice.’ Connecting Giorgione and Leonardo.”

Goffen, *Renaissance Rivals*.

Rosand, *Painting in Cinquecento Venice*.

Last Years—Leonardo in France

Lecture 33

late in his life and amidst the turmoil of European politics in the early 16th century, Leonardo received an invitation to take his talents to the French court of François I. There he spent the last years of his life working on some of his most famous paintings—including not quite finishing the *Mona Lisa*—and advising on architectural projects. But his real purpose at François's court was to lend polish to a kingdom that was, culturally, far behind its peers.

Rome in Decline, France in Ascendance

- Leonardo's time in Italy permanently ended in 1516. For 64 years, he had thrived in an environment that was fluid and unstable: The Pandora's box opened by Alexander VI in 1494 had not been closed by Julius II.
- Pope Leonardo X inherited a realm still under threat by France, the Holy Roman Empire, Spain, England, and even Venice, all of whom used agents, spies, assassins, and armed forces to wrest control from each other in an ever-shifting web of alliances and leagues.
- The northern powers were now wise to the papacy's needs and strategies. They began working to undermine Rome's authority, and a number of people began to listen. Leonardo X was soon deeply in debt to creditors he could never hope to repay. He intensified Julius's practices of simony and the sale of indulgences.
- Desperate to maintain their power, the Medici looked almost everywhere for support, and in 1515, the pope's new strange bedfellow was France, under its new young king **François I**, who had not yet made a name for himself as the daring, cultured, and highly regarded Renaissance king he would later become.

- To secure the alliance Giuliano de' Medici married François's aunt, Philiberta of Savoy, in February 1515. To return the gift, Giuliano had his talented courtier Leonardo make a mechanical lion for François, which apparently pleased François I enormously.

Leonardo Moves to France

- In March, 1516, Giuliano de' Medici died suddenly and unexpectedly at the age of 37 with no legitimate heirs to inherit his estate. Philiberta was not in a position to retain Leonardo's services at court.
- Sometime in August of 1516, Leonardo was transferred to the French court at the castle of Amboise, to begin the last phase of his career as the most famous courtier in the entourage of King François I of France.
- François not only had to confront a host of European rivals on the battlefield and negotiating tables, but also in the imagination of the common people. Henry VIII of England was demonstrating an interest in expanding his interests beyond his shores. In Spain, King Charles I was shortly to become Emperor Charles V of the Holy Roman Empire. François wanted the prominence of his court to match his political exploits.
- Nearly all of François's predecessors had focused on maintaining power. The kings of France did not spend money on art, and they only commissioned buildings for defensive or political purposes. This disregard for cultural commissions is obvious when we examine works produced at this time, like those of Jean Clouet, whose paintings of François I from about 1525 reveal a certain ability to capture a face and display some charm, but have none of the naturalistic sensitivity that we see in the works of Italy's best artists.
- Failure to invest in objects of luxury, style, class, and culture had caused a vacuum of quality within the borders of France. So François quickly came to the conclusion that the best thing to do when you do not have stallions in your own barn was to take the stallions in the poorly guarded barn of a neighbor.

- François attacked Milan in September of 1515 and looked into the possibility of moving Leonardo's *Last Supper*. Once it became clear that it could not be done, François made an overture to the picture's painter instead. Getting a giant of Italian art into his court would give this new monarch instant credibility.

The Deluge

- At this time, Leonardo was working on some studies that allowed him to consider some new and important issues. *The Deluge* is a drawing of a massive, active, ferocious storm as it passes over a country setting.
- The loosely handled, gestural swipes of his pen only create an impression of what is happening below from his elevated vantage point. The storm envelopes his vista so completely that the blackened clouds and the driving, swirling rain obscure the very landscape.
- Leonardo annotated this drawing in his *Treatise on Painting* in great and elegant detail. It is one of the few times when a written passage by Leonardo compares favorably to a corresponding drawing.
- The sketch of *The Deluge* was not the first time Leonardo drew while outdoors, but a lot had changed since that 1473 landscape. The drawing from 1473 is essentially a teaching tool. *The Deluge* is a completed work in itself. It is not only a study of how the world looks but also how the world works.
- Leonardo did not date this drawing, but in this case, the looseness of the composition and the freedom of its handling indicate that it is a late work. It is a useful rule of thumb, when trying to set up a chronology of works by a single artist, that the tighter the composition and the handling of details, the earlier the image was made. The older an artist gets, the less concerned he is about playing by the rules.

A Quiet Retirement

- François does not seem to have had anything in mind for Leonardo, at least at the outset, save for enhancing the reputation of the French court. Leonardo and his retinue arrived at Amboise, southwest of Paris, in the early spring of 1516.
- Leonardo's trusted inner circle included Salai, who had been with him for 25 years, and Melzi who had been with him for seven. Salai was quite skilled as a painter, and Melzi, the educated nobleman, could carry on an intellectual conversation.
- Leonardo was now free to work on his unfinished paintings, including the *Mona Lisa*, *John the Baptist*, and the *Saint Anne Madonna*. None of them was ever quite completed.
- As soon as he arrived at Amboise, Leonardo threw himself into some architectural projects that interested François. François's palace, the Chateau d'Amboise, was in need of repair. The extent of his participation in the project is unknown, but scholars see his touch in a royal fountain that was built there in 1518.
- In 1517, Leonardo drew plans for a chateau near Blois called Romorantin and has been credited with advising builders on the unique chateau at Chenonceau, which traverses a river on a series of arches and takes advantage of water as a source of power.
- Two other chateaux where the inspiration, if not the actual structure, of two double helix staircases built between 1515 and 1530 have also been credited to Leonardo's imagination. The first is an exterior staircase at the Chateau de Blois; the second is about 12 miles away at the Chateau de Chambord, which was begun a year after Leonardo died. Here, some have also suggested that Leonardo's presence is visible in the use of open-air loggia and other features typical of northern Italy.



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Leonardo may have been an advisor to the architects and builders of Chenonceau Chateau, which incorporates the river into its design.

- We have no set of drawings to indicate his participation in these projects specifically, but they are reminiscent of one of his drawings of the Castello Sforzesco, which includes a revolving stairway.
- As he had done for the Medici, Leonardo was also charged with designing theatrical stages and costumes. In 1518, when François's niece, Maddalena de la Tour d'Auvergne, was married to Lorenzo de' Medici, the nephew of his former patron Giuliano, he designed the bride's ring, as well as a stage set for the entertainment.

Death and Burial

- In 1517, Leonardo was plagued by partial paralysis on his right side—fortunately not his dominant hand—after what seems to have been a stroke.

- In April 1519, Leonardo acknowledged the contents of his last will and testament, a clear indication in that era that the testator believed he was mortally ill. On May 2, just two weeks after his birthday, the 67-year-old Leonardo passed away.
- Salai was left a vineyard that Leonardo had acquired during his Florentine years, along with the unfinished paintings—*Mona Lisa*, *Leda and the Swan*, *John the Baptist*, and the *Saint Anne Madonna*. Melzi was left with literally thousands of pages of notes, all of them loose sheets of paper in unbound and uncatalogued stacks. Each bequest was suited to the assistant’s talents and needs.
- Not present at Leonardo’s deathbed was François I, who was off riding with a hunting party dozens of miles away. A monarch was neither expected nor wanted at such a delicate time.
- Leonardo’s body was placed in a casket and interred in the cloister of a church next to the Chateau d’Amboise called Saint-Florentin, where his tomb was largely forgotten for centuries. During the Napoleonic era, an architect declared that there was nothing salvageable in the church and he ordered the stones to be removed to repair the adjacent chateau. Leonardo’s tomb was lost.
- Sixty years later, the site was explored by archaeologists, who found a tomb bearing an inscription containing letters of Leonardo’s name. Inside were skeletal remains, including an unusually large skull, which were removed and transported to the nearby chapel of Saint-Hubert. There Leonardo da Vinci may—or may not—rest today.

Name to Know

François I (1494–1547): French king of the Valois dynasty and distant relative of Louis XII, who preceded him on the throne. François ascended to power in 1515 and gradually enjoyed a political and military career that made him one of the most important and successful figures in early modern history. He was well educated and politically savvy. One of François's early acts as head of state was to invite Leonardo da Vinci to serve as his courtier. Leonardo accepted the invitation in 1516, thus giving François's court instant credibility.

Suggested Reading

Heydenreich, “Leonardo da Vinci, Architect of Francis I.”

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*, chap. 5.

Pedretti, *Leonardo da Vinci: The Royal Palace at Romorantin*.

Renaissance Man and Man of the Renaissance

Lecture 34

Both today and during his own lifetime, Leonardo shaped our idea of what it means to be a Renaissance man. His mastery of so many fields—and the effortlessness, or *sprezzatura*, with which he mastered them—came to define the perfect Renaissance courtier in his day. To us, Leonardo embodies the spirit of relentless curiosity we associate with the Renaissance. But in a very real sense, the Renaissance made Leonardo's achievements possible in a way they would not have been a mere generation before him.

Castiglione and the Perfect Courtier

- Baldassare Castiglione's *Book of the Courtier* recounts a fictitious dialogue that takes place in 1507 among a group at the court of the Duke of Urbino. This quintessential examination of Italian cultural life at the end of the High Renaissance describes the virtues and qualities of the perfect courtier.
- Such a specimen should have physical prowess and beauty, athleticism, and a keen sense of fashion. He should have a sense of elegance of carriage and demeanor. He should be intelligent, wise, and have a classical education. His speech should be colored by wit and a sense of humor.
- Castiglione goes on to say that the courtier not only does many things well but does them with a certain effortlessness and ease that Italians call ***sprezzatura***.
- Except for the classical education, Leonardo possessed all these characteristics, and we have good reason to think Castiglione had Leonardo in mind as he wrote his text.

- In 1496, at the age of 16, Castiglione was sent to Milan to begin his humanistic education. He must at least have heard of Leonardo during his three years as student there, which overlapped with the period when Leonardo was painting *The Last Supper*. Leonardo was already a living legend.
- Fifteen years later, Castiglione and Leonardo again shared a city. Both were in Rome from 1513 to 1516, and this time, they also shared a court. Castiglione was Urbino's ambassador to the Vatican. He befriended Raphael and Giuliano de' Medici.
- In a very real sense, Castiglione helped invent the concept of the Renaissance man more than 20 years before Vasari would write about a rebirth, and in a very real sense, Leonardo helped shape Castiglione's conception of the ideal man.

Leonardo's Wealth of Talents

- If there is any doubt that Leonardo was a model Renaissance man, let us consider the fields where we have witnessed his mastery: perspective and optics; mechanical engineering, in every field from flight to weaponry; courtly behavior; hydraulics; architecture; military strategy; the classical painting style; bronze sculpture; and naturalism and environmental science.
- Leonardo excelled in other fields we did not discuss. For example, he undertook botanical studies, usually not for the sake of pure knowledge but in anticipation of a painting. The *Annunciation* relies heavily on the symbolism of the lily and the enclosed garden, so their accurate portrayals were important to Leonardo's message. In *Ginevra de' Benci*, the juniper bush and laurel wreath are important symbols of the sitter's identity and virtues, and a mistake in these areas would have ruined the portrait.
- Due to his inherent inquisitiveness and his dedication to the belief that true knowledge of nature could only come through experience, Leonardo drew plants and flowers with a careful and exacting eye.

- The drawing of multiple types of flowers from the Accademia museum in Venice seems to be more of a scientific drawing than a study for a painting: Different examples have been carefully rendered according to size and shape; identified and distinguished by their formal features, and set apart from their neighbors so as to be more easily inspected.
- The only thing Leonardo was truly trained to do was draw, paint, and sculpt a little on the side. He was not known for doing those things quickly; however, he handled everything that he applied himself to with such apparent ease and grace that we can call it sprezzatura.

What Was the Renaissance?

- Why do we refer to people like Leonardo as Renaissance men, instead of Baroque men or Medieval men? What was it about the period we call the Renaissance that gave rise more frequently to the kind of person who excels at so many diverse and unrelated things?
- The world changed so dramatically during this period that, arguably, it would not have been possible to be a Renaissance man before the Renaissance. These rapid and dramatic changes were caused directly by the inventions and discoveries of the age. Without them, the level of expertise that Leonardo attained would have been impossible to match.
- Leonardo was among the first generation of thinkers who had access to volumes of printed books, which contained a wealth of information on almost any subject that anyone with any curiosity wanted to absorb.
- Leonardo's personal library contained 116 books according to an inventory written while he was in Florence in 1503. These included
 - Vitruvius's architectural treatises
 - Mathematical studies by Euclid and Luca Pacioli

- Theories on art, perspective, and proportion by Leon Battista Alberti and Piero della Francesca
- Scientific essays by Johannes Peckham, Alberto of Saxony, and Claudio Tolomeo
- Three books on the anatomy of horses
- Italian translations of ancient works by Pliny the Elder, Aristotle, and Ovid
- Medieval philosophy by Albertus Magnus, Saint Augustine, and Bernardino da Siena
- The Bible, accounts of Christ's Passion, sermons, and hagiographies
- Aesop's *Fables*
- Anatomical studies by Duns Scotus, Mondino de Liuzzi, and other anonymous authors
- Latin grammars
- Books on civics, political theory, and military principles
- All were printed books—not expensive, hand-written copies—and virtually all of them pertained to the specific projects that Leonardo pursued as a courtier, painter, philosopher, scientist, and an engineer.
- Despite his rather snide comment about the laziness of scholars who depend too heavily on the works of others, Leonardo was familiar with the ideas of generations of thinkers who had come before him.

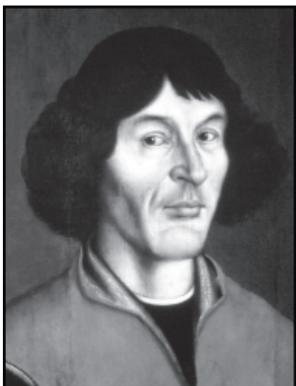
The Renaissance beyond Europe

- A second crucial part of the Renaissance man phenomenon was a change in the global quality of life. News of the existence of a new continent half way round the world fundamentally changed the way people thought about themselves, the world, and their concepts of the potential of the future.
- The European powers spent a good bit of time and money carving out for themselves colonies in the New World. Just as Europeans were showing greater interest in the world beyond their own shores, so too were people from those distant lands showing greater interest in them.
- In 1500, as Leonardo fled from French forces that had just invaded Milan, the artist received an invitation to join the court of the Sultan Mahmed, the Ottoman ruler, in Istanbul. East and West were on better terms than they had been in centuries, and one of the many results was the spread of Leonardo's fame.
- Leonardo declined the first offer, but a second offer was extended a few months later. In 1502 Leonardo replied to this second summons with a letter that he sent to the son of Mahmed, **Bayezid II**, describing how he might construct a bridge across the Golden Horn. Ultimately Leonardo's proposal for a single-span structure some 720 feet in length was dismissed.

A Rebel among Rebels

- A third reason why Leonardo could have only been a Renaissance man in the Renaissance is that, by the time of his adulthood, these conditions had cultivated a more critical and questioning mentality among Europe's leading thinkers.
- In this era, the people questioning the assumptions of contemporary authorities were not just challenging outmoded traditions and old-fashioned customs; they were challenging cherished concepts of the universal order and the laws and rules that governed life itself.

- The High Renaissance produced more than its fair share of social rebels, and we can understand Leonardo's achievements better if we situate his own work in the context of leading rebels of his time.
 - **Nicolas Copernicus**, the Polish scientist whose groundbreaking astronomical studies determined that the sun, and not the earth, was at the center of the solar system.
 - Niccolò Machiavelli, the courtier whose bold and ambitious political treatise suggested how to govern during times of enormous instability and danger and how the Italian peninsula might be united under a single government.
 - Martin Luther, the Augustinian monk who chafed under the stigma of a corrupt papal institution and whose 95 Theses condemned Pope Leonardo X and the entire hierarchical structure that had brought him to power and kept him there.
- Unlike dissidents driven by a single idea, not everything that Leonardo did or said was borne of a revolutionary mindset. When Leonardo made out his will, he requested that Masses for the Dead be said on his behalf and that he be buried inside the cloister of a monastery. That is not to say that Leonardo was blindly or even actively religious, but questions of spirituality clearly interested him.
- Like all of us, Leonardo was a product of his times. But to a larger degree than most of us, Leonardo was also responsible for shaping that world in which he lived, too.



Nicolas Copernicus
proposed the heliocentric
solar system.

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Important Term

sprezzatura: Italian for “ease” or “effortlessness,” used by Baldassare Castiglione to praise courtiers who excelled at a variety of activities with a certain grace and elegance.

Names to Know

Bayezid II (1447–1512): Sultan of the Ottoman Empire and son of Mehmed II. Bayezid briefly toyed with the idea of commissioning Leonardo da Vinci to design a bridge to span the Golden Horn of Istanbul.

Castiglione, Baldassare (1478–1529): Diplomat and writer who worked in the courts of Urbino, Mantua, and the Vatican during his successful career. After serving as papal nuncio to Spain, he wrote a widely read and influential description of life at court in Renaissance Italy called *The Book of the Courtier* (1528).

Copernicus, Nicholas (1473–1543): Polish scientist educated in Italian universities whose posthumously published findings posited that the sun, not the Earth, was the center of the solar system.

Luther, Martin (1483–1546): Augustinian friar and professor of theology who was outraged by the excesses of the papal courts of Alexander VI, Julius II, and Leo X. He went public with his protests in 1517, refused to recant in 1520, was excommunicated in 1521, and was hence seen as the founder and leader of the Protestant movement.

Suggested Reading

Morley, “The Plant Illustrations of Leonardo da Vinci.”

Reti, “The Two Unpublished Manuscripts of Leonardo da Vinci in the Biblioteca Nacional of Madrid – II.”

The End of an Era

Lecture 35

Now and again, a new painting surfaces that art historians wish to attribute to Leonardo. One such painting, called *Salvator Mundi*, bears many of the master's hallmarks, but it also bears problematic differences from his style. Part of the problem in attributing work to Leonardo or his followers lies in how few close followers he had. Shortly after his departure from Italy in 1516, Raphael died suddenly, and Michelangelo's Mannerist approach to art swept the Italian Peninsula, rejecting Leonardo's classical ideals.

A New Leonardo?

- In November 2011, the National Gallery of London opened an exhibition called Leonardo da Vinci: Painter at the Court of Milan. The curators brought together paintings and drawings that Leonardo had produced between 1482 and 1499, including medical drawings, portraits, figure studies, and an assortment of other pictures produced by Leonardo and his small circle of followers.
- The show also included a painting that experts believed is a new, previously unknown work by Leonardo. This was the art-historical equivalent of announcing that a new planet had been discovered in our solar system.
- The painting, called *Salvator Mundi*—or *Savior of the World*—bears all the markings of a Leonardo from his first Milanese period. About 24" × 18" and painted in oil on a walnut panel, it shows the figure of Christ, gazing at us stoically and blessing us with his right hand while holding a transparent orb in his left. His blue robe hemmed with gold helps set off the bust-length figure from the dark background. The facial features and body contours seem to float and dissolve, thanks to the sfumato technique.

- *Salvator Mundi* was quickly connected to the *John the Baptist* in the Louvre, which Leonardo largely painted during and after 1510. A more obvious connection was *The Last Supper*, which was the only other figure of the adult Christ that Leonardo had ever been known to paint.
- Some striking similarities connect the two: The eyelids of both figures close just a bit, and long hair is parted in the middle and cascades down the neck and shoulders. There are also significant points of departure, which suggests that *Salvator Mundi* is, in fact, by Leonardo, who was too innovative and ambitious to merely copy himself.
- A technical analysis of the paint, the direction of the brushstrokes, and the undercoat drawings revealed by X-rays also supported an attribution to Leonardo. However, there are still many reasons to doubt the attribution.

The Case against *Salvator Mundi*

- Leonardo had a small following during his own lifetime, but those who imitated him were quite skilled painters. We have a handful of pictures that are close to Leonardo's style but not quite up to par with the great works of the master lumped together under the broad category of School of Leonardo.
- The *Bacchus* found in the Louvre near the *Mona Lisa* was once attributed to Leonardo but now to a follower. It does not have the master's sense of fluidity or grace, and the landscape does not conform to the types of natural settings that he was painting during the 16th century, when this picture was most probably produced.
- A new attribution is made and unmade every few years as a new panel is presented for authentication. It is always small, intimate, and darkened by overcoats of varnish applied by earlier restorers. And every time, a positive analysis is scuttled by the fact that there is no mention of such a picture in Leonardo's notebooks or in the letters and archives of the people and institutions that sought works by him.

- *Salvator Mundi* is first mentioned in 1651 by an engraver who claimed he was copying a Leonardo. It is probably no coincidence that this is the year when Leonardo's *Treatise on Painting* was first released to the wider public, published in French and Italian.

The School of Leonardo

- Unlike most great masters, Leonardo's career moves were not conducive to embracing a traditional arrangement that cultivated a large following of students and partners. He moved around so often that he did not have the opportunity to make those longstanding relationships.
- Leonardo only influenced a small group of immediate disciples. **Giovanni Boltraffio** went on to paint portraits of the Sforza family. **Giovanni de' Predis** worked with Leonardo on both versions of the *Madonna of the Rocks*. Those who carried on Leonardo's approach after his death include **Bernardino Luini**, Francesco Melzi, and Salai.
- We do not know very much about Bernardino Luini, but we can trace his presence in Milan and the surrounding towns in Lombardy from 1500 until about 1520, when he went to Rome to learn from the work of Raphael—too late, for Raphael died that year.
- Luini's *Christ Child with a Lamb*, from about 1515, plucks a number of themes from works by Leonardo: Christ embracing the Lamb was lifted directly from the *Saint Anne Madonna*. Luini mixes Leonardo's two major mature stylistic approaches as well: the tenebristic background and the sfumato contours.
- His *Christ Blessing* also borrows from these sources, and that intimate, personal interaction between the figure and the viewer, in which no authorities are needed to intercede on behalf of the worshiper, reminds us of both Leonardo's *John the Baptist* and the *Salvator Mundi*.

- Salai was a skilled artist, although undisciplined and poorly suited for making it on his own. The few pictures he produced show a heavy dose of Leonardo in nearly every way. His *John the Baptist*, painted in the 1510s, was obviously inspired by Leonardo's, but Salai chose to include more detail in the landscape.
- Salai's approach to the figure of Bacchus—with a more overt attempt to show landscapes and figures than Leonardo had employed—leads one naturally to identify Salai as the author of the other Bacchus in the Louvre.
- The few works attributed to Francesco Melzi suggest a more original take on Leonardo's classicism. His *Portrait of a Woman* adopts the three-quarter pose, the use of flora and fauna as identifiers, and the dramatic spotighting effects, but it is not a copy or an unoriginal take on a specific picture by Leonardo. He seems to be taking what he learned from the master and applying those lessons in an original way. Melzi did not have the same kind of manual dexterity that Salai did, and the rigid contours of his figure have little in common with the more subtle and gentle feeling of a Leonardo painting.

Michelangelo and the Mannerists

- When Leonardo left Italy in 1516, Italian painters became more willing to experiment with new approaches to figures and scenes. Even Raphael broke free with his highly experimental *Transfiguration*, employing the figure-eight composition.
- Raphael's sudden death in 1520 and dearth of immediate followers cut short the ideal of the High Renaissance that he and Leonardo had worked so hard to create. The one figure who was determined to break it apart was the one figure who survived them both: Michelangelo.

- Michelangelo invented new poses and themes that would allow him to go beyond that which the human eye had already experienced. This hypernaturalism seeks to convey the intensity of a singular emotional sensation through the physicality of gesture. In that sense, Michelangelo had learned this from Leonardo, who, in *The Last Supper* had done this more subtly.
- In 1516, Michelangelo was back in Florence, forced to return to his home town by Pope Leonardo X to design a burial chapel for the Medici in the church of San Lorenzo. For the next 50 years, Michelangelo would hold the field, and the classical ideals of Leonardo and Raphael would take a distant second place to his vision.
- Michelangelo's sculptural works for the Medici tombs demonstrate his extraordinarily anticlassical, or **Mannerist**, approach. Their bodies twist and turn, coiling and uncoiling in positions that simply cannot be replicated by normal human beings. They are big, bulky, and overly muscled, as though Michelangelo has told us that the laws of nature no longer apply to the works that he wants to produce.

The Politics of Mannerism

- Exacerbating the artistic situation was the chaotic and urgently dangerous political situation in Italy during these crucial years. The rapid ascent of François I and Charles V put two young, ambitious men on the wealthiest thrones in Europe, and they considered each other rivals for the duration of their reigns.
- Charles eventually expelled the French from Italian soil, this time without the interference of papal alliances or outside mercenary troops. However, in 1527, a group of his mutinous troops splintered off from the main force, ransacked the papal city, and humiliated Pope Clement VII.

- This incident served to demonstrate, once and for all, that the concept of Italian unification and glory, with the pope as the Christian Emperor, was pure fantasy. With the destruction of that dream came a reaction amongst artists and thinkers who had worked for so long to celebrate the classical vision that had driven the dream of Renaissance in the first place.
- Within less than a decade, the last true disciples of Raphael and Leonardo had left the field. Those who were left converted to Michelangelo and Mannerism.
- The change of stylistic preferences probably had as much to do with court culture as it did with the presence of foreign soldiers on Italian soil. Instead of a focus on controlling and extending Italian domains, there was an emphasis on manners, figures of speech, and acts of charity.
- By the 1520s, a very different culture, marked by extreme demonstrations of self-awareness and obsequious self-deprecation, had seeped into court life. Italian courts were losing their ambition. Now they just wanted to survive and be recognized by their Spanish overlords as cultural tourist attractions that ought to be preserved.
- The Italian princes who commissioned works of art often insisted that their painters elaborate on eccentricities and expressions of elegance. The sober approach to subject matter that Leonardo had taken was no more than a memory.
- The interest in mannered pictures was exported to wide swaths of European society. Trying to figure out what was going on in a work of art became part of the fun. The logical or natural was considered boring; the fantastic was considered a tour de force.
- This is not to say that Leonardo was forgotten or that those who remembered him dismissed his innovations and ideas. Vasari was one of the great Mannerists of the 16th century, yet he lionized Leonardo in his *Lives of the Artists*.

- Still, by the middle of the 1520s, the dream of the High Renaissance was coming to an end. Maybe the classical style had run its course and had exhausted all its interesting possibilities. Maybe the sway of Michelangelo's fame was too great to ignore. Maybe the deaths of Raphael and Leonardo so close to one another were simply too great to overcome. Maybe there was a collective grieving for the demise of the papacy. Maybe it was due to a realization that life in Italy would never again be the same. Or maybe it was a combination of all of these.

Important Term

Mannerism: An artistic style popularized in the 1520s and 1530s that evolved as an alternative to the classicism of the High Renaissance.

Suggested Reading

Friedlaender, *Mannerism and Anti-Mannerism in Italian Painting*.

Shearman, *Mannerism*.

Syson, ed. *Leonardo da Vinci: Painter at the Court of Milan*.

The Legacies of Leonardo da Vinci

Lecture 36

Leonardo's legacies are almost too many to count. Whether championing his cause or rebelling against his rules, artists and scientists in the five centuries since his death have all been working in his shadow, thanks to the handful of paintings and treasure trove of sketches and notes he left behind. It is hard to imagine our modern world without Leonardo to help lay its foundations.

The Period

- We have noted three things about the so-called Italian High Renaissance: First, it was not merely a rebirth of antiquity: it was an age of innovation and originality. Much of Leonardo's best work, for example, showed no particular reliance on ancient sources at all.
- Second, the period was not entirely a high point: Much of Leonardo's career took place when Italian city-states were falling underneath the power of France, Spain, or whoever was paying the Swiss mercenaries.
- Third, the Renaissance was never exclusively Italian, not even within Italy. Even the word “Renaissance” was coined by a 19th-century French historian. The fact that we use Renaissance rather than Vasari's term—Rinascita—reminds us that France, among other powers, did a lot to shape the context for what we think of as the High Renaissance.

The Genre

- The paintings Leonardo produced are among the easiest things to discuss, both because they are the most readily available and because in almost every painting he produced, he experimented with some aspect of traditional modes of representation.

- Any great work of art—whether a painting or a poem, a symphony or a sculpture—speaks to us. *The Last Supper* moves us with its dramatic power, with its fleeting references to both the depths of human depravity and the hope for redemption. If any single image from Leonardo’s repertoire captures the essence of the man, the artist, and the scientist, it is *The Last Supper*—that failed experiment in mural painting that has been one of the greatest success stories in the entire history of narrative art.
- Leonardo was such a gifted artist at such an early age that most of the things we are told he painted have survived. People who owned a Leonardo usually held onto it, knowing they had something special.
- Of the paintings he left to Salai—*Leda and the Swan*, the *Saint Anne Madonna*, *John the Baptist*, and the *Mona Lisa*—all but the first passed into the hands of the French monarchy and, after the French Revolution, became part of the national collection at the Louvre. Because they became public at such an early date, they became representative of Leonardo’s innovative spirit as an artist.
- *Mona Lisa*, the most famous work of art in the world, reminds us of Leonardo’s masterful invention of the new genre of portraiture in the High Renaissance. His innovations tie directly to the convictions he held about the importance of human beings as individuals, with brains and ideas and character traits that deserved to be celebrated, no matter who they were, where they came from, or what sex they were.
- We sometimes forget the great distance that portraiture traveled with Leonardo at the helm from the staid and formulaic approach that had been taken by Leonardo’s predecessors. When we see his lively, enigmatic, and deeply dramatic representation of Cecilia Gallerani, we remember the power of his observational skills.

- Leonardo's portraiture is also a testament to his scientific innovation. He used his oil paints to hone the appearance of his sitter's heads and faces based on his anatomical studies of the human head and created ways to help viewers identify his sitters and see them as real, living breathing people.
- *John the Baptist* reminds us of the unusually powerful dramatic flair Leonardo had. Tenebrism allowed him to make his sitters and figures leap from the surface, imbuing them with a liveliness that surprised those who saw his pictures for the first time.
- Future generations of artists would recognize the value of these approaches. When art historians consider the greatest age of painted portraiture—the 17th century—and review the work of the Dutch and Flemish artists who made it so great, the kinds of portraits they see all have the trademark qualities of a Leonardo portrait.
- The *Saint Anne Madonna* painting contained important features that continued the artistic interests of Leonardo into the last years of his career. Leonardo invented the theme of the human relationship between his Madonna figures, and his contemporaries who understood this quickly copied the theme in their own works.
- His other great *Saint Anne Madonna*, the cartoon in the British Museum, contains the swimming Christ figure, who squirms from Mary's grasp on his way to greet John the Baptist and his future. This signaled a brand new approach to Madonna paintings in the 16th century.
- In the background of the *Saint Anne Madonna*, we see the vast landscape that has its roots in the drawing that Leonardo did in the Tuscan hills on August 5, 1473, and speaks to his scientific interest in how the atmosphere affects the way that we see objects both near and far away.

- Leonardo's willingness to go outdoors and draw the things he saw with his own eye, to capture the natural world just as it appears to the naked eye, came to inform the great movements of 19th- and 20th-century art, including the Impressionists and the technique of *plein aire* painting.
- Leonardo was not afraid to paint the nude form, and he was not afraid to speak frankly about the desires of human beings in his notebooks. The Venetians quickly followed this lead, and its trajectory through the 17th, 18th, and 19th centuries leads us through some of history's greatest and most important paintings.
- Probably the longest-lasting and most important painterly contribution Leonardo made to the history of art was his creation of, and insistence on, true classical composition. The triangular format resonated with generations of artists.
- When Leonardo's *Treatise on Painting* was published in 1651, a whole series of his 17th-century admirers and imitators who had looked closely at Leonardo's lessons through his paintings now could do so through his writings. Their adherence to Leonardo's laws resulted in the creation of the Royal Academy of Art in France and the triumph of classical painting in Europe for roughly 200 years.
- Leonardo was a complicated person, who sought to unite within himself what others might have regarded as opposites. On the one hand, Leonardo was adamant that the natural world be his guide in all things. But at the same time, he was interested in perfection and sought to place the elements of this world into order.
- Leonardo was both an Aristotelian and a Platonist. He also looked at Nature as something that unifies all people as members of the human race, while also celebrating the details and specific features that make each of us individuals.

The Academies

- Leonardo, more than anyone else before him, confirmed in the minds of his peers and his followers that practitioners of the visual arts had every right to be considered as intellectuals, on par with poets and philosophers and scientists.
- The notion that artists had to be educated in ancient literature, mathematics, and philosophy had come from Alberti in the middle of the 15th century. Alberti insisted that painters needed to understand how the world looked and worked to draw and paint successfully. Leonardo added that artists could expand on the body of knowledge in each of these subjects and add to our understanding of the natural world.
- Leonardo's determination to add artists to the list of intellectuals was met with general approval soon after his death. Art academies sprang up in Florence, Rome, Paris, and London in the late 16th and 17th centuries. Today, colleges and universities all around the world have fine arts and art history as core components of their academic programs.

The Notebooks

- Yet another important legacy are Leonardo's 7,000 or so pages of notes, drawings, and essays. Only about a third of that survived the 16th century, but this probably is not as big a loss as it sounds. Melzi seems to have thrown out duplicates and pages Leonardo himself believed were useless. The fact that Melzi retained thousands of pages—some of them puzzling and only barely legible—indicates that he erred on the side of caution and preservation.
- After making his choices, Melzi arranged the notes into different categories and had them bound into manuscripts or boxed together as sets. He held onto them for the duration of his life but allowed selected others to study them.

- When he died in 1579, Melzi's descendants inherited the notebooks and sold them off to different collectors. In 1630 Pompeo Leoni, a sculptor in the Spanish court of Philip IV, hunted them down, reassembled, and reorganized them by category.
- Over time, the manuscripts have been sold off to museums and collectors, and today most of them are in European collections. The largest of these is the Codex Atlanticus, 12 volumes containing more than 1,000 pages of inventions, experiments, and scientific observations.
- The legacy of Leonardo that survives in his notebooks is, in some ways, even more relevant today than his paintings are. It would take centuries for science and technology to catch up with Leonardo's visions.
- The development of the combustion engine in the 19th century was the key ingredient that he had lacked. With it, Leonardo's most imaginative inventions changed the course of modern warfare and modern history.
- Of all the inventions that emerge from Leonardo's manuscripts, the one that has probably had the greatest impact on modern society was the airplane. Even into the late 18th century, aviators like Sir George Cayley were designing their flying machines as extensions of Leonardo's, and the questions they were asking about speed, power, and weight were almost identical to the ones Leonardo asked.
- It was in these manuscripts that Leonardo's work as a scientist came to be known, respected, and imitated. He thought everything was fair game for study, and he thought we should care. He wrote, "The acquisition of any knowledge whatever is always useful to the intellect, for nothing can be either loved or hated unless it is first known."

- He urged himself, and anyone who came into contact with his notes, to study, study, study—no matter the subject—for everything was worth review, but nothing could be improved on until it had been studied firsthand.
- His extraordinary talents as a draftsman were matched by his curiosity and courage. As a result, Leonardo was able, for the very first time in human history, to draw with precision human organs, bones, and muscle tissue. His work inspired the first illustrated anatomical textbook in history, produced by the great physician Vesalius in 1543, which became the standard work in Europe for over a century.

The Followers

- The world of the visual arts changed forever because of Leonardo. His approach to the depiction of nature is the standard about which all artists—every single one—have taken a stance, either for or against, ever since.
- The great Mannerists, like Michelangelo, intentionally turned their backs on the classical style and took Leonardo's adages as their point of departure. The Neoclassicism of the 17th century, found in the paintings of Rubens, Poussin, and Caravaggio, was grounded in a conscious return to Leonardo's rules. The Impressionists, rebelling against the academies and their classical rules, simultaneously challenged the assertions of Leonardo and celebrated his legacy, casting him as Romantic hero who had gone beyond the conventions of his own day.
- It is nearly impossible to calculate with any accuracy the magnitude of Leonardo's achievements or the debt we owe him today. What is more, those debts might accrue even more in the coming years. New nuggets of insight and inspiration may be waiting for us, just around the corner.

- Leonardo remains relevant today, and not merely because tourists line up to see his works in museums or because he paved the way for our modern approach to scientific inquiry. Leonardo is relevant because he speaks to us from the grave: in his paintings, which remind us of our human frailty and celebrate the beauty of our potential; in his scientific achievements that impact the lives of millions of people every day; and in his belief that we should never be satisfied with what we already have before us.

Suggested Reading

Cropper, “Poussin and Leonardo: Evidence from the Zoccolini MSS.”

The Diaries of Leonardo da Vinci.

Goffen, *Renaissance Rivals*, pt. III.

Klein, *Leonardo's Legacy*, epilogue.

Richter, *Leonardo da Vinci: Notebooks*, pt I.

Robison, “Leonardo’s *Trattato della Pittura*.”

Zöllner and Nathan, *Leonardo da Vinci: The Complete Paintings and Drawings*.

Leonardo's Notebooks and the Main Codex Collections

Leonardo da Vinci crafted thousands of pages of notes, drawings, and thought pieces, none of which were published during his lifetime and only a few of which were known to anyone outside his inner circle of assistants and admirers. The range of subject matter astounds us today; his writings cover topics from human anatomy to the examination of clock mechanisms to the development of locks and canals to compositions for paintings large and small. The exact number of pages at his death was never tabulated; some scholars have estimated that there were as many as 13,000 sheets of notes and sketches in Leonardo's possession in 1519, while others believe there were approximately half that number.

Most of those thousands of pages were loose sheets of paper, unbound and unedited, although some were collected in small notebooks. All were bequeathed by Leonardo to his aristocratic assistant, Francesco Melzi. Melzi preserved those that he believed held merit or represented his master's thoughts accurately, but he may also have thrown away a vast number of others that did not meet his criteria for preservation. He then organized some of what he had saved by theme, creating a series of manuscripts. Melzi then acted as an unofficial archivist: He granted access to Leonardo's notes to those who could demonstrate a need to know, and some of Leonardo's ideas—particularly those pertaining to his theory of painting—circulated among a small group of artists and intellectuals.

Melzi died in 1570, and his will stipulated that Leonardo's notes be passed on to his son, Orazio, who soon began to disperse the notes to various collectors in Europe. By the end of the 16th century, the collection was in disarray. Identifying the need to reassemble and centralize Leonardo's output, a sculptor named Pompeo Leoni (1537–1608), then a member of the Spanish royal court, tirelessly hunted them down and purchased most of them for his patrons. Leoni cut some of them out of old bindings, trimmed down others to make them more manageable, and then bound them into different manuscripts, again organized by category. Some of these notes and drawings

are quite modest in scale: the so-called Manuscript M in the Bibliothèque de l’Institut de France, Paris, contains pages that measure only $4 \times 2\frac{3}{4}''$ (10×7 cm). Other drawings are much larger, like those in the Codex Atlanticus in the Biblioteca Ambrosiana in Milan, some of which measure $25\frac{5}{8} \times 17\frac{3}{8}''$ (65×44 cm).

With a few notable artistic exceptions from his first period in Florence, the notes and papers bound into discrete books span the period from Leonardo’s arrival in Milan in 1482 until about 1517, when a stroke severely hindered his ability to control a stylus. As was common in the period, he usually used both sides of a sheet of paper—known as the **recto** and **verso**—and often crammed onto a surface a variety of ideas that might or might not be related. Annotations accompanied some of his drawings, particularly when he believed he had made an important observation or breakthrough that might not be evident from the sketch (and it appears that Leonardo often, but not always, drew first and wrote later). He commonly used a pen or stylus—a slender writing utensil—that he dipped into an inkwell, but he also applied black and red chalk to some of his drawings, as well as a light wash of translucent inks, to accentuate forms or highlight specific areas of interest.

Leonardo’s notebooks and manuscripts are mostly scattered among various European collections. The largest number may be found at the Biblioteca Ambrosiana in Milan, where a 12-volume set of scientific drawings is collectively known as the Codex Atlanticus. (“Codex” is simply a Latin word for book and is used especially to refer to a manuscript book.) Most of the codex’s 1,119 separate sheets were bound together by Pompeo Leoni and were later donated to the Biblioteca Ambrosiana in 1636. Napoleon’s troops removed the collection and shipped it to Paris, but the Codex Atlanticus was repatriated to Milan in 1815 and has remained there ever since. The drawings were rebound into their current 12 discrete units between 1968 and 1972. The Codex Atlanticus has been scheduled for public exhibition during Expo 2015 in Milan.

The Institut de France in Paris owns 12 smaller manuscripts dedicated to architecture, flight, optics, and engineering. Like the Codex Atlanticus, the so-called Paris Manuscripts were brought to Paris in 1796 by French troops during their occupation of Milan, but this set was never returned to their

former home. J. B. Venturi gave each book its own letter name: Manuscripts A (c. 1492), B (1488–1490), C (1490–1491), D (1508–1509), E (1513–1514), F (1508–1513), G (1510–1515), H (1493–1594), I (1497–1505), K (1503–1508), L (1497–1502), and M (1490s–1500). The Paris Manuscripts originally included the Codex Ashburnham I and II (c. 1492), which were separated from Manuscript A and stolen in the 19th century, bound in cardboard, sold by the thieves to the Earl of Ashburnum in 1875, and then returned to the Institut de France in 1890.

The Codex Arundel (1490s–c. 1518) is in the British Library in London. The contents of its 283 sheets spans the period from 1478 to 1518. Pompeo Leoni brought these drawings to the Habsburg court in Spain, where they were seen and purchased by the British art collector Thomas Howard, Earl of Arundel (d. 1646). His family then passed them to the British Royal Society in 1667. A digitized version of this book may be consulted online at http://www.armadillosystems.com/ttp_commercial/case.html.

The Biblioteca Nacional in Madrid has two volumes of notes: Madrid Codex I contains works from the 1490s, and Madrid Codex II features drawings from 1503 to 1504. The 700 pages that comprise these two manuscripts were only discovered in 1966, when long-forgotten boxes were examined in library storage. Codex I features a written text about machines, while Codex II contains geometrical studies and tinted maps of Tuscany and the Arno River.

The **folios** of the Royal Collection at Windsor Castle in England are dedicated primarily to Leonardo's anatomical drawings and his figural studies for artistic projects. Most of these drawings were purchased in the late 17th century but were either ignored or forgotten for more than 100 years.

The Codex Leicester (c. 1508–1512) is dedicated primarily to the study of hydraulics and is comprised of 18 folio sheets that have been folded into 72 pages. Leonardo personally bound these sheets but detached them later. The book was in the possession of the Earl of Leicester in 1717 and was retained by his descendants until 1980, when it was sold to Armand Hammer. The book was sold at auction to Bill and Melinda Gates in 1994 and has since been exhibited in different cities around the world.

Leonardo's observations on aviation are contained in the Codex on the Flight of Birds (1490–1505) in the Biblioteca Reale, Turin. This manuscript is comprised of 18 recto and verso sheets and was originally located in Milan; it was looted by French soldiers in 1796 and attached to what became known as Paris Manuscript B, but it was stolen during the 19th century and sold to a Russian collector, who then donated it to King Umberto I of Savoy in 1893.

The Codex Urbinas in the Biblioteca Vaticana contains Leonardo's manuscript of the *Treatise on Painting*, organized and edited posthumously by Melzi.

The Codex Trivulzianus (c. 1487–1490) in the Archivio de Stato, Milan, features architectural and military drawings, along with Leonardo's attempts to learn Latin.

The three-volume set called the Codex Forster in the Victoria & Albert Museum in London (1487 and 1490–1505; 1495–1497; and 1490–1496) focuses on geometry, weights, and hydraulic machines. The first volume measures $5\frac{1}{2} \times 4"$ (14×10 cm), the second $4 \times 2\frac{3}{4}"$ (10×7 cm), and the third only $3\frac{1}{2} \times 2\frac{3}{4}"$ (9×7 cm). They are the smallest of all the Leonardo manuscripts.

In addition, noteworthy collections of Leonardo drawings never bound into a codex can also be found in other museums, including the Gabinetto dei Disegni e delle Stampe of the Uffizi in Florence; the National Gallery in London; the Gallerie dell'Accademia in Venice; and the Louvre in Paris.

Important Terms

folio: A single sheet of paper or parchment. Scholars refer to Leonardo's papers using folio numbers (abbreviated as *fol.*) instead of page numbers.

recto: The front side of a piece of parchment or paper, always the right-hand page of an open book.

verso: The back side of a piece of parchment or paper, always the left-hand page of an open book.

Suggested Reading

Keele and Roberts, *Leonardo da Vinci: Anatomical Drawings from the Royal Library, Windsor Castle*.

Kemp, *Leonardo da Vinci: The Marvellous Works of Nature and Man*.

Pedretti, *The Codex Atlanticus of Leonardo da Vinci*.

Works Discussed

Note: Renaissance paintings, including those by Leonardo da Vinci, were almost never given a title by the artist. The descriptive phrases used to refer to drawings are even less standardized; the most reliable way to identify a given drawing is with codex information.

Lectures where a specific work is discussed are generally indicated in square brackets at the end of each entry.

Works by Leonardo da Vinci

The Paintings and Major Works

Adoration of the Magi. c. 1481. Oil on wood, $7'11\frac{5}{8}'' \times 8'7\frac{7}{8}''$ (2.43 × 2.46 m). Galleria degli Uffizi, Florence. [1, 9, 15, 18, 23, 36]

Annunciation. c. 1473–1474. Oil and tempera on wood, $3'2\frac{5}{8}'' \times 7'1\frac{3}{8}''$ (98 × 217 cm). Galleria degli Uffizi, Florence. [1, 5, 7, 8, 15, 32]

Benois Madonna (Madonna with a Flower). 1478–1481 Oil on panel transferred to canvas in the 19th century, $19\frac{1}{2}'' \times 13''$ (49.5 × 33 cm). The State Hermitage Museum, St. Petersburg. [1, 7, 8, 36]

Ceiling Fresco with Trellis and Coat of Arms at Center. c. 1488–1498. Sala delle Asse, Castello Sforzesco, Milan. [11]

Ginevra de' Benci [obverse]. c. 1474/1478. Oil on wood, $15 \times 14\frac{9}{16}''$ (38.1 × 37 cm). National Gallery of Art, Washington, DC. [1, 6, 7, 26, 36]

Ginevra de' Benci [reverse]. c. 1474/1478. Tempera on panel, $15 \times 14\frac{9}{16}$ " (38.1 × 37 cm). National Gallery of Art, Washington, DC. [6]

Isabella d'Este. 1499–1500. Red and ochre chalks, heightened with white on prepared white paper and pricked for transfer, $24 \times 18\frac{3}{8}$ " (61 × 46.5 cm). Musée du Louvre, Paris. [2, 12, 22, 23, 26]

La belle ferronnière (Portrait of a Lady—Lucrezia Crivelli). c. 1496. Oil on wood, $24\frac{7}{8} \times 17\frac{3}{4}$ " (63 × 45 cm). Musée du Louvre, Paris. [1, 12, 28, 36]

Lady with an Ermine (Cecilia Gallerani; Dama z Gronostajem). c. 1490–1491. Oil on wood, $21\frac{1}{8} \times 15\frac{7}{8}$ " (54.8 × 40.3 cm). Czartoryski Museum, National Museum, Kraców, Poland. [1, 12, 26, 36]

Litta Madonna (Madonna Litta). c. 1482–1490. Tempera on canvas transferred from wood, $16\frac{1}{2} \times 13$ " (42 × 33 cm). The State Hermitage Museum, St. Petersburg. [11]

Madonna of the Carnation (Madonna mit der Nelke). 1473–1476. Oil on wood, $24\frac{1}{2} \times 18\frac{3}{4}$ " (62 × 47.5 cm). Alte Pinakothek, Munich. [1, 7, 8, 11]

Madonna of the Rocks (Virgin of the Rocks; La Vierge aux rochers). 1483–1489. Oil on canvas, $6'6\frac{3}{8}$ " × 4' (1.99 × 1.22 m). Musée du Louvre, Paris. [1, 10, 11, 23, 28, 34, 36]

Madonna of the Rocks (London). c. 1491–1508. Oil on wood, $6'2\frac{3}{8}$ " × 4' (1.89 × 1.20 m). The National Gallery, London. [10, 28]

Madonna of the Yarnwinder (The Lansdowne Madonna). c. 1501–1507. Oil on wood, $19\frac{3}{4} \times 14\frac{3}{8}$ " (50.2 × 36.4 cm). Private collection. [1, 23]

Madonna of the Yarnwinder (Madonna with a Yarnwinder). c. 1501. Oil on wood. $19\frac{1}{2} \times 14$ " (48.3 × 36.9 cm). The Trustees of the 9th Duke of Buccleuch's Chattels Fund, Bowhill, Selkirk, Scotland. [1, 23]

Mona Lisa (La Gioconda; La Joconde; Portrait de Lisa Gherardini). 1503–1506 and/or 1516–1519. Oil on wood, $30\frac{3}{8} \times 20\frac{7}{8}$ " (77 × 53 cm). Musée du Louvre, Paris. [1, 2, 26, 31, 33, 36]

Portrait of a Musician (Il ritratto di musico). 1485–1490. Oil on wood, $17 \times 12\frac{1}{4}$ " (43 × 31 cm). Pinacoteca Ambrosiana, Milan. [11]

Saint Anne Madonna (Virgin and Child with Saint Anne and a Lamb; La Vierge à l'Enfant avec Sainte Anne). c. 1510. Oil on wood, $5'6\frac{1}{4}$ " × $4'3\frac{1}{4}$ " (1.68 × 1.30 m). Musée du Louvre, Paris. [1, 7, 18, 31, 32, 33, 36]

Saint Anne Madonna (Virgin and Child with Saint Anne and Saint John the Baptist). c. 1505–1508. Black chalk and touches of white chalk on brownish paper, mounted on canvas, $4'7\frac{3}{4}$ " × $3'5\frac{1}{4}$ " (1.41 × 1.05 m). The National Gallery, London. [1, 23, 25, 27, 31, 36]

Saint Jerome (Saint Girolamo). c. 1480. Tempera and oil on wood, $40\frac{1}{2} \times 29\frac{1}{2}$ " (103 × 75 cm). Pinacoteca, Vatican Museums. [8, 21, 23, 29]

Saint John the Baptist (Saint Jean Baptiste). 1508–1516. Oil on wood, $27\frac{1}{8} \times 22\frac{1}{2}$ " (69 × 57 cm). Musée du Louvre, Paris. [28, 36]

Salvator Mundi. c. 1500. Oil on wood, $25\frac{3}{4} \times 17\frac{3}{4}$ " (65.5 × 45.1 cm). Private collection. Attributed to Leonardo in 2011. [35]

The Last Supper (Il Cenacolo; also L'Ultima Cena). c. 1495–1498. Oil and tempera on plaster, $15'2$ " × $28'10$ " (4.6 × 8.8 m). Santa Maria delle Grazie Refectory, Milan. [1, 2, 20, 21, 36]

Vitruvian Man. c. 1487–1490. Pen and ink, brush and some brown wash over metalpoint on paper, $13\frac{9}{16} \times 9\frac{5}{8}$ " (34.44 × 24.45 cm). Gallerie dell'Accademia, Venice. [1, 2, 15]

Preparatory Drawings for Known Paintings

Adoration of the Magi (background and architecture). c. 1480–1481. Pen and ink on paper, $6\frac{1}{2} \times 11\frac{1}{2}$ " (16.3 × 29 cm). Gabinetto dei Disegni e delle Stampe, Galleria degli Uffizi, Florence. [9, 15, 18, 20, 30]

Adoration of the Magi (Joseph and two shepherds and sketches for the Christ child). c. 1481. Pen and ink on paper, $6\frac{3}{4} \times 4\frac{3}{8}$ " (17.2 × 11.0 cm). Hamburger Kunsthalle, Hamburg, Germany. [18]

Adoration of the Magi (six figures study). 1481. Pen and ink with silverpoint on paper, $11 \times 10\frac{1}{2}$ " (27.8 × 26.8 cm). Musée du Louvre, Paris. [18]

Adoration of the Magi (study). 1481. Pen and ink over black chalk on paper, $11\frac{1}{4} \times 8\frac{3}{8}$ " (28.5 × 21.2 cm). Musée du Louvre, Paris. [9]

Adoration of the Magi (Virgin Mary). c. 1481. Metalpoint on paper, $7 \times 6\frac{5}{8}$ " (17.9 × 16.8 cm). Musée du Louvre, Paris. [11]

Battle of Anghiari (skirmish of horses and footsoldiers). c. 1503–1505. Pen and ink on paper. Gallerie dell'Accademia, Venice. [25, 30]

Battle of Anghiari (studies of horsemen, including one charging with a spear at top left). c. 1503–1505. Pen and ink on paper, $3\frac{1}{4} \times 4\frac{3}{4}$ " (8.2 × 12 cm). British Museum, London. [18, 25]

Battle of Anghiari (study for the heads of two warriors). c. 1505. Charcoal and traces of red chalk on paper, $7\frac{1}{2} \times 7\frac{3}{8}$ " (19.1 × 18.8 cm). Esterhazy Collection, Museum of Fine Arts (Szepmuveszeti Muzeum), Budapest. [25]

Battle of Anghiari (study of a warrior's head). c. 1505. Red pencil on paper, $8\frac{1}{8} \times 7\frac{3}{8}$ " (22.6 × 18.6 cm). Esterhazy Collection, Museum of Fine Arts (Szepmuveszeti Muzeum), Budapest. [25]

Battle of Anghiari (warrior on horseback). c. 1503–1505. Pen and ink on paper. Gabinetto dei Disegni e delle Stampe, Galleria degli Uffizi, Florence. [25]

Leda and the Swan. c. 1505. Pen and brown ink over black chalk on paper, $6\frac{1}{4} \times 5\frac{1}{2}$ " (16 × 13.7 cm). Chatsworth House, Bakewell, Derbyshire, UK. [27]

Nativity or Adoration of the Christ Child; Perspectival Projection (recto); Slight Doodles (verso). 1480–1485. Metalpoint partly reworked with pen and ink on pink prepared paper; lines ruled with metalpoint (recto); pen and ink (verso), $7\frac{7}{8} \times 6\frac{3}{8}$ " (19.3 × 16.2 cm). The Metropolitan Museum of Art, New York. [18]

Saint Anne Madonna (Madonna and Child with Saint Anne and a Lamb), first study. 1501. Pen and ink on paper, $4\frac{3}{4} \times 4$ " (12.1 × 10 cm). Gallerie dell'Accademia, Venice. [22, 23]

Saint John the Baptist. c. 1485. Metalpoint with white heightening on paper. The Royal Collection, Windsor. [8]

The Last Supper, Christ. 1495–1497. Pen and brush on paper, $15\frac{1}{4} \times 12\frac{5}{8}$ " (40 × 32 cm). Pinacoteca di Brera, Milan. [20, 35]

The Last Supper, figure studies. c. 1495–1497. Pen and brown ink over metalpoint on paper, $11 \times 8\frac{1}{4}$ " (27.8 × 20.8 cm). Musée du Louvre, Paris. [18, 20]

The Last Supper, head of Saint James and architectural sketches. c. 1495. Red chalk, pen and ink on paper, $9\frac{15}{16} \times 6\frac{3}{4}$ " (25.2 × 17.2 cm). The Royal Collection, Windsor. [20]

The Last Supper, Saint Peter. c. 1495–1497. Pen and ink on paper, $5\frac{3}{4} \times 4\frac{1}{2}$ " (14.5 × 11.3 cm). Graphische Sammlung Albertina, Vienna. [20]

The Last Supper, study. 1495–1497. Red chalk on paper, $10\frac{1}{4} \times 15\frac{1}{2}$ " (26 × 39.2 cm). Gallerie dell'Accademia, Venice. [20, 21]

Preparatory Drawings for Known Sculptures

Casting hood for a horse's head. c. 1511. Red chalk on paper, $8\frac{3}{8} \times 11\frac{7}{8}$ " (21 × 30 cm). Codex Madrid II, fol. 157 recto. Biblioteca Nacional, Madrid. [1, 19, 30]

Casting pit for the Sforza horse seen from above and the side. c. 1493. Pen and ink on paper, $9\frac{7}{8} \times 14\frac{1}{2}$ " (25 × 37 cm). Codex Madrid I, fol. 149 recto. Biblioteca Nacional, Madrid. [1, 19]

Sforza Monument, horse in profile and from the front. c. 1490. Silverpoint on paper. The Royal Collection (1232), Windsor. [19]

Trivulzio Monument, c. 1509–1510. Pen and ink on paper, $11 \times 7\frac{7}{8}$ " (28.0 × 19.8). The Royal Collection, Windsor. [30]

Studies for an equestrian monument. c. 1508–1511. Pen and ink over black chalk on paper, $8\frac{7}{8} \times 6\frac{3}{8}$ " (22.4 × 16 cm). The Royal Collection, Windsor. [30]

Study for *Sforza Monument*, no. 19 (facsimile). c. 1493. Pen and ink on paper. Gabinetto dei Disegni e delle Stampe, Galleria degli Uffizi, Florence. [19, 30]

Studies of Anatomy

Coitus. c. 1490–1493. Pen and ink on paper, $10\frac{7}{8} \times 8\frac{1}{8}$ " (27.6 × 20.4 cm). The Royal Collection, Windsor. [29]

Foetus in the womb and the external genitalia, c. 1507. Pen and ink with wash over black and red chalk on paper, $12 \times 8\frac{3}{8}$ " (30.4 × 21.3 cm). The Royal Collection, Windsor. [29, 31]

Heart and pulmonary vessels of an ox. c. 1511–1513. Pen and ink over black chalk on blue paper, $11\frac{3}{8} \times 8$ " (28.8 × 20.3 cm). The Royal Collection, Windsor. [29]

Lungs, bladder, and male genitalia, with notes. c. 1508–1510. Pen and ink over chalk on paper, $10\frac{3}{4} \times 7\frac{5}{8}$ " (27.2 × 19.2 cm). The Royal Collection, Windsor. [29]

Male anatomical figure showing the viscera and principal vessels. c. 1490–1493. Pen and ink with wash over black chalk on paper, $11\frac{1}{8} \times 7\frac{5}{8}$ " (28.0 × 19.8 cm). The Royal Collection, Windsor. [29]

Male musculature. c. 1508. Pen and ink on paper. The Royal Collection, Windsor. [29]

Man's face and study of human skull. c. 1488–1492. Pen and ink on paper. Codex Atlanticus, fol. 118 verso. Biblioteca Ambrosiana, Milan. [34]

Mesentery of the bowel and its blood supply, with notes. c. 1508. Pen and ink over black chalk on paper, $7\frac{5}{8} \times 5\frac{5}{8}$ " (19.3 × 14.3 cm). The Royal Collection, Windsor. [29]

Muscles of the shoulder. c. 1510. Pen and ink with wash over black chalk on paper, $11\frac{1}{2} \times 7\frac{5}{8}$ " (29.2 × 19.8 cm). The Royal Collection, Windsor. [29, 36]

Neck. c. 1512–1513. Pen and ink on blue paper, $10\frac{7}{8} \times 8\frac{1}{4}$ " (27.6 × 20.7 cm). The Royal Collection, Windsor. [29]

Principal organs and vessels of a woman. c. 1510. Pen and ink with chalk and wash on paper, $18\frac{3}{4} \times 13\frac{1}{8}$ " (47.6 × 33.2 cm). The Royal Collection, Windsor. [1, 29, 31, 36]

Skull, sectioned (frontal view). c. 1489. Pen and ink over black chalk on paper, $7\frac{1}{2} \times 5\frac{1}{2}$ " (19.0 × 13.7 cm). The Royal Collection, Windsor. [29]

Skull, sectioned (side view). c. 1489. Pen and ink over black chalk on paper, $7\frac{3}{8} \times 5\frac{3}{8}$ " (18.8 × 13.4 cm). The Royal Collection, Windsor. [29]

Stomach and intestines. c. 1508–1509. Pen and ink over black chalk on paper, $7\frac{5}{8} \times 5\frac{1}{2}$ " (19.2 × 13.8 cm). The Royal Collection, Windsor. [14]

Surface anatomy of the shoulder and arm. c. 1510. Pen and ink with black chalk on paper, $11\frac{1}{4} \times 7\frac{7}{8}$ " (28.6 × 20.0 cm). The Royal Collection, Windsor. [29]

Figure Drawings

Bust and head of a man seen in profile with schematic proportions of the human head. c. 1497. Pen and ink on paper, $11 \times 8\frac{7}{8}$ " (27.9 × 22.3 cm). Gallerie dell'Accademia, Venice. [18]

Bust of a young man with wild hair. c. 1495. Pen and ink over red chalk on paper. Gallerie dell'Accademia, Venice. [18]

Child with cat (from facsimile). c. 1478. Pen and ink on paper, $8\frac{1}{8} \times 5\frac{5}{8}$ " (20.6 × 14.3 cm). Gabinetto dei Disegni e delle Stampe, Galleria degli Uffizi, Florence, Italy. [7, 18]

Drapery for a seated figure. c. 1475. Distemper with white highlights on paper, $10\frac{1}{2} \times 10$ " (26.5 × 25.3 cm). Musée du Louvre, Paris. [18]

Drapery study for a kneeling figure, c. 1472–1475. Brush and grey tempera with white on canvas, $7\frac{1}{8} \times 9\frac{1}{4}$ " (18.1 × 23.4 cm). Galleria degli Uffizi, Florence. [5]

Fall of light on a face. c. 1488. Pen and ink over black chalk on paper, $8 \times 5\frac{5}{8}$ " (20.3 × 14.3 cm). The Royal Collection, Windsor. [30]

Five studies of grotesque faces. c. 1490. Red chalk on paper. Gallerie dell'Accademia, Venice. [18]

Folds of the dress of a female figure. c. 1472–1478. Silverpoint and wash drawing heightened with white on red paper, 10×7.5 " (25.7 × 19 cm). Galleria Nazionale d'Arte Antica di Palazzo Corsini, Rome. [5, 20]

Hand and notations. c. 1490. Pen and ink on paper. Codex Atlanticus, fol. 146 recto. Biblioteca Ambrosiana, Milan. [14]

Hanged man. 1479. Pen and ink on paper, $7\frac{1}{2} \times 2\frac{7}{8}$ " (19.2 × 7.3 cm). Musée Bonnat, Bayonne, France. [9]

Head of a child three-quarter view. c. 1483. Metalpoint with white highlights on grey paper, $5\frac{3}{8} \times 3\frac{3}{8}$ " (13.5 × 8.5 cm). Musée du Louvre, Paris. [18]

Heads of horses, a lion, and a man. c. 1503–1504. Pen and ink with wash and red chalk on paper, $7\frac{3}{4} \times 12\frac{1}{8}$ " (19.6 × 30.8 cm). The Royal Collection, Windsor. [30]

Human physiognomy and horseback riders. Gallerie dell'Accademia, Venice. [21]

Infant Christ. c. 1501–1510. Red chalk on paper, $11\frac{1}{8} \times 7\frac{3}{4}$ " (28.4 × 19.6 cm). Gallerie dell'Accademia, Venice. [18]

Madonna and Child with a cat. c. 1479. Pen and ink on beige paper, $9\frac{1}{8} \times 6\frac{7}{8}$ " (23.2 × 17.5 cm). Musée Bonnat, Bayonne, France. [18]

Madonna offering a bowl of fruit to the Child. Pen and ink on paper. Facsimile. Gabinetto dei Disegni e delle Stampe, Galleria degli Uffizi, Florence. [4, 5]

Man blowing a trumpet into the ear of a nude man, and two seated men, c. 1480–1481. Pen and ink over stylus sketch on paper, $10\frac{1}{8} \times 7\frac{7}{8}$ " (25.8 × 19.3 cm). Malcolm Collection, British Museum, London. [18]

Man tricked by gypsies. c. 1493. Pen and ink on paper, $10\frac{1}{4} \times 8$ " (26 × 20.5 cm). The Royal Collection, Windsor. [18]

Nude man, standing with right hand on hip, holding a staff with his left hand, looking to right. c. 1504. Pen and ink over black chalk on paper, $4\frac{1}{4} \times 2\frac{1}{8}$ " (10.8 × 5.4 cm). British Museum, London. [25]

Old man (self-portrait?). c. 1512. Red chalk on paper, $13\frac{1}{8} \times 8\frac{3}{8}$ " (33.3 × 21.3 cm). Biblioteca Reale, Turin, Italy. [1, 34, 36]

Profile, three-quarter and frontal study of a male head, possibly a portrait of Cesare Borgia. 1502. Sanguine on yellowed white paper. Biblioteca Reale, Turin, Italy. [24]

Seven studies of grotesque faces. Red chalk on paper. Gallerie dell'Accademia, Venice. [18, 36]

Standing figure, draped; view of profile from right. c. 1475. Distemper with point of brush on canvas, heightened with white, on paper. $12\frac{3}{8} \times 6\frac{5}{8}$ " (31.5 × 16.8 cm). Musée du Louvre, Paris. [4]

Studies of hands. c. 1480. Metalpoint, much faded, on pink prepared paper, $11 \times 7\frac{3}{8}$ " (27.8 × 18.5 cm). Photographed under ultraviolet light. The Royal Collection, Windsor. [4]

Study for a Madonna's head. c. 1481. Silverpoint on prepared paper. $7 \times 6\frac{5}{8}$ ". Musée du Louvre, Paris. [11]

Study of a "nutcracker" man and beautiful youth. c. 1500. Red chalk on paper, $8\frac{1}{4} \times 5\frac{7}{8}$ " (20.8 × 15.0 cm). Galleria degli Uffizi, Florence. [18]

Three female figures dancing and a head. c. 1515. Pen and ink on paper, $3\frac{7}{8} \times 5\frac{7}{8}$ " (9.8 × 14.9 cm). Gallerie dell'Accademia, Venice. [15, 31]

Three studies of the Virgin and Child, seated. c. 1478. Metalpoint with pen and ink on prepared paper. $8 \times 6\frac{1}{8}$ " (20.3 × 15.6 cm). British Museum, London. [7]

Two studies of the Virgin and Child with a cat and three studies of the Child with a cat. Late 1470s or early 1480s. Pen and ink over stylus on paper, $11 \times 7\frac{3}{4}$ " (28 × 19.7 cm). British Museum, London. [7]

Virgin and Child with cat (verso) and Virgin and Child with cat (recto). c. 1478–1481. Pen and ink with brown wash on paper, $5\frac{1}{4} \times 3\frac{3}{4}$ " (13.0 × 9.4 cm). British Museum, London. [7, 18, 23]

The Physical Sciences and Technology, General

Draft of a letter to Ludovico il Moro. c. 1485. Codex Atlanticus, fol. 1082 recto. Biblioteca Ambrosiana, Milan, Italy. [10, 16]

Architecture

Architectural study of Castello Sforzesco (with detail for a helical staircase). c. 1485–1490. Pen and ink on paper, $5\frac{3}{4} \times 8\frac{5}{8}$ " (14.5 × 22.0 cm). Musée du Louvre, Paris. [11, 22, 33]

Bridge designs. c. 1487–1488. Pen and ink on paper. Manuscript B, fol. 23 recto. Bibliotheque de l’Institut de France, Paris. [14, 15]

Colosseum on a plaza. 1485–1488. Chalk and ink, $9\frac{1}{8} \times 6\frac{1}{2}$ " (23.2 × 16.5 cm). Manuscript B, Ms. 2173, fol. 11 verso. Bibliotheque de l’Institut de France, Paris. [15]

Elevation and plan of a church. Imitation ship. 1485–1488. Pen and ink on paper, $9\frac{1}{8} \times 6\frac{1}{2}$ " (23.2 × 16.5 cm). Manuscript B, Ms. 2173, fol. 23/24. Bibliotheque de l’Institut de France, Paris. [15, 28]

Geometrical drawings about transformation from curved to rectilinear surfaces and vice versa; in left center, planimetry of a building. Codex Atlanticus, fol. 429, recto. Biblioteca Ambrosiana, Milan. [15]

Istanbul Bridge. 1497–1502. Manuscript L, fol. 65/66. Bibliotheque de l’Institut de France, Paris. [34]

Octagonal plan (and elevation of a church); plan of two levels of the Basilica of the Holy Sepulchre in Milan. 1485–1488. Pen and ink on paper, $9\frac{1}{8} \times 6\frac{1}{2}$ " (23.2 × 16.5 cm). Manuscript B, Ms. 2173, fol. 56 verso and fol. 57 recto. Bibliotheque de l’Institut de France, Paris. [15]

Plan and elevation of a church (fol. 93 verso); plan and elevation of a church (fol. 94 recto). Pen and ink on paper, $8\frac{1}{2} \times 5\frac{3}{4}$ " (21.4 × 14.6 cm). 1487–1490. Codex Ashburnham, Manuscript B, Ms. 2184, fol. 93 verso and fol. 94 recto. Bibliotheque de l’Institut de France, Paris. [15, 20]

Plan of a church and device for pearl fishing (underwater breathing). c. 1488. Pen and ink over chalk on paper, $9\frac{1}{8} \times 6\frac{1}{2}$ " (23.2 × 16.5 cm). Manuscript B, Ms. 2173, fol. 17 verso. Bibliotheque de l’Institut de France, Paris. [15, 28]

Stage set, Orpheus. 1508–1516. Pen and ink on paper. Codex Arundel 263, fol. 224 recto. British Library, London. [15]

Aviation

Birds in flight. 1505. Pen and ink on paper, $8\frac{3}{8} \times 6$ " (21 × 15 cm). Page from the Codex on the Flight of Birds. Biblioteca Reale, Turin, Italy. [17]

Birds in flight. c. 1507. Pen and ink on paper. Codex Atlanticus, fol. 214 verso. Biblioteca Ambrosiana, Milan. [17, 33]

Experiment on lifting power of wings. c. 1488. Pen and ink on paper. Manuscript B, Ms. 2173, fol. 88 verso. Bibliotheque de l’Institut de France, Paris. [17]

Flight of birds. 1513–1515. Pen and ink on paper, 6×4 " (15.1 × 10.2 cm). Manuscript E, Ms. 2176, fol. 42/43. Bibliotheque de l’Institut de France, Paris. [17]

Flying machine (man in ornithopter). c. 1487. Pen and ink on paper. Codex Atlanticus, fol. 276 recto. Biblioteca Ambrosiana, Milan. [1, 17]

Flying machine, mechanical wings. Flying machine, structure of the wings. 1485–1488. Pen and ink on paper, $9\frac{1}{8} \times 6\frac{1}{2}$ " (23.2 × 16.5 cm). Manuscript B, Ms. 2173, fol. 74 recto. Bibliotheque de l’Institut de France, Paris. [1, 17, 21, 36]

Flying machine, propelling devices. c. 1490. Pen and ink on paper. Codex Atlanticus, fol. 897 recto. Biblioteca Ambrosiana, Milan. [17]

Flying machine with operator in lower parts (ornithopter). c. 1487–1490. Pen and ink on paper. Manuscript B, Ms. 2173, fol. 80 recto. Bibliotheque de l’Institut de France, Paris. [17]

Flying machine with pulleys. Pulley system. Detail of a wooden arch. Method of framework for a festival platform. 1485–1488. Pencil and ink. $9\frac{1}{8} \times 6\frac{1}{2}$ " (23.2 × 16.5 cm). Manuscript B, Ms. 2173, fol. 78 verso and fol. 79 recto. Bibliotheque de l’Institut de France, Paris. [17]

Helicopter: propeller (aerial screw) of a flying machine; propulsion system for a flying machine. c. 1487–1490. Pen and ink over chalk on paper, $9\frac{1}{8} \times 6\frac{1}{2}$ " (23.2 × 16.5 cm). Manuscript B. Ms. 2173, fol. 83 verso and fol. 88 recto. Bibliotheque de l’Institut de France, Paris. [17]

Human figure with wings on his back. Pen and ink on paper. Codex Atlanticus, fol. 166 recto. Biblioteca Ambrosiana, Milan. [17]

Machine for artificial flight, with caption. c. 1487–1490. Pen and ink on paper. Codex Atlanticus, fol. 824 verso. Biblioteca Ambrosiana, Milan. [17, 34]

Man in an ornithopter. c. 1485–1487. Pen and ink on paper. Manuscript B, Ms. 2173, fol. 77 verso, detail. Bibliotheque de l’Institut de France, Paris. [1, 17, 21, 36]

Methods and devices to obtain the alternate motion of wings, having in common a screw with inverse threads. c. 1487–1490. Pen and ink on paper. Codex Atlanticus, fol. 755 recto. Biblioteca Ambrosiana, Milan. [17]

Machines and Engineering

Assault chariot with scythes. c. 1485. Silverpoint, pen and ink on paper, $8\frac{1}{4} \times 11\frac{1}{2}$ " (21.0 × 29.2 cm). Biblioteca Reale, Turin, Italy. [16, 21, 22, 24]

Bridge crane (that can be lifted by a big screw). c. 1485–1490. Pen and ink on paper. Codex Atlanticus, fol. 1083 verso. Biblioteca Ambrosiana, Milan. [14]

Canal digging machine (with its measures); below, devices for the automatic dumping of the soil from a box with bottom that can be opened (the power for lifting the box is given by an ox or two men). Pen and ink on paper. Codex Atlanticus, fol. 1012 recto. Biblioteca Ambrosiana, Milan. [24]

Carriage-mounted bombard made of several barrels fitted to a rotating drum. c. 1481–1485. Pen and ink on paper. Codex Atlanticus, fol. 16 recto. Biblioteca Ambrosiana, Milan. [16]

Catapult. c. 1485–1490. Pen and ink on paper, $8\frac{1}{2} \times 11\frac{3}{4}$ " (21.7 × 29.7 cm). Codex Atlanticus, fol. 181 recto. Biblioteca Ambrosiana, Milan. [16]

Clock. c. 1497. Pen and ink on paper. Codex Madrid, Ms. 8937, fol. 27. Biblioteca Nacional, Madrid. [14]

Covered drawbridge provided with ladders for crossing moats and climbing walls; three-wheeled carriage for carrying bombards. c. 1485. Pen and ink on paper. Codex Atlanticus, fol. 49 recto. Biblioteca Ambrosiana, Milan. [16]

Double water pump (machine to lift water with a double pump). Pen and ink on paper. Codex Atlanticus, fol. 20 recto. Biblioteca Ambrosiana, Milan. [14]

Dredges: device to dredge and wipe the bottom of harbor; barrage to stop access to sea; systems of dredges; tool for discharging sea water after pumps have lowered harbor level. c. 1485–1490. Pen and ink on paper. Codex Atlanticus, fol. 904 recto. Biblioteca Ambrosiana, Milan. [14]

Giant crossbow (below); spontoon with iron spikes to use against enemies; two models of a crossbow on stand; bombard mounted on a boat with shield; mechanical machine to align and to screw the elements of a bombard (above). c. 1485. Pen and ink over chalk on paper, $8\frac{1}{8} \times 10\frac{7}{8}$ " (20.5 × 27.5 cm). Codex Atlanticus, fol. 149 recto. Biblioteca Ambrosiana, Milan. [16]

Machines for lifting and pumping water, towers, and buildings on top of which water is lifted by Archimedean spirals. c. 1485–1490. Pen and ink on paper. Codex Atlanticus, fol. 1069 verso. Biblioteca Ambrosiana, Milan. [1, 14]

Machine to draw rods; up left, details of the same machine. c. 1500. Pen and ink on paper. Codex Atlanticus, fol. 10 recto. Biblioteca Ambrosiana, Milan. [1, 14]

Machines to lift water. On the left, machine to lift water; on the right, machine to draw water from a well and bring it into the houses. c. 1480. Pen and ink on paper. Codex Atlanticus, fol. 26 verso. Biblioteca Ambrosiana, Milan. [1, 14, 24]

Machine to study velocity composed of 24 rotating axes, each fitted with a gearwheel with 100 teeth and a spool with ten spindles at the opposite side. c. 1487–1490. Pen and ink on paper. Codex Atlanticus, fol. 83 verso. Biblioteca Ambrosiana, Milan. [14, 15]

Mechanism for repelling ladders. c. 1481. Pen and ink on paper, $10\frac{1}{8} \times 7\frac{3}{4}$ " (25.6 × 19.6 cm). Codex Atlanticus, fol. 139 recto. Biblioteca Ambrosiana, Milan. [1, 14]

Military machines (human scythe; human-powered covered cart). c. 1487. Pen and ink with brown wash on paper, $6\frac{7}{8} \times 9\frac{5}{8}$ " (17.3 × 24.5 cm). British Museum, London. [1, 16, 36]

Mortar machine. c. 1485–1490. Pen and ink on paper, $25\frac{5}{8} \times 17\frac{3}{8}$ " (65 × 44 cm). Codex Atlanticus, fol. 31 recto. Biblioteca Ambrosiana, Milan. [16]

Motion device. c. 1485–1490. Pen and ink on paper, $25\frac{5}{8} \times 17\frac{3}{8}$ " (65 × 44 cm). Codex Madrid, Ms. 8937, fol. 30 recto. Biblioteca Nacional, Madrid. [14]

Needle-grinding machine. c. 1487–1490. Pen and ink on paper. Codex Atlanticus, fol. 74 recto. Biblioteca Ambrosiana, Milan. [14]

Notes and diving suit. c. 1500. Pen and ink on paper. Codex Arundel 263, fol. 24 verso. British Library, London. [22]

Odometer. c. 1500–1505. Pen and ink on paper. Codex Atlanticus, fol. 1 recto. Biblioteca Ambrosiana, Milan. [14]

Screw-threading machine (machine to thread female screw and screw; in the center, boat; above and below, machine to raise and to collect water). c. 1485–1490. Pen and ink on paper. Codex Atlanticus, fol. 156 recto. Biblioteca Ambrosiana, Milan. [14]

Self-propelled cart (automotive wagon, moved by system of springs and equipped with differential transmission). c. 1478–1482. Metalpoint, pen, and brush on paper, $10\frac{5}{8} \times 7\frac{7}{8}$ " (27 × 20 cm). Codex Atlanticus, fol. 296 verso. Biblioteca Ambrosiana, Milan. [1, 14]

Seven types of machines to lift and collect water with gears, wheels, bellows, levers, pumps, Archimedean screw; on the left, at the border, instruments to walk on water and to breathe underwater. c. 1480. Pen and ink on paper. Codex Atlanticus, fol. 26 recto. Biblioteca Ambrosiana, Milan. [14]

Shearing machine with detailed captions explaining its working. 1496. Pen and ink on paper. Codex Atlanticus, fol. 1105 recto. Biblioteca Ambrosiana, Milan. [14]

Siege machine with horizontal bridge (for crossing the walls of the enemy fortress). c. 1483. Pen and ink on paper, $10\frac{5}{8} \times 7\frac{3}{4}$ " (27 × 19.5 cm). Codex Atlanticus, fol. 1084 recto. Biblioteca Ambrosiana, Milan. [16]

Siege machine with horizontal bridge for crossing the walls of the enemy fortress (preparatory drawing for fol. 1084 verso); above, small round dome-shaped cage, containing an animal head; below, sketches of bombard. c. 1483. Pen and ink on paper. Codex Atlanticus, fol. 1087 recto. Biblioteca Ambrosiana, Milan. [16, 36]

Sixteen guns mounted on a rotating platform; on the right, wheelbarrow equipped with an instrument to measure miles and a wheelbarrow equipped to count steps. c. 1500–1505. Pen and ink on paper. Codex Atlanticus, fol. 1 recto. Biblioteca Ambrosiana, Milan. [16, 36]

Teaselling machine to manufacture plush fabric. c. 1495. Pen and ink on paper. Codex Atlanticus, fol. 106 recto. Biblioteca Ambrosiana, Milan. [1, 14, 36]

Three machines to raise columns (above, the first drawn in pencil; in the center, the second in a triangular scaffolding drawn in ink, on the right, the third). c. 1495. Pen and ink on paper. Codex Atlanticus, fol. 138 recto. Biblioteca Ambrosiana, Milan. [14]

Unsinkable ships (right) and “submarine” (top left). 1485–1488. Pen and ink on paper, Manuscript B, Ms. 2173, fol. 11 recto. Bibliotheque de l’Institut de France, Paris. [16]

War machine composed of a big wheel with 44 steps, set in motion by the weight of 10 men mounting on a ladder and by a soldier sitting on a seat hung from the fixed pin; 1485–1488. Pen and ink on paper. Codex Atlanticus, fol. 1070 recto. Biblioteca Ambrosiana, Milan. [16]

Nature, Landscapes, and Maps

Canal to bypass the Arno. c. 1503. Brush and ink over black chalk on paper, $13\frac{1}{4} \times 19"$ (33.5 × 48.2 cm). The Royal Collection, Windsor. [24, 26]

Deluge. c. 1515. Pen and ink with wash on paper, $6\frac{3}{8} \times 8"$ (16.2 × 20.3) cm. The Royal Collection, Windsor. [33, 36]

Flowers. c. 1485. Black chalk and ink on paper, $9\frac{1}{8} \times 6\frac{1}{2}"$ (23.2 × 16.5 cm). Manuscript B, Ms. 2173; fol. 14 recto. Bibliotheque de l’Institut de France, Paris. [34]

Landscape. 1473. Pen and ink on paper, $7.5 \times 11"$ (19 × 28.5 cm). Gabinetto dei Disegni e delle Stampe, Galleria degli Uffizi, Florence. [5, 33, 36]

Lily (Madonna lily; *Lilium candidum*). c. 1485. Pen and ink, wash, chalk, and white heightening on paper. The Royal Collection, Windsor. [1, 34]

Plan of Imola. 1502. Pen and ink, wash and chalk on paper, $17\frac{3}{8} \times 23\frac{3}{4}$ " (44 × 60.2 cm). The Royal Collection, Windsor. [1, 24]

Star of Bethlehem, wood anemone and sun spurge. c. 1485–1505. Pen and ink with red chalk on paper. The Royal Collection, Windsor. [1, 34]

Studies of flowers. c. 1481–1483. Pen and ink on paper, $7\frac{1}{4} \times 8$ " (18.3 × 20.1 cm). Gallerie dell'Accademia, Venice. [34]

Physics and Math

Calculating diameter of sun and moon. Pen and ink on paper. Codex Atlanticus, fol. 662 recto. Biblioteca Ambrosiana, Milan. [2, 14, 15]

Illustrated scientific manuscript (optics). Codex Ashburnham, Manuscript A, fol. 14. Pen and ink on paper. Bibliotheque de l'Institut de France, Paris. [22, 29]

Perspectograph (optical instrument) with a man that is examining inside. c. 1480–1482. Pen and ink on paper. Codex Atlanticus, fol. 5 recto. Biblioteca Ambrosiana, Milan. [15]

Study of perspective and calculation of distances. c. 1490–1493. Pen and ink on paper. Codex Atlanticus, fol. 119 recto. Biblioteca Ambrosiana, Milan. [15]

Models of Leonardo's Designs

Aerial screw. Model after a drawing in Manuscript B, fol. 83 verso. c. 1487–1490. Museo Ideale Leonardo da Vinci, Vinci, Italy. [17]

Akamu, Nina. Leonardo da Vinci's Horse, outside the Milan Hippodrome. 1999. Bronze, 24' (7.3 m). Milan. [19]

———. Leonardo da Vinci's Horse. 1999. Bronze, 24' (7.3 m). The Frederik Meijer Gardens and Sculpture Park, Grand Rapids, Michigan. [19]

Ginevra de' Benci. 2001. Digital reconstruction. National Gallery of Art, Washington, DC. [6]

Mechanism for a clock. Model after a drawing in the Codex Madrid I, fol. 14 recto. Collection Niccolai, Florence. [14]

Model for an articulated wing. Model after a drawing in the Codex Atlanticus, fol. 308 recto. Museo Ideale Leonardo da Vinci, Vinci, Italy. [17]

Model of a machine with flapping wings. Museo della Scienza e della Tecnica, Milan. [17]

Model of an inclined flying machine (ornithopter). Model (detail) after a drawing in the Codex Atlanticus, fol. 302 verso. Museo Ideale Leonardo da Vinci, Vinci, Italy. [17]

Mileage meter (odometer). Model after a drawing in the Codex Atlanticus, fol. 1 recto. Collection Niccolai, Florence. [14]

Model of the first automobile, designed by Leonardo da Vinci. Castle of Clos Luce, Amboise, France. [14]

War machine: chariot with scythes, detail. Model after a drawing in the Codex Turin. Collection Niccolai, Florence, Italy. [16]

War machine, detail. Model after a drawing in the British Museum, London. Museo Ideale Leonardo da Vinci, Vinci, Italy. [16]

Wreath of laurel, palm, and juniper with a scroll inscribed "Virtutem Forum Decorat" [reverse of *Ginevra de' Benci*]. 2001. Digital reconstruction. National Gallery of Art, Washington, DC. [6]

Works by Other Artists

Agnese, Gian Battista. Map of Central Europe. Mid-16th century. Museo Correr, Venice. [13]

Alberti, Leon Battista. Facade of the Palazzo. Begun c. 1453. Palazzo Rucellai, Florence. [3, 5]

_____. Santa Maria Novella. c. 1458–1470. Florence. [3]

_____. *Self-portrait*. c. 1440. Medallion, bronze, 6 $\frac{1}{8}$ × 4 $\frac{1}{2}$ " (15.4 × 11.5 cm). Musée du Louvre, Paris. [6]

_____. Tempio Malatestiano. c. 1450–1460. Rimini, Italy. [3]

Altissimo, Cristofano dell'. *Portrait of Leonardo da Vinci*. c. 1560. Oil on canvas. Galleria degli Uffizi, Florence. [35, 36]

Angelico, Fra. *Annunciation*. c. 1440–1445. Fresco, 7'6 $\frac{1}{2}$ " × 9'9" (2.30 × 2.97 m). Museo di San Marco, Florence. [4, 5]

Anonymous. Anatomy lecture at Padua, Italy, 1483. From *Fasciocolo di Medicina* by Johannes de Ketham (1493). 16 $\frac{1}{2}$ × 11 $\frac{3}{4}$ " (41.9 × 29.8 cm). Oxford Science Archive, Oxford, UK. [29]

_____. Anatomy of the human body. Mid-15th century. From *Tractatus de Pestilencia* (vellum) by Albik (mid-15th century). Vellum. National University Library, Prague, Czech Republic. [1, 29]

_____. Assumed Portrait of Anne de Bretagne (1477–1514), Queen of France, spouse of Charles VIII (1470–1498). c. 1490–1500. Latin 1198, Bibliothèque Nationale, Paris. [13, 22]

———. The Battle of Pavia: Flight and scattering of the French army. 1528–1531. Tapestry, 14'5 $\frac{1}{4}$ " × 26'10 $\frac{1}{4}$ " (4.40 × 8.18 m). Museo Nazionale di Capodimonte, Naples, Italy. [35]

———. The Battle of Pavia: Invasion of the French camp and escape of the French ladies. 1528–1531. Tapestry, 14'5 $\frac{1}{4}$ " × 26'10 $\frac{1}{4}$ " (4.40 × 8.18 m). Museo Nazionale di Capodimonte, Naples, Italy. [35]

———. The Battle of Pavia: The Spanish in Pavia exit and attack the French troops. 1528–1531. Tapestry, 14'5 $\frac{1}{4}$ " × 26'10 $\frac{1}{4}$ " (4.40 × 8.18 m). Museo Nazionale di Capodimonte, Naples, Italy. [35]

———. Blanche of Castile and King Louis IX of France; Author Dictating to a Scribe. Moralized Bible, France, c. 1230. MS. M.240, F.8. The Pierpont Morgan Library, New York. [4]

———. *Bust of Julius Caesar*. c. 45 BC. Marble, 35 $\frac{7}{8}$ ". Museo Archeologico Nazionale, Naples, Italy. [6]

———. Chart attributed to the navigator Christopher Columbus. 1492. 27 $\frac{1}{2}$ × 43 $\frac{3}{8}$ " (70 cm × 110 cm). Bibliotheque Nationale, Paris. [13]

———. *The Coronation of Otto III*. From the Gospels of Otto III. Miniature, late 10th century. 13 $\frac{1}{8}$ × 9 $\frac{1}{2}$ " (33.4 × 24.2 cm). Bayerische Staatsbibliothek, Munich, Germany. [6]

———. *Departure of Columbus from Seville*. 15th century. Woodcut, ink on paper. [13]

———. *Domenico di Michelino*. 1465. Dante and the *Divine Comedy*. Fresco. Duomo, Florence. [1]

———. Equestrian armor of Gattamelata (Erasmo da Narni). 15th century. Iron and leather. Palazzo Ducale, Venice. [16]

- _____. Firing a blunderbuss. From the Bellifortis Manuscript. 15th century. Illuminated manuscript, 13³/₈ × 10¹/₄" (33.8 × 25.8 cm). Universitaetsbibliothek, Goettingen, Germany. [16]
- _____. Florence in c. 1470–1480. Detail from the Catena Map, showing the Duomo, Piazza della Signoria, and Palazzo Vecchio. Museo di Firenze com'era, Florence. [1, 24]
- _____. Great bronze gun, Turkish. 1464. Bronze, 37,630 pounds (17,069 kg); 17' (5.18 m); caliber 25" (63.5 cm). The Board of Trustees of the Armouries, Leeds, UK. [16]
- _____. Harquebusier aiming, wounded knights. Illustration from *Theuerdank*, an epic tale by Emperor Maximilian I (1449–1519). Augsburg, 1517. Colored woodcut, 8⁷/₈ × 6" (22.5 × 15 cm). Dillingen Library, Dillingen, Germany. [16]
- _____. *Head of Pompey the Great*. c. 50 B.C. Marble. Ny Carlsberg Glyptotek, Copenhagen, Denmark. [6]
- _____. Illuminated page from the Bible of Charles the Bald. 9th century. Ms. Lat. 1, fol. 423. Bibliotheque Nationale, Paris. [6]
- _____. Intarsia door showing armor. 1476. 7'3³/₈" × 11' (2.22 × 3.35 m). Studiolo, Palazzo Ducale, Urbino, Italy. [16]
- _____. Jerusalem besieged by Anthiocus. From *Chronique Universelle*, by Jean de Courcy. Bruges, c. 1470. 17 × 12⁵/₈" (43 × 32 cm). MS. M.224, fol. 117 verso. The Pierpont Morgan Library, New York. [16]
- _____. *Jocasta's Embassy to Adrastus*. The siege of Thebes; King Adrastus receives Jocasta and her ladies. c. 1525. 15⁵/₈ × 11¹/₂" (39.5 × 28 cm). From the *Troy Book* and the *Story of Thebes*, by John Lydgate. Roy D II fol. 158 verso. British Library, London. [16]

_____. *Knight in Armour with Fancyful “Firearm.”* 1449. $13\frac{7}{8} \times 9\frac{3}{4}$ " (35 × 24.5 cm). From MS. lat. 7239, “De rebus militaribus” by Taccola (Mariano Daniello di Jacopo), fol. 70 verso. Bibliotheque Nationale, Paris. [16]

_____. *The Last Supper.* Jesus and his disciples. 6th century. Mosaic. Sant’Apollinare Nuovo, Ravenna, Italy. [20]

_____. Lira da Braccio [Lyre]. 1511. Kunsthistorisches Museum, Vienna. [10]

_____. Medieval dissection scene. From manuscript of “Les propriétaire des choses” by Bartholomaeus Angelicus. France, c. 1475. Ms. fr. 218, fol. 56 recto. Bibliothèque Nationale, Paris. [29]

_____. Monument of Marcus Aurelius (Equestrian statue of Marcus Aurelius). c. 180. Gilt bronze, 11'6" (3.5 m). Piazza del Campidoglio, Rome. [3, 10]

_____. *Nebuchadnezzar II besieges Jerusalem.* c. 1405–1415. $17\frac{3}{4} \times 11\frac{1}{8}$ " (45 × 30 cm). From the Great Bible, Saint Jerome version. Royal 1 E.IX, fol. 222. British Library, London. [16]

_____. *Portrait of Leonardo da Vinci.* End of 17th century. Oil on wood, $28\frac{3}{4} \times 22\frac{7}{8}$ " (73 × 58 cm). Galleria degli Uffizi, Florence. [1, 35]

_____. Siege of a castle, using a cannon and mortar. c. 1471–1483. $10\frac{5}{8} \times 8\frac{1}{2}$ " (27 × 21.5 cm). Chronique d’Angleterre. British Library, London. [16]

_____. *The Siege of Constantinople, 1453.* Above: Descent into limbo. 16th century. Fresco. Church of the Annunciation, Moldovita, Romania. [1]

_____. *Siege of a Town*, panel of an Italian *cassone* (wedding chest). 15th century. Oil on wood, $19 \times 62\frac{1}{4}$ " (48.5 × 158 cm). Musée National de la Renaissance, Ecouen, France. [16]

_____. *Tournament in the Vatican.* 16th century. Museo di Roma, Rome. [11]

- Anonymous. *Upright Shields*, illustration from the Bellifortis Manuscript. 15th century. 13 $\frac{3}{8}$ × 10 $\frac{1}{4}$ " (33.8 × 25.8 cm). Universitaetsbibliothek, Goettingen, Germany. [16]
- _____. View of the Certosa in Pavia. 16th century. Certosa di Pavia, Pavia, Italy. [11]
- _____. Wilton Diptych. c. 1396–1399. Tempera on wood, 20 $\frac{7}{8}$ × 14 $\frac{5}{8}$ " (53 × 37 cm). The National Gallery, London. [6]
- Anonymous, after Leonardo da Vinci. A horseman wearing helmet and armour and riding to left. Pen and ink, with brown wash, heightened with white, on pink prepared paper. 10 $\frac{5}{8}$ × 9 $\frac{3}{8}$ " (27 × 23.9 cm). Malcolm Collection, British Museum, London. [25]
- _____. *Bacchus*. Oil on wood, transferred to canvas, 5'10" × 3'9" (177 × 115 cm). Musée du Louvre, Paris. [1, 35]
- _____. *The Battle of Anghiari*. c. 1560. Oil on canvas. Palazzo Vecchio, Florence. [25]
- _____. *Bust-Length Female Nude*. Early 16th century, Lombard School. Oil on canvas, 22 $\frac{1}{4}$ × 16 $\frac{5}{8}$ " (56 × 42 cm). Musée du Louvre, Paris. [32]
- _____. Grotesque caricature heads of five men and two women. Pen and ink on paper, 6 $\frac{3}{4}$ × 4 $\frac{3}{4}$ " (17.2 × 12.0 cm). British Museum, London. [18, 21]
- _____. *Leda and the Swan*. c. 1515. Tempera on wood, 44 $\frac{1}{8}$ × 33 $\frac{7}{8}$ " (112 × 86 cm). Galleria Borghese, Rome. [1, 27]
- _____. *Leda and the Swan*. Red chalk on paper, 10 $\frac{7}{8}$ × 6 $\frac{3}{4}$ " (27.5 × 17.0 cm). Musée du Louvre, Paris. [27, 32, 36]
- _____. *Mounted Warrior* (formerly attributed to Giovan Francesco Rustici). 1516–1519. Bronze with artificial verdigris, 9 $\frac{1}{2}$ " (24 cm). The Museum of Fine Arts, Budapest. [30]

———. *The Virgin and Child*. After 1510. Oil on wood, 23½ × 17¼" (59.7 × 43.8 cm). The National Gallery, London. [32]

———. Three caricature heads with grotesque features. Pen and ink on paper, 7¾ × 5¼" (18.5 × 13.3 cm). British Museum, London. [18]

Anonymous, after Raphael. *Giuliano de' Medici*. c. 1515. Tempera and oil on canvas, 32¾ × 26" (83.2 × 66 cm). The Jules Bache Collection. The Metropolitan Museum of Art, New York. [31]

Anonymous Dutch painter. *King Ferdinand II of Aragon*. c. 1490–1500. Kunsthistorisches Museum, Vienna. [13]

Anonymous (Ferrarese School). *Portrait of a Man in Red*. c. 1450–1475. Oil on wood, 15½ × 10⅓" (39.5 × 25.7 cm). The Wallace Collection, London. [6]

Anonymous (Spanish School). *Portrait of Alexander VI*. c. 1492. Pinacoteca, Vatican Museums. [13, 21]

Antonio, di. *The Siege of Troy: The Death of Hector*. c. 1490. Tempera on wood, 18½ × 63¾" (47 × 161 cm). Fitzwilliam Museum, Cambridge, UK. [16]

Bartolommeo, Fra (Baccio della Porta). *Portrait of Girolamo Savonarola*. c. 1499–1500. Oil on wood, 18¾ × 12¾" (46.5 × 32.5 cm). Museo di San Marco, Florence. [25]

Bellini, Giovanni. *Madonna and Child with Saints*, from the *Saint Giobbe Altarpiece*. c. 1487. Oil on wood, 15'5½" × 8'5¾" (4.71 × 2.58 m). Gallerie dell'Accademia, Venice. [32]

———. *Madonna and Child*. c. 1475–1485. Oil on canvas, 18½ × 13½" (47 × 34 cm). Accademia Carrara, Bergamo, Italy. [32]

———. *Madonna of the Meadow*. c. 1500. Oil and egg on synthetic panel, transferred from wood, 26½ × 34" (67.3 × 86.4 cm). The National Gallery, London. [32]

Bembo, Bonifacio. *Francesco Sforza*. c. 1460. Tempera on wood, $15\frac{3}{4} \times 12\frac{1}{4}$ " (40 × 31 cm). Pinacoteca di Brera, Milan. [10, 19]

Bergen, Claus. *German Submarine Sinks a British Fishing Steamer*. 1917. Watercolor. Collection of Claus Bergen, Germany. [36]

Birago, Giovanni Pietro da. *The Last Supper, with a Spaniel, after Leonardo da Vinci*. c. 1500. Engraving on paper, $8\frac{3}{8} \times 17\frac{5}{16}$ " (21.3 × 44.0 cm). The Metropolitan Museum of Art, New York. [20, 21]

Boltraffio, Giovanni Antonio. *Portrait of Ludovico il Moro*. 1490s. Private collection. [10, 22]

Bonfigli, Benedetto. *Siege of Perugia by Totila and Decapitation of Saint Ercolano*. 1461–1477. Fresco. Galleria Nazionale dell’Umbria, Perugia, Italy. [16]

Botticelli, Sandro. *Adoration of the Magi*. c. 1475. Tempera on wood, $43\frac{3}{4} \times 52\frac{3}{4}$ " (111 × 134 cm). Galleria degli Uffizi, Florence. [9]

_____. *The Annunciation*. 1489–1490. Tempera on wood, $59\frac{1}{4} \times 61\frac{1}{2}$ " (150 × 156 cm). Galleria degli Uffizi, Florence. [5]

_____. *Birth of Venus*. c. 1484–1486. Tempera on canvas, $5'8" \times 9'1\frac{5}{8}"$ (1.72 × 2.78 m). Galleria degli Uffizi, Florence. [3, 27, 32]

_____. *Calumny of Apelles*. 1490s. Tempera on wood, $24\frac{1}{2} \times 35\frac{7}{8}$ " (62 × 91 cm). Galleria degli Uffizi, Florence. [32]

_____. *Portrait of a Man with a Medal of Cosimo the Elder*. 1474. Tempera on wood, $22\frac{5}{8} \times 17\frac{3}{8}$ " (57.5 × 44 cm). Galleria degli Uffizi, Florence. [10]

_____. *Primavera (Spring)*. c. 1481. Tempera on wood. $6'7\frac{7}{8}" \times 10'3\frac{5}{8}"$ (203 × 314 cm). Galleria degli Uffizi, Florence. [31]

_____. *Virgin and Child*. 1464–1470. Oil on wood, $28\frac{3}{8} \times 20\frac{1}{8}$ " (72 × 51 cm). Musée du Petit Palais, Avignon, France. [7]

Boucher, François. *Reclining Girl (portrait of Louise O'Murphy, mistress of Louis XV)*. 1750. Oil on canvas, $23\frac{1}{4} \times 28\frac{3}{4}$ " (59 × 73 cm). Alte Pinakothek, Bayerische Staatsgemaeldesammlungen, Munich, Germany. [36]

Bourdichon, Jean. *King Louis XII enters Genova*. 1507. Miniature. Manuscript illustration in *La Conquête de Gênes* by Jean Marot. Bibliothèque Nationale, Paris. [13, 22]

Bramante, Donato. Church of Santa Maria delle Grazie. Milan. [14, 15]

_____. Cloister, Santa Maria della Pace. Façade designed by Bramante in 1500–04. [28]

_____. Plan for the new St. Peter's Basilica. 1506. No. 20A. Pen and ink on paper. Gabinetto dei Disegni e delle Stampe, Galleria degli Uffizi, Florence. [15, 28]

_____. Santa Maria delle Grazie. Exterior of apse (1492–1497); interior facing the altar. 15th century. Milan. [15, 20]

_____. Santa Maria presso San Satiro. 1477–1491. Milan, Italy. [15]

_____. Tempietto. 1502–1511. San Pietro in Montorio, Rome. [15, 28]

Bronzino, Agnolo. *An Allegory with Venus and Cupid*. c. 1540–1550. Oil on wood, $57\frac{1}{2} \times 45\frac{3}{4}$ " (146.1 × 116.2 cm). The National Gallery, London. [35]

Bronzino, Agnolo. *Portrait of Cosimo I de' Medici as Orpheus*. c. 1538–1540. Oil on wood, unframed: $36\frac{7}{8} \times 30\frac{1}{16}$ " (93.7 × 76.4 cm). Philadelphia Museum of Art. [35]

Brunelleschi, Filippo. Baptistry. 1420–1436. Duomo, Florence. [1, 3]

_____. Dome lantern. 1446–1470. Duomo, Florence. [3]

_____. Facade. 1419–1460s. Church of San Lorenzo, Florence. [3]

———. Old Sacristy. 1428. Church of San Lorenzo, Florence. [5]

Campin, Robert. *Portrait of a Man*. Undated. Oil on wood, $11\frac{1}{4} \times 7"$ (28.5 × 17.7 cm). Gemäldegalerie, Staatliche Museen zu Berlin. [6, 9]

Caprotti, Gian Giacomo (Salai). *Saint John the Baptist*. 1510–1520. Tempera and oil on wood, $28\frac{3}{4} \times 20\frac{1}{8}"$ (73 × 51 cm). Pinacoteca Ambrosiana, Milan. [35]

Caravaggio, Michelangelo Merisi da (1571–1610). *Young Bacchus*. 1596–1598. Oil on canvas, $37\frac{3}{8} \times 33\frac{1}{2}"$ (95 × 85 cm). Galleria degli Uffizi, Florence. [8]

Castagno, Andrea del. *The Last Supper*. 15th century. Fresco, $15'5" \times 32'$ (4.70 × 9.75 m). Convent of Sant’Apollonia, Florence. [20]

Christus, Petrus. *Portrait of a Carthusian*. 1446. Oil on wood, overall $11\frac{1}{2} \times 8\frac{1}{2}"$ (29.2 × 21.6 cm); painted surface $11\frac{1}{2} \times 7\frac{3}{8}"$ (29.2 × 18.7 cm). The Metropolitan Museum of Art, New York. [6, 9]

Cione, Andrea di (Andrea Orcagna). *Cenacolo di Santo Spirito*. Early 1360s. Santo Spirito, Florence. [20]

Claesz, Pieter. *The Last Supper*: Copy of work by Peter Paul Rubens after Leonardo da Vinci. c. 1620. Etching, $11\frac{3}{4} \times 19\frac{4}{5}"$ (29.8 × 50.3 cm). Herzog Anton Ulrich-Museum, Braunschweig, Germany. [20, 21]

Clouet, Jean. *François I.* c. 1525–1530. Oil and tempera on wood, $37\frac{1}{4} \times 29\frac{1}{4}"$ (95.9 × 74 cm). Musée du Louvre, Paris. [33]

Clouet, Jean, workshop of. *François I.* c. 1525–1530. Oil on wood, $8\frac{3}{8} \times 6\frac{3}{4}"$ (21 × 17 cm). Musée du Louvre, Paris. [33]

Danti, Ignazio. *The Duchy of Milan, including a map of the city of Milan*. 1580–1582. Fresco, $10'6" \times 13'11"$ (320 × 425 cm). Galleria delle Carte Geografiche, Vatican Museums. [10]

De Predis, Cristoforo (attributed). *The Professions*. From *De Sphaera*. c. 1475. Vellum. Ms. Lat 209 fol. 11 recto. Biblioteca Estense, Modena, Italy. [11]

Donatello. *David*. c. 1455–1459. Bronze, 5'2 $\frac{1}{4}$ " (1.58 m). Museo Nazionale del Bargello, Florence. [2, 3, 8, 19, 22]

———. *Equestrian statue of Gattamelata*. 1447–1453. Bronze on marble and stone base, 11'2" (3.4 m). Piazza del Santo, Padua, Italy. [3, 10, 19, 30]

———. *Feast of Herod (Detail from the Baptistry Font)*. 1423–1425. Gilt bronze relief. Baptistry, Siena Cathedral, Siena, Italy. [1]

Flandes, Juan de. *Isabella the Catholic*. c. 1500. Oil on wood, 8 $\frac{3}{4}$ × 5 $\frac{1}{8}$ " (21 × 13 cm). Museo del Prado, Madrid. [13]

Francesca, Piero della. *The Baptism of Christ*. Late 1440s. Tempera on wood, 5'6" × 3'9 $\frac{5}{8}$ " (1.67 × 1.16 m). The National Gallery, London. [4]

———. *Portraits of Federico da Montefeltro, Duke of Urbino, and his wife Battista Sforza*. c. 1465–66. Tempera on wood, 18 $\frac{1}{2}$ × 13" (47 × 33 cm) each. Galleria degli Uffizi, Florence. [26]

———. *Sigismondo Pandolfo Malatesta*. c. 1451. Oil on wood, 17 $\frac{3}{8}$ × 13 $\frac{3}{8}$ " (44 × 34 cm). Musée du Louvre, Paris. [6]

Gaddi, Taddeo. Wall with frescoes of the *Tree of the Cross* and other scenes. c. 1355. Fresco, 36'9" × 38'4 $\frac{5}{8}$ " (11.2 × 11.7 m). Museo dell'Opera, Santa Croce, Florence. [20]

Gagliardi, Filippo. *Fresco depicting the interior of Old St. Peter's, Rome*. San Martino ai Monti, Rome. [28]

Ghiberti, Lorenzo. *East Doors of the Florence Baptistry (Gates of Paradise)*. 1425–1452. Gilded bronze, 15' (4.57 m). Baptistry of San Giovanni, Florence. [3]

———. *Flagellation*. North Door. 1407–1424. Baptistry, Florence. [1]

———. *Sacrifice of Isaac*. c. 1401. Bronze, partly gilded, $18\frac{3}{8} \times 15\frac{3}{5}$ " (4.65 × 4.0 cm) including frame. Museo Nazionale del Bargello, Florence. [1]

Ghirlandaio, Domenico. *Adoration of the Shepherds*. From the *Sassetti Altarpiece*. 1485. Tempera on wood, 5'6" × 5'6" (1.67 × 1.67 m). Santa Trinita, Florence. [9, 32]

———. *Calling of Saints Peter and Andrew*. 1480–1482. Fresco. Sistine Chapel, Vatican Palace. [9]

———. *Last Supper*. 1480. Fresco, $13'1\frac{1}{2}$ " × $28'10\frac{1}{2}$ " (4.0 × 8.8 m). Museo di San Marco, Florence. [20]

———. *Old Man with a Young Boy*. c. 1490. Tempera on wood, $24\frac{2}{5} \times 18\frac{1}{10}$ " (62 × 46 cm). Musée du Louvre, Paris. [6]

———. *Virgin and Child*. Oil on wood, $31 \times 21\frac{5}{8}$ " (78.7 × 55 cm). Musée du Louvre, Paris. [3, 36]

Giambologna. *The Rape of Sabine*. 1583. Marble, $13'5\frac{1}{2}$ " (4.1 m). Loggia dei Lanzi, Florence. [35]

Giorgione (Giorgio da Castelfranco). *Portrait of Laura*. 1506. Oil on canvas on wood, $16\frac{1}{4} \times 13\frac{1}{4}$ " (41 × 33.6 cm). Kunsthistorisches Museum, Vienna. [32]

———. *The Sleeping Venus (The Dresden Venus)*. 1508–1510. Oil on canvas, $42\frac{1}{2} \times 69$ " (1.08 × 1.75 m). Gemäldegalerie Alte Meister, Staatliche Kunstsammlungen, Dresden, Germany. [27, 32]

———. *Old Woman*. c. 1508. Oil on canvas, $26\frac{3}{4} \times 23\frac{1}{4}$ " (68 × 59 cm). Gallerie dell'Accademia, Venice. [32]

Giotto di Bondone. *The Last Supper*. c. 1305. Fresco, $16'1$ " × $15'5\frac{7}{8}$ " (4.90 × 4.72 m). Scrovegni (Arena) Chapel, Padua, Italy. [2, 20]

_____. *Ognissanti Madonna*. 1306–1310. Tempera on wood, 10'8" × 6'8 $\frac{3}{8}$ " (3.25 × 2.04 m). Galleria degli Uffizi, Florence. [3, 7, 22]

_____. *Stefaneschi Altarpiece* (recto). c. 1330. Tempera on wood, 5'10 $\frac{1}{8}$ " × 8'4 $\frac{1}{2}$ " (1.78 × 2.55 m). Pinacoteca, Vatican Museums. [6]

_____. *Stigmatization of Saint Francis*. c. 1320. Fresco, 9'2 $\frac{1}{4}$ " × 14'9 $\frac{1}{4}$ " (2.8 × 4.5 m). Bardi Chapel, Santa Croce, Florence. [1]

Gozzoli, Benozzo. *Adoration of the Magi*. 1459. Fresco. Palazzo Medici Riccardi, Florence [3]

Gutenberg, Johannes. *Gutenberg Bible*. Biblia Latina. Mainz: Johann Gutenberg & Johann Fust, c. 1455. PML 818, Volume II, fol. 131 verso–132 recto. The Pierpont Morgan Library, New York. [18]

Guy of Pavia. *Dissection of the Thorax of a Corpse*. From *Liber notarium Philippi septimi, Francorum regis, a libri Galieni extratus*, written by Guy of Pavia. 1345. 12 $\frac{3}{8}$ × 8 $\frac{3}{4}$ " (32 × 22 cm). Ms. 334, fol. 264. Musée Condé, Chantilly, France. [29]

Heemskerck, Maarten van. Pillar of the crossing of New St. Peter's Basilica and remnants of the northern wing of Old St. Peter's. c. 1532–1536. From the Roman Sketchbook I. Pen and ink on paper, 5 $\frac{3}{8}$ × 8 $\frac{3}{8}$ " (13.5 × 21 cm). Kupferstichkabinett, Staatliche Museen, Berlin. [15]

_____. Pope Clement VII during the siege of the Castel Sant'Angelo near the Vatican in 1527 (Sack of Rome). 1554. Pen and ink over black chalk on paper, 5 $\frac{3}{8}$ × 9 $\frac{1}{4}$ " (14.8 × 23.4 cm). Hamburger Kunsthalle, Hamburg, Germany. [35]

Hogenbergh, Franz. Plan of Milan. 1572. Engraving on paper. [10]

Illustration from the *Hypnerotomachia Poliphili* by Francesco Colonna. Manutius: Venice, 1499. [27]

Ingres, Jean Auguste Dominique. *François I of France at Leonardo da Vinci's Deathbed*. 1818. Oil on canvas, $15\frac{3}{4} \times 19\frac{7}{8}$ " (40 × 50.5 cm). Musée du Petit Palais, Paris. [2, 36]

Koelderer, Joerg. *Arquebuses*. From the Zeugbucher, the Books of Arms of Emperor Maximilian I. c. 1512. Kunsthistorisches Museum, Vienna. [16]

_____. *Guns*. From the Zeugbucher, the Books of Arms of Emperor Maximilian I. c. 1512. Kunsthistorisches Museum, Vienna. [16]

Lippi, Filippino. *The Adoration of the Magi*. 1496. Tempera on wood, $6'6" \times 6'10\frac{1}{2}"$ (2.0 × 2.1 cm). Galleria degli Uffizi, Florence. [9, 23]

Lippi, Fra Filippo. *Madonna and Child*. c. 1440. Tempera on wood, $31\frac{1}{8} \times 20\frac{1}{8}"$ (79 × 51.1 cm) National Gallery of Art, Washington, DC. [7]

_____. *Portrait of a Woman and a Man at a Casement*. c. 1440. Tempera on wood, $25\frac{1}{4} \times 16\frac{1}{2}"$ (64.1 × 41.9 cm). Marquand Collection. The Metropolitan Museum of Art, New York. [6]

_____. *Virgin and Child with Two Angels*. 1455. Tempera on wood, $37\frac{3}{8} \times 24\frac{3}{8}"$ (95 × 62 cm). Galleria degli Uffizi, Florence. [3, 7, 26]

Lorenzo di Credi. *The Annunciation*. c. 1478–1480. Oil on wood, $6\frac{3}{8} \times 23\frac{5}{8}"$ (16 × 60 cm). Musée du Louvre, Paris. [8, 32]

_____. *Madonna and Child with a Pomegranate*. Oil on wood, $6\frac{1}{2} \times 5\frac{1}{4}"$ (16.5 × 13.4 cm). National Gallery of Art, Washington, DC. [8]

_____. *Madonna and Child with Saint John the Baptist*. c. 1480–1485. Oil on wood, $14\frac{1}{2} \times 10\frac{5}{8}"$ (37 × 27 cm). Gemäldegalerie Alte Meister, Dresden. [8]

Luini, Bernardino. *Christ Blessing*. c. 1520. Tempera and oil on wood, $17 \times 14\frac{5}{8}"$ (43 × 37 cm). Pinacoteca Ambrosiana, Milan. [35]

_____. *The Holy Family*. Oil on wood, $20\frac{1}{8} \times 17"$ (51 × 43 cm). Musée du Louvre, Paris. [35]

———. *Infant Jesus with a Lamb*. 1500–1524. Tempera and oil on wood, $11\frac{1}{8} \times 9\frac{7}{8}$ " (28 × 25 cm). Pinacoteca Ambrosiana, Milan. [35]

———. *The Virgin and Child in a Landscape*. c. 1520. Oil on wood, $28\frac{7}{8} \times 21\frac{1}{2}$ " (73.2 × 54.4 cm). Wallace Collection, London. [35]

Manet, Edouard. *Olympia*. 1863. Oil on canvas, $4'3\frac{1}{4}$ " × $6'2\frac{7}{8}$ " (1.3 × 1.9 m). Musée d'Orsay, Paris, France. [36]

Mantegna, Andrea. *Decoration of the Camera degli Sposi (Camera Picta)*. 1465–1474. Fresco and dry tempera, $26'3$ " × $26'3$ " (8 × 8 m). Palazzo Ducale, Mantua, Italy. [11, 22]

Martini, Simone. *Annunciation with Saints Ansano and Margaret*. Four medallions: Prophets Jeremiah, Ezechiel, Isaiah, and Daniel. 1333. Tempera on wood. $6\frac{1}{2}$ " × $6'10\frac{3}{4}$ " (1.84 × 2.10 m). Galleria degli Uffizi, Florence. [5]

Masaccio (Tommaso di Giovanni di Simone Cassai). *Expulsion from Paradise*. c. 1427. Fresco, $84\frac{1}{2} \times 35\frac{1}{2}$ " (214 × 90 cm). Brancacci Chapel, Santa Maria del Carmine, Florence. [3]

———. *Tribute Money*. c. 1425. Fresco, $7'6\frac{1}{2}$ " × $19'7$ " (2.3 × 6 m). Brancacci Chapel, Santa Maria del Carmine, Florence. [3, 5]

———. *Trinity*. 1427. Fresco, $21' \times 10'4\frac{7}{8}$ " (6.40 × 3.17 m). Santa Maria Novella, Florence. [2, 3, 10]

Masaccio (Tommaso di Giovanni di Simone Cassai), perhaps with Tommaso Masolino da Panicale. *Saint Anne Madonna (Madonna and Child with Saint Anne)*. 1424–1425. Tempera on wood, $5'8\frac{7}{8}$ " × $3'4\frac{1}{2}$ " (1.75 × 1.03 m). Galleria degli Uffizi, Florence. [3, 7, 27]

Masolino da Panicale, Tommaso. *Temptation of Adam and Eve*. 1425. Fresco, $81\frac{1}{8} \times 34\frac{3}{4}$ " (208 × 88 cm). Brancacci Chapel, Santa Maria del Carmine, Florence. [27]

Master of the Pala Sforzesca. *The Sforza Altarpiece (Madonna and Child Enthroned with the Doctors of the Church and the Family of Ludovico il Moro; Includes Detail of Duchess Beatrice d'Este)*. c. 1495. Tempera on wood, 7'6½" × 5'5" (2.30 × 1.65 m). Pinacoteca di Brera, Milan. [12, 20, 22]

Mazzolini, Ludovico. *Madonna and Child, Saint Anne, Saint Joachim, and Saint John the Baptist*. 1522–1523. 11½" × 9" (29.5 × 22.8 cm). Galleria degli Uffizi, Florence. [35]

Melozzo da Forli. *Sixtus IV Founding the Vatican Library*. 1477. Fresco transferred to canvas, 12'1¾" × 10'4" (3.70 × 3.15 m). Pinacoteca, Vatican Museums. [13, 28]

Melzi, Francesco. *Portrait of a Woman*. 1510–1515. Oil on canvas, 30 × 24¾" (76 × 63 cm). The State Hermitage Museum, St. Petersburg. [35]

———. *Vertumnus and Pomona*. c. 1518–1522. Oil on wood, 6'1¼" × 4'5¼" (1.86 × 1.35 cm). Gemäldegalerie, Staatliche Museen zu Berlin. [35]

Messina, Antonello da. *Portrait of a Man (in Red Cap)*. c. 1475. Oil on wood, 14 × 10" (35.6 × 25.4 cm). The National Gallery, London. [4, 6, 11]

———. *Portrait of a Man*. c. 1475. Oil on wood, 11¾" × 9½" (30 × 24 cm). Galleria Borghese, Rome. [6, 26]

———. *Portrait of a Man (Gian Giacomo Trivulzio?)*. c. 1474. Oil on wood, 14½ × 11" (37 × 28 cm). Museo Civico D'Arte Antica, Turin, Italy. [6]

———. *Virgin Annunciate*. 1473–1474. Oil on wood, 16¾ × 13" (42.5 × 32.8 cm). Alte Pinakothek, Munich. [28, 32]

Michelangelo Buonarroti. *Atlas Slave*. 1519–1536. Marble, 9'1½" (2.78 m). Galleria dell'Accademia, Florence. [35]

———. *Creation of Adam*. 1508–1512. Fresco, 9'2¼" × 18'8½" (2.8 × 5.7 m). Sistine Chapel, Vatican. [1, 28]

———. *David*. 1501–1504. Marble, 13'5" (4.08 m). Gallerie dell'Accademia, Florence. [25]

———. Design for the Tomb of Pope Julius II (Giuliano della Rovere) in San Pietro in Vincoli, Rome. 1505–1506. Pen and ink, brush, and brown wash over stylus ruling and leadpoint on paper, $20\frac{1}{16} \times 12\frac{9}{16}$ " (51 × 31.9 cm). The Metropolitan Museum of Art, New York. [28]

———. Drawing for the Tomb of Pope Julius II. 1505. Pen and ink on paper, $11\frac{3}{4} \times 14\frac{5}{8}$ " (29.8 × 37.1 cm). Gabinetto dei Disegni e delle Stampe, Uffizi, Florence. [30]

———. *The Dying Slave*. c. 1513–1514. For the Tomb of Pope Julius II. Marble, 7'6½" (2.3 m). Musée du Louvre, Paris. [31]

———. *The Medici Tombs. Tomb of Giuliano de' Medici*. 1526–1533. Marble; overall tomb is 20' × 13'9¾" (6.3 × 4.2 m). Medici Chapels, New Sacristy, San Lorenzo, Florence. [35]

———. *Moses*. From the Tomb of Pope Julius II. 1513–1515. Marble, 7'8½" (2.35 m). San Pietro in Vincoli, Rome. [31]

———. *The Medici Tombs. Tomb of Lorenzo de Medici, Duke of Urbino, with Dawn and Evening*. c. 1525. Marble. Medici Chapels, New Sacristy, Church of San Lorenzo, Florence. [35]

———. *Pietà*. 1498. Marble. 5'8½" (173.9 cm), Basilica of St. Peter's, Vatican City.

———. *The Rebellious Slave*. 1513–1516. For the tomb of Pope Julius II. Marble, 7'1" (2.16 m). Musée du Louvre, Paris. [30, 35]

———. Virgin and Child with Saint Anne, a male nude, and an inscription after a sonnet by Petrarch. c. 1502–1506. Pen and ink, black chalk, reworked with darker ink, on paper, $12\frac{3}{4} \times 10\frac{1}{4}$ " (32.4 × 26 cm). Muéee du Louvre, Paris. [25]

Michelozzo di Bartolomeo. Palazzo Medici Riccardi. 1444–1459. Florence. [3]

Monaco, Lorenzo. *The Man of Sorrows (Christ in Pietà) and the Symbols of the Passion*. 1404. Tempera on wood, 8'9 $\frac{1}{8}$ " × 5'7 $\frac{3}{8}$ " (2.67 × 1.71 m). Gallerie dell'Accademia, Florence, Italy. [20, 21]

Monet, Claude. *The Basin of Argenteuil*. c. 1872. Oil on canvas, 23 $\frac{5}{8}$ × 31 $\frac{3}{4}$ " (60 × 80.5 cm). Musée d'Orsay, Paris. [36]

Oggiono, Marco da. *Last Supper, after Leonardo da Vinci*. c. 1515. Oil on canvas, 8'6 $\frac{3}{8}$ " × 18' (2.60 × 5.49 m). Musée national de la Renaissance, Ecouen, France. [21]

Parmigianino (Girolamo Francesco Maria Mazzola). *Madonna and Child with Angels (Madonna of the Long Neck)*. 1534–1540. Oil on wood. 7'2 $\frac{1}{4}$ " × 4'5 $\frac{5}{8}$ " (2.19 × 1.35 m). Galleria degli Uffizi, Florence. [35]

———. *Madonna and Child with Saints John the Baptist and Jerome*. 1526–1527. Oil on wood, 11'3" × 4'10 $\frac{3}{4}$ " (3.43 × 1.49 m). The National Gallery, London. [35]

Perugino, Pietro. Study of a kneeling youth and of the head of another. 1500. Metalpoint on pale pink-beige prepared paper, 8 $\frac{11}{16}$ × 4 $\frac{1}{2}$ " (22 × 11.5 cm). The Metropolitan Museum of Art, New York. [18]

Perugino, Pietro (attributed to). Head of the virgin, view of the face. Musée du Louvre, Paris. [4, 7, 18, 27]

Pisanello, Antonio. *Portrait of Filippo Maria Visconti*. Pen and black ink, black chalk on paper, 11 $\frac{3}{8}$ × 7 $\frac{3}{8}$ " (28.9 × 18.6 cm). Musée du Louvre, Paris. [10]

Pollaiuolo, Antonio del. *Galeazzo Maria Sforza*. c. 1471. Tempera on wood, 25 $\frac{5}{8}$ × 16 $\frac{1}{2}$ " (65 × 42 cm). Galleria degli Uffizi, Florence. [10, 19]

———. *Monument of Sixtus IV*. 1484–1493. Bronze, 14'7 $\frac{1}{4}$ " (4.45 m). Museo Petriano, St. Peter's Basilica, Vatican City. [19]

_____. *Portrait of a Woman*. c. 1475. Tempera on wood, $21\frac{5}{8} \times 13\frac{3}{8}$ " (55 × 34 cm). Galleria degli Uffizi, Florence. [6, 36]

_____. Study for an equestrian monument. c. 1482–1483. Pen and brown ink, light and dark brown wash on paper; outlines of the horse and rider pricked for transfer, $11\frac{1}{16} \times 10$ " (28.1 × 25.4 cm). Robert Lehman Collection. The Metropolitan Museum of Art, New York. [19]

Pollaiuolo, Antonio del, and Piero del Pollaiuolo. *The Martyrdom of Saint Sebastian*. 1475. Oil on wood, $9'6\frac{1}{2}$ " × $6'8$ " (2.91 × 2.03 m). The National Gallery, London. [19]

Pontormo, Jacopo da. *Descent from the Cross*. c. 1528. Oil on wood, $10'3\frac{1}{4}$ " × $6'3\frac{5}{8}$ " (3.13 × 1.92 m). Capponi Chapel. Santa Felicita, Florence. [35]

_____. *Madonna del latte (Madonna Nursing the Child)*. c. 1530. Oil on wood, $34\frac{3}{4} \times 25\frac{1}{4}$ " (88 × 64 cm). Museo Nacional de San Carlos, Mexico City. [35]

Poussin, Nicolas. *The Judgment of Solomon*. 1649. Oil on canvas, $39\frac{3}{4} \times 63$ " (101 × 160 cm). Musée du Louvre, Paris. [36]

Predis, Giovanni Ambrogio de. *Bianca Maria Sforza*. Oil on wood, $18\frac{1}{2} \times 15$ " (47 × 38 cm). Portraigtalerie, Schloss Ambras, Innsbruck, Austria. [13, 19]

_____. *An Angel in Green with a Vielle* (Panel from the *San Francesco Altarpiece*, Milan). c. 1490–1499. Oil on wood, $45\frac{3}{4} \times 24$ " (116 × 61 cm). The National Gallery, London. [10, 28]

_____. *An Angel in Red with a Lute* (Panel from the *San Francesco Altarpiece*, Milan). c. 1495–1499. Oil on wood, $46\frac{3}{4} \times 24$ " (118.8 × 61 cm). The National Gallery, London. [10, 35]

_____. *Emperor Maximilian I of Germany*. 1502. Oil on wood, $17\frac{3}{8} \times 12$ " (44 × 30.3 cm). Kunsthistorisches Museum, Vienna. [13, 19]

- _____. *Portrait of a Woman (Beatrice d'Este)*. 1495–1500. Tempera and oil on wood, $20 \times 13\frac{3}{8}$ " (51 × 34 cm). Pinacoteca Ambrosiana, Milan. [12, 14, 15]
- Raphael. *Baldassare Castiglione*. c. 1514–1515. Oil on canvas, $32\frac{3}{8} \times 26\frac{3}{8}$ " (82 × 67 cm). Musée du Louvre, Paris. [33, 34]
- _____. Bust of a woman, three-quarters to the left, arms crossed. Pen and brown ink, black chalk, on paper, $8\frac{3}{4} \times 6\frac{1}{4}$ " (22.2 × 15.8 cm). Musée du Louvre, Paris. [27]
- _____. *La Velata*. c. 1516. Oil on wood, $33\frac{1}{2} \times 25\frac{1}{4}$ " (85 × 64 cm). Galleria Palatina, Palazzo Pitti, Florence. [32]
- _____. *Lady with a Unicorn*. c. 1505–1507. Oil on wood (transferred to canvas), $26\frac{5}{8} \times 21$ " (67.7 × 53.2 cm). Galleria Borghese, Rome. [27]
- _____. *Leda and the Swan*. c. 1507. Pen and ink over black chalk on paper, $12\frac{1}{4} \times 7\frac{7}{8}$ " (31 × 19.2 cm). The Royal Collection, Windsor. [27]
- _____. *Madonna of the Goldfinch (Madonna del Cardellino)*. 1506. Oil on wood, $42\frac{1}{8} \times 30\frac{3}{8}$ " (107 × 77 cm). Galleria degli Uffizi, Florence. [23, 27]
- _____. *Madonna of the Meadow*. 1505. Oil on wood, 44×35 " (113 × 88 cm). Kunsthistorisches Museum, Vienna. [27, 36]
- _____. *Parnassus*. 1510–1511. Fresco, $19 \times 22'$ (5.8 × 6.7 m). Stanza della Segnatura, Stanze di Raffaello, Vatican Palace. [31]
- _____. *Pope Leo X with Cardinals Giulio de' Medici and Luigi de' Rossi*. c. 1517. Oil on wood, $5'1\frac{1}{4}$ " × $3'11"$ (1.55 × 1.19 m). Galleria degli Uffizi, Florence. [32]
- _____. *Portrait of Agnolo Doni*. c. 1506. Oil on wood, $24\frac{7}{8} \times 17\frac{3}{4}$ " (63 × 45 cm). Galleria Palatina, Palazzo Pitti, Florence. [27]
- _____. *Portrait of Maddalena Strozzi Doni*. c. 1506. Oil on wood, $24\frac{7}{8} \times 17\frac{3}{4}$ " (63 × 45 cm). Galleria Palatina, Palazzo Pitti, Florence, Italy. [27]

———. *Portrait of Pope Julius II*. 1511–1512. Oil on wood, 42 $\frac{3}{4}$ × 31 $\frac{1}{8}$ " (108.7 × 81 cm). The National Gallery, London. [28, 31]

———. *The School of Athens*. 1512. Fresco, width at base 25'3 $\frac{1}{8}$ " (7.7 m). Stanza della Segnatura, Stanze di Raffaello, Vatican. [1, 28, 31]

———. *Self-Portrait*. 1506. Oil on wood, 26 × 20 $\frac{1}{2}$ " (66 × 52 cm). Galleria Palatina, Palazzo Pitti, Florence. [23, 35]

———. *Sistine Madonna*. c. 1513. Oil on canvas, 8'10 $\frac{1}{4}$ " × 6'7" (2.70 × 2.01 m). Gemäldegalerie Alte Meister, Staatliche Kunstsammlungen, Dresden, Germany. [32]

———. *The Transfiguration*. 1516–1520. Oil on wood, 13'5 $\frac{1}{2}$ × 9'1 $\frac{1}{8}$ " (4.10 × 2.79 m). Pinacoteca, Vatican Museums. [32, 35]

———. *The Virgin and Child with the Young Saint John the Baptist (La belle jardinier)*. 1507. Oil on canvas, 48 × 31 $\frac{1}{2}$ " (122 × 80 cm). Musée du Louvre, Paris. [27]

Reiser, Niclas. *Mary of Burgundy*. 15th century. Oil on wood, 29 $\frac{3}{4}$ × 21 $\frac{1}{2}$ " (75.5 × 54.5 cm). Portraitgalerie, Schloss Ambras, Innsbruck, Austria. [13]

Rembrandt van Rijn. *Saskia van Uylenburgh as a Girl*. 1633. Oil on wood, 20 $\frac{3}{4}$ × 17 $\frac{1}{8}$ " (52.5 × 44 cm). Gemäldegalerie Alte Meister, Staatliche Kunstsammlungen, Dresden, Germany. [36]

Romano, Gian (Giovanni) Cristoforo. *Francesco Gonzaga, Margrave of Mantua and Condottiere*. 1498. Terracotta, 24 $\frac{1}{4}$ " (69 cm). Palazzo Ducale, Mantua, Italy. [23]

———. *Gian Galeazzo Visconti* (1351–1402), 1st Duke of Milan. Mid-1490s. Marble. Certosa di Pavia, Pavia, Italy. [10, 30]

Romano, Giulio. *Deesis (Christ between Saint Mary and John the Baptist) with Saints Paul and Catherine of Alexandria*. 1520–1522. Oil on wood, 48 $\frac{1}{8}$ × 38 $\frac{1}{8}$ " (124 × 98 cm). Galleria Nazionale, Parma, Italy. [35]

- . *Olympus*. c. 1530–1532. Fresco. Palazzo del Te, Mantua, Italy. [35]
- Rubens, Peter Paul. *Battle of Anghiari* (also called the *Battle for the Standard*). c. 1603. Black chalk, pen and brown ink, heightened with gray white, on paper, $17\frac{7}{8} \times 25\frac{1}{8}$ " (45.2 × 63.7 cm). Musée du Louvre, Paris. [25]
- . *Felicity of the Regency*. 1623–1625. Oil on canvas, $12'11\frac{1}{8}$ " × $9'8\frac{1}{4}$ " (3.94 × 2.95 m). Musée du Louvre, Paris. [36]
- . *Self-Portrait with Hat*. 1639. Oil on canvas, $43\frac{1}{8} \times 33\frac{1}{2}$ " (109.5 × 85 cm). Kunsthistorisches Museum, Vienna. [36]
- . *The Philosophers (Self-Portrait with the Artist's brother Philip, Justus Lipsius, and Jan van der Wouwre)*. 1611–1612. Oil on wood, $64\frac{5}{8} \times 54\frac{3}{4}$ " (164 × 139 cm). Galleria Palatina, Palazzo Pitti, Florence. [36]
- Sand, Vebjorn. Leonardo Bridge Project. 2001. Oslo, Norway. [34]
- Sangallo, Aristotile da. *Copy of the Drawing of the Cartoon for Michelangelo's "Battle of Cascina."* 1542. Oil on wood, $30\frac{1}{8} \times 50\frac{7}{9}$ " (76.5 × 129 cm). Collection Leicester, Holkham Hall, Norfolk, UK. [25, 27]
- Sano di Pietro. *Saint Jerome Penitent*. From *The Life of Saint Jerome*, predella of an altar for a Monastery in Siena. c. 1444. Tempera on wood, 9 × 14" (23.5 × 36 cm). Musée du Louvre, Paris. [8]
- Sarto, Andrea del. *The Last Supper*. 1520–1525. Fresco, $17'2\frac{3}{4}$ " × $28'7$ " (5.25 × 8.71 m). San Salvi, Florence. [32]
- . *Madonna of the Harpies*. 1515–1517. Oil on wood, $6'9\frac{1}{2} \times 5'10$ " (2.07 × 1.78 m). Galleria degli Uffizi, Florence. [32]
- Sebastiano del Piombo. *Portrait of a Man, said to be Christopher Columbus*. 1519. Oil on canvas, $42 \times 34\frac{3}{4}$ " (106.7 × 88.3 cm). The Metropolitan Museum of Art, New York. [13]

Solario, Andrea. *Portrait of Charles II d'Amboise*. Oil on wood, 29 $\frac{5}{8}$ × 20 $\frac{1}{2}$ " (75 × 52 cm). Musée du Louvre, Paris. [28]

Student of Leonardo da Vinci. Horses, machinery, and an angel, c. 1503–1504. Black chalk and pen and ink, 7 $\frac{7}{8}$ × 11 $\frac{1}{4}$ " (20.0 × 28.3 cm). The Royal Collection, Windsor. [28]

Titian (Tiziano Vecellio). *Assumption of the Virgin*. 1516–1518. Oil on wood, 22'7 $\frac{1}{2}$ " × 11'9 $\frac{3}{4}$ " (6.9 × 3.6 m). Santa Maria Gloriosa dei Frari, Venice. [32]

_____. *Isabella d'Este*. 1534. Oil on canvas, 40 $\frac{1}{4}$ × 25 $\frac{1}{4}$ " (102 × 64 cm). Kunsthistorisches Museum, Vienna. [22]

_____. *Sacred and Profane Love (Amor sacro e Amor profano)*. c. 1514. Oil on canvas, 3'10 $\frac{1}{2}$ " × 9'1 $\frac{1}{8}$ " (1.18 × 2.79 m). Galleria Borghese, Rome. [32]

_____. *Venus of Urbino*. 1538. Oil on canvas. 46 $\frac{7}{8}$ × 65" (119 × 165 cm). Uffizi, Florence, Italy. [32, 36]

Titian (Tiziano Vecellio) or Giorgione (da Castelfranco). *Concert in the Open Air*. c. 1510. Oil on canvas, 43 $\frac{3}{8}$ × 54 $\frac{3}{8}$ " (110 × 138 cm). Musée du Louvre, Paris. [32]

Tito, Santi di. *Portrait of Niccolò Machiavelli*. c. 1575. Oil on wood, 41 × 33 $\frac{1}{2}$ " (104 × 85 cm). Palazzo Vecchio, Florence. [34]

Uccello, Paolo (1397–1475). *Battle of San Romano*. c. 1438–1440. Egg tempera and oil on wood, 5'11 $\frac{5}{8}$ " × 10'6" (1.82 × 3.20 m). The National Gallery, London. [16]

_____. *The Battle of San Romano in 1432 (The Counterattack of Micheletto da Cotignola)*. 1450–1456. Oil on wood, 5'10 $\frac{7}{8}$ " × 10'4 $\frac{3}{8}$ " (1.80 × 3.16 m). Musée du Louvre, Paris. [11, 16]

Urbino, Carlo. *Treatise on Art Theory, after Leonardo da Vinci*. Pen and ink on paper. Codex Huygens, M.A. 1139, fol. 10. [30]

Van der Goes, Hugo. *Portinari Altarpiece*. 1475–1476. Tempera on wood, 8'3½ × 9'11⅝" (2.53 × 3.04 m). Galleria degli Uffizi, Florence. [9]

Van der Weyden, Rogier. *Entombment of Christ*. 1450. Oil on wood, 43⅓ × 37¾" (110 × 96 cm). Galleria degli Uffizi, Florence. [9]

_____. *Virgin with the Child and Four Saints (The Medici Madonna)*. 1450–1451. Oil on wood, 24⅓ × 18⅛" (61.7 × 46.1 cm). Staedelsches Kunstinstitut, Frankfurt am Main, Germany. [9]

Van Dyck, Anthony. *Self-Portrait*. 1614. Oil on wood, 10¼ × 7¾" (26 × 20 cm). Akademie der Bildenden Kuenste, Vienna. [36]

Van Eyck, Jan. *Portrait of a Man (Man in Red Turban)*. 1433. Oil on wood, 10¼ × 7½" (26 × 19 cm). The National Gallery, London. [4, 11]

Van Orley, Bernaert. *Charles Vjeune*. 1515. Oil on wood, 14¾ × 10½" (36.5 × 26.5 cm). Musée du Louvre, Paris. [35]

Vasari, Giorgio, and assistants. *Battle of Scannagallo in Valdichiana*. c. 1565–1571. Fresco. Salone dei Cinquecento, Palazzo Vecchio, Florence. [25]

_____. *Saint Luke Painting a Portrait of the Madonna (Self-Portrait)*. 1565. Fresco. Santissima Annunziata, Florence. [4]

_____. *Self-Portrait*. c. 1550–1566/68. Oil on canvas, 39½ × 31½" (100.5 × 80 cm). Galleria degli Uffizi, Florence. [1, 2, 21]

Velazquez, Diego Rodriguez. *Las Meninas (The Family of Philip IV)*. 1656. Oil on canvas, 9' × 10'5¼" (2.76 × 3.18 m). Museo del Prado, Madrid, Spain. [36]

Veneziano, Domenico. *Madonna and Child*. c. 1445/50. Tempera (and oil?) on wood. 32¹¹/₁₆ × 22⁷/₁₆" (83 × 57 cm). National Gallery of Art, Washington, DC. [7]

———. *The Annunciation*. From *The Saint Lucy Altarpiece*. c. 1445. Tempera on wood, 10 $\frac{3}{4}$ " × 21 $\frac{1}{4}$ " (27.3 × 54.0 cm). Fitzwilliam Museum, Cambridge, UK. [5]

Vernet, Horace. *Raphael at the Vatican*. 1832. Oil on canvas, 12'10 $\frac{3}{8}$ " × 9'10 $\frac{1}{8}$ " (3.92 × 3.00 m). Musée du Louvre, Paris. [36]

Verrocchio, Andrea del. *Baptism of Christ*. 1472–1480s. Tempera and oil on wood, 5'10 $\frac{1}{8}$ " × 4'11 $\frac{7}{8}$ " (1.80 × 1.52 m). Galleria degli Uffizi, Florence. [1, 4, 5]

———. *David*. c. 1468–1472. Bronze, 4'1 $\frac{1}{2}$ " (1.26 m). Museo Nazionale del Bargello, Florence. [4, 5]

———. *Equestrian statue of the Condottiere Bartolomeo Colleoni*. c. 1479–1492. Bronze, 13' (3.95 m). Campo Santissimi Giovanni e Paolo, Venice. [10, 19, 22, 30]

———. *Giuliano de' Medici*. c. 1475/78. Teracotta, 24 × 26 × 11 $\frac{1}{8}$ " (61 × 66 × 28.3 cm). National Gallery of Art, Washington, DC. [9]

———. *Head of an Angel*. c. 1475. Black chalk on paper, Gabinetto dei Disegni e delle Stampe. Galleria degli Uffizi, Florence. [4, 18]

———. *The Incredulity (Doubting) of Saint Thomas*. 1466–1483. Bronze, H 7'6 $\frac{5}{8}$ " (2.30 m). Museo di Orsanmichele, Florence. [4]

———. *Lorenzo de' Medici*. c. 1478/1521. Painted terracotta, 25 $\frac{7}{8}$ × 23 $\frac{1}{4}$ × 12 $\frac{7}{8}$ " (65.8 × 59.1 × 32.7 cm). National Gallery of Art, Washington, D.C. [9]

———. *Madonna and Child*. c. 1470. Oil on wood, 26 $\frac{1}{2}$ × 19 $\frac{1}{2}$ " (67.3 × 49.4 cm). Gemäldegalerie, Staatliche Museen zu Berlin. [4, 7]

———. *Madonna and Child*. c. 1470. Tempera and gold on wood, 26 × 19" (66 × 48.3 cm). The Metropolitan Museum of Art, New York. [7]

———. *Putto Holding a Dolphin*. c. 1470. Bronze, 49 $\frac{1}{4}$ " (125 cm). Palazzo Vecchio, Florence. [3, 22, 23]

———. *The Virgin and Child with Two Angels*. c. 1470–1480. Tempera on wood, $38 \times 27\frac{3}{4}$ " (96.5 × 70.5 cm). The National Gallery, London. [4]

———. *Tomb of Piero and Giovanni de' Medici*. 1469–1472. Marble, porphyry, serpentine, bronze, and pietra serena, $17'8\frac{5}{8}$ " (5.40 m). Church of San Lorenzo, Florence. [5]

———. *Woman Holding Flowers*. 1475–1480. Marble, 24" (61 cm). Museo Nazionale del Bargello, Florence. [6]

Verrocchio, Andrea del, workshop of. *Tobias and the Angel*. 1470–1480. Tempera on wood, 33×26 " (83.6 × 66 cm). The National Gallery, London. [4]

Verrocchio, Andrea del, and Lorenzo di Credi. *Madonna and Child*. 1480–1500. Oil and tempera on wood, 28×19.5 " (71.1 × 49.5 cm). The National Gallery, London. [3, 4]

Vivarini, Alvise (1442/53–1503/05). *Assumption of the Virgin*. 1480. Commissioned for the church of Santa Maria dell’Incoronata at Martinengo near Bergamo. Oil on wood, $7'4\frac{5}{8}$ " × $3'8\frac{1}{8}$ " (2.25 × 1.14 m). Pinacoteca di Brera, Milan. [11]

Volterra, Daniele da. Portrait bust of Michelangelo. 1564–1570. Bronze, $23\frac{1}{4}$ " (59 cm). Casa Buonarroti, Florence. [25, 35]

Waldseemueller, Martin. *World Map; Ptolemy with His System and Amerigo Vespucci with His Discoveries*. 1507. Woodcut print made with 12 blocks. Originally published in Saint-Dié, Lorraine. Map Division, Staatsbibliothek zu Berlin, Stiftung Preussischer Kulturbesitz, Berlin, Germany. [13]

Timeline

Leonardo da Vinci's Life

- 1452..... Born in Vinci, about 22 miles west of Florence, to Ser Piero da Vinci and Caterina, a maid.
- 1457..... Listed as a dependent of his grandfather, Antonio di Ser Piero.
- 1464..... Deaths of grandfather and stepmother, Albiera degli Amadori.
- 1465–1469..... Begins apprenticeship in Florence with Andrea del Verrocchio.
- 1472..... Participates in production of *Baptism of Christ*; joins confraternity of San Luca, Florence.
- 1473–1476..... Paints *Annunciation* for San Bartolomeo in Monte Oliveto; paints *Madonna of the Carnation* (a.k.a. *Munich Madonna*).
- 1474–1475..... Paints *Ginevra de' Benci*.
- 1478..... Receives commission for *The Virgin and Child with Saints*.
- 1478–1479..... Paints *Benois Madonna* (unfinished, perhaps continuing until 1481); designs the self-propelled cart for a Medicean theatrical production.

- 1479 Receives commission for *Adoration of the Magi* from the Augustinians at San Donato a Scopeto; draws *Bernardo di Bandino Baroncelli hanging*.
- 1480 Paints *Saint Jerome*.
- 1481 *Adoration of the Magi* begun for San Donato a Scopeto (unfinished; project completed with a different image by Filippino Lippi, c. 1496); sent on diplomatic mission to Milan on behalf of Lorenzo de' Medici.
- 1482 Meets Donato Bramante (Ludovico Sforza's official architect).
- c. 1482–1490 *Madonna Litta*.
- 1483 Commission of *Madonna of the Rocks* for the Oratory of the Immaculate Conception, Milan.
- 1484–1485 Draws *New City*—designs for model urban center, precipitated by plague in Milan; goes to Pavia with the Sforza court, meets Fazio Cardano, university mathematician; begins intensive study of Euclidian geometry, optics, perspective, and astrology.
- 1485 Sees a total eclipse of the sun; paints *Portrait of a Musician* (portrait of Franchino Gaffurio or Atalante Migliorotti).

- 1485–1499..... Milan notebooks: flying machines and experiments with winged contraptions.
- 1487..... Begins work on the examination of the senses; earliest anatomical drawings.
- 1488..... Work commences on *Colossus*.
- 1489..... Begins book on the human figure, including proportional drawings of the human skull.
- 1490..... Teams with Francesco di Giorgio Martini to repair Cathedral of Pavia; paints *Portrait of Cecilia Gallerani (Lady with the Ermine)*; writes earliest outlines for *Treatise on Painting*; designs stage sets for Bellincioni's *Feast of Paradise*, Castello Sforzesco, and a musical play celebrating the marriage of Giangaleazzo Sforza and Isabella of Aragon.
- c. 1492..... Draws *Vitruvian Man*.
- 1493..... Clay model of *Colossus* is installed in Milan Cathedral for marriage of Emperor Maximilian I to Bianca Maria Sforza, niece of Ludovico Sforza.
- 1494..... Bronze allocated for *Colossus* (c. 75 tons) is diverted to Ercole d'Este to cast cannons for defense against French invaders; Leonardo plans a test-flight of a flying machine or glider.

- 1495–1498 Paints *The Last Supper*, Santa Maria delle Grazie.
- 1496 Collaborates with Fra Luca Pacioli on studies of geometry, proportion, and mathematics; paints *La belle ferronnière (Portrait of Lucrezia Crivelli)*; creates stage set for Taccone's *Jupiter and Danae*.
- 1499 Leaves Milan.
- February 1500 Arrives in Mantua; draws *Isabella d'Este*, a preparatory sketch for portrait never completed.
- March 1500 Arrives in Venice; produces drawings for military machines for defense of Venice from the Turkish threat (diving equipment, flying machines, ship hulls, catapults, crossbows, and cannon).
- April 1500 Moves to Florence and sets up his home and workshop near Santissima Annunziata.
- 1501 Exhibits cartoon of *Virgin and Child with Saint Anne and Lamb*; paints *Madonna of the Yarnwinder*.
- 1502 Named family architect and general engineer in Marches and Romagna by Cesare Borgia.

- 1503.....Leaves Borgia family, returns to Florence; receives commission to assist Florence in siege against Pisa; embarks on the canal project with Machiavelli; receives commission for *Battle of Anghiari*, Sala dei Cinquecento, Palazzo della Signoria; begins *Mona Lisa*.
- 1504.....Becomes member of the committee to determine location of Michelangelo's *David*; death of father, Ser Piero; goes to Piombino to work on fortifications.
- 1504–1506.....Works on *Battle of Anghiari* (unfinished) in encaustic; paints *Leda and the Swan*.
- 1505.....Writes *Treatise on Flying*.
- 1506.....Called to Milan by its French governor, Charles d'Amboise, to complete commission for *Madonna of the Rocks* for the Oratory of the Immaculate Conception.
- 1507.....Receives rights to water in the canal of San Cristoforo, Milan; begins cartoon of *Saint Anne Madonna*; meets and befriends Francesco Melzi, who becomes his pupil and companion; anatomical drawings intensify.
- 1508.....Begins formal work on *Treatise on Anatomy*; draws entire human pulmonary system; dissects a 100-year-old man in the hospital of Santa Maria Nuova, Florence.

- 1509.....Creates artificial heart model, demonstrating blood flow to and from the aorta.
- 1509–1510.....Produces designs for *Trivulzio Monument*.
- 1510.....Works with Marcantonio della Torre, professor of anatomy at the University of Pavia, to hone anatomical drawing techniques; begins production of 56 detailed drawings of the cardiovascular system; draws a human fetus in the womb.
- 1513.....Swiss invade Milan; Leonardo flees to Melzi villa in Vaprio d'Adda; joins the court of Giuliano de' Medici, brother of Pope Leonardo X in Rome (December) in Bramante's Palazzo Belvedere.
- 1513–1516.....Works alternately on mechanical lion, anatomical studies, *Treatise on Painting*, maps, architectural designs, and burning mirrors; draws *The Deluge*; sculpts lightweight wax animals that fly short distances, using internal sacks of compressed air; designs huge concave mirrors to direct concentrated sun rays at enemy ship riggings.
- 1515.....Produces mechanical lion as gift for François I; designs plans for new facade of old Medici Palace in Florence; paid to participate in grand papal procession from Rome to Bologna, via Florence.

- 1516..... Giuliano de' Medici dies in March; Leonardo writes, "The Medici made me, and the Medici destroyed me"; invited to France by François I to become "peintre du Roi"; goes to French court at Amboise; works on *Saint Anne Madonna* and *John the Baptist*.
- 1517..... Partially paralyzed on right side by a possible stroke; draws plans for Chateau at Romorantin, near Blois.
- 1518..... Royal fountain at Amboise; possible advisor for double helix staircase at Chambord; designs wedding ring for Maddalena de la Tour d'Auvergne, niece of François I; designs stage set for Bellincioni's *Feast of Paradise*.
- 1519..... Acknowledges will in April; dies on May 2 at Chateau de Cloux; buried in the cloister of church of Saint-Florentin in Amboise (later destroyed).

Leonardo's Artistic Predecessors and Contemporaries

- 1305..... Giotto, *Arena Chapel*, Padua.
- 1417..... Donatello, *St. George*, Orsanmichele.
- 1420s Brunelleschi designs dome of Florentine Cathedral.
- 1425..... Masaccio and Masolino, *Brancacci Chapel*.

- 1427.....Masaccio, *Trinity*.
- 1432.....Jan van Eyck, *Arnolfini Double Portrait, Ghent Altarpiece*.
- 1435–1436.....Leon Battista Alberti, *On Painting*.
- 1436.....Van Eyck, *Van der Paele Madonna, Madonna of Chancellor Rolin*.
- 1440–1455.....Fra Filippo Lippi active in Florence: portraits of women.
- 1440.....Fra Angelico, *San Marco Altarpiece*; Donatello, *Cantoria*, Florence Cathedral.
- 1445.....Domenico Veneziano, *Saint Lucy Altarpiece*.
- 1450.....Alberti, *Tempio Malatestiano*, Rimini and *Palazzo Rucellai*, Florence; Michelozzo, *Palazzo Medici*, Florence; Rogier van der Weyden in Florence.
- 1452.....Ghiberti, *Gates of Paradise; I Commentarii*.
- 1453.....Donatello, *Gattamelata*.
- 1455–1459.....Donatello, *David*.
- 1457.....Andrea Mantegna, *San Zeno Altarpiece*, Verona.
- 1459.....Mantegna court artist in Mantua.

- 1461..... Andrea del Verrocchio working independently in Florence.
- 1465..... Piero della Francesca joins court of Federigo de Montefeltro in Urbino.
- 1465..... Mantegna, *Camera Picta*, Ducal Palace, Mantua.
- 1466–1483..... Verrocchio, *Doubting Thomas*, Orsanmichele.
- 1471..... Verrocchio, *Orb*, Florentine Cathedral.
- 1472..... Verrocchio, *Baptism of Christ*.
- 1475–1481..... Hugo van der Goes active in Flanders.
- 1475..... Birth of Michelangelo, Settignano; birth of Albrecht Durer, Nuremburg; Giovanni Bellini active in Venice.
- 1476..... Antonello da Messina in northern Italy.
- 1477–1491..... Bramante, *Santa Maria presso San Satiro*, Milan.
- 1479–1483..... Construction and decoration, Sistine Chapel.
- 1480..... Ghirlandaio, *Last Supper*, Florence.
- 1481–1496..... Verrocchio and assistants in Venice, *Bartolommeo Colleoni*.

- 1482–1492..... Botticelli, *Primavera*, *Birth of Venus*, *Venus and Mars*.
- 1483..... Birth of Raphael, Urbino; Arrival of *Portinari Altarpiece* in Florence.
- 1494..... Durer in Venice.
- 1498..... Michelangelo, *Pieta*, Chapel of the French, Old St. Peter's.
- 1500–1505..... Giorgione at work in Venice; *Dresden Venus*, *Fete Champetre*; Signorelli, *Last Judgment*, Orvieto Cathedral.
- 1500..... Durer, *Self-Portrait*.
- 1501–1504..... Michelangelo in Florence, *David*; Bramante, *Tempietto*, Rome.
- 1504..... Michelangelo commissioned to paint *Battle of Cascina*.
- 1505..... Michelangelo, cartoon of *Battle of Cascina*; Raphael in Florence, *Madonna of the Goldfinch*.
- 1505–1516..... Michelangelo in Rome.
- 1505..... Old St. Peter's dismantled.
- 1506..... Michelangelo, first designs of *Tomb of Julius II*; Bramante, designs for New St. Peter's.

- 1508–1520.....Raphael in Rome.
- 1508–1512.....Michelangelo, *Sistine Ceiling*.
- 1509.....Raphael, *Disputa*.
- 1511.....Raphael, *Parnassus*.
- 1512.....Raphael, *School of Athens, Julius II*.
- 1513.....Raphael, *Sistine Madonna*.
- 1514.....Titian, *Sacred Allegory*.
- 1515.....Death of Bramante.
- 1516.....Michelangelo in Florence; New Sacristy; Raphael, *Leo X*.
- 1516–1518.....Raphael, *Transfiguration*.
- 1517.....Andrea del Sarto, *Madonna of the Harpies*.
- 1518.....Titian, *Assumption of the Virgin*, Venice.
- 1520.....Death of Raphael.

Politics in Leonardo's Lifetime

- 1450.....Francesco Sforza establishes the Duchy of Milan and dynastic lineage in Lombardy.

- 1453.....Constantinople falls.
- 1454.....Peace of Lodi, enforced by Sforza, protects territories in Lombardy, Marches, Emilia-Romagna from Venice.
- 1469.....Death of Piero de' Medici; government of Lorenzo and Giuliano de' Medici in Florence.
- 1476.....Assassination of Duke Galeazzo Maria Sforza; Milan governed by his widow, Bona Sforza, as regent for the infant Giangaleazzo Sforza; Ludovico Sforza (Galeazzo's brother) exiled by Bona Sforza.
- 1478.....Pazzi Conspiracy: assassination of Giuliano de' Medici.
- 1478–1479.....War between Florence and the papacy.
- 1479.....Return of Ludovico Sforza as new regent of Milan for still-minor Giangaleazzo Sforza.
- 1483–1484.....Milan at war with Venice.
- 1484–1485.....Plague in Milan; Sforza court relocates to Pavia.
- 1492.....Columbus lands on islands in the Caribbean Sea; Death of Lorenzo de' Medici; election of Rodrigo Borgia as Pope Alexander VI.

- 1494..... Invasion of Milan by French under King Charles VIII; rise to power of Fra Savonarola in Florence; birth of François I, future king of France; death of Giangaleazzo Sforza; Ludovico Sforza named duke of Milan by Holy Roman Emperor Maximilian I; Alexander VI partitions the New World among European powers.
- 1494–1512..... Medici expelled from Florence.
- 1495..... French depart Italian soil.
- 1498..... Fra Savonarola arrested and executed; Niccolò Machiavelli named chancellor of Florence; Cesare Borgia, son of Pope Alexander VI, assumes command of Papal Armies in Italy; Amerigo Vespucci charts eastern coast of the New World.
- 1499..... French under King Louis XII invade Milan; Ludovico Sforza exiled.
- 1500..... Ludovico Sforza briefly retakes Milan with German mercenaries, then is captured and imprisoned in France.
- 1503 Death of Alexander VI; election and quick death of Pius III; election of Giuliano della Rovere as Pope Julius II; Cesare Borgia relinquishes to Julius II territories claimed in name of his father, Alexander VI.

- 1508.....Death of Cesare Borgia; death of Ludovico Sforza, in exile.
- 1509.....Venetians defeated by papal armies.
- 1512.....Battle of Ravenna: French driven from Italy; Swiss restore Duchy of Milan to Maximilian Sforza; death of Julius II; Medici return to Florence.
- 1513.....Election of Giovanni dei Medici as Pope Leonardo X; Machiavelli writes *The Prince*.
- 1515.....Death of Louis XII of France; coronation of François I.
- 1517.....Martin Luther nails the 95 Theses to church door in Wittenburg.
- 1527.....Sack of Rome; Medici expelled from Florence.

Glossary

altarpiece: An image—usually a painting or a sculpture—placed on an altar facing the priest and congregation. Often covered by curtains or shutters and revealed during the Mass.

atmospheric perspective: The effect of deep space in a landscape painting, created by diminution of scale and softened contour line and by giving a bluish-green tint to distant objects. This technique imitates what our eyes perceive when looking at a landscape, which results from water and dust particles suspended in the atmosphere. Also called aerial perspective.

Archimedean screw: A large screw that, when turned, pulls both liquids and solids up and out of the ground.

armature: A wooden model of a sculpture that an artist covers in clay.

basilica: Any church that has a longitudinal nave flanked by side aisles and terminating in a domed area called an apse. Originally the name for an ancient Roman public building with the same ground plan.

blunderbuss: A small cannon derived from the harquebus.

caravel: A sailing vessel used by navigators and explorers in the 15th century.

caricature: An exaggerated facial study, often comical in intent.

cartoon: From the Italian *cartone* (“cardboard”), a full-size preparatory drawing from which a design is transferred to a surface for painting.

cathedral: From the Latin *cathedra* (“throne”), a church where a bishop has his diocese and official seat.

chiaroscuro: Italian word meaning “light-dark”; refers to the dramatic or theatrical contrast of light and dark in painting.

Cinquecento: The century of the 1500s.

cire perdue: In French, literally “lost wax”; a technique used to cast figures in bronze. A clay mold is covered with wax, which is in turn encased in a shell. Molten bronze is poured between the shell and the mold, replacing the wax, which melts and drips out from between the two surfaces. The shell is then chipped away and the mold dug out from the hardened bronze encasement.

classical composition: A triangular or pyramidal approach to artistic compositional design that emphasizes balance.

condottiere: A mercenary general.

contrapposto: From the Italian for “set against”; the method of introducing movement into the human form in sculpture or painting by placing the weight principally on one leg with the other leg relaxed, which causes the body to assume an asymmetrical posture with a modified S-curve.

courtier: A member of a noble or royal court, often employed as an advisor, entertainer, or thinker paid to publish scholarly works while in the service of an enlightened patron.

crossing: The juncture in a church where the nave meets the transept.

cruciform: An architectural term used to describe a church designed in the shape of a cross, formed by a long nave and a shorter, perpendicular transept.

cupola: A dome.

diptych: A religious image consisting of two paintings of the same size side-by-side, usually on panels, often hinged to be opened and closed.

dowry: A fixed gift—usually property, cash holdings, and/or textiles—that accompanied brides as they left their parents' homes and entered into the marital union with their husbands.

duomo: The Italian word for a cathedral; when capitalized, refers to the cathedral of Florence.

egg tempera: Water-based painting medium in which ground colors are suspended in egg yolk. It is characterized by a gleaming surface, decorative flatness, and durability. The principal paint medium before the Cinquecento.

encaustic: A painterly process whereby pigments are mixed with melted wax and applied to a dry surface.

equestrian monument: A large-scale sculpture of a horse and rider.

Eucharist: The sacrament of the Lord's Supper, celebrated in the Mass.

figure eight composition: Created simultaneously by Raphael and Titian, a compositional pattern that causes the eye to move in a circular interweave across a picture's design.

folio: A single sheet of paper or parchment. Scholars refer to Leonardo's papers using folio numbers (abbreviated as *fol.*) instead of page numbers. *See also recto* and *verso*.

fresco: Italian for “fresh,” the technique of painting in wet plaster on a wall. If the color becomes part of the plaster wall, the painting is a true fresco (*buon fresco*).

gesso: A thick, glue-like white pigment used as the base coat for Renaissance paintings.

golden ratio: The theoretically perfect proportion for art, equal to approximately 1.618:1, whereby the dimensions of a rectangular appendix to a square are equal to the dimensions of the new rectangle formed by the square and the appendix.

Greek cross: An architectural term for a church plan where each of the four arms of the building is of the same length and width.

harquebus: A firearm used by infantrymen standing in a fixed position.

High Renaissance: A historical and cultural era that extended from the middle of the 15th century through the first quarter of the 16th century. This period of innovation and exploration combined references to the lessons of ancient writers and the independent discoveries of contemporary thinkers and artists.

hodometer: A device used to measure distances traveled by foot. Leonardo's design for one resembled a wheelbarrow.

Holy Roman Empire: A collection of states under the domain of a single ruler that originally comprised the Germanic principalities of Central Europe. Various emperors added to this core, so that by the time of Charles V (r. 1519–1559), the empire also included Flanders, the Netherlands, Spain, and most of Italy.

linear perspective: The system of creating the illusion of three-dimensional space on a flat surface that was first known in ancient Rome and was redeveloped in the early 15th century in Florence. The architect Filippo Brunelleschi is generally credited with its reinvention.

Mannerism: An artistic style popularized in the 1520s and 1530s that evolved as an alternative to the classicism of the High Renaissance.

maquette: A small-scale preparatory sculpture for a larger monument, usually created to garner a patron's approval before moving ahead with a project.

metal point: An instrument used by Renaissance artists when drawing. A metal stick (often made of silver) is dragged across a surface to create lines.

mural: A generic term for a painting on a wall. The term often used to distinguish the image from a true fresco painting.

nave: The central aisle of a basilican church, extending from the entrance to the chancel.

Neoplatonism: A system that attempted to reconcile the ancient philosophy of Plato and Plotinus with the teachings of Christianity. Developed in Alexandria and other Greek centers in the 3rd century A.D. and revived during the Italian Renaissance.

notary: A member of the legal profession during the Renaissance, usually educated in Latin, primarily called on to negotiate and write contracts.

oil: A medium, such as linseed oil or walnut oil, in which pigments are suspended while they dry. Because pigments in oil do not dry rapidly, they can be applied freely over a wide area, and because they are translucent rather than opaque, they create effects of depth and luminosity. When dry, they are solid films. The Renaissance development of oil paint as a medium can be traced to the Netherlands in the early 15th century, and it became the dominant medium from the 16th century onward.

ornithopter: Literally “bird vehicle,” the name given by Leonardo to his earliest flying machines.

orthogonal lines: Diagonal lines drawn or painted on a two-dimensional surface that illusionistically extend into space, appearing to converge at a single point (the vanishing point) and giving the effect of a measurable three-dimensional space in linear perspective. Also used in relief sculpture.

palazzo: Italian for “big building,” usually referring to a structure occupied by government workers or bureaucrats (e.g., Palazzo della Signoria), although it can also be used to describe a large home of a wealthy family (e.g., Palazzo Medici).

paragone: An Italian word meaning “debate” or “discourse”; a popular form of intellectual inquiry in the Renaissance, in which the author or speaker demonstrated the virtues of one particular theme or concept by comparing it favorably to another.

parchment: A writing surface made from dried and treated animal skins. Also known as vellum.

pattern book: A bound book of drawn compositions and figures that could be reused whenever patrons sought particular images. Apprentices and assistants were taught to copy them, and those who could replicate the master's style were the most celebrated members of the workshop. Pattern books gradually went out of style near the end of the 15th century.

piazza: Italian word for a city square, usually bracketed by public buildings.

pittura infamante: Italian term for pictures of the executed painted on the sides of prisons and government buildings. These images were part of the punishment meted out for particularly heinous crimes of high treason and murder.

polyptych: A multi-panel altarpiece or other devotional picture or relief sculpture. Typically, the central panel is flanked by wings and surmounted by gables or other forms and sometimes placed on a base, called a predella.

porphyry: A rare and expensive colored stone used for special sculptural or architectural projects.

pouncing: A process whereby chalk dust is placed inside a cheesecloth sack and lightly patted against a drawing that has been pinpricked along its contours and laid on top of the surface to be painted. The dust pushes through the pinpricks, forming an exact copy of the original drawing on the new surface.

putto (pl. putti): Small nude boys, sometimes winged, seen in both religious and secular Renaissance painting and sculpture.

Quattrocento: The century of the 1400s.

recto: The front side of a piece of parchment or paper, always the right-hand page of an open book.

refectory: The dining hall in a convent or monastery.

Renaissance: The period of Western history loosely bracketed by the 13th and 16th centuries and characterized by an overt and intentional appropriation of ideas, themes, and images from the ancient cultures of Greece and Rome. The age featured gradual and then rapid shifts in political systems, manufacturing, social hierarchies, literature, scientific inquiry, and artistic production.

Renaissance man: A phrase coined after the Renaissance, used to describe a person who demonstrates superior skill and talent in a number of different and unrelated fields. Frequently used to reference Leonardo da Vinci's mastery of the areas of engineering, hydraulics, aerodynamics, anatomy, painting, music, and sculpture. During the Renaissance itself, the expression used by writers such as Leon Battista Alberti and influential for Leonardo da Vinci was “universal man” (*uomo universale*).

sfumato: An Italian word meaning “smoky”; the method of painting subtle gradations of light and dark, especially in modeling the human figure, developed by Leonardo da Vinci.

simony: The practice of selling church offices for money. This method of raising revenue was popular during the pontificates of Alexander VI, Julius II, and particularly Leonardo X.

sprezzatura: Italian for “ease” or “effortlessness,” used by Baldassare Castiglione to praise courtiers who excelled at a variety of activities with a certain grace and elegance.

Stanze: From the Italian word for “rooms,” the rooms built in the Vatican Palace during the pontificate of Alexander VI and decorated by Raphael and his followers between 1509 and 1524.

tenebrism: An intense and dramatic juxtaposition of light and dark colors on a painted surface.

terminus post quem: Latin term meaning “completed after this date.”

transept: The short axis, or cross arm, of a basilican church. It intersects the nave just before the chancel. The ground plan of such a church is cross-shaped.

triptych: An altarpiece or other devotional image made up of three painted or carved panels. The wings are usually smaller than the center panel and are sometimes hinged for closing.

triglyph: A block that forms part of a Doric frieze.

Ufficiali di Notte: The Guardians of the Night, Renaissance Florence's vice squad, charged with prosecuting cases of sexual misconduct—usually defined as acts of prostitution or sodomy.

underdrawing: A charcoal or chalk sketch on the penultimate coat of plaster laid on a wall before the final fresco coat was placed over it.

vanishing point: The place where orthogonal lines converge on the visual field of a two-dimensional surface when linear perspective is employed by an artist.

verso: The back side of a piece of parchment or paper, always the left-hand page of an open book.

Biographical Notes

Alberti, Leon Battista (1404–1472): Humanist writer, architect, and social commentator. Alberti became interested in the visual arts during a visit to Florence. His subsequent writings—*On Painting*, *On Sculpture*, and *Ten Books on Architecture*—codified new rules that came to represent a new style of artistic production that we now refer to as Renaissance.

Alexander VI (a.k.a. **Rodrigo Borgia**; 1431–1503): Pope and son of Spanish nobility. Alexander was the nephew of Pope Calixtus III and rose through the ecclesiastical hierarchy as a cleric and administrator in Rome. Notoriously ambitious and prone to prodigious (and lecherous) vices, Rodrigo bribed and bullied his way to the papal throne in 1492. He extorted and embezzled funds to support his insatiable appetites, funded his children’s rapacious military exploits in eastern Italy during the late 1490s and early 1500s, and shortsightedly invited both French and Spanish troops onto Italian soil to undermine his political enemies. To this day, Alexander VI is considered among the most corrupt figures in modern European history.

Alighieri, Dante (1265–1322): Florentine thinker, poet, politician, and social critic. Dante wrote theologically driven love poetry and treatises on modern government but found himself on the wrong side of a civil war in Florence and was exiled from his homeland in 1301. During his itinerant years as persona non grata, Dante penned the most important work of literature of the early modern period, *The Divine Comedy*, which was the very first work of literature written in Italian.

Bayezid II (1447–1512): Sultan of the Ottoman Empire and son of Mehmed II. Bayezid briefly toyed with the idea of commissioning Leonardo da Vinci to design a bridge to span the Golden Horn of Istanbul.

Bellincioni, Bernardo (1452–1492): Poet and humanist favored by both Lorenzo de’ Medici and Ludovico Sforza. Bellincioni wrote plays and sonnets for the entertainment and edification of the Milanese court. Leonardo

designed stage sets for his theatrical pieces, and Bellincioni mentioned Leonardo by name in his poems.

Bellini, Giovanni (c. 1430–1516): Painter and son of another important artist, Jacopo Bellini, Giovanni pioneered the oil technique in Venice through his depictions of Madonnas and landscapes. He was the master of Titian and influenced Giorgione with his subtle forms and balanced compositions.

Bembo, Bernardo (1433–1519): Venetian aristocrat and diplomat who travelled to Florence in 1475 and witnessed the famous tournament in which Giuliano de' Medici conquered the field. He is also reputed to have met Ginevra de' Benci there and initiated a platonic relationship that was recognized in Leonardo's portrait of her.

Benci, Ginevra de' (c. 1458–1520): The wife of Luigi di Bernardo Niccolini and the presumptive muse of the Venetian diplomat Bernardo Bembo, she was the subject of humanistic poems and a painting by Leonardo da Vinci in the 1470s.

Boltraffio, Giovanni (c. 1466–1516): Painter of distinction in the Milanese court of Ludovico Sforza and a colleague and follower of Leonardo da Vinci during the 1490s. He specialized in portraits of Ludovico's courtiers and mistresses and may have assisted Leonardo on the *Madonna Litta*.

Borgia, Cesare (1475–1507): Known during his lifetime as “the wickedest man in Italy,” Cesare Borgia was made a cardinal by his father, Rodrigo Borgia (Pope Alexander VI), when he was only 18 years old. He resigned that office in 1498 to pursue political and military ventures and, with his father’s blessing and assistance, attempted to conquer lands in eastern Italy and create a duchy for himself. His reputation for duplicity, brutality, and murder earned him the fear and respect of his contemporaries, including Machiavelli and Leonardo da Vinci. He was expelled from Italy by his father’s successor, Pope Julius II, and died on the battlefield outside Viana, Spain, in 1507.

Borgia, Lucrezia (1480–1519): Daughter of Rodrigo Borgia (Pope Alexander VI), Lucrezia carried a reputation for wantonness and promiscuity that has lasted to this day. She was married to a string of Italian princes and was the mistress of Francesco Gonzaga, who was the duke of Mantua and the husband of Isabella d’Este. She is known to have given birth to at least eight children, although a number of others born out of wedlock have also been assigned to her.

Rodrigo Borgia: *See Alexander VI.*

Botticelli, Sandro (1445–1510): Popular painter of religious pictures in Florence during the 1470s who caught the attention of the Medici family. During the 1480s, he worked for Pope Sixtus IV in Rome and for Lorenzo de’ Medici in Florence, the latter of whom encouraged Botticelli’s exploration of pagan and allegorical subjects. With the rise of Fra Savonarola during the 1490s, Botticelli rejected his own allegiance to the Medici and their humanistic court.

Bramante, Donato (1444–1514): Painter who made his mark as an architect. Born near Urbino, he worked in Milan during the 1470s, 1480s, and 1490s, where he met and collaborated with Leonardo da Vinci, and then worked in Rome for Pope Julius II, who hired him to design the new cathedral of Saint Peter. Bramante was responsible for the Tempietto and Palazzo Belvedere in Rome.

Brunelleschi, Filippo (1377–1446): Goldsmith who achieved fame as an architect, sculptor, and artistic theoretician. His design of the cupola of the Florentine cathedral was considered the pinnacle of early modern architectural design during the latter half of the 15th century, and he has been widely credited with perfecting the use of linear perspective in the painterly arts.

Buonarroti, Michelangelo (1475–1564): One of the most prolific artists of all time, who revolutionized the world of the visual arts through his drawings, paintings, sculptures, and architectural works—primarily in Florence and Rome. Among Michelangelo’s most famous and influential projects were the frescoes for the Sistine Chapel, the sculptures for the Tomb of Julius II, and his designs for the New Sacristy in the Church of San Lorenzo, Florence.

Campin, Robert (1375–1444): Perhaps the first great master of Northern Renaissance painting, Campin produced paintings for French and Flemish patrons during the 15th century. His portraits of anonymous men and women reveal his acute interest in light and shadows, but his best-known work—the *Merode Triptych* in the Cloisters Museum in New York—is an explosion of mystical color.

Castagno, Andrea del (c. 1419–1457): Florentine fresco painter who worked for a variety of patrons, including the nuns in the convent of Sant’Apollonia, where his *Last Supper* demonstrated how linear perspective could be employed on a horizontal surface to great effect.

Castiglione, Baldassare (1478–1529): Diplomat and writer who worked in the courts of Urbino, Mantua, and the Vatican during his successful career. After serving as papal nuncio to Spain, he wrote a widely read and influential description of life at court in Renaissance Italy called *The Book of the Courtier* (1528).

Charles VIII (1470–1498): French king of the Valois dynasty who led a military campaign into Italy in 1494 to dislodge Naples from Spanish hands. He succeeded briefly but was forced to retreat back across the Alps by an alliance of European powers that feared the balance of power had tilted too heavily in France’s favor.

Christus, Petrus (c. 1420–1476): Northern painter active in Bruges who was deeply influenced by the works of Robert Campin and Jan van Eyck. His *Portrait of a Carthusian* (1446) in New York’s Metropolitan Museum of Art displays his understanding of oil paint and his interest in tenebrism.

Colleoni, Bartolomeo (1400–1475): Knight, mercenary soldier, and military leader who fought alternately for the Milanese and the Venetians. Colleoni’s will stipulated that a monument to him be erected in the city of Venice. Andrea del Verrocchio was commissioned to produce the equestrian statue in his honor, and the finished product was installed in 1496.

Columbus, Christopher (1451–1506): Genoese navigator who sought the support of a variety of European powers as he considered a new route to India. He found favor in the Spanish court of Ferdinand and Isabella, and in 1492 he led the first of four voyages that resulted in his accidental landing on islands in the Caribbean Sea.

Copernicus, Nicholas (1473–1543): Polish scientist educated in Italian universities whose posthumously published findings posited that the sun, not the Earth, was the center of the solar system.

d'Amboise, Charles (1473–1511): Military leader and skilled diplomat who served in the French royal court and was appointed governor of Milan after the occupation of Northern Italy by the forces of Louis XII in 1499. As head of state, Charles acted as patron and protector of Leonardo da Vinci from 1506 to 1511.

da Messina, Antonello (c. 1430–1479): Sicilian painter who traveled widely during his professional career. Active in Naples, Venice, and probably France or Flanders, Antonello perfected the use of oil pigments in his paintings and helped teach artists in Italy how to employ them.

da Vinci, Leonardo (1452–1519): The quintessential Renaissance man, Leonardo's innovations in painting, architecture, engineering, anatomy, and aerodynamics revolutionized the fields of art and science during and after his lifetime. His travels and professional missions took him from Florence to Milan, Rome, and France, during which time he was able to influence a host of artists, patrons, and thinkers. Among his most famous works are *The Last Supper*, *Mona Lisa*, and *Vitruvian Man*.

della Francesca, Piero (c. 1420–1492): One of the most dedicated and skillful practitioners of linear perspective in all of Renaissance Italy. Born in the city of Arezzo, he was brought to the court of Federigo da Montefeltro in 1465, where he served faithfully as the duke's painter and courtier until his death. Among his most celebrated works are the frescoes of *The Legend of the True Cross* in the Church of San Francesco in Arezzo and the *Portrait of Federigo da Montefeltro and Battista Sforza* in the Uffizi Gallery, Florence.

d'Este, Beatrice (1475–1497): Beatrice was the daughter of Ercole d'Este, the duke of Ferrara, and the sister of Isabella d'Este. In 1491 she was married to Ludovico Sforza and spent the rest of her short life learning the ways of courtly life in Milan.

d'Este, Isabella (1474–1539): One of the day's greatest art connoisseurs and collectors, Isabella d'Este was the daughter of the prince of Ferrara and the wife of Francesco Gonzaga, the duke of Mantua. She was noted for her literary eloquence and her avid love of painting, and she went to great lengths to procure works from the day's most important artists. Well-educated and articulate, she also went on diplomatic missions of great sensitivity and counted as friends and confidants some of Europe's most important political and intellectual figures.

di Cione, Andrea (a.k.a. **Orcagna**; c. 1308–1368): Popular and prolific painter and sculptor in Florence during the middle decades of the 14th century. Among his best-known works are the monumental marble tabernacle in the Florentine church of Orsanmichele and his *Strozzi Altarpiece* for Santa Maria Novella.

di Credi, Lorenzo (1459–1537): Florentine painter and colleague of Leonardo da Vinci from the workshop of Andrea del Verrocchio who was noted for his intimate depictions of the Madonna.

di Giorgio Martini, Francesco (1439–1501/2): Architect and theoretician who experimented with the idea that designs of buildings could correspond to the proportions of the human figure.

Donatello (1386–1466): Perhaps the most inventive and influential artist of the early Renaissance, Donatello's sculptures repeatedly redefined the medium. Active in Florence and Padua, his bronze equestrian monument of *Gattamelata* was the first of its kind since antiquity. His marble relief *St. George and the Dragon* and his bronze relief *The Banquet of Herod* are among the earliest surviving examples of linear perspective on a two-dimensional surface. His appropriation of ancient motifs and subtle naturalistic elements helped create the standard by which all sculptures would be judged until the time of Michelangelo Buonarroti.

Eyck, Jan van (c. 1395–1441): Flemish painter and courtier who is largely considered the finest painter of the Northern European 15th century, a reputation he held even within his own lifetime. His best-known works are the *Ghent Altarpiece* (1432) and the *Arnolfini Double Portrait* (1434), now in London. His *Man in the Red Turban* (1433) is widely believed to be a self-portrait.

Francis of Assisi (1182–1226): Merchant's son who denounced his inheritance and initiated a spiritual movement that called on his followers to preach stories from the Gospels in public and in vernacular tongues. At his death in 1226, his Order of Friars Minor was known across Western Christendom as a key player in the popularization of religion among lay worshippers.

François I (1494–1547): French king of the Valois dynasty and distant relative of Louis XII, who preceded him on the throne. François ascended to power in 1515 and gradually enjoyed a political and military career that made him one of the most important and successful figures in early modern history. He was well educated and politically savvy. One of François's early acts as head of state was to invite Leonardo da Vinci to serve as his courtier. Leonardo accepted the invitation in 1516, thus giving François's court instant credibility.

Gaddi, Taddeo (c. 1300–1366): A disciple of Giotto, Taddeo Gaddi painted frescoes and altarpieces primarily in Florence from 1328 until 1360. Among his best-known works are the cycle called *The Life of the Virgin* in the Baroncelli Chapel of Santa Croce (1328–1330) and the *Tree of Life and Last Supper* in the refectory of the same complex (c. 1355).

Gaffurio, Franchino (1451–1522): Musician and composer of the late 15th century who worked in the court of Ludovico Sforza at the same time as Leonardo da Vinci.

Gallerani, Cecilia (1473–1536): The aristocratic mistress of Ludovico Sforza during the late 1480s and early 1490s. The subject of Leonardo's *Woman with the Ermine*, Cecilia was Ludovico's favored consort even after his marriage to Beatrice d'Este in 1491, and she bore him a child in 1491. Under pressure from Beatrice, Cecilia was later married to a local count and left the Sforza court permanently.

Ghiberti, Lorenzo (c. 1378–1455): A contemporary of Filippo Brunelleschi and Donatello, with whom he competed repeatedly, Ghiberti produced two sets of bronze reliefs for the doors of the Florentine Baptistery, the second of which (1430–1452) was later dubbed by Michelangelo *The Gates of Paradise*.

Ghirlandaio, Domenico (1449–1494): Painter who trained with Andrea del Verrocchio in Florence and was a colleague of Leonardo da Vinci during the 1460s and 1470s. He was known for his mastery of Madonna forms and his adherence to traditional modes of painting. He helped teach his student Michelangelo the fresco technique during the production of a series of paintings called *The Life of the Virgin Mary* for the Florentine church of Santa Maria Novella in 1488.

Gioconda, Elisabetta Gherardini (1479–1542/51): Traditionally recognized as the sitter of Leonardo's *Mona Lisa* (known as *La Gioconda* in Italian), she was the wife of a political figure named Francesco and was buried in the Florentine nunnery of Sant'Orsola.

Giorgione (a.k.a. **Giorgio da Castelfranco**; c. 1476/8–1510): The extraordinary career of this talented Venetian artist was mysteriously cut short in 1510, yet his allegorical pictures remain among the period's most innovative and influential paintings, and his employment of oil paint was rivaled only by that of his master, Giovanni Bellini, and his colleague Titian.

Giotto (a.k.a. **Giotto di Bondone**; 1266–1337): Giotto's origins are largely unknown, but it appears that he made his reputation in Rome during the 1290s as a fresco painter. His murals in the Arena Chapel of Padua (1304–1306) and his paintings in Florence (1310–1325), including the *Ognissanti Madonna*, ushered into European painting a naturalistic style that emphasized the careful use of human proportions, figural details, and rational representations of depth.

Goes, Hugo van der (c. 1440–1482): Flemish painter who was commissioned by Tommaso Portinari, the director of a branch office of the Medici bank in Flanders, to paint an enormous triptych now known as *The Portinari Altarpiece* (1476; installed 1483) for the Florentine hospital church of Santa Maria Nuova.

Gutenberg, Johannes (1398–1468): A blacksmith by trade who focused his energies on creating a printing press that could produce multiple copies of texts through the employment of reusable, movable type. His perfection of this process led to the artistic medium of printmaking, provided a communications revolution for thinkers and poets, and caused an increased demand for paper that completely changed the way writers and artists approached their respective subjects.

Julius II (a.k.a. **Giuliano della Rovere**; 1443–1513): Elected pope in 1503, Julius II served in that capacity for a decade. He worked to expel foreign armies from Italian soil and to organize a confederation of states loyal to the pope as a common leader. He also organized one of the most grandiose (and expensive) urban renewal projects in history and brought to Rome three of the day's greatest artists—Bramante, Michelangelo, and Raphael—to rebuild and redecorate the city.

Leonardo X (a.k.a. **Giovanni de' Medici**; 1475–1521): The second son of Lorenzo the Magnificent; he succeeded Julius II to the papal throne in 1513. Whereas Julius II initiated a systematic program of “revenue enhancements” to help pay for the rebuilding of Rome during his pontificate, Leo expanded on these approaches to cover the expenses of his personal art collection and parties.

Lippi, Filippino (1457/8–1504): The son of the mendicant painter Fra Filippo Lippi, Filippino was a successful painter in his own right. Among his best-known works are frescoes in the Brancacci Chapel in the Florentine church of Santa Maria del Carmine, scenes from the *Life of Saint Philip* in Santa Maria Novella, and the altarpiece *Adoration of the Magi*, which ultimately replaced the version that Leonardo had intended to install in the church of San Donato a Scopeto (but then abandoned) in 1481.

Lippi, Fra Filippo (c. 1406–1469): Carmelite friar who continued the early Renaissance explorations and experiments of Masaccio. Among his best known works are *Annunciation of the Virgin* in San Lorenzo and *Madonna and Child with Angels* in the Uffizi Gallery (which, according to tradition, celebrates the birth of Filippino Lippi to Lucrezia Buti, the nun to whom Fra Filippo was married in secret).

Lorenzo Monaco (c. 1372–1424): Monk who left his cloister at Santa Maria degli Angeli in Florence to pursue a career as a lay painter. Among his most important works were panels of *The Coronation of the Virgin* (1414) and *The Man of Sorrows (Vir Dolorum)* (1404)—both in Florence today.

Louis XII (1462–1515): A French king of the Valois-Orleans family and distant cousin of Charles VIII, Louis XII took control of France in 1498 after Charles died from a brain hemorrhage caused by a fall at a tennis match—and after Charles's wife, Anne, agreed to marry Louis in an act of political unification. In 1499, Louis invaded Italy and conquered Milan, which resulted in the expulsion of Ludovico Sforza and the departure of Leonardo da Vinci.

Luini, Bernardino (c. 1480–1532): Lombard painter who was an admirer and follower of Leonardo da Vinci, although direct contact between the two was minimal.

Luther, Martin (1483–1546): Augustinian friar and professor of theology who was outraged by the excesses of the papal courts of Alexander VI, Julius II, and Leo X. He went public with his protests in 1517, refused to recant in 1520, was excommunicated in 1521, and was hence seen as the founder and leader of the Protestant movement.

Machiavelli, Niccolò (1469–1527): Government official and political theorist. Machiavelli took on a number of diplomatic posts as a representative of the new Florentine republic during the early years of the 1500s. During this time he met and collaborated with Leonardo da Vinci on a number of projects. He was arrested when the Medici returned to take control of Florence in 1513 and wrote his political treatise *The Prince* and a number of plays during a self-imposed exile.

Mantegna, Andrea (c. 1430/31–1506): Painter who worked in Padua and Verona but made his most important contributions as a member of the Gonzaga court in Mantua, where he worked from about 1465 until his death in 1506. He is best known for his imaginative mural paintings in one of the bedchambers of the ducal palace there, known as the Camera Picta.

Masaccio (a.k.a. **Tommaso di ser Giovanni**; 1401–1428): The most important and influential painter of the early Renaissance. Masaccio employed the lessons of Giotto and Donatello in his monumental fresco paintings and literally invented early modern painting in Florence. His best known pictures—which were copied repeatedly by generations of artists—are *The Life of Saint Peter* in Santa Maria del Carmine (1425) and *The Trinity* in Santa Maria Novella (1427).

Maximilian I (1459–1519): Holy Roman Emperor of the Hapsburg dynasty, Maximilian was the son of Frederick III and in 1493 inherited his father's title as Holy Roman Emperor. In 1494 he married Bianca Sforza, Ludovico Sforza's niece, which gave Maximilian and his descendants a claim to Milanese territories in later years. Although not known for his accomplishments on the battlefield, Maximilian was a gifted and savvy politician who expanded the territories of the Holy Roman Empire. When he died, his grandson Charles V was able to transform the power and wealth that Maximilian had accumulated into the largest and most potent international force of the early modern period.

Medici, Cosimo de' (1389–1464): Banker by training but politician by inclination, before his exile in 1433, Cosimo opposed the policies of the Florentine government and was punished for his views and tactics. After his return to power in 1434, he became the de facto ruler of the city, manipulating the electoral process and orchestrating public policy from behind the scenes—all to the benefit of the city, which enjoyed an age of peace and prosperity during his reign.

Medici, Giovanni de': See **Leonardo X**.

Medici, Giuliano di Lorenzo de' (1479–1516): The third son of Lorenzo di Piero de' Medici (a.k.a. Lorenzo the Magnificent), Giuliano was one of the leaders of the coup d'état that reinstated his family as the governors of Florence in 1512. One of the characters in Baldassare Castiglione's *Book of the Courtier* and the person to whom Machiavelli's *The Prince* was originally dedicated, Giuliano was both a poet and a diplomat. He spent much of his time in Rome at the side of his brother, Pope Leonardo X, and was the patron of Leonardo da Vinci from 1513 to 1516.

Medici, Giuliano di Piero de' (1453–1478): The second son of Piero de' Medici and the grandson of Cosimo the Elder, Giuliano governed the city of Florence, together with his brother Lorenzo, from 1469 until his assassination in 1478.

Medici, Lorenzo di Piero de' (a.k.a. **Lorenzo the Magnificent**; 1449–1492): The first son of Piero de' Medici and the grandson of Cosimo the Elder, Lorenzo was known just as much for his interest in the arts and letters as he was a political ruler. In addition to governing the city for the duration of his adult life, Lorenzo created around himself one of Italy's most prominent courts of thinkers and writers. Included in his entourage were the philosophers Giovanni Pico della Mirandola and Marsilio Ficino and the artists Sandro Botticelli, Michelangelo Buonarroti, and Leonardo da Vinci.

Medici, Piero de' (1416–1469) The son of Cosimo the Elder and the father of Lorenzo the Magnificent, Piero the Gouty governed Florence for five years after his father's death in 1464.

Melzi, Francesco (c. 1491–1570): A painter of noble birth, Melzi joined the studio of Leonardo as a teenager and became a trusted member of the inner circle for the rest of Leonardo's life. Melzi inherited Leonardo's notes and writings and maintained them carefully until his own death.

Pacioli, Luca (1447–1517): Mathematician from Pavia who befriended Leonardo da Vinci late in the artist's tenure as a courtier in the Sforza court.

Perugino (a.k.a. **Pietro Vanucci**; 1446–1523): A native of the city of Perugia and an accomplished artist who worked in Perugia, Florence, and Rome during his highly successful career. Among his students was the painter Raphael.

Petrarch, Francesco (1304–1374): Bibliophile, poet, and philosopher, and one of the founders of early modern humanism. A keen student of ancient Roman history, Petrarch helped revive the study of antique Latin during the 14th century.

Pollaiuolo, Antonio (1433–1498): Prominent sculptor, painter, draftsman, and printmaker, Pollaiuolo and his brother Piero operated one of Florence's largest artistic workshops. He designed the sculptural tomb monument for Pope Sixtus IV and painted the influential altarpiece of *The Martyrdom of Saint Sebastian*, now in London.

Predis, Ambrogio de' (c. 1455–c. 1508): Milanese painter and colleague of Leonardo's in the 1480s who continued to work with and for Leonardo into the 16th century. The two artists collaborated on both versions of *The Madonna of the Rocks* (Paris and London).

Raphael (a.k.a. **Raffaello Sanzio** or **Raffaello Santi**; 1483–1520): Enormously talented painter and deft courtier who earned a reputation for artistic elegance and diplomatic skill during his years in Florence and Rome. A member of Julius II's entourage of artists from 1508 to 1513, Raphael painted frescoes in the Vatican (*The School of Athens*, 1512), portraits of his papal patrons (*Julius II*, 1512; *Leo X*, 1516), and altarpieces for Roman churches (*The Transfiguration of Christ*, 1518), before his sudden death at the age of 37.

Romano, Giulio (1499–1546): Painter and printmaker of great creativity and ingenuity who trained with Raphael and spent his youth assisting his master on the frescoes painted inside the Vatican Stanze. Romano left Rome after Raphael's death and spent 10 years designing and decorating the Palazzo del Te in Mantua.

Salai (a.k.a. **Gian Giacomo Caprotti da Oreno**; 1480–1524): Salai, or “the little devil,” was Leonardo’s assistant and colleague for 30 years. In 1519, he inherited from Leonardo *Mona Lisa*, *Saint Anne Madonna*, *John the Baptist*, and the now-lost *Leda and the Swan*, all of which passed into the hands of his sisters on his death. They, in turn, sold the pictures to King François I of France.

Sarto, Andrea del (1486–1530): Follower of Raphael and Leonardo who worked in the classical idiom, primarily in Florence. His best-known work is *The Madonna of the Harpies* (1517).

Savonarola, Fra Girolamo (1452–1498): Fiery preacher who opposed the humanistic interests of Lorenzo de' Medici and led the reactionary movement against the family in the 1490s. He organized bonfires of the vanities, in which common people burned the material possessions they were ashamed to own. He led the Florentine government from 1494 until 1498, when moderates overthrew him and burned him at the stake in the middle of the Piazza della Signoria.

Sforza, Francesco (1401–1466): Italian knight, mercenary soldier, and husband of Biana Maria Visconti. When his brother-in-law—Filippo Maria Visconti, duke of Milan—died without a male heir, Francesco claimed the throne. After a four-year war to determine the rightful ruler, Francesco was installed as the autocrat of Milan. His sons—Galeazzo Maria and Ludovico—forever worried that their father's method of attaining power was illegitimate, thus stained their own regimes.

Sforza, Galeazzo Maria (1444–1476): Known primarily for his cruelty, Galeazzo Maria Sforza inherited the throne of Milan from his father, Francesco, in 1466. His reputation as a bully, extortionist, and rapist helped forge an alliance of his enemies, and he was assassinated by members of his own court in 1476.

Sforza, Giangaleazzo (1469–1494): The legitimate and rightful heir to the throne of Milan after the assassination of his father, Galeazzo Maria, Giangaleazzo was outmaneuvered by his uncle, Ludovico, for control of Milan. He died at the age of 25, perhaps from poison.

Sforza, Ludovico (1452–1508): Leonardo's patron from 1482 to 1499, Ludovico Sforza came to power by wresting control from his sister-in-law, who was acting as regent on behalf of her infant son (who had inherited the throne of Milan after the assassination of Galeazzo Maria Sforza in 1476). Ludovico served—without official title—as the ruler of the city until Maximilian I made him duke of Milan in 1494. Ludovico was chased from Milan by a French army in 1499 and, after a brief return to the city the next year, was captured and imprisoned by them.

Sixtus IV (a.k.a. **Francesco della Rovere**; 1414–1484): A scholar of great intellect and sobriety who was elected pope in 1471 and helped solidify Rome’s place as a political and spiritual entity at the beginning of the High Renaissance. A large chapel was built to commemorate his victory over Florence in 1478, and in the early 1480s the artists Botticelli, Perugino, and Ghirlandaio helped decorate the side walls of his so-called Sistine Chapel.

Soderini, Piero (1450–1522): Gifted politician and a favorite of Lorenzo de’ Medici, after Lorenzo’s death in 1492 and the execution of Fra Savonarola in 1498, Soderini helped organize and then presided over the new republican government of Florence until its fall at the hands of the Medici during the coup d’etat of 1512. Soderini worked with both Leonardo and Michelangelo during the project to paint murals in the Salone dei 500 of the Palazzo della Signoria from 1503 to 1505.

Titian (a.k.a. **Tiziano Vecellio**; c. 1488/90–1576): Along with Giorgione, Titian is widely regarded as the greatest of all Venetian painters. After completing his studies with Giovanni Bellini around 1510, he went on to produce a series of highly influential oil paintings on canvas, including the *Assumption of the Virgin* for the church of the Frari, the *Venus of Urbino* in the Uffizi Gallery, and a series of portraits of Holy Roman Emperor Charles V.

Trivulzio, Giovanni (c. 1440–1518): Aristocrat, mercenary soldier, military commander, and political leader. Eager to establish a legacy for himself, he briefly engaged Leonardo da Vinci to produce designs for an equestrian monument in his honor. The project was dropped when Trivulzio took control of Milan in 1511 and focused his energies on matters of state.

Uccello, Paolo (1397–1475): Early practitioner of linear perspective and the painter of three battle scenes produced in the mid-15th century—each of which illustrates the *Battle of San Romano*—now in Paris, London, and Florence.

Vasari, Giorgio (1511–1574): Prolific painter, architect, and historian who worked for the Medici family in Florence during the 1550s and 1560s. He helped remodel the Palazzo della Signoria for the new duke, Cosimo I de’ Medici, and painted a number of pictures for the family, including the *Battle of Scannagallo*, which may have covered over Leonardo’s mural of the

Battle of Anghiari. Vasari is best known for his encyclopedic treatment of contemporary art, called *The Lives of the Artists*, which includes some of the earliest biographies of Leonardo, Raphael, and Michelangelo. The first edition appeared in 1550, and the second (corrected) version was published in 1568.

Veneziano, Domenico (c. 1410–1461): Northern Italian painter who came to Florence in search of commissions in the late 1430s. He quickly learned the trade secret of linear perspective and in 1445 produced one of the very best examples of a modern picture with his *Saint Lucy Altarpiece*, now in the Uffizi Gallery.

Verrocchio, Andrea del (c. 1435–1488): Exceptionally gifted sculptor and painter who operated one of Florence's largest and most successful artistic workshops during the 1460s and 1470s. Among his students were Perugino, Botticelli, and Ghirlandaio, and he went into a brief partnership with his most famous protégé—Leonardo da Vinci. Verrocchio is best known for *The Incredulity of Saint Thomas* for the Orsanmichele in Florence, *Putto with Dolphin* in the Palazzo della Signoria, and *The Monument of Bartolommeo Colleoni* that was cast posthumously and installed outside the Venetian church of Santissimi Giovanni e Paolo in 1496.

Vitruvius (c. 75 B.C.E.–c. 15 B.C.E.): Soldier and engineer in the Roman legions best known for his treatise *De architectura* (*On Architecture*), which articulates the building practices and design theories of antiquity. Vitruvius's lessons formed the foundation of architectural study during the 15th century, informed Leon Battista Alberti's approach to Renaissance architecture, and inspired Leonardo's drawing known as the *Vitruvian Man*.

Weyden, Rogier van der (c. 1400–1464): A Flemish painter of enormous skill who trained with Robert Campin and perfected the Northern European approach to early Renaissance painting that employed heavy shadows mixed with rich colors. He traveled to Italy in 1450 and lived for a time in Florence, thus helping introduce the traditions of his homeland to artists and audiences south of the Alps.

Bibliography

The scholarly literature dedicated to the life and career of Leonardo da Vinci is vast. Still, a few sources stand out. The first great monograph on Leonardo's career was by Kenneth Clark, whose *Leonardo da Vinci: An Account of His Development as an Artist* (1939) struck an excellent balance between the artist's life and work as a painter and courtier. Clark continued his examination of Leonardo's drawings for decades thereafter, including *The Drawings of Leonardo da Vinci in the Collection of Her Majesty the Queen at Windsor Castle* (1968). His legacy has been continued by Martin Kemp, whose monograph *Leonardo da Vinci: The Marvellous Works of Nature and Man* (1981) is the most comprehensive and sophisticated treatment of Leonardo's artistic career. David Alan Brown's important contributions include new findings and compelling hypotheses about Leonardo's early work in Florence, especially *Leonardo da Vinci: Origins of a Genius* (1998).

Works especially useful for placing Leonardo in the context of his times are Lauro Martines's *Power and Imagination: City-States in Renaissance Italy*; Peter Burke's *The Italian Renaissance: Culture and Society in Italy*; and *History of Italian Renaissance Art* by Frederick Hartt and David G. Wilkins, now in its 7th edition. Their approaches to politics, culture, and patronage help readers understand why works of art and architecture were so vital to Italian power brokers in the 15th and 16th centuries.

Among the more unorthodox interpretations of the artist's work is *Leonardo's Incessant Last Supper* (2001) by Leo Steinberg, which still stands as the most innovative and interesting interpretation of the mural in Milan. A catalog produced in tandem with an exhibition in London during the fall of 2011 and winter of 2012, edited by Luke Syson and titled *Leonardo da Vinci: Painter at the Court of Milan*, brings together an abundance of paintings, drawings, and documents about the artist and his circle of colleagues during his first Milanese period (1482–1499). The recently restored image of the *Salvator Mundi* is a featured component of the exhibition.

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Brown, David Alan. *Leonardo da Vinci: Origins of a Genius*. New Haven, CT: Yale University Press, 1998. Brown's book covers the early years of Leonardo's career as an apprentice and partner of Andrea del Verrocchio. His chapters on Leonardo's work as a sculptor and his paintings of the angel in the *Baptism of Christ*, the *Annunciation*, and his Florentine Madonnas are the most thorough summations of Leonardo's career up to 1478. Brown reviews the technical and interpretative history of Leonardo's portrait *Ginevra de' Benci* and places the picture in the context of Leonardo's development as a young artist in Florence during the 1470s.

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Most of the material chronicles his work as an inventor, and the material on aviation is most useful.

Maiorino, Giancarlo. *Leonardo da Vinci: The Daedalian Mythmaker*. University Park, PA: The Pennsylvania State University Press, 1992. Maiorino's book addresses Leonardo's philosophical nature and his use of drawings and paintings to express his beliefs, particularly Leonardo's drawings and designs of war machines, the *Vitruvian Man*, and the caricatures.

Mariotti, Josephine Rogers. *Monna Lisa: La ‘Gioconda’ del Magnifico Giuliano*. Florence: Polistampa, 2009. A thorough review of documentation surrounding the Giocondo family. Mariotti focuses on its affiliation with Giuliano de' Medici and the governors of Florence during the 16th century and argues that Giuliano saw Elisabetta as his muse of poetry, which inspired his commission of the portrait from Leonardo da Vinci.

Martines, Lauro. *Power and Imagination: City-States in Renaissance Italy*. New York: Knopf, 1979. Martines's broad survey of Italian political systems also addresses issues of art, education, economics, and philosophy. A brilliant blend of varying themes, his chapters on "The Princely Courts," "Art: An Alliance with Power," and "Invasion: City-States in Lightning and Twilight" are most pertinent for this course.

Masters, Roger. *Fortune is a River: Leonardo da Vinci and Niccolò Machiavelli's Magnificent Dream to Change the Course of Florentine History*. New York: The Free Press, 1998. An examination of the project to alter the course of the Arno River, this study also reviews the careers of Leonardo and Machiavelli before and after their work for the Florentine state.

Morley, Brian. "The Plant Illustrations of Leonardo da Vinci." *Burlington Magazine* 121, no. 918 (1979): 553–562. Examines a set of botanical drawings by Leonardo and identifies the flowers illustrated. Morley demonstrates that Leonardo's examination of plants was detailed and specific and merges the painter's interests in art and science nicely.

Nathan, Johannes. "Some Drawing Practices of Leonardo da Vinci: New Light on the *St. Anne*." *Mitteilungen des Kunsthistorischen Institutes in Florenz* 36, nos. 1/2 (1992): 85–102. Considers a number of studies that led to the completion of the cartoon of 1501, followed by the cartoon now in the British Museum. Nathan demonstrates the evolution of the theme in Leonardo's career.

Nicholl, Charles. *Leonardo da Vinci: Flights of the Mind*. New York: Viking Press, 2004. This lengthy summary of the artist's career includes a discussion of his work with Verrocchio as an apprentice and his work on his arrival at Ludovico Sforza's court in 1482. Among the projects examined here is the *Madonna of the Rocks*, which is considered from the perspective of both the artist and the institutional patron that rejected it.

O'Malley, Charles Donald, ed. *Leonardo's Legacy: An International Symposium*. Berkeley: University of California Press, 1969. A collection of essays examining Leonardo's interests in physiology, architecture, engineering, and philosophy.

Pallanti, Giuseppe. *Mona Lisa Revealed: The True Identity of Leonardo's Model*. London: Thames and Hudson, 2006. Pallanti's short review of the documentation pertaining to the Giocondo family of Florence summarizes conventional interpretations of the painting and the circumstances of its commission. The author also presents observations about the career of Leonardo and argues that there was a personal relationship between the artist and the sitter that influenced his representation of Elisabetta.

Partridge, Loren. *Renaissance Rome*. Upper Saddle River, NJ: Prentice Hall, 1996. A review of the court of Pope Julius II and the contextual circumstances that motivated papal patronage at the turn of the 16th century. Short and focused, this book is an excellent introduction to the period and its main characters.

Pedretti, Carlo. *The Codex Atlanticus of Leonardo da Vinci: A Catalogue of Its Newly Restored Sheets*. 2 vols. New York: Johnson Reprint, 1978–1979. A thorough and exhaustive study of the largest collection of notes and drawings by Leonardo da Vinci. Pedretti examines the technical designs of the artist and considers them in the context of his work for Ludovico Sforza.

_____. *Leonardo Architect*. Translated by Sue Brill. New York: Rizzoli, 1981. An exhaustive survey of Leonardo's architectural, engineering, and sculptural drawings. Includes an examination of Leonardo's town planning for Pavia and Milan, his vision for the church of Santa Maria delle Grazie, and his conceptual drawings for structures conceived in collaboration with Donato Bramante.

_____. *Leonardo da Vinci: The Royal Palace at Romorantin*. Cambridge, MA: Harvard University Press, 1972. Pedretti argues that the designs for the French palace at Romorantin reflect Leonardo's earlier architectural conceptions.

Phillips, William D., Jr. and Carla Rahn Phillips. *The Worlds of Christopher Columbus*. New York: Cambridge University Press, 1992. An excellent survey of the life of the Genoese explorer. William and Carla Phillips describe the traditions that shaped his formative years and the results of his exploration of the Caribbean Sea in the 1490s.

Radke, Gary. *Leonardo da Vinci and the Art of Sculpture*. New Haven: Yale University Press, 2009. An exhibition catalogue dedicated to Leonardo's preliminary work for the Colossus of Milan, this book examines in detail various components of the project, including the complicated method of casting the bronze horse. Also addresses the problems faced (and the solutions found) by Leonardo during his work on the project for the *Trivulzio Monument*. An excellent treatment of one of Leonardo's least studied mediums.

Reti, Ladislao. "The Two Unpublished Manuscripts of Leonardo da Vinci in the Biblioteca Nacional of Madrid – II," *Burlington Magazine* 110, no. 779 (1968): 81–91. Motivated by the discovery of a new manuscript by Leonardo da Vinci in Spain, Reti published the inventory of Leonardo's library holdings in 1503, with comments on the books he owned and read. This article was an important contribution to Leonardo studies in that it alerted scholars to the artist's interests and personal education.

Richner, Jean Paul, trans. *The Diaries of Leonardo da Vinci*. New Orleans: Cornerstone Books, 2007. An exhaustive translation of hundreds of pages of notes by Leonardo da Vinci.

Richter, Irma. *Leonardo da Vinci: Notebooks*. 3rd edition. Thereza Wells, ed. and trans. New York: Oxford University Press, 2008. This selective compilation of notes and drawings includes his observations on flight, mechanics, physics, the arts, and philosophy.

Robison, Pauline Maguire. “Leonardo’s *Trattato della Pittura*, Nicolas Poussin, and the Pursuit of Eloquence in Seventeenth-Century France.” In *Leonardo da Vinci and the Ethics of Style*, edited by Claire Farago, 189–236. Manchester, UK: Manchester University Press, 2008. Robison examines the project undertaken by Nicolas Poussin to illustrate the first published version of Leonardo’s *Treatise on Painting*. The French painter’s debts to Leonardo, Raphael, and Italian classicism are considered in the context of ancient literature and the ideal of intellectual eloquence.

Rocke, Michael. *Forbidden Friendships: Homosexuality and Male Culture in Renaissance Florence*. New York: Oxford University Press, 1996. The first—and best—examination of homosexuality in 15th-century Florence, Rocke’s important study reviews the laws against sodomy, the punishments meted out to the guilty, and the standards and expectations of society at large. Rocke’s work helps us put Leonardo’s indiscretion of 1476 squarely in the context of normative behavioral patterns of the age.

Rosand, David. *Painting in Cinquecento Venice*. New Haven, CT: Yale University Press, 1982. Through case studies, Rosand makes the point that Venetian painting of the 16th century was fundamentally different from its Florentine and Roman rivals in both technique and execution.

Schapiro, Meyer. “Leonardo and Freud: An Art-Historical Study,” *Journal of the History of Ideas* 17, no. 2 (1956): 147–178. Schapiro reviewed Freud’s essay from 1910 (see above) but offered an alternative interpretation, arguing that Leonardo’s recollection invoked a medieval legend that promoted the theory that genius was passed along to human beings by the touch of a kite’s tail to their lips.

Shearman, John. “Leonardo’s Colour and Chiaroscuro,” *Zeitschrift für Kunstgeschichte* 25, no. 1 (1962): 13–47. A lengthy discussion of the use of color and light in Leonardo’s paintings. Shearman argues that the *Madonna*

of the Rocks serves as an early illustration of Leonardo's theory of painting, which includes a tonal unity within paintings and depends on the use of light as a dramatic effect.

_____. *Mannerism*. New York: Penguin Books, 1967. The best description and definition of the cultural period that evolved out of Leonardo's classical age. Shearman's interest in fountains, gardens, and theatrical performances places sculptures and paintings into an important context.

Simons, Patricia. "Women in Frames: The Gaze, the Eyes, the Profile in Renaissance Portraiture." In *The Expanding Discourse: Feminism and Art History*, edited by Norma Broude and Mary D. Garrard, 39–57. New York: Icon Editions, 1992. This essay notes the custom of painting women in profile during the 15th century and argues that this artistic choice was tied to the social and cultural status of women at the time. An extremely important and influential essay in the history of Italian Renaissance studies.

Steinberg, Leo. *Leonardo's Incessant Last Supper*. New York: Zone Books, 2001. Steinberg's inventive (and unconventional) reading of *The Last Supper* argues that the painting was not a static image but rather touched on a variety of themes and subjects all at once. Still the most interesting approach to the mural in scholarly literature.

Stites, Raymond S. *The Sublimations of Leonardo da Vinci*. Washington, DC: Smithsonian Institution, 1970. Along with a translation of the Codex Trivulzianus, Stites connects the artistic and technical drawings of Leonardo to his painterly projects, including *The Adoration of the Magi*, *The Madonna of the Rocks*, and the other paintings produced by Leonardo during the early years of his tenure at the court of Ludovico Sforza.

Strathern, Paul. *The Artist, the Philosopher, and the Warrior: The Intersecting Lives of Da Vinci, Machiavelli, and Borgia and the World They Shaped*. New York: Bantam Books, 2009. Mostly a study of the patron and his interests. Strathern recounts the works and interests of Cesare Borgia in 1502, with an emphasis on his use of Leonardo and Machiavelli to further them.

Suh, H. Anna, ed. *Leonardo's Notebooks*. New York: Black Dog and Leventhal, 2005. This book is divided into sections according to the categories of Leonardo's interests. Unlike other collections of designs, this book includes translations of Leonardo's backwards notes that describe how his inventions were supposed to work.

Syson, Luke, ed. *Leonardo da Vinci: Painter at the Court of Milan*. London: Yale University Press, 2011. This exhibition catalog from the National Gallery's show of Leonardo's drawings and paintings produced in Milan during the 1480s and 1490s reviews the artist's work for Ludovico Sforza. Images and arguments work together nicely here, and the catalog of works—including the *Salvator Mundi* (attributed to Leonardo in 2011)—defines the School of Leonardo thoroughly.

Syson, Luke, and Rachel Billinge. "Leonardo da Vinci's Use of Underdrawing in the 'Virgin of the Rocks' in the National Gallery and 'St. Jerome' in the Vatican," *Burlington Magazine* 147, no. 1228 (2005): 450–463. Considers the preparatory studies and the iconographic features of these two paintings from the early mature phase of Leonardo's career.

Travers Newton, H., and John Spencer. "On the Location of Leonardo's *Battle of Anghiari*." *The Art Bulletin* 64, no. 1 (1982): 45–52. Reports on an ultrasonic examination of the Salone dei Cinquecento, which indicates that the *Battle of Anghiari* is located on the west wall of the room and that enough of the mural survives to warrant a temporary removal of Vasari's painting that covers it today.

Turner, Richard. *Inventing Leonardo*. New York: Alfred A. Knopf, 1993. Turner addresses the myths, legends, and misconceptions about Leonardo da Vinci and argues that many of them were born of the period in which they were promulgated.

Vasari, Giorgio. *The Lives of the Artists*. Translated by Julia Conaway Bondanella and Peter Bondanella. New York: Oxford University Press, 1991. The first modern book of art history, Vasari's *Lives* contains the first

attempt to piece together a biography of Leonardo da Vinci. It used a mixture of factual information, personal observation, gossip, legend, and hypothesis.

Verdon, Timothy. "Pagans in the Church: The *School of Athens* in Religious Context." In *Raphael's School of Athens*, edited by Marcia Hall, 114–130. New York: Cambridge University Press, 1997. A thoughtful interpretation of Raphael's famous fresco, which identifies the various scholars depicted there as well as some of the contemporary portraits that Raphael included.

Wallace, William. "Michelangelo In and Out of Florence Between 1500 and 1508." In *Leonardo, Michelangelo, and Raphael in Renaissance Florence from 1500 to 1508*, edited by Serafina Hager, 55–88. Washington, DC: Georgetown University Press, 1992. A brief account of Michelangelo's works during his Florentine period, Wallace's essay includes commentary on the cartoon of the *Battle of Cascina*.

Wasserman, Jack. "The Dating and Patronage of Leonardo's Burlington House Cartoon," *Art Bulletin* 53, no. 3 (1971): 312–325. Addresses the stylistic similarities between the London cartoon of the *St. Anne Madonna* and the *Madonna of the Yarnwinder*. Wasserman suggests that the patron for the cartoon was Louis XII of France.

Wittkower, Richard. *Architectural Principles in the Age of Humanism*. New York: W. W. Norton, 1971. A brilliant iconographic reading of Renaissance buildings, Wittkower's analysis includes an examination of Neoplatonic themes and the use of harmonic proportions in architecture of the period.

Zammattio, Carlo. "The Mechanics of Water and Stone." In *The Unknown Leonardo*, edited by Ladislao Reti, 190–215. London: McGraw-Hill, 1974. This chapter in a book of Leonardo's private notes and drawings features the engineer's interest in hydraulics and his experimental attempts to harness water power.

Zöllner, Frank, and Johannes Nathan. *Leonardo da Vinci: The Complete Paintings and Drawings*, 2 vols. London: Taschen, 2003. An overview of Leonardo's artistic career, with excellent color reproductions of his painterly works.

Zwijnenberg, Robert. “*St. John the Baptist* and the Essence of Painting.” In *Leonardo da Vinci and the Ethics of Style*, edited by Claire Farago, 96–118. Manchester, UK: Manchester University Press, 2008. Zwijnenberg argues that *John the Baptist* is an experimental picture in which Leonardo tested his theories on painting, sfumato, light, and gesture.