

Leonardo da Vinci

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Leonardo di ser Piero da Vinci (pronunciation), April 15, 1452 – May 2, 1519) was an Italian polymath; a scientist, mathematician, engineer, inventor, anatomist, painter, sculptor, architect, botanist, musician and writer. Born as the illegitimate son of a notary, Piero da Vinci, and a peasant girl, Caterina, at Vinci in the region of Florence, Leonardo was educated in the studio of the renowned Florentine painter, Verrocchio. Much of his earlier working life was spent in the service of Ludovico il Moro in Milan. He later worked in Rome, Bologna and Venice, spending his final years in France at the home given to him by King François I.

Leonardo has often been described as the archetype of the " Renaissance man", a man whose seemingly infinite curiosity was equalled only by his powers of invention. He is widely considered to be one of the greatest painters of all time and perhaps the most diversely talented person ever to have lived.

It is primarily as a painter that Leonardo was and is renowned. Two of his works, the *Mona Lisa* and *The Last Supper* occupy unique positions as the most famous, most reproduced and most parodied portrait and religious painting of all time, their fame approached only by Michelangelo's *Creation of Adam*. Leonardo's drawing of the *Vitruvian Man* is also iconic. Perhaps fifteen of his paintings survive, the small number due to his constant, and frequently disastrous, experimentation with new techniques, and his chronic procrastination. Nevertheless, these few works together with his notebooks, which contain drawings, scientific diagrams, and his thoughts on the nature of painting, comprise a contribution to later generations of artists only rivalled by that of his contemporary, Michelangelo.

As an engineer, Leonardo's ideas were vastly ahead of his time. He conceptualised a helicopter, a tank, concentrated solar power, a calculator, the double hull and outlined a rudimentary theory of plate tectonics. Relatively few of his designs were constructed or were even feasible during his lifetime, but some of his smaller inventions, such as an automated bobbin winder and a machine for testing the tensile strength of wire, entered the world of manufacturing unheralded. As a scientist, he greatly advanced the state of knowledge in the fields of anatomy, civil engineering, optics, and hydrodynamics.

Biography

Leonardo da Vinci



Self-portrait in red chalk, circa 1512 to 1515.

Birth name Leonardo di Ser Piero

Born April 15, 1452

Vinci, Florence, in present-day
Italy

Died May 2, 1519 (aged 67)
Amboise, Indre-et-Loire, in
present-day France

Nationality Italian

Early life, 1452–1466

Leonardo was born on April 15, 1452, "at the third hour of the night" in the Tuscan hill town of Vinci, in the lower valley of the Arno River in the territory of Florence, and lived for his first five years in the nearby hamlet of Anchiano. He was the illegitimate son of Messer Piero Fruosino di Antonio da Vinci, a Florentine notary, and Caterina, a peasant. There is evidence that Caterina was a slave from the Middle East, Leonardo had no surname in the modern sense, "*da Vinci*" simply meaning "of Vinci": his full birth name was "Leonardo di ser Piero da Vinci", meaning "Leonardo, son of (Mes)ser Piero from Vinci." Little is known about his early life, which has been the subject of historical conjecture by Vasari and others. At the age of five, he went to live in the household of his father, grandparents and uncle, Francesco, in the small town of Vinci, where his father had married a sixteen-year-old girl named Albiera, who loved Leonardo but who died young.

Leonardo was later to record only two incidents of his childhood. One, which he regarded as an omen, was when a kite dropped from the sky and hovered over his cradle, its tail feathers brushing his face. The second incident occurred while he was exploring in the mountains. He discovered a cave and recorded his emotions at being, on one hand, terrified that some great monster might lurk there and on the other, driven by curiosity to find out what was inside.

Vasari, the 16th century biographer of Renaissance painters, tells the story of how a local peasant requested that Ser Piero ask his talented son to paint a picture on a round plaque. Leonardo responded with a painting of snakes spitting fire which was so terrifying that Ser Piero sold it to a Florentine art dealer, who sold it to the Duke of Milan. Meanwhile, having made a profit, Ser Piero bought a plaque decorated with a heart pierced by an arrow, which he gave to the peasant.

Verrocchio's workshop, 1466–1476

Field Many and diverse fields of arts and sciences

Movement High Renaissance

Works *Mona Lisa*, *The Last Supper*, *The Vitruvian Man*



Leonardo's earliest known drawing, the Arno Valley, (1473) - Uffizi

In 1466, at the age of fourteen, Leonardo was apprenticed to one of the most successful artists of his day, Andrea di Cione, known as Verrocchio. The workshop of this renowned master was at the centre of the intellectual currents of Florence, assuring the young Leonardo of an education in the humanities. Among the painters apprenticed or associated with the workshop and also to become famous, were Ghirlandaio, Perugino, Botticelli, and Lorenzo di Credi.

In a Quattrocento workshop such as Verrocchio's, artists were regarded primarily as craftsmen and only the master such as Verrocchio had social standing. The products of a workshop included decorated tournament shields, painted dowry chests, christening platters, votive plaques, small portraits, and devotional pictures. Major commissions included altarpieces for churches and commemorative statues. The largest commissions were fresco cycles for chapels, such as those created by Ghirlandaio and his workshop in the Tornabuoni Chapel, and large statues such as the equestrian statues of *Gattamelata* by Donatello and *Bartolomeo Colleoni* by Verrocchio.

As an apprentice, Leonardo would have been trained in the diverse skills employed in a traditional workshop of that era. Although many craftsmen specialised in tasks such as frame-making, gilding and bronze casting, Leonardo would have been exposed to a vast range of technical skills and had the opportunity to learn drafting, chemistry, metallurgy, metal working, plaster casting, leather working, mechanics and carpentry as well as the obvious artistic skills of drawing, painting, sculpting and modelling.



The Baptism of Christ (1472–1475)—
Uffizi, by Verrocchio and Leonardo

Although Verrocchio appears to have run an efficient and prolific workshop, he was primarily a goldsmith and metalworker. Most of the painted production of his workshop was done by his employees, and few paintings can be ascertained as coming from his hand. On one of those, according to Vasari, Leonardo collaborated. The painting is the *Baptism of Christ*. According to Vasari, Leonardo painted the young angel holding Jesus' robe in a manner that was so far superior to his master's that Verrocchio put down his brush and never painted again. This is probably an exaggeration. On close examination, the painting reveals much that has been painted or touched up over the tempera using the new technique of oil paint. The landscape, the rocks that can be seen through the brown mountain stream and much of the figure of Jesus bears witness to the hand of Leonardo.

The other creation of Verrocchio's which is pertinent to the young Leonardo is the bronze statue of *David*, now in the Bargello Museum, which according to tradition is a portrait of the apprentice, Leonardo. If this is the case, then in the figure of David we see Leonardo as a thin muscular boy, quite different to the rounded androgynous figure made by Verrocchio's teacher, Donatello and with which it is often compared. It is also suggested that the Archangel Michael in Verrocchio's *Tobias and the Angel* is a portrait of Leonardo.

There are few records from this period of Leonardo's life. One is his earliest known dated work, a drawing done in pen and ink of the Arno valley, drawn on 5 August 1473. By 1472, at the age of twenty, Leonardo qualified as a master in the Guild of St Luke, the guild of artists and doctors of medicine, but even after his father set him up in his own workshop, his attachment to Verrocchio was such that he continued to collaborate with him.

Professional life, 1476–1513

Adoration of the Magi, return to text

It is assumed that Leonardo had his own workshop in Florence between 1476 and 1481. Court records of 1476 show that, with three other young men, he was charged with sodomy, of which charge all were acquitted. From that date until 1478 there is no record of his work or even of his whereabouts.

In 1478 he was commissioned to paint an altarpiece for the Chapel of St Bernard. In 1481 the Monks of San Donato a Scopeto commissioned *The Adoration of the Magi*. In 1482 Leonardo, who according to Vasari was a most talented musician, created a silver lyre in the shape of a horse's head. Lorenzo de' Medici was so impressed that he decided to send both the lyre and its maker to Milan, in order to secure peace with Ludovico il Moro, Duke of Milan. At this time Leonardo wrote an often-quoted letter to Ludovico, describing the many marvellous and diverse things that he could achieve in the field of engineering and informing the Lord that he could also paint.

Between 1482 and 1499, when Louis XII of France occupied Milan, much of Leonardo's work was in that city. It was there that he was commissioned to paint two of his most famous works, the *Virgin of the Rocks* for the Confraternity of the Immaculate Conception, and *The Last Supper* for the monastery of Santa Maria delle Grazie. While living in Milan between 1493 and 1495 Leonardo listed a woman called Caterina as among his dependents in his taxation documents. When she died in 1495, the detailed list of expenditure on her funeral suggests that she was his mother rather than a servant girl.



The Adoration of the Magi, (1481)—
Uffizi, Florence, Italy. This important
commission was interrupted when Leonardo
went to Milan.



Study of horse from
Leonardo's journals –
Royal Library, Windsor
Castle

He worked on many different projects for Ludovico, including the preparation of floats and pageants for special occasions, designs for a dome for Milan Cathedral and a model for a huge equestrian monument to Francesco Sforza, Ludovico's predecessor. Leonardo modelled a huge horse in clay, which became known as the "Gran Cavallo". It surpassed in size the only two large equestrian statues of the Renaissance, Donatello's statue of Gattamelata in Padua and Verrocchio's Bartolomeo Colleoni in Venice. Seventy tons of bronze were set aside for casting it. The monument remained unfinished for several years, which was not in the least unusual for Leonardo. In 1492 the clay model of the horse was completed, and Leonardo was making detailed plans for its casting. Michelangelo rudely implied that Leonardo was unable to cast it. In November 1494 Ludovico gave the bronze to be used for cannons to defend the city from invasion by Charles VIII.

In 1499, Charles VIII's successor, Louis XII, returned to conquer Milan. The invading French troops used the life-size clay model for the "Gran Cavallo" for target practice. With Ludovico Sforza overthrown, Leonardo, with his assistant Salai and friend, the mathematician Luca Pacioli, fled Milan for Venice, where he was employed as a military architect and engineer, devising methods to defend the city from naval attack.

On his return to Florence in 1500, he and his household were guests of the Servite monks at the monastery of Santissima Annunziata and were provided with a workshop where, according to Vasari, Leonardo created the cartoon of *The Virgin and Child with St. Anne and St. John the Baptist*, a work that won such admiration that "men and women, young and old" flocked to see it "as if they were attending a great festival". In

1502 Leonardo entered the service of Cesare Borgia, the son of Pope Alexander VI, acting as a military architect and engineer and travelling throughout Italy with his patron. He returned to Florence where he rejoined the Guild of St Luke on 18 October 1503, and spent two years designing and painting a great mural of *The Battle of Anghiari* for the Signoria, with Michelangelo designing its companion piece, *The Battle of Cascina*. In Florence in 1504, he was part of a committee formed to relocate, against the artist's will, Michelangelo's statue of David.

In 1506 he returned to Milan, which by then was in the hands of Maximilian Sforza after Swiss mercenaries had driven out the French. Many of Leonardo's most prominent pupils or followers in painting either knew or worked with him in Milan, including Bernardino Luini, Giovanni Antonio Boltraffio and Marco D'Oggione. However, he did not stay in Milan for long because his father had died in 1504, and in 1507 he was back in Florence trying to sort out problems with his brothers over his father's estate. By 1508 he was back in Milan, living in his own house in Porta Orientale in the parish of Santa Babila.

Old age

From September 1513 to 1516, Leonardo spent much of his time living in the Belvedere in the Vatican in Rome, where Raphael and Michelangelo were both active at the time. In October 1515, François I of France recaptured Milan. On 19th December, Leonardo was present at the meeting of François I and Pope Leo X, which took place in Bologna. It was for François that Leonardo was commissioned to make a mechanical lion which could walk forward, then open its chest to reveal a cluster of lilies. In 1516, he entered François' service, being given the use of the manor house Clos Lucé near the king's residence at the royal Chateau Amboise. It was here that he spent the last three years of his life, accompanied by his friend and apprentice, Count Francesco Melzi, supported by a pension totalling 10,000 scudi.

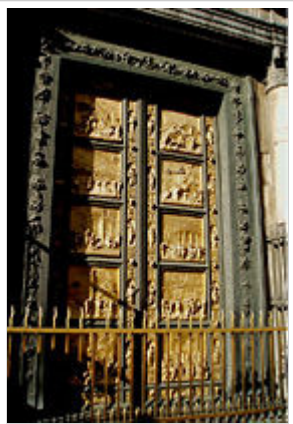
Leonardo died at Clos Lucé, France, on May 2, 1519. François I had become a close friend. Vasari records that the King held Leonardo's head in his arms as he died, although this story, beloved by the French and portrayed in romantic paintings by Ingres, Ménageot and other French artists, may be legend rather than fact. Vasari also tells us that in his last days, Leonardo sent for a priest to make his confession and to receive the Holy Sacrament. In accordance to his will, sixty beggars followed his casket. He was buried in the Chapel of Saint-Hubert in the castle of Amboise. Melzi was the principal heir and executor, receiving as well as money, Leonardo's paintings, tools, library and personal effects. Leonardo also remembered his other long-time pupil and companion, Salai and his servant Battista di Vilussis, who each received half of Leonardo's vineyards, his brothers who received land, and his serving woman who received a black cloak of good stuff with a fur edge.

Some twenty years after Leonardo's death, François was reported by the goldsmith and sculptor Benevenuto Cellini as saying: "There had never been another man born in the world who knew as much as Leonardo, not so much about painting, sculpture and architecture, as that he was a very great philosopher."

Relationships and influences



Clos Lucé in France, where
Leonardo died in 1519



Ghiberti's *Gates of Paradise*, (1425-1452) were a source of communal pride. Many artists assisted in their creation.

Florence—Leonardo's artistic and social background

Leonardo commenced his apprenticeship with Verrocchio in 1466, the year that Verrocchio's master, the great sculptor Donatello, died. The painter Uccello whose early experiments with perspective were to influence the development of landscape painting, was a very old man. The painters Piero della Francesca and Fra Filippo Lippi, sculptor Luca della Robbia, and architect and writer Alberti were in their sixties. The successful artists of the next generation were Leonardo's teacher Verrocchio, Antonio Pollaiuolo and the portrait sculptor, Mino da Fiesole whose lifelike busts give the most reliable likenesses of Lorenzo Medici's father Piero and uncle Giovanni.

Leonardo's youth was spent in a Florence that was ornamented by the works of these artists and by Donatello's contemporaries, Masaccio whose figurative frescoes were imbued with realism and emotion and Ghiberti whose *Gates of Paradise*, gleaming with gold leaf, displayed the art of combining complex figure compositions with detailed architectural backgrounds. Piero della Francesca had made a detailed study of perspective, and was the first painter to make a scientific study of light. These studies and Alberti's *Treatise* were to have a profound effect on younger artists and in particular on Leonardo's own observations and artworks.

Massaccio's depiction of the naked and distraught Adam and Eve leaving the Garden of Eden created a powerfully expressive image of the human form, cast into three dimensions by the use of light and shade which was to be developed in the works of Leonardo in a way that was to be influential in the course of painting. The Humanist influence of Donatello's *David* can be seen in Leonardo's late

paintings, particularly *John the Baptist*.

A prevalent tradition in Florence was the small altarpiece of the Virgin and Child. Many of these were created in tempera or glazed terracotta by the workshops of Filippo Lippi, Verrocchio and the prolific della Robbia family. Leonardo's early Madonnas such as the *The Madonna with a carnation* and *The Benois Madonna* followed this tradition while showing indiosyncratic departures, particularly in the case of the Benois Madonna in which the Virgin is set at an oblique angle to the picture space with the Christ Child at the opposite angle. This compositional theme was to emerge in Leonardo's later paintings such as *The Virgin and Child with St. Anne*.

Leonardo was a contemporary of Botticelli, Ghirlandaio and Perugino, who were all slightly older than he was. He would have met them at the workshop of Verrocchio, with whom they had associations, and at the Academy of the Medici. Botticelli was a particular favourite of the Medici family and thus his success as a painter was assured. Ghirlandaio and Perugino were both prolific and ran large workshops. They competently delivered commissions to well-satisfied patrons who appreciated Ghirlandaio's ability to portray the wealthy citizens of Florence within large religious frescoes, and Perugino's ability to deliver a multitude of saints and angels of unflinching sweetness and innocence.



A small devotional picture by Verrocchio, c. 1470



The Portinari Altarpiece, by Hugo van der Goes for a Florentine family

These three were among those commissioned to paint the walls of the Sistine Chapel, the work commencing with Perugino's employment in 1479. Leonardo was not part of this prestigious commission. His first significant commission, *The Adoration of the Magi* for the Monks of Scopeto, was never completed.

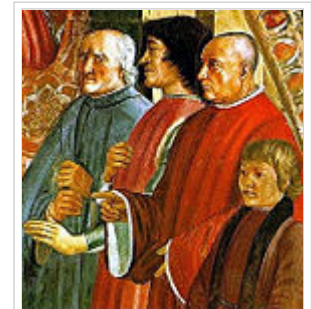
In 1476, during the time of Leonardo's association with Verrocchio's workshop, Hugo van der Goes arrived in Florence, bringing *the Portinari Altarpiece* and the new painterly techniques from Northern Europe which were to profoundly effect Leonardo, Ghirlandaio, Perugino and others. In 1479, the Sicilian painter Antonello da Messina, who worked exclusively in oils, travelled north on his way to Venice, where the leading painter, Giovanni Bellini adopted the technique of oil painting, quickly making it the preferred method in Venice. Leonardo was also later to visit Venice.

Like the two contemporary architects, Bramante and Antonio da Sangallo the Elder, Leonardo experimented with designs for centrally-planned churches, a number of which appear in his journals, as both plans and views, although none was ever realised.

Leonardo's political contemporaries were Lorenzo Medici (il Magnifico), who was three years older, and his popular younger brother Giuliano who was slain in the Pazzi Conspiracy in 1478. Ludovico il Moro who ruled Milan between 1479–1499 and to whom Leonardo was sent as ambassador from the Medici court, was also of Leonardo's age.

With Alberti, Leonardo visited the home of the Medici and through them came to know the older Humanist philosophers of whom Marsiglio Ficino, proponent of Neo Platonism, Cristoforo Landino, writer of commentaries on Classical writings, and John Argyropoulos, teacher of Greek and translator of Aristotle were foremost. Also associated with the Academy of the Medici was Leonardo's contemporary, the brilliant young poet and philosopher Pico della Mirandola. Leonardo later wrote in the margin of a journal "The Medici made me and the Medici destroyed me." While it was through the action of Lorenzo that Leonardo was to receive his important Milanese commissions, it is not known exactly what Leonardo meant by this cryptic comment.

Although usually named together as the three giants of the High Renaissance, Leonardo, Michelangelo and Raphael were not of the same generation. Leonardo was 23 when Michelangelo was born and 31 when Raphael was born. The short-lived Raphael died in 1520, the year after Leonardo, but Michelangelo went on creating for another 45 years.



Lorenzo de' Medici between Antonio Pucci and Francesco Sassetti, with Giulio de' Medici, fresco by Ghirlandaio



Study for a portrait of Isabella d'Este (1500) Louvre. Isabella appears to have been his only female friend.

Personal life

Leonardo had many friends who are now renowned either in their fields or for their historical significance. They included the mathematician Luca Pacioli, with whom he collaborated on a book in the 1490s, and Cesare Borgia, whose service he was in from 1502–1503. During that time he also met Niccolò Machiavelli, with whom he later developed a close friendship. Also among his friends were Franchinus Gaffurius and Isabella d'Este. Leonardo appears to have had no close relationships with women except for Isabella d'Este. He drew a portrait of her while on a journey which took him through Mantua, and which appears to have been used to create a painted portrait now lost.

Beyond friendship, Leonardo kept his private life secret. Within his own lifetime his extraordinary powers of invention, his "outstanding physical beauty", "infinite grace", "great strength and generosity", "regal spirit and tremendous breadth of mind" as described by Vasari attracted the curiosity of others. Many authors have speculated on various aspects of Leonardo's personality. His sexuality has often been the subject of study, analysis and speculation. This trend began in the mid-16th century and was revived in the 19th and 20th centuries, most notably by Sigmund Freud.

Leonardo's most intimate relationships were perhaps with his pupils Salai and Melzi, Melzi writing that Leonardo's feelings for him were both loving and passionate. It has been claimed since the 16th century that these relationships were of an erotic nature. Since then much has been written about Leonardo's presumed homosexuality and its role in his art, particularly in the androgyny and eroticism manifested in *John the Baptist* and *Bacchus*, and more explicitly in a number of drawings.

Assistants and pupils

Gian Giacomo Caprotti da Oreno, known as *il Salaino* ("The little devil) or *Salai*, was described by Giorgio Vasari as "a graceful and beautiful youth with fine curly hair, in which Leonardo greatly delighted". Il Salaino entered Leonardo's household in 1490 at the age of ten. The relationship was not an easy one. A year later Leonardo made a list of the boy's misdemeanours, calling him "a thief, a liar, stubborn, and a glutton", after he had made off with money and valuables on at least five occasions, and spent a fortune on clothes, including twenty-four pairs of shoes. Nevertheless, Leonardo's notebooks during their early years contain many pictures of the handsome, curly-haired adolescent. Salai remained his companion, servant, and assistant for the next thirty years.

In 1506, Leonardo took as a pupil Count Francesco Melzi, the fifteen-year-old son of a Lombard aristocrat. Melzi became Leonardo's life companion, and is considered to have been his favourite student. He travelled to France with Leonardo and Salai, and was with him until his death. Salai, however, left France in 1518 and returned to Milan, where he built a house in part of the vineyard owned by Leonardo, which was eventually bequeathed to him. In 1525 he died violently, either murdered or as the result of a duel.

Salai executed a number of paintings under the name of Andrea Salai, but although Vasari claims that Leonardo "taught him a great deal about painting", his work is generally considered to be of less artistic merit than others among Leonardo's pupils such as Marco



Salai as *John the Baptist* (c. 1514)—
Louvre

d'Oggione and Boltraffio. In 1515 he painted a nude version of the *Mona Lisa*, known as *Monna Vanna*. Salai owned the *Mona Lisa* at the time of his death in 1525, and in his will it was assessed at 505 lire, an exceptionally high valuation for a small panel portrait.

Painting

Despite the recent awareness and admiration of Leonardo as a scientist and inventor, for the better part of four hundred years his enormous fame rested on his achievements as a painter and on a handful of works, either authenticated or attributed to him that have been regarded as among the supreme masterpieces ever created.

These paintings are famous for a variety of qualities which have been much imitated by students and discussed at great length by connoisseurs and critics. Among the qualities that make Leonardo's work unique are the innovative techniques that he used in laying on the paint, his detailed knowledge of anatomy, light, botany and geology, his interest in physiognomy and the way in which humans register emotion in expression and gesture, his innovative use of the human form in figurative composition and his use of the subtle gradation of tone. All these qualities come together in his most famous painted works, the *Mona Lisa*, the *Last Supper* and the *Virgin of the Rocks*.

Early works

Leonardo's early works begin with the *Baptism of Christ* painted in conjunction with Verrocchio. Two other paintings appear to date from his time at the workshop, both of which are Annunciations. One is small, 59 cm (23 in) long and 14 cm (5.5 in) high. It is a "predella" to go at the base of a larger composition, in this case a painting by Lorenzo di Credi from which it has become separated. The other is a much larger work, 217 cm (85 in) long. In both these Annunciations, Leonardo has used a formal arrangement, such as in Fra Angelico's two well known pictures of the same subject, of the Virgin Mary sitting or kneeling to the right of the picture, approached from the left by an angel in profile, with rich flowing garment, raised wings and bearing a lily. Although previously attributed to Ghirlandaio, the larger work is now almost universally attributed to Leonardo.

In the smaller picture Mary averts her eyes and folds her hands in a gesture that symbolised submission to God's will. In the larger picture, however, Mary is not in the least submissive. The beautiful girl, interrupted in her reading by this unexpected messenger, puts a finger in her bible to mark the place and raises her hand in a formal gesture of greeting or surprise. This calm young woman appears to accept her role as the Mother of God not with resignation but with confidence. In this painting the young Leonardo presents the Humanist face of the Virgin Mary, recognising humanity's role in God's incarnation.



Annunciation (1475–1480)—Uffizi, is thought to be Leonardo's earliest complete work



Unfinished painting of *St. Jerome in the Wilderness*, (c. 1480), Vatican

Paintings of the 1480s

In the 1480s Leonardo received two very important commissions, and commenced another work which was also of groundbreaking importance in terms of composition. Unfortunately two of the three were never finished and the third took so long that it was subject to lengthy negotiations over completion and payment. One of these paintings is that of *St. Jerome in the Wilderness*. Bortolon associates this picture with a difficult period of Leonardo's life, and the signs of melancholy in his diary: "I thought I was learning to live; I was only learning to die."

Although the painting is barely begun the composition can be seen and it is very unusual. Jerome, as a penitent, occupies the middle of the picture, set on a slight diagonal and viewed somewhat from above. His kneeling form takes on a trapezoid shape, with one arm stretched to the outer edge of the painting and his gaze looking in the opposite direction. J. Wasserman points out the link between this painting and Leonardo's anatomical studies. Across the foreground sprawls his symbol, a great lion whose body and tail make a double spiral across the base of the picture space. The other remarkable feature is the sketchy landscape of craggy rocks against which the figure is silhouetted.

The daring display of figure composition, the landscape elements and personal drama also appear in the great unfinished masterpiece, the *Adoration of the Magi*, (see above) a commission from the Monks of San Donato a Scopeto. It is a very complex composition about

250 cm square. Leonardo did numerous drawings and preparatory studies, including a detailed one in linear perspective of the ruined classical architecture which makes part of the backdrop to the scene. But in 1482 Leonardo went off to Milan at the behest of Lorenzo de' Medici in order to win favour with Ludovico il Moro and the painting was abandoned.

The third important work of this period is the *Virgin of the Rocks* which was commissioned in Milan for the Confraternity of the Immaculate Conception. The painting, to be done with the assistance of the de Predis brothers, was to fill a large complex altarpiece, already constructed. Leonardo chose to paint an apocryphal moment of the infancy of Christ when the Infant John the Baptist, in protection of an angel, met the Holy Family on the road to Egypt. In this scene, as painted by Leonardo, John recognizes and worships Jesus as the Christ. The painting demonstrates an eerie beauty as the graceful figures kneel in adoration around the infant Christ in a wild landscape of tumbling rock and whirling water. While the painting is quite large, about 200 x 120 cms, it is not nearly as complex as the painting ordered by the monks of St Donato, having only four figures rather than about 50 and a rocky landscape rather than architectural details. The painting was eventually finished; in fact, two versions of the painting were finished, one which remained at the chapel of the Confraternity and the other which Leonardo carried away to France. But the Brothers did not get their painting, or the de Predis their payment, until the next century.

Paintings of the 1490s

Leonardo's most famous painting of the 1490s is *The Last Supper*, also painted in Milan. The painting represents the last meal



Virgin of the Rocks, National Gallery, London, possibly 1505–1508, demonstrates Leonardo's interest in nature.

shared by Jesus with his disciples before his capture and death. It shows specifically the moment when Jesus has said "one of you will betray me". Leonardo tells the story of the consternation that this statement caused to the twelve followers of Jesus.

The novelist Matteo Bandello observed Leonardo at work and wrote that some days he would paint from dawn till dusk without stopping to eat, and then not paint for three or four days at a time. This, according to Vasari, was beyond the comprehension of the prior, who hounded him until Leonardo ask Ludovico to intervene. Vasari describes how Leonardo, troubled over his ability to adequately depict the faces of Christ and the traitor Judas, told the Duke that he might be obliged to use the prior as his model.



The Last Supper (1498)— Convent of Sta. Maria delle Grazie, Milan, Italy

When finished, the painting was acclaimed as a masterpiece of design and characterisation, but it deteriorated rapidly, so that within a hundred years it was described by one viewer as "completely ruined". Leonardo, instead of using the reliable technique of fresco, had used tempera over a ground that was mainly gesso, resulting in a surface which was subject to mold and to flaking. Despite this, the painting has remained one of the most reproduced works of art, countless copies being made in every medium from carpets to cameos.

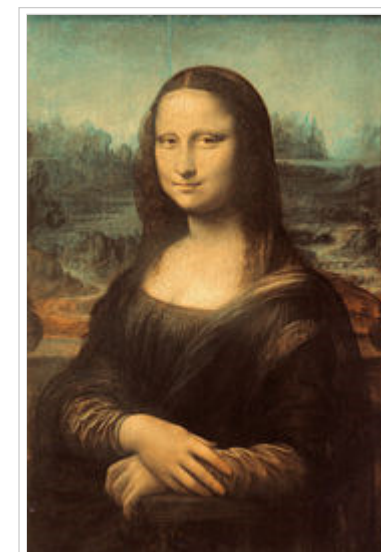
Paintings of the 1500s

Among the works created by Leonardo in the 1500s is the small portrait known as the *Mona Lisa* or "la Gioconda", the laughing one. The painting is famous, in particular, for the elusive smile on the woman's face, its mysterious quality brought about perhaps by the fact that the artist has subtly shadowed the corners of the mouth and eyes so that

the exact nature of the smile cannot be determined. The shadowy quality for which the work is renowned came to be called "sfumato" or Leonardo's smoke. Vasari, who is generally thought to have known the painting only by repute, said that "the smile was so pleasing that it seemed divine rather than human; and those who saw it were amazed to find that it was as alive as the original".

Other characteristics found in this work are the unadorned dress, in which the eyes and hands have no competition from other details, the dramatic landscape background in which the world seems to be in a state of flux, the subdued colouring and the extremely smooth nature of the painterly technique, employing oils, but laid on much like tempera and blended on the surface so that the brushstrokes are indistinguishable. Vasari expressed the opinion that the manner of painting would make even "the most confident master ... despair and lose heart." The perfect state of preservation and the fact that there is no sign of repair or overpainting is extremely rare in a panel painting of this date.

In the *Virgin and Child with St. Anne* (see below) the composition again picks up the theme of figures in a landscape which



Mona Lisa or *La Gioconda* (1503–1505/1507)—Louvre, Paris, France

Wasserman describes as "breathtakingly beautiful" and harks back to the St Jerome picture with the figure set at an oblique angle. What makes this painting unusual is that there are two obliquely-set figures superimposed. Mary is seated on the knee of her mother, St Anne. She leans forward to restrain the Christ Child as he plays roughly with a lamb, the sign of his own impending sacrifice. This painting, which was copied many times, was to influence Michelangelo, Raphael, and Andrea del Sarto, and through them Pontormo and Correggio. The trends in composition were adopted in particular by the Venetian painters Tintoretto and Veronese.

Drawings

Leonardo was not a prolific painter, but he was a most prolific draftsman, keeping journals full of small sketches and detailed drawings recording all manner of things that took his attention. As well as the journals there exist many studies for paintings, some of which can be identified as preparatory to particular works such as *The Adoration of the Magi*, *The Virgin of the Rocks* and *The Last Supper*. His earliest dated drawing is a *Landscape of the Arno Valley*, 1473, which shows the river, the mountains, Montelupo Castle and the farmlands beyond it in great detail.

Among his famous drawings are the *Vitruvian Man*, a study of the proportions of the human body, the *Head of an Angel*, for *The Virgin of the Rocks* in the Louvre, a botanical study of *Star of Bethlehem* and a large drawing (160×100 cm) in black chalk on coloured paper of the *The Virgin and Child with St. Anne and St. John the Baptist* in the National Gallery, London. This drawing employs the subtle *sfumato* technique of shading, in the manner of the *Mona Lisa*. It is thought that Leonardo never made a painting from it, the closest similarity being to *The Virgin and Child with St. Anne* in the Louvre.

Other drawings of interest include numerous studies generally referred to as "caricatures" because, although exaggerated, they appear to be based upon observation of live models. Vasari relates that if Leonardo saw a person with an interesting face he would follow them around all day observing them. There are numerous studies of beautiful young men, often associated with Salai, with the rare and much admired facial feature, the so-called "Grecian profile". These faces are often contrasted with that of a warrior. Salai is often depicted in fancy-dress costume. Leonardo is known to have designed sets for pageants with which these may be associated. Other, often meticulous, drawings show studies of drapery. A marked development in Leonardo's ability to draw drapery occurred in his early works. Another often-reproduced drawing is a macabre sketch that was done by Leonardo in Florence in 1479 showing the body of Bernardo Baroncelli, hanged in connection with the murder of Giuliano, brother of Lorenzo de' Medici, in the Pazzi Conspiracy. With dispassionate integrity Leonardo has registered in neat mirror writing the colours of the robes that Baroncelli was wearing when he died.

Leonardo as observer, scientist and inventor

Journals

Renaissance humanism saw no mutually exclusive polarities between the sciences and the arts, and Leonardo's studies in science and engineering are as impressive and innovative as his artistic work, recorded in notebooks comprising some 13,000 pages of notes and drawings, which fuse art and natural philosophy (the forerunner of modern science). These notes were made and maintained daily throughout Leonardo's life and travels, as he made continual observations of the world around him.

The journals are mostly written in mirror-image cursive. The reason may have been more a practical expediency than for reasons of secrecy as is often suggested. Since Leonardo wrote with his left hand, it is probable that it was easier for him to write from right to left.



A page from Leonardo's journal showing his study of a foetus in the womb (c. 1510) Royal Library, Windsor Castle

His notes and drawings display an enormous range of interests and preoccupations, some as mundane as lists of groceries and people who owed him money and some as intriguing as designs for wings and shoes for walking on water. There are compositions for paintings, studies of details and drapery, studies of faces and emotions, of animals, babies, dissections, plant studies, rock formations, whirl pools, war machines, helicopters and architecture.

These notebooks—originally loose papers of different types and sizes, distributed by friends after his death—have found their way into major collections such as the Royal Library at Windsor Castle, the Louvre, the Biblioteca Nacional de España, the Victoria and Albert Museum, the Biblioteca Ambrosiana in Milan which holds the twelve-volume *Codex Atlanticus*, and British Library in London which has put a selection from its notebook *BL Arundel MS 263* on the web. The *Codex Leicester* is the only major scientific work of Leonardo's in private hands. It is owned by Bill Gates, and is displayed once a year in different cities around the world.

Leonardo's journals appear to have been intended for publication because many of the sheets have a form and order that would facilitate this. In many cases a single topic, for example, the heart or the human foetus, is covered in detail in both words and pictures, on a single sheet. Why they were not published within Leonardo's lifetime is unknown.

Scientific studies



The *Vitruvian Man* (c. 1485)
Accademia, Venice

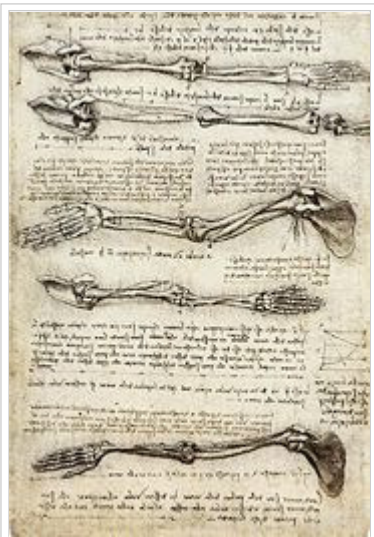
Leonardo's approach to science was an observational one: he tried to understand a phenomenon by describing and depicting it in utmost detail, and did not emphasize experiments or theoretical explanation. Since he lacked formal education in Latin and mathematics, contemporary scholars mostly ignored Leonardo the scientist, although he did teach himself Latin. In the 1490s he studied mathematics under Luca Pacioli and prepared a series of drawings of regular solids in a skeletal form to be engraved as plates for Pacioli's book *Divina Proportione*, published in 1509.



Rhombicuboctahedron
as published in
Pacioli's *Divina
Proportione*

It appears that from the content of his journals he was planning a series of treatises to be published on a variety of subjects. A coherent treatise on anatomy was said to have been observed during a visit by Cardinal Louis D'Aragon's secretary in 1517. Aspects of his work on the studies of anatomy, light and the landscape were assembled for publication by his pupil Francesco Melzi and eventually published as *Treatise on Painting by Leonardo da Vinci* in France and Italy in 1651, and Germany in 1724, with engravings based upon drawings by the Classical painter Nicholas Poussin. According to Arasse, the treatise, which in France went into sixty two editions in fifty years, caused Leonardo to be seen as "the precursor of French academic thought on art".

Anatomy



Anatomical study of the arm,
(c. 1510)

Leonardo's formal training in the anatomy of the human body began with his apprenticeship to Andrea del Verrocchio, his teacher insisting that all his pupils learn anatomy. As an artist, he quickly became master of *topographic anatomy*, drawing many studies of muscles, tendons and other visible anatomical features.

As a successful artist, he was given permission to dissect human corpses at the hospital Santa Maria Nuova in Florence and later at hospitals in Milan and Rome. From 1510 to 1511 he collaborated in his studies with the doctor Marcantonio della Torre and together they prepared a theoretical work on anatomy for which Leonardo made more than 200 drawings. It was published only in 1680 (161 years after his death) under the heading *Treatise on painting*.

Leonardo drew many studies of the human skeleton and its parts, as well as muscles and sinews, the heart and vascular system, the sex organs, and other internal organs. He made one of the first scientific drawings of a fetus *in utero*. As an artist, Leonardo closely observed and recorded the effects of age and of human emotion on the physiology, studying in particular the effects of rage. He also drew many figures who had significant facial deformities or signs of illness.

He also studied and drew the anatomy of many other animals as well, dissecting cows, birds, monkeys, bears, and frogs, and comparing in his drawings their anatomical structure with that of humans. He also made a number of studies of horses.

Engineering and inventions

During his lifetime Leonardo was valued as an engineer. In a letter to Ludovico il Moro he claimed to be able to create all sorts of machines both for the protection of a city and for siege. When he fled to Venice in 1499 he found employment as an engineer and devised a system of moveable barricades to protect the city from attack. He also had a scheme for diverting the flow of the Arno River in order to flood Pisa. His journals include a vast number of inventions, both practical and impractical. They include musical instruments, hydraulic pumps, reversible crank mechanisms, finned mortar shells and a steam cannon.

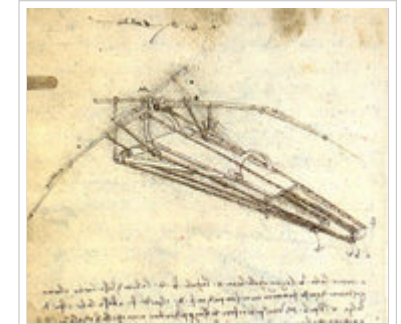
In 1502, Leonardo produced a drawing of a single span 720-foot (240 m) bridge as part of a civil engineering project for Ottoman Sultan Beyazid II of Istanbul. The bridge was intended to span an inlet at the mouth of the Bosphorus known as the Golden Horn. Beyazid did not pursue the project, because he believed that such a construction was impossible. Leonardo's vision was resurrected in 2001 when a smaller bridge based on his design was constructed in Norway. On 17 May 2006, the Turkish government decided to construct Leonardo's bridge to span the Golden Horn.

For much of his life, Leonardo was fascinated by the phenomenon of flight, producing many studies of the flight of birds, including his c. 1505 Codex on the Flight of Birds, as well as plans for several flying machines, including a helicopter and a light hang glider. Most were impractical, but the hang glider has been successfully constructed and demonstrated.

Leonardo the legend

Within Leonardo's own lifetime his fame was such that the King of France carried him away like a trophy, and was claimed to have supported him in his old age and held him in his arms as he died. Vasari, in his *Lives of the Artists* written about thirty years after Leonardo's death, described him as having talents that "transcended nature".

The interest in Leonardo has never slackened. The crowds still queue to see his most famous artworks, T-shirts bear his most famous drawing and writers, like Vasari, continue to marvel at his genius and speculate about his private life and, particularly, about what one so intelligent actually believed in.



A design for a flying machine,
(c. 1488) Institut de France,
Paris

Giorgio Vasari, in the enlarged edition of *Lives of the Artists*, 1568, introduced his chapter on Leonardo da Vinci with the following words:

In the normal course of events many men and women are born with remarkable talents; but occasionally, in a way that transcends nature, a single person is marvellously endowed by Heaven with beauty, grace and talent in such abundance that he leaves other men far behind, all his actions seem inspired and indeed everything he does clearly comes from God rather than from human skill. Everyone acknowledged that this was true of Leonardo da Vinci, an artist of outstanding physical beauty, who displayed infinite grace in everything that he did and who cultivated his genius so brilliantly that all problems he studied he solved with ease.

— Giorgio Vasari

The continued admiration that Leonardo commanded from painters, critics and historians is reflected in many other written tributes. Baldassare Castiglione, author of *Il Cortegiano* ("The Courtier"), wrote in 1528: "... Another of the greatest painters in this world looks down on this art in which he is unequalled ..." while the biographer known as "Anonimo Gaddiano" wrote, c. 1540: "His genius was so rare and universal that it can be said that nature worked a miracle on his behalf ...".

The 19th century brought a particular admiration for Leonardo's genius, causing H. Fuseli to write in 1801: "Such was the dawn of modern art, when Leonardo da Vinci broke forth with a splendour that distanced former excellence: made up of all the elements that constitute the essence of genius ..." This is echoed by A. E. Rio who wrote in 1861: "He towered above all other artists through the strength and the nobility of his talents."

By the 19th century, the scope of Leonardo's notebooks was known, as well as his paintings. H. Taine wrote in 1866: "There may not be in the world an example of another genius so universal, so incapable of fulfilment, so full of yearning for the infinite, so naturally refined, so far ahead of his own century and the following centuries."

The famous art historian Bernard Berenson wrote in 1896: "Leonardo is the one artist of whom it may be said with perfect literalness: Nothing that he touched but turned into a thing of eternal beauty. Whether it be the cross section of a skull, the structure of a weed, or a study of muscles, he, with his feeling for line and for light and shade, forever transmuted it into life-communicating values."

The interest in Leonardo's genius has continued unabated; experts study and translate his writings, analyse his paintings using scientific techniques, argue over attributions and search for works which have been recorded but never found. Liana Bortolon, writing in 1967, said: "Because of the multiplicity of interests that spurred him to pursue every field of knowledge ... Leonardo can be considered, quite rightly, to have been the universal genius par excellence, and with all the disquieting overtones inherent in that term. Man is as uncomfortable today, faced with a genius, as he was in the 16th century. Five centuries have passed, yet we still view Leonardo with awe."

List of paintings



Statue of Leonardo da Vinci at the Uffizi, Florence

None of Leonardo's paintings are signed. Certain works still in existence are cited by Vasari or are referred to in contracts. All notes in this section are drawn from the analysis of opinions of various scholars by Angela Ottino della Chiesa.

Entirely by Leonardo

- *The Last Supper* (1498)— Convent of Sta. Maria delle Grazie, Milan, Italy
- *Mona Lisa* or *La Gioconda* (1503–1505/1507)—Louvre, Paris, France
- *Adoration of the Magi* unfinished painting (1481)— Uffizi, Florence, Italy
- *The Virgin and Child with St. Anne* (c. 1510)—Louvre, Paris, France
- *Virgin of the Rocks*, Louvre, Paris, considered by most historians to be the earlier of two versions and therefore to date from 1483–1486.
- *The Virgin and Child with St. Anne and St. John the Baptist* large drawing (c. 1499–1500)—National Gallery, London, UK.
- *St. Jerome in the Wilderness*, (c. 1480), Vatican, unfinished painting.

Leonardo with other hands

- *The Baptism of Christ* (1472–1475)— Uffizi, Florence, Italy. Cited by Vasari as by Verrocchio, with the angel on the left-hand side by Leonardo. It is generally considered that Leonardo also painted the background landscape and the torso of Christ. One of Leonardo's earliest extant works.
- *Virgin of the Rocks*, National Gallery, London, generally accepted as postdating the version in the Louvre, possibly 1505–1508, with collaboration of de Predis and perhaps others.

Accepted attributions

- *Annunciation* (1475–1480)—Uffizi, Florence, Italy. Generally thought to be the earliest extant work entirely by Leonardo.
- *The Benois Madonna* (1478–1480)— Hermitage Museum, Saint Petersburg, Russia.
- *The Madonna of the Carnation*, (1478–1480) Alte Pinakothek, Munich
- *St. John the Baptist* (c. 1514)—Louvre, Paris, France.

Attribution dependent upon each other

These two paintings are almost certainly by the same artist, generally accepted to be Leonardo, but not without critics.

- *Ginevra de' Benci* (c. 1475)— National Gallery of Art, Washington, D.C., United States
- *Lady with an Ermine* (1488–1490)— Czartoryski Museum, Kraków, Poland.



The Virgin and Child with St. Anne (c. 1510)—Louvre, Paris, is a masterly figure composition.



Leda and the Swan, copy by Cesare Sesto, 1515-1520, Wilton House, England

Disputed

Of the following paintings, the first two are cited by Angela Ottino della Chiesa as having more general acceptance than the others. All have been claimed at some time to be Leonardos.

- *La belle Ferronière* (1495–1498)—Louvre, Paris, France
- *Portrait of a Musician* (c. 1490)—Pinacoteca Ambrosiana, Milan, Italy
- *Madonna Litta* (1490–91)—Hermitage Museum, Saint Petersburg, Russia, thought perhaps to be by Marco d'Oggiono
- *Madonna of the Yarnwinder* 1501. Three versions exist, apparently by different hands, perhaps copies of a lost work that is described by Leonardo.
- *The Dreyfus Madonna*, previously attributed to Verrocchio or Lorenzo di Credi. The anatomy of the Christ Child is so poor as to discourage firm attribution by most critics while some believe that it is a work of Leonardo's youth.
- *Bacchus* (or *St. John in the Wilderness*) (1515)—Louvre, Paris, France, is generally considered to be a workshop copy of a drawing.

Recent attribution

- *The Holy Infants Embracing* c. 1486–1490 several versions in private collections.
- *Madonna and Child with St Joseph*, Borghese Gallery, previously attributed to Fra Bartolomeo.
- *Mary Magdalene*, recently attributed as a Leonardo by Carlo Pedretti. Previously regarded as the work of Giampietrino who painted a number of similar Magdalenes.
- *Christ Carrying the Cross*, date unknown, private collection. Attribution by Carlo Pedretti.

Known only as a copy

- *Leda and the Swan* (1508)—(Only copies survive—best-known example in Galleria Borghese, Rome, Italy. Another is in Wilton House, England.)
- *The Battle of Anghiari* (1505), Hall of Five Hundred (Salone dei Cinquecento) in the Palazzo Vecchio, Florence.

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