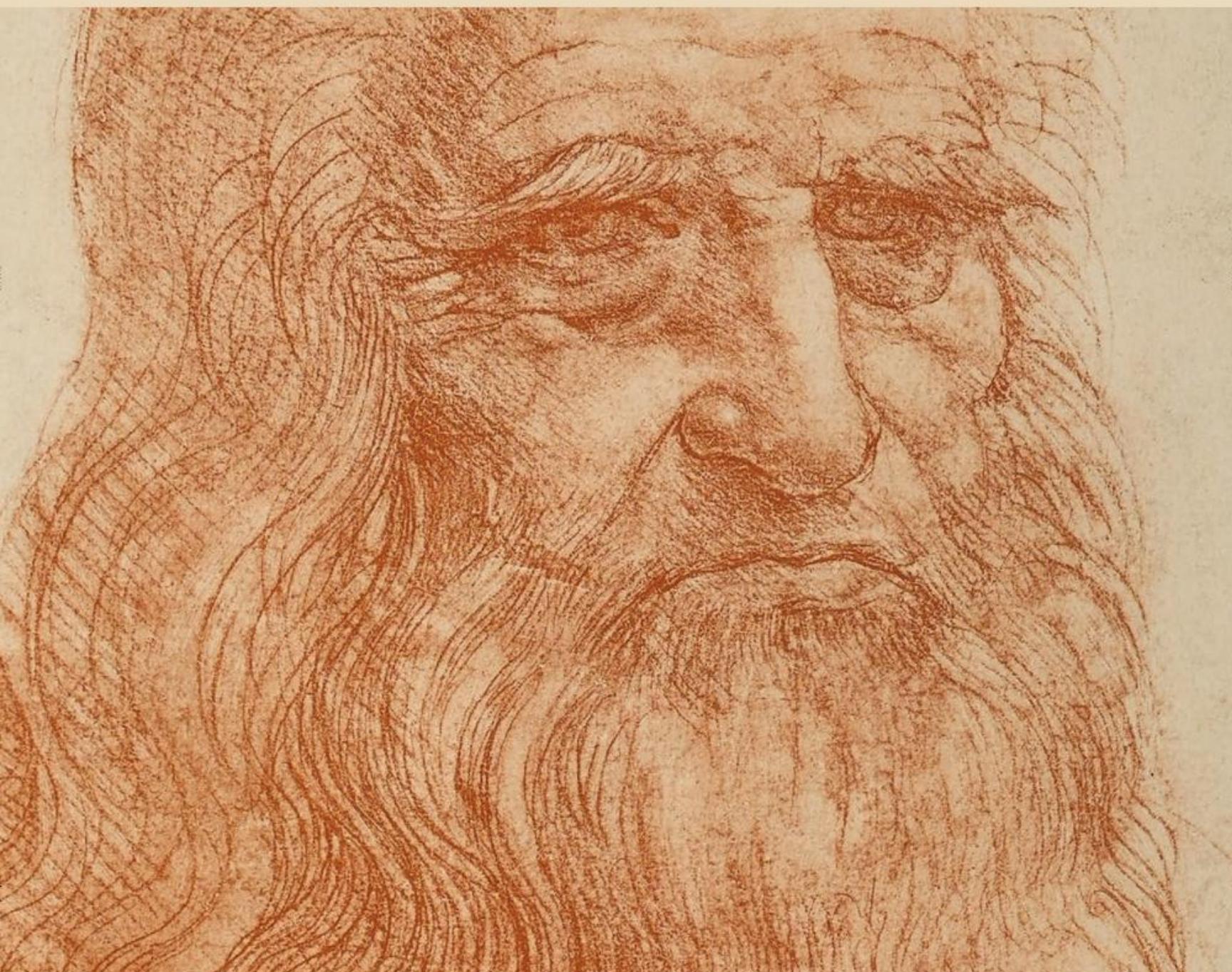


THROUGH THE EYES OF LEONARDO DA VINCI

SELECTED DRAWINGS BY THE
GREAT RENAISSANCE MASTER



WITH ACCOMPANYING TEXT BY BARRINGTON BARBER

THROUGH THE EYES OF
LEONARDO
DA VINCI



THROUGH THE EYES OF
**LEONARDO
DA VINCI**

WITH ACCOMPANYING TEXT BY BARRINGTON BARBER
AND INTRODUCTIONS BY WILLIAM WRAY



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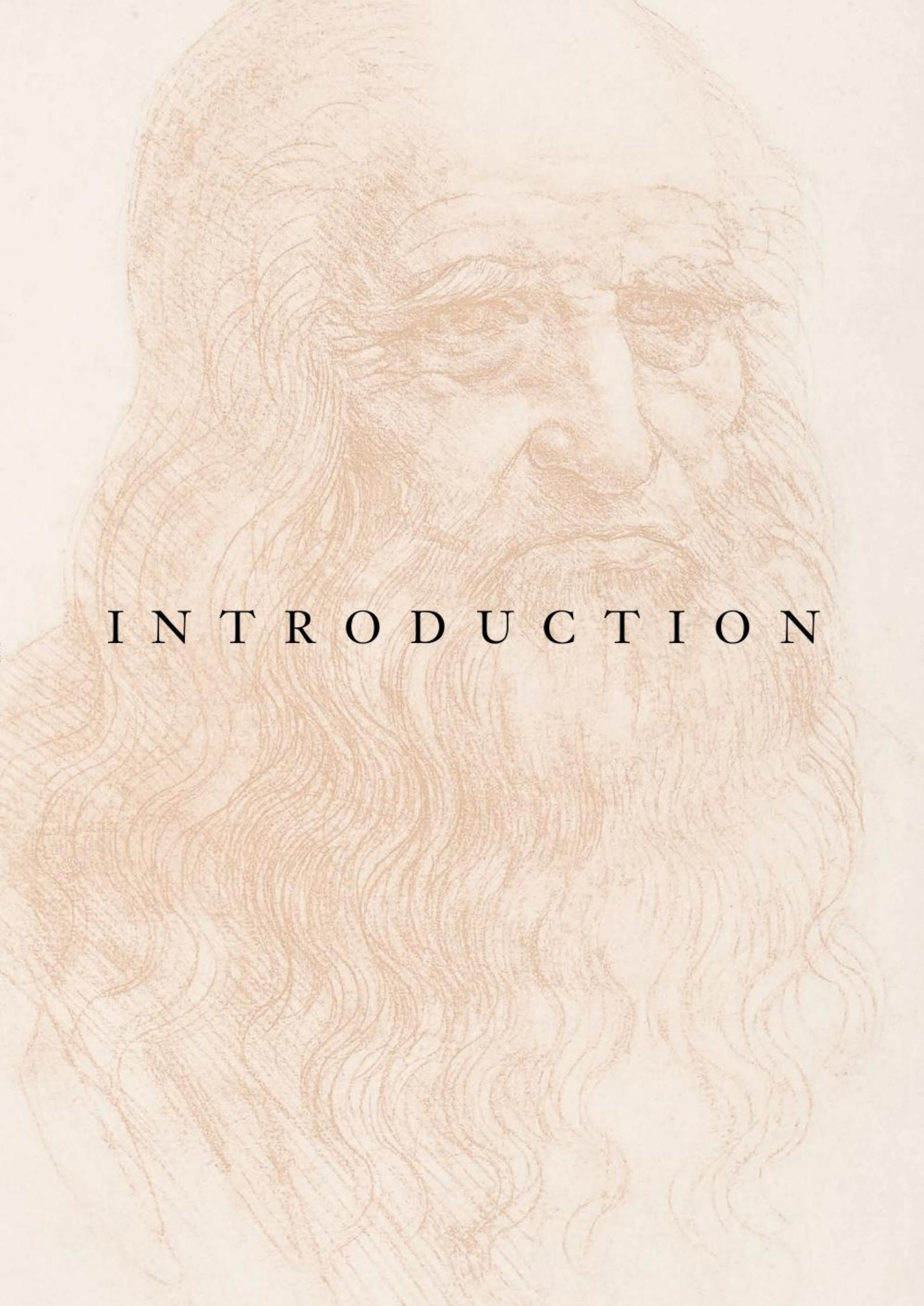
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INTRODUCTION

W

hat must it be like to look through the eyes of Leonardo, to see things that are beyond our normal way of viewing the world, to connect so fully, so deeply, that nothing escapes the gaze? To start not from a pre-formulated set of assumptions, but to lay nature out before exacting eyes in order to discover what is really there? These were powers that Leonardo possessed, and with his mind engaged and powered by a limitless curiosity, he turned his life into an all-embracing study of anatomy, astronomy, botany, geology, geometry and physics.

Leonardo started life as an artist and craftsman but he was by nature a scientist as much as a painter. Today the definition of science is established, but in Leonardo's day experimental science was virtually unknown and the observation of nature was scorned as an unscholarly activity. Scholarship adhered to the approved classical texts such as those of Aristotle, and empirical observation and experimental methods were yet to develop.

Leonardo's drawing skills created an exact method of recording his observations. Nobody before had observed in the way that he observed, nor recorded findings in such meticulous detail or such beauty:

Now do you not see that the eye embraces the beauty of the whole world?... It counsels and corrects all the arts of mankind... it is the prince of mathematics, and the sciences founded on it are absolutely certain. It has measured the distances and sizes of the stars, it has discovered the elements and their location... it has given birth to architecture and to perspective and to the divine art of painting.

Leonardo created a new way of looking at nature and a new way of understanding ourselves in relationship to nature. In the process he created a way of thinking that did much to lay the foundations for the modern world, and at the same time he created some of the finest and most profound works of art known to man. He was one of the greatest painters and most versatile geniuses in history, and a key figure in the Renaissance; that great shift in western culture which still illuminates the world today.

Leonardo's notebooks show what the human mind can do and what the human spirit might rise to, given that one possesses patience and

determination. His tools? His mind, eyes and drawing implement. This book explores the particular conjunction of these three in order to begin to follow in Leonardo's footsteps, and thus begin to see through his eyes:

The eye, which is called the window of the soul, is the chief means whereby the understanding may most fully and abundantly appreciate the infinite works of nature.

HIS STORY

Leonardo was born in 1452, the illegitimate son of Ser Piero da Vinci, a successful notary, and a peasant woman named Caterina. His father took him from his natural mother to be raised in his own family in Vinci, a village near Florence, and it was to Florence that the young Leonardo was inevitably drawn when his prodigious talents became evident. His father arranged for him to be apprenticed at the age of twelve to Andrea del Verrochio, one of the greatest of Florence's artists. In Verrochio's workshop was the cream of Florentine art: Ghirlandio, Botticini, Perugino and Lorenzo di Credi.

This suited him perfectly. As Leonardo's biographer Vasari, a painter in his own right and an astute observer of his contemporaries, said:

The boy was delighted with his decision, and he began to practise not only the branch of the arts but all branches in which design plays a part. He was marvellously gifted, and he proved himself to be a first-class geometrician in his work as a sculptor and architect.



Heads of Two Types
of Rush. See page 30

Leonardo studied little Latin or Greek, a drawback in the era of the Renaissance which was founded on the culture of Greece and Rome. The Renaissance celebrated the rebirth of the classical world and all the knowledge that world contained but Leonardo's access to it was limited by his lack of education. He made an attempt in his thirties to learn Latin on his own, but all his notebooks are written in a robust

style of Italian. This lack of Latin, however, proved to be an advantage as, unable to read the teachings of classical scholars, Leonardo was able to make the point that his work was not rooted in speculation but in observation:

To me it seems that all sciences are vain and full of errors that are not born of Experience, mother of all certainty...that is to say, that do not at their origin, middle or end, pass through any of the five senses...where reason is not, its place is taken by clamour. This never occurs where things are certain. Therefore, where there are quarrels, there true science is not... wherever it is known controversy is silenced for all time.

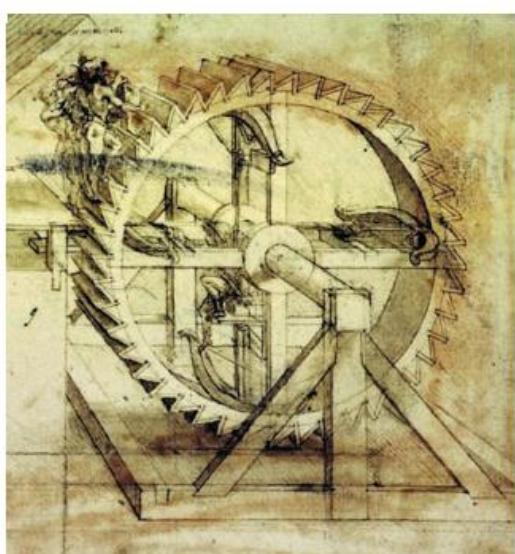
Leonardo had a fiercely independent view about almost everything. There is a sentence that appears in the first edition of Vasari's writings on Leonardo (but disappears thereafter) which indicates how Vasari saw his thinking:

Leonardo was so heretical a cast of mind, that he conformed to no religion whatever accounting it perchance much better to be a philosopher than a Christian.

Under the tutelage of Verrochio, Leonardo's talents quickly flowered. Arriving in 1464 to serve his apprenticeship, he remained with him as an assistant for several years. From about 1477 to 1482, Leonardo had his own studio in Florence and it is assumed that he worked under the patronage of Lorenzo de Medici. Through 'the Magnifico', Leonardo was to gain access



Horse's Head.
See page 34



Machine Gun.
See page 130



Young Child.
See page 66

to one of the most influential institutions of the Florentine Renaissance – the Platonic Academy. Marcilio Ficino, a renowned scholar and philosopher of Leonardo's time, had translated the works of Plato and other classical philosophers into Latin to make them more available to scholars in Europe. Ficino would have read the work of the philosopher Plotinus and it is

Plotinus that Leonardo echoed when he talked of painting being:

...a philosophy, because it deals in movements of the bodies in the vividness of their actions.

Leonardo left Florence around 1482 to become court artist for Lodovico Sforza, Duke of Milan and the city's ruler.

As a fully trained artist Leonardo was expected to have knowledge of many things besides painting and sculpting. As a sculptor, Leonardo planned a huge statue of the Duke of Milan's father mounted on a horse. It is claimed that Leonardo worked on a full-size clay model for casting for sixteen years, only to have the allocated bronze turned into cannons during a time of war, and the invading French troops use the clay model for target practice. The drawings, however, are still intact, and include ingenious schemes for the casting of this monumental piece. Interestingly, however, when Leonardo first proposed the idea for the construction of the great horse to the Duke of Milan, his letter concentrated not so much on his skills as an artist as on his competence as a military engineer:

Also I will make covered cars, safe and unassailable, which will enter among the enemy with their artillery, and there is no company at arms so great that they will break it.

Where Leonardo learnt his engineering know-how nobody knows; perhaps his research into the laws of mechanics and his creative mind provided all that was required. Mechanics was certainly an abiding interest. He made designs for all kinds of weaponry, and drawings of

military bridges, and forts and other defences. He drew plans for ships with double hulls so that if damaged they would stay afloat. He even designed methods for piercing ships' hulls and diving suits in which to test this, and it was during this period too that drawings of Leonardo's first flying machines began to appear. But he never neglected his art. In the notes and sketches for a book on light and shade begun at this time, Leonardo's eye is as penetrating as ever:

The air as soon as there is light is filled with innumerable images to which the eye serves as a magnet.

In 1490 Leonardo collaborated with the poet Bernardo Bellincioni in the creation of a court masque. For this an enormous gilt hemisphere that opened to reveal personifications of the planets was created. For a man who relied on his eyes so much, the power of the sun was of central importance:

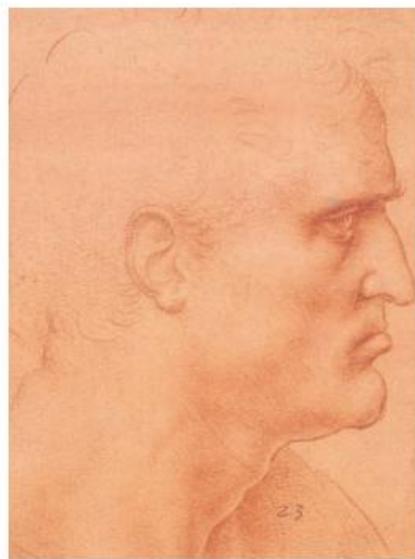
The sun has substance, shape, motion, radiance, heat and generative power: and these qualities emanate from it without its diminution.

During this time work continued and Leonardo began to paint the Last Supper. His notebooks suggest he was seeking somebody to model as Christ. It was noted at the time, by those who observed Leonardo working, that he looked out for the people he wanted, seeking them out where he knew they would be:

...troubled or serene, old or young, irate or quiet...he observed their manners, dresses and gestures; and when he found what fitted his purpose, he noted it in his little book which he was always carrying at his belt.

In the refectory of the monastery of Santa Maria delle Grazie he would work on the fresco from sunrise to sunset, never pausing to stop. He would then not paint for days on end, yet would visit it every day, standing in front of it, reflecting and considering. He would then climb the scaffolding only to add a few brush strokes.

None of this could have been done if Leonardo had used the



*Head of Apostle –
St Bartholomew.
See page 104*

fresco technique traditionally employed for wall paintings. This requires the artist to paint onto damp, freshly laid plaster. It requires him to work quickly. But Leonardo did not work like this; his was a slow, reflective approach as his style was dependent on the careful modulation of light and shade. He developed a new technique that involved coating the wall with a compound he had created. Unfortunately the compound, which was supposed to hold the paint in place and protect it from moisture, did not work.

What remains today of the fresco reveals the clear indication of Leonardo's ideas on composition. Christ and His apostles were usually shown in a line, with Judas set apart. Leonardo painted the apostles in several small groups, each apostle fully realized as an individual responding in a different way to Christ's announcement that one of them will betray Him. The composition, in which the space recedes to a point behind the head of Christ, is one of the great examples of one-point perspective.

Mathematics was also a great love of Leonardo's, and in 1497 Leonardo illustrated *De Divina Proportione* for Fra Luca Pacioli. It was, undeniably, Leonardo's mastery of proportion and perspective, as revealed to him by his understanding and acute insight into mathematics, that enabled him to create works of such realism:

Every part of the whole must be in proportion to the whole... I would have the same thing understood as applying to all animals and plants... Let the pit of the throat always be over the centre of the ankle of that foot on

which the man is leaning. The leg which is free should have the knee lower than the other; and near the other leg. The positions of the head and the arms are infinitely varied... Let them, however, be easy and pleasing, with various turns and twists and the joints gracefully bent, that they may not look like pieces of wood.

Leonardo's participation in a debate at court between representatives of the arts and sciences is also mentioned by Vasari, who considered Leonardo's



Rearing Horse.
See page 108

powers of debate supreme. In the cut and thrust of debate, Leonardo:

...silenced the learned and confounded the liveliest intellect.

Given his profound insights into the worlds of both art and science there can have been little doubt of Leonardo's authority.

In 1499 the French armies entered Milan. Some months later Leonardo left Milan altogether and travelled to Venice, via Mantua. The Venetian authorities employed him as an engineer for advice on how best to strengthen their military defences.

By 1500 Leonardo was back in Florence. His work had made him famous and he was received by his own people with great honour and acclaim. The early work Leonardo had done in Florence before he left for Milan had strongly influenced a number of young artists, including Sandro Botticelli and Piero di Cosimo, and on his departure these artists had become the leaders of the next generation of Florentine painters. The work Leonardo was to create after his return to Florence would inspire yet another generation of artists, and this generation would include Andrea del Sarto, Michelangelo and Raphael.

Leonardo's questing mind would not allow him to rest. Again he left Florence and for a year he served Cesare Borgia, the able and ruthless military leader, in his campaign to subdue the petty despots of Romagna. Leonardo had now taken up the study of topography and geology and Borgia made Leonardo his chief engineer, giving him the authority to take whatever resources he needed in order to strengthen Borgia's fortifications. Inevitably, Leonardo had many ideas of how this might be done. Early in 1503 the campaign was over; Borgia returned to Rome and Leonardo again returned to Florence.

In October of 1503 Leonardo was commissioned by the city council to paint a large fresco on one of the walls of the new Sala di



Shoulders and Head of an Elderly Man.
See page 56

Gran Consiglio in the Palazzo Vecchio. Leonardo's subject matter was to be the Battle of Anghiari, in which Florence had defeated Milan in 1440. His sketches showed a cavalry battle with tense soldiers, leaping horses and clouds of dust. He broke completely from what had been attempted before and the picture is full of violent movement as the figures of men and horses clash and tumble over one another. He described some of the scenes in his notebooks:

The figures in the foreground you must make with dust on their hair and eyebrows... You will make conquerors rushing onwards with their hair and other light things streaming in the wind, with brows bent down... Make the conquered beaten and pale, with brows raised up and knit, and the skin above their brows furrowed with pain... Show someone using one hand for a shield for his terrified eyes with palm turned towards the enemy.

Sadly, the wall painting no longer exists. Its general appearance is known from Leonardo's sketches and from copies made by other artists, including Rubens. Amazingly, whilst working on the Battle of Anghiari, Leonardo was also painting another of his great masterpieces; the Mona Lisa. According to Vasari he worked on it for four years, claiming it was unfinished. Whether this was what he genuinely thought or whether he could not bear to part with it, the painting went with him everywhere.

There is a story that Vasari tells of how Leonardo kept the famous smile alive:

He retained musicians who played and sang and jested in order to dispel the melancholy that painters tend to give their portraits.



Figures from the Last Supper. See page 156

Study, particularly of geometry, became of paramount importance to Leonardo as he aged. His notebooks are filled with examples of his trying – and succeeding – to solve long-standing geometrical problems:

Having for so long time sought to square the angle... now in the year 1509 on the eve of the calends of May, I have solved the proposition at ten o'clock on the evening of Sunday!

Leonardo's studies continued into all areas of natural philosophy. The famous anatomist, Marcantonio della Torre, helped him in his research and it was at this time that Leonardo produced this note and a wonderful drawing of a child in the womb (see page 64) to accompany it:

It lies continually in water, and if it were to breathe it would be drowned, and breathing is not necessary to it since it receives life and is nourished from the life and food of its mother.

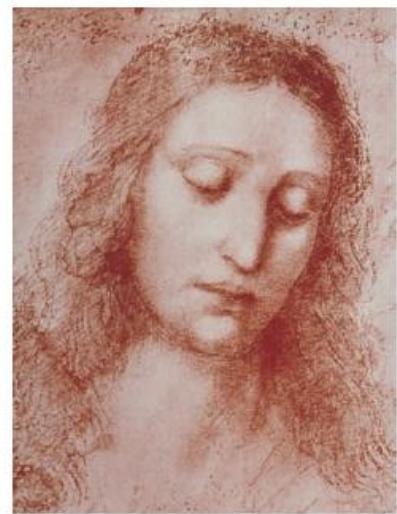
Due to political changes, in 1512 Leonardo left Florence for Rome in the hope of greater patronage under the two sons of Lorenzo de Medici, the man who had done so much to support him in his earlier life. Giuliano de Medici was happy to welcome Leonardo to Rome. Shortly after though, Giuliano died and Leonardo was left feeling old and neglected:

The Medicis made me and ruined me.

Francis I of France, a man with a genuine love of learning and art, persuaded Leonardo to come to France, and in 1516 Leonardo was installed in a small castle at Cloux near the royal palace at Amboise on the Loire. There, despite suffering partial paralysis of his right hand, Leonardo continued to draw and teach, producing for Cardinal Luigi of Aragon drawings that had lost none of their vitality and closely observed details.

A year later Leonardo died. Vasari certainly did not exaggerate when he wrote:

In the normal course of events many men and women are born with various remarkable qualities and 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 art. Everyone acknowledged that this was true of Leonardo da Vinci.



*Study for the Head of Christ for the Last Supper.
See page 142*

I
T H E
N A T U R A L
W O R L D

Leonardo

Plants, water, rocks, clouds, landscapes and animals

Early in his career, Leonardo compiled an inventory of his works. At the top of his list was the item:

...many flowers copied from nature.

Leonardo's botanical interest lasted throughout his life, with studies on growth and form regularly appearing in his notebooks.

As both artist and scientist Leonardo's approach was based on an empirical study of nature. As an artist Leonardo was interested in representing nature's inherent beauty, and as a scientist he was interested in the universal laws which lay behind nature's expression:

The senses are of the earth; reason stands apart in contemplation.

It is this mix of analysis and reflective contemplation that is one of the most noticeable features of Leonardo's work.

Leonardo's drawings, and the writings that accompany them, show his interest in the way the elements interacted and how that interaction influenced the natural world. His notebooks are full of observations about the interplay of the elements as they expressed themselves in the movement of water, rocks and clouds. Water, in particular, fascinated him and he hoped to discover the most fundamental of nature's laws by the study of the movement of water through earth and air:

Water is the driver of nature ... It is the expansion and humour of all vital bodies. Without it nothing retains its form. By its inflow it unites and augments bodies.

Leonardo also created ways to represent more accurately and naturally the suggestive interplay of light and mist, with his renowned *sfumato* technique of softly modelled tones:

The painter can suggest to you various distances by the change in colour produced by the intervening atmosphere between the object and the eye.

To Leonardo there was no separation between science and art. He strove for, and achieved, a masterly realism in the balance and harmony of all his work.



Arno Landscape

This accomplished drawing of the landscape of Tuscany around the Arno, dated c.1473, is probably the first study of a landscape in existence. Before Leonardo, a drawing of landscape without human figures and symbolism would have been unthinkable: the first complete painted landscape is credited to Peter Paul Rubens, almost two hundred years after this drawing of Leonardo's. Roman frescoes of landscape survive, but they were unknown in Leonardo's time and the preceding seven hundred years.

The fluency of Leonardo's technique is also ahead of its time in the handling of rocks, rivers and vegetation. The pen and ink lines over a partially erased pencil sketch are simply drawn as horizontal strokes to suggest tree branches and leaves; lines following the contours of the landforms suggest the solidity of the earth. Closely drawn horizontal lines efficiently suggest reflections on the surface of the water, and Leonardo's understanding of perspective meant that he made the tonal effects of the pen lines less prominent as they recede into the distant landscape. With multiple lines of hatching, he builds up the large, closer rocky shapes and convinces the eye of the solidity of the terrain. Where he has drawn many lines converging to represent swiftly flowing water, the eye perceives substance and movement. The delicacy of the smaller objects in the landscape – the fortified buildings and the dark shapes of floating boats – brings them into prominence.

The controlled vigour of the drawing entirely satisfies, and one can only speculate how Leonardo's talent must have overwhelmed his contemporaries when they saw the effectiveness of this drawing.



Storm Over Valley in Foothills of the Alps

This drawing, dated to around 1506, is a remarkable view of an Alpine scene, from a viewpoint that would suggest that Leonardo did indeed achieve flight with one of his flying machines. More probable, though, is that he combined sketches from a mountain top with drawings from memory: the care with which he has drawn the rainclouds stretching from mountain top to mountain top across the low-lying valley, carefully built up with strokes of sanguine chalk, whilst behind them sit more angular peaks above the clouds, suggests familiarity with such a scene. During the early 1500s Leonardo was in the Veneto region and may have visited the Dolomites, which some of these peaks resemble.

The lines spraying out from the darkened clouds give an effect of heavy rainfall and add to the stormy darkness of the scene. The division between the dark rainy area and the town and hills is well defined and creates space towards the foreground of the drawing. Although some of this scene may be derived from imagination, it is so well informed by his studies of natural forms that it gives an impression of being viewed from direct experience. The detailed foreground and hazier, apparently emptier, background would seem based on experience of viewing across a large distance. Most artists of this time would have drawn the distant rocky prominences with as much detail as the foreground, but Leonardo's accurate studies and observations from nature gave him the knowledge to disregard the artistic convention that had been in force until then.



Star of Bethlehem

An exquisite piece of drawing of plant form. This Star of Bethlehem drawing has been dated to about 1506–8 and is in pen and ink over red chalk underdrawing. The details of the blooms are clearly rendered and the intricate swirl of leaves with their similarity to some of Leonardo's studies of water movement (see page 42) make a nice connection between the plant, which depends on water, and the shapes and patterns of swirls of water as they pass through constricted openings.

This image – so finely observed that modern botanists can readily identify it and all his plant drawings – shows that Leonardo welcomed the problems of investigative drawing. There was nothing that he could not turn his mind and hand to and, by observation, drawing and investigation of the facts, he derived enormous pleasure and satisfaction in the mysteries of life.

Study of Two Plants – *Caltha Palustris* and *Anemone nemorsa*

Dated to about 1508–10, this image is drawn in pen and ink over faint black chalk. The elegance of the hatching and the precision of the outlines of the petals and leaves make this a good botanical study as well as a work of art; the shapes are precisely drawn but at the same time the forms are naturally positioned, and not presented as a diagram.

It has been suggested that the care with which it was drawn might have been in order to allow an engraver to transpose the image onto plates. At this period of the Renaissance many artists were preparing drawings for reproduction as engravings, partly because of the increased income that this could generate, and also to supply to students in other parts of Italy who were eager to learn from renowned masters. To this day, indeed, artists use these drawings to test their ability.



Sprays of Oak Leaves and Acorns

Leonardo's drawings of sprigs of plants are as informative as botanists' drawings. They are given greater life also by the artistic subtlety and brilliance of the drawing. There is no doubt that this is drawn from life; see how from a drawing like this, one could draw oak leaves and acorns ad infinitum and still make them look as though they themselves were drawn from life. The densely drawn red chalk lines give plasticity and form to the leaves and acorns, almost giving the impression of a bas-relief sculpture. This also gives it a rather formal, heraldic character while losing nothing of its naturalness. It is believed to have been used as a basis for the foliage in the painting of Leda and the Swan, while others believe it to have been the basis for a garland above the Last Supper mural which Leonardo was to produce for the church of Santa Maria delle Grazie near Milan.

These drawings, also from 1506–8, make it clear that Leonardo took seriously his dictum that the artist should always return to nature as the greatest of teachers. There is no doubt about the accuracy of his rendering, and at the time, even with all the other great Renaissance artists clustering around Florence, Venice and Rome, the image would have been so highly prized for its usefulness that it may have been used again and again by other artists. Nowadays sketch books tend to be personal files of an artist's ideas, but in the period in which Leonardo was working all 'sketches' would be gathered into copybooks for use by the whole studio. Verrocchio's studio must have had some spectacular examples to use, with assistants like Leonardo putting in their pieces of work.

The sprig of dyer's greenwood on the left of the oak leaves is also a wonderfully accurate drawing of the plant. When one scrutinizes Leonardo's drawings in this way, it becomes apparent why his interest moved into scientific directions, as his extraordinary interest and observation knew no bounds.



*B*ranch of Blackberry

This drawing is in red chalk, touched with white on a reddish prepared paper, probably from the same sketch book as the oak leaves and acorns drawing, but dated to 1504–8. It is related to the studies for Leda and the Swan, in which it also appears.

The feeling of growth and form in these drawings often gives a tactile impression; one can understand why at different times there was some belief that these were meant to be made into relief carvings. This is not necessarily so, however; some experts think that a certain amount of touching up was carried out by, for example, Leonardo's student Melzi, at some later time. Nevertheless, both the beauty of form and the perception of the growth of these berries and leaves are very fine and show a clear understanding of how this plant is formed.





*H*orizontal Outcrop of Rock

This extremely accurate piece of geological drawing is believed to have been produced around 1481, when it is known that Leonardo was interested in the geological formation of rocks as he was beginning his work on *The Madonna of the Rocks*. The way the medium of pen and ink over black chalk complements the beauty of the composition of the forms is so typical of Leonardo; even a study which was primarily of scientific interest would be produced in an artistic way. Thus the expansive sweep of rock shapes crosses the paper and continues around into the background.

Leonardo's method of hatching with closely placed lines gives a clear idea of the different surfaces of the rock and the stratification.

*R*iver Scene

This is a view of the Adda river at a point between its exit from Lake Como and the stretch between Trezzo and Vaprio. The date is about 1510 or later. The view shows the canal as well as the river and the rapids here are strong and dangerous: Leonardo planned a dam to regulate the flow of the water by sluices, which would have made navigation through the adjoining canal possible.

This remarkably detailed drawing of the area – a topographical drawing probably made from various sketches on the spot – has much similarity to Leonardo's anatomical drawings of about the same period, and is drawn with precise pen and ink lines over a faint black chalk base. Leonardo's interest in the manipulation of rivers for use by navigation or for irrigation is well known, and this dam may also have had a military function in the defences of this part of the Duchy of Milan.

The subtlety of the drawing, which not only gives information about the topography but is also attractive as a pictorial view, renders landscape drawing interesting as never before.



Copse of Birches

The distinguished scholar of Leonardo, Kenneth Clark, said of this drawing: ‘Technically it is a miracle.’ How, he asks, could Leonardo sharpen a piece of red chalk so finely that he could show so clearly the boughs and leaves of the trees in this fashion? The notebook containing this drawing dates from 1498 to 1502 and contains other similar drawings of trees in groups like this. It is not known if this drawing was produced for any particular painting but it is one of the finest groups of trees ever drawn. Other artists certainly knew of it at the time and there are pieces of work in Milan by some of Leonardo’s followers that have very similar trees painted in them. The brilliance of this group of trees, giving just the right amount of tactile information with its chiaroscuro, and the skilful handling of clumps of leaves feathering off the branches, is a valuable record of the talent and perception of this great Renaissance artist.

Heads of Two Types of Rush

This pair of drawings, c.1508, resembles other scientific illustrations with accompanying notes. The finely wrought method of pen and ink over black chalk suggests that they were intended to be translated to copper engravings, in order that they could be reproduced. Leonardo wrote all the notes in his notebooks from right to left, in a manner of mirror writing, and as such the words could have been easily transferred for printing. Leonardo, who taught himself to write, was left-handed, which could explain this unorthodox form of writing: when his writing was for public gaze, however, he would write as normal from left to right.

The two rushes may have been intended for a ‘discourse on herbs’ planned as part of a book on painting. The emphasis in these drawings on the elements of flower and seed, reinforces this idea.



11 verso
Sketches of lions and cats in various poses, including walking, running, jumping, and resting.

ER
11

Studies of Cats, a Dragon and Other Animals

This exceptional sheet of studies, mainly of cats, is from Leonardo's last years. It is known that he was suffering from ailments that partially paralysed him, but his drawings are as lively and fresh as those from when he was a much younger man. These pictures, dated c.1515, are in pen, ink and wash over black chalk. They show the remarkable variety of the movements of cats and are similar to another sheet showing the movements of horses. The studies show cats and kittens playing with each other, one cat with its hair erect, and cats stalking, washing and sleeping. It is obvious that it is all from direct observation and that his speed and skill of drawing survived despite his advancing years. The liveliness and freshness of these magnificent sketches reveal that artistically the power of youth persisted; one cannot fail to be delighted by the brilliant sense of movement and life in these drawings.

It is also very interesting to see how the drawing of the dragon, by using the analysis of the movement seen in the cats, suggests the powerful movement of this mythical creature.





*H*orse's Head

This vigorous pen and ink drawing of a horse's head, dated c.1503–4, gives some idea of the emotional power that might have been shown in the great mural that Leonardo was commissioned to do for the Palazzo Vecchio in Florence. This was a depiction of the Battle of Anghiari which the Florentines desired on one wall of a hall in their main government building, with a similar painting by Michelangelo of the Battle of Cascina opposite. The project was begun but never finished by either artist because of political changes in the governing body of Florence and because of calls from Milan and Rome for the services of the two artists. This painting of a battle scene would have been quite unlike anything produced before because of its unprecedented expression of the confusion and ferocity of battle. All the drawings still in existence for this work show a powerful, moving tableau of rearing horses and shouting warriors. This passionate charge was called 'beastly madness' by Leonardo, and he represented this in his drawings.

*H*indquarters of Horse and Two Other Views

These sketches, from around 1490, show Leonardo's meticulousness in painting or sculpting animals. There are scores of his drawings in existence of horses in every posture. Here he concentrates on the hindquarters with a careful drawing of the details of one back leg, and in another drawing the shoulders from a semi-rear viewpoint. The medium is silverpoint, resulting in very fine lines; the vigour of these drawings is evident in the incisive outline with its flowing strokes.



*A*n Ass and a Cow

This drawing of an ass lying down and a cow standing behind, dated to around 1478, brings to mind the nativities of Christ that were so much a part of the Renaissance artistic endeavour. Perhaps this is connected with the great Adoration of the Magi scene that was never completed, like so many of Leonardo's projects. Though he could work rapidly, his exceptionally wide range of interests and projects, such as scientific studies, artistic masterpieces, notes on his work and studies for various proposed treatises on mathematics, painting, fortification and weaponry must have caused difficulty in keeping all his productions going at the same time.

This beautiful little group of animals looks like a fairly quick sketch, with smudges and redrawn parts, which he probably did from life. The impression of the animals paying attention to something just out of the picture is nicely shown, so that the adoration of Christ is already suggested by the animals' pose.



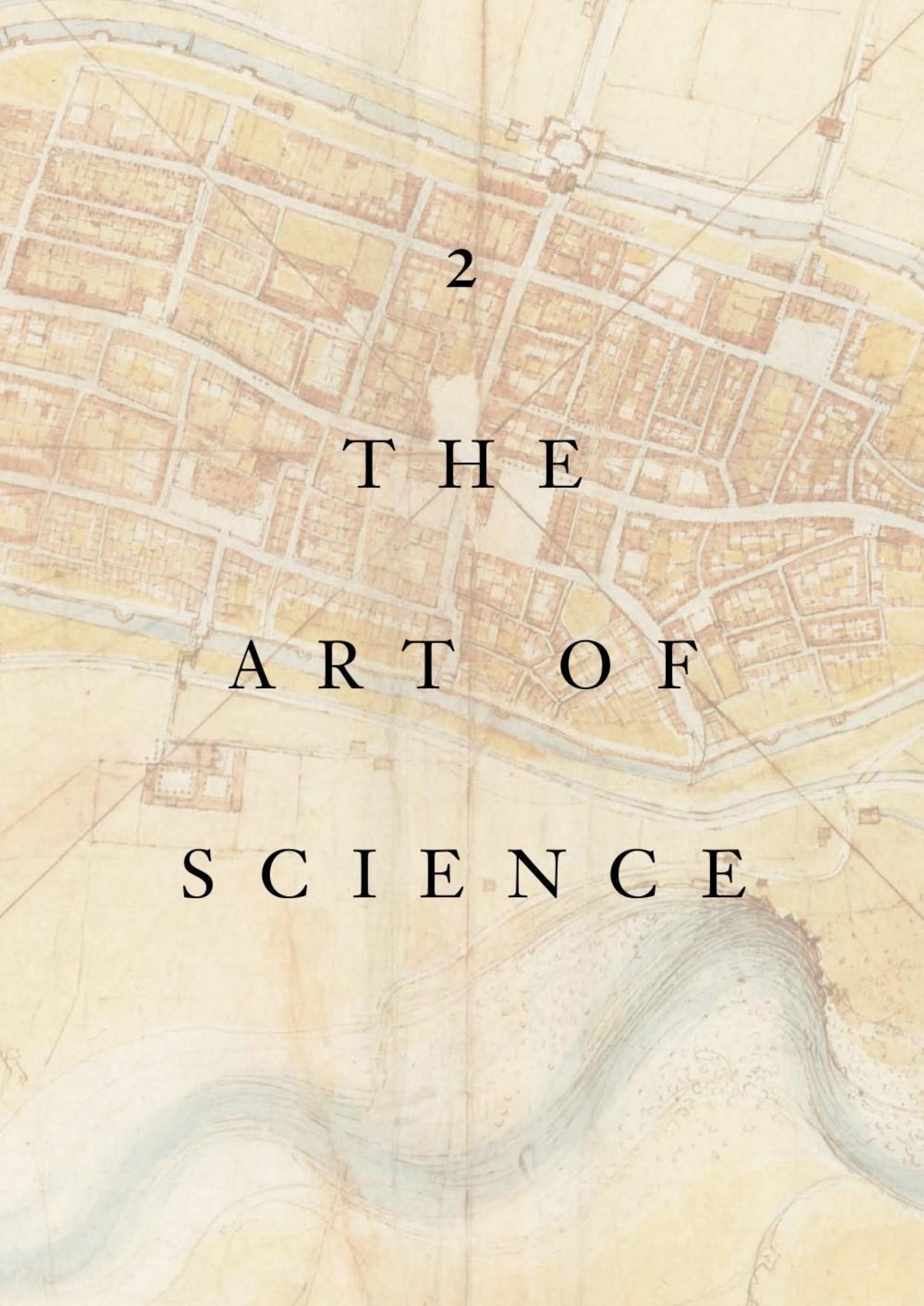


Bird's-Eye View of a Ferry Swinging Across a River

This minutely observed drawing, where everything is as though seen through a telephoto lens, is drawn with great freedom of composition. All inessential parts have been left out and yet the balance of the drawing is exquisite. The whole space is shown clearly and the ferryboat guided on a rope from bank to bank commands our notice before we begin to explore the beautifully drawn background of the winding river.

A ferry of this type was in use on the Adda river in at least four different stations between Milan and Lake Como. This one is thought to be connecting Vaprio to Canonica di Caprio as seen from the terraces of the Villa Melzi. The drawing in pen and ink shows the shapes of the riverbanks with a defined realism, and once again one assumes that Leonardo was drawing from life. As it is supposed that this was drawn about 1513, it establishes that once again, Leonardo's powers were as strong in his sixties as when he was younger.





2

T H E

A R T O F

S C I E N C E

Anatomy, engineering, architecture and cartography

Part of Leonardo's study both as artist and scientist was of the human body:

The painter who has a knowledge of the nature of the sinews, muscles and tendons will know very well in the movement of a limb how many and which of the sinews are the cause of it, and which muscle by the swelling in the cause of the contraction of that sinew.

Leonardo was not content with 'seeing' the body from the surface only, but carried out a number of detailed dissections in order to be aware of the mechanics of the body.

By understanding how things were created, Leonardo believed it was possible for man, the most intelligent of creatures, to create in turn. He explored the four 'natural powers':

... weight and force, movement and percussion,

and made acute observations about them. His interest in flight inevitably led him into a detailed examination of the flight of birds, and from there to his designs for flying machines.

He examined the flow of blood around the body and the flow of water across the earth. Whilst in the service of Cesare Borgia, Leonardo proposed plans for the draining of the marshes at Piombino in the Romagna, and on his return to Florence Leonardo drew maps of the lower course of the Arno.

Earlier in his career, Leonardo had commended himself to Lodovico Sforza, the Duke of Milan, as a military engineer and as a designer of many things, including breech-loading guns, slings, catapults, bridges and forts. He also proposed methods of tunnelling to destroy enemy defences, and ways in which to pierce hulls underwater and so destroy enemy ships.

Drawings of gears and ratchets, joints of various kinds, and designs for lathes, die-stamping machines and devices for raising water abound in Leonardo's notebooks. He identified the fundamental principles of mechanics and observed these laws in operation all around him in the natural world. By observing them he sought to create a language that could be applied in all circumstances to invent devices of immense variety: his own inventions were not only ingenious, they were also accompanied by beautiful drawings.



*S*tudies of Water Passing Obstacles

Earth as an organism similar to the human body was one of Leonardo's concepts both for his paintings and his scientific works. He studied the human anatomy and the structure of the earth in direct sequence, apprehending direct links between the two.

His advocacy of the superiority of painting over sculpture was supported by his knowledge that the painter could show transparency while the sculptor could not: Leonardo's preoccupations as a philosopher and scientist informed his painter's concern for showing effects realistically.

His depiction here of the effects of flowing water in all its transparency, with waves and bubbles, is keenly observed, hinting at the length of time he must have spent watching how water moved. In some way his drawings are always scientific diagrams and his diagrams always works of art, and it is this ambiguity that sometimes makes it difficult to discern which is which.

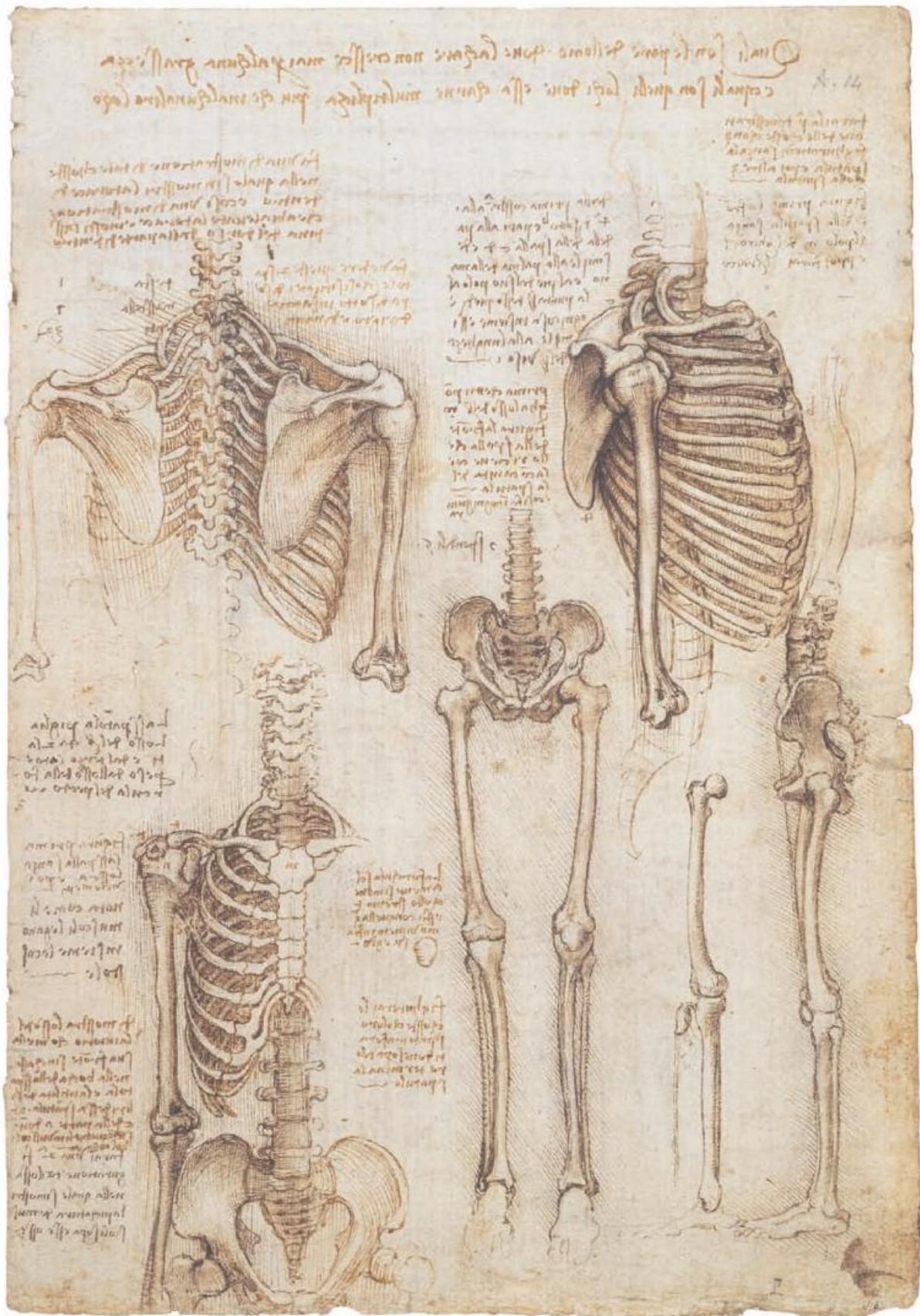
In these pictures of water flowing past obstacles, dated to around 1507, the accuracy of the observation is matched by the artistic beauty of the water patterns. The water pouring into the pool with the natural patterns of the forms of the swirling waves is reminiscent of the drawings of plants, such as the Star of Bethlehem (see page 22).



A Long-Stemmed Plant

This drawing in pen and ink over faint black chalk is of the popular Jacob's Tears (*Coix lachryma-jobi*) which may be related to the studies Leonardo made for the architectural work he intended for the new Medici palace in Florence around 1515. It particularly resembles his drawings of the archivolts made out of intertwined branches which spring from tree-trunk columns. The elegant accuracy of the line drawing and the long, free lines of shading give the plant the depth and naturalness that a plain outline would not have. No drawing of his, however small or hurried, is ever without its artistic quality; the acuity of his perception contributing more than a bare diagram.





The Skeleton

This magnificent series of drawings of the human skeleton, all from around 1510, shows Leonardo at his observational and analytical best. His drawings have yet to be bettered by any modern anatomical artist, having not only accuracy but also some impression of the spatial depth of the bone structure and its texture. Leonardo intended to show the body in all aspects from infancy to old age.

The positions of the spine with its curves, the tilt of the sacrum, and how they relate to the statics of the erect posture are correct to the last detail in this image. Nobody before Leonardo had drawn the human skeleton so accurately nor so beautifully; most of his predecessors' work being crude by comparison.

His notes on this page speak of his interest in:

...parts of man where the flesh never increases and what parts it increases more than elsewhere...

There are some anomalies in Leonardo's details of the ribcage because contemporary knowledge of the subject was not accurate, but it is noticeable that he often shows what is actually there when a more traditional illustration is wrong. Slight mistakes can be understood because of the difficulty of assembling a complete skeleton.





The Skull

This drawing of the human skull has been presented by Leonardo in such a way that the student can see what goes on under the superficial layer of bone structure as well as see the whole shape. The skull, cut in two, has the frontal and maxillary air sinuses, the nasal cavity and the roots of the teeth exposed on the side where the wall of the skull has been cut away. All the fissures in the skull visible from this angle are clearly and accurately shown.

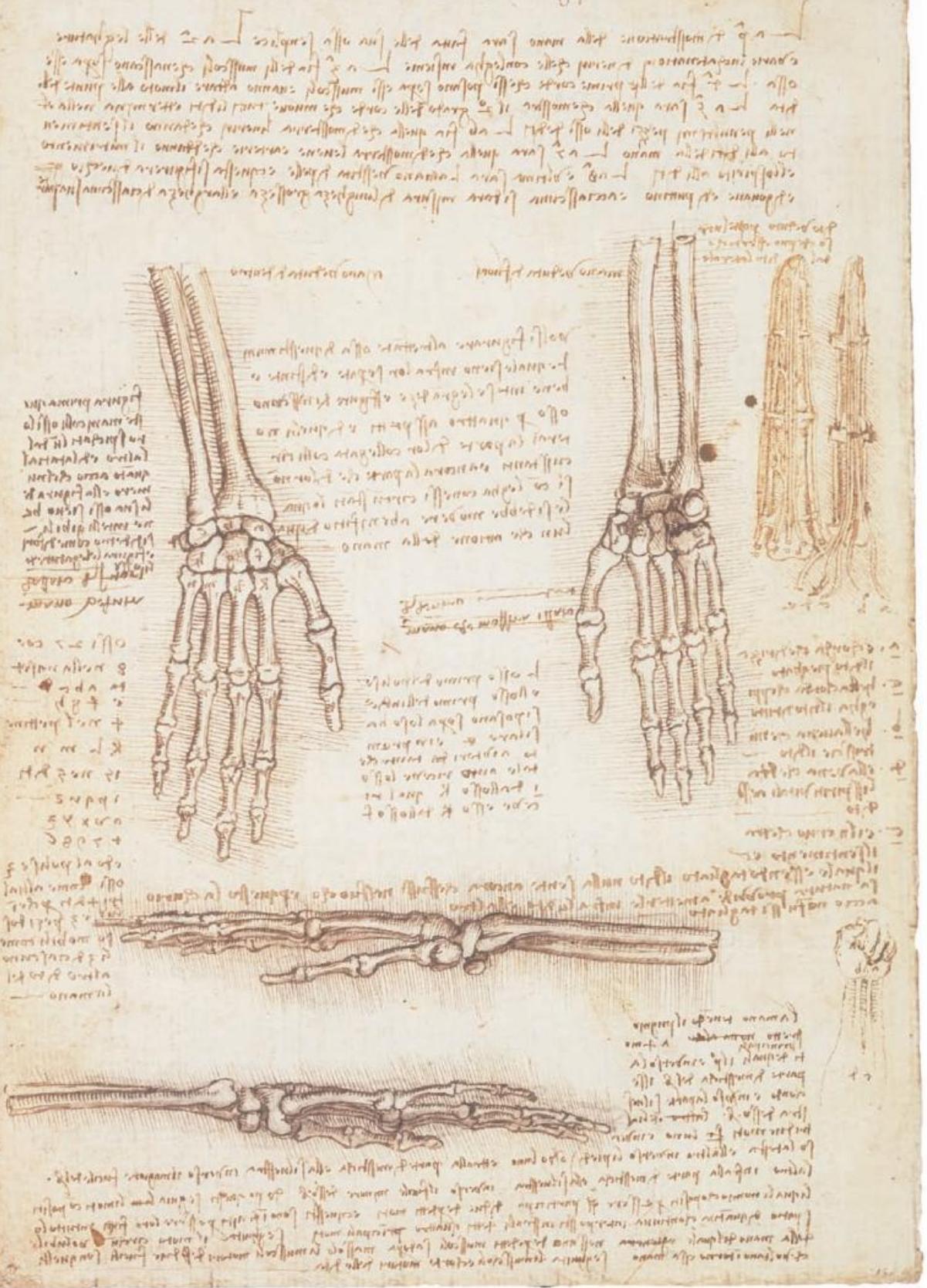
As a drawing of the bone structure of the head it has been universally admired for its accuracy and proportion. Alongside are careful drawings of teeth with their roots shown and numbered. In his notes Leonardo gives the number and position of all the teeth.

The Skull, Side View

This second view of the skull is the only one that Leonardo left which is complete, although the jawbone is not shown. He has placed a block under the occipital bone to level the head as it would be when alive. He shows all the sutures and cavities accurately and with a sense of their definition. Anyone, an art student for example, who has had to draw the skull can appreciate the outstanding proportion of this drawing. He emphasizes hollows and edges where they need it and softens the emphasis where the outline or edge is less definite.

In the lower example, the cheekbone has been removed to show the maxillary sinus; Leonardo in his notes remarked that the cavity of the cheekbone resembles, in size and depth, the eye cavity.

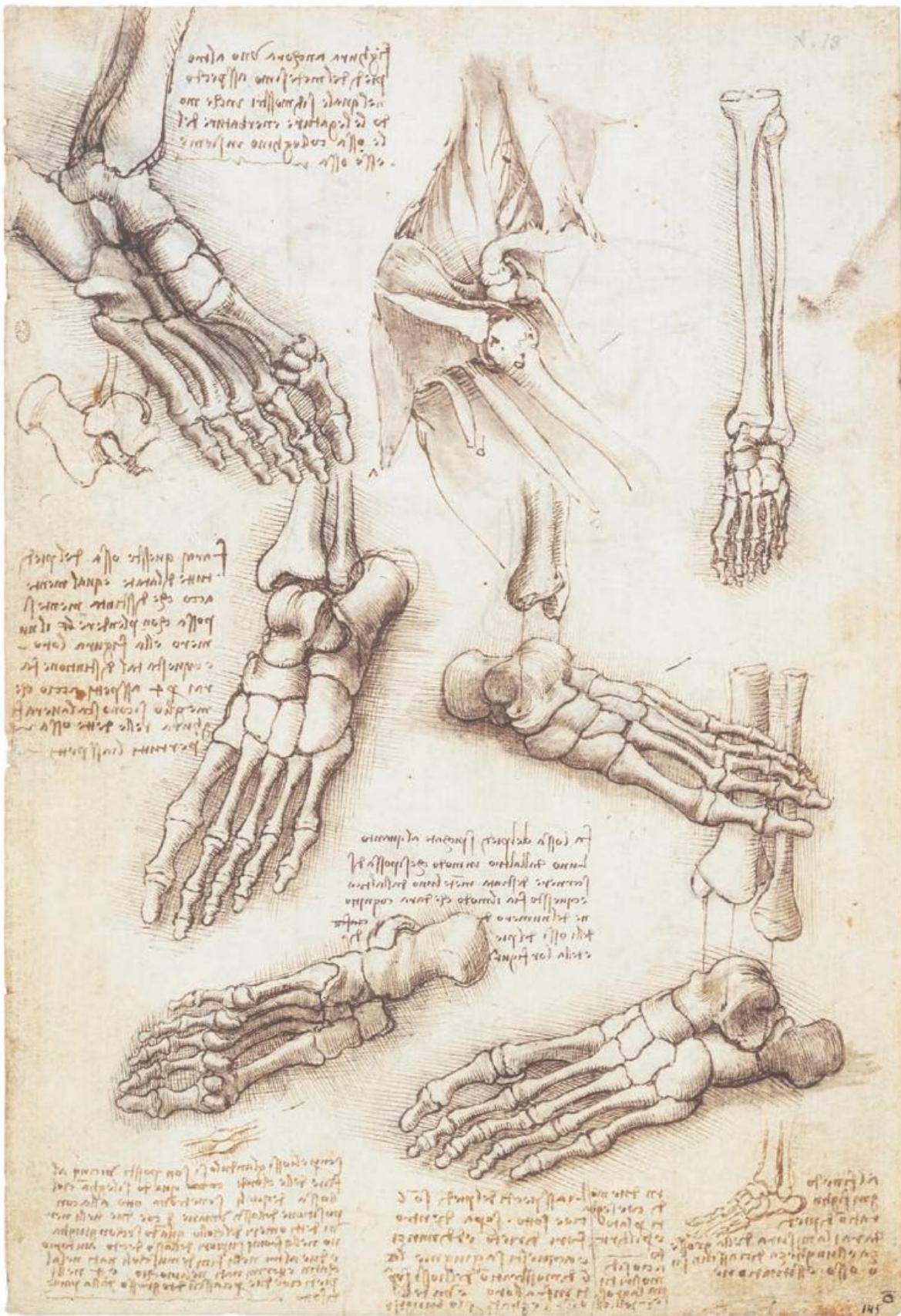
anatomia ossium manus



Skeleton Hand

These drawings of the bone structure of the hand are the first to be done with accuracy from observation. Leonardo shows the inside view and the outside view of the hand, then the view seen from the left side and right side, and the image is thus a complete set of drawings showing the actual bone structure.

His notes contain careful descriptions of how the hand is manipulated by the muscles and tendons. There is also the small sketch of the hand in a fist with descriptions about how this works. His terms are not exactly the same as are used today, as he seems to have taken some from Arabic and some from Greek. As a diagram of the structure of the hand and an example of its appearance and texture these drawings are superlative.

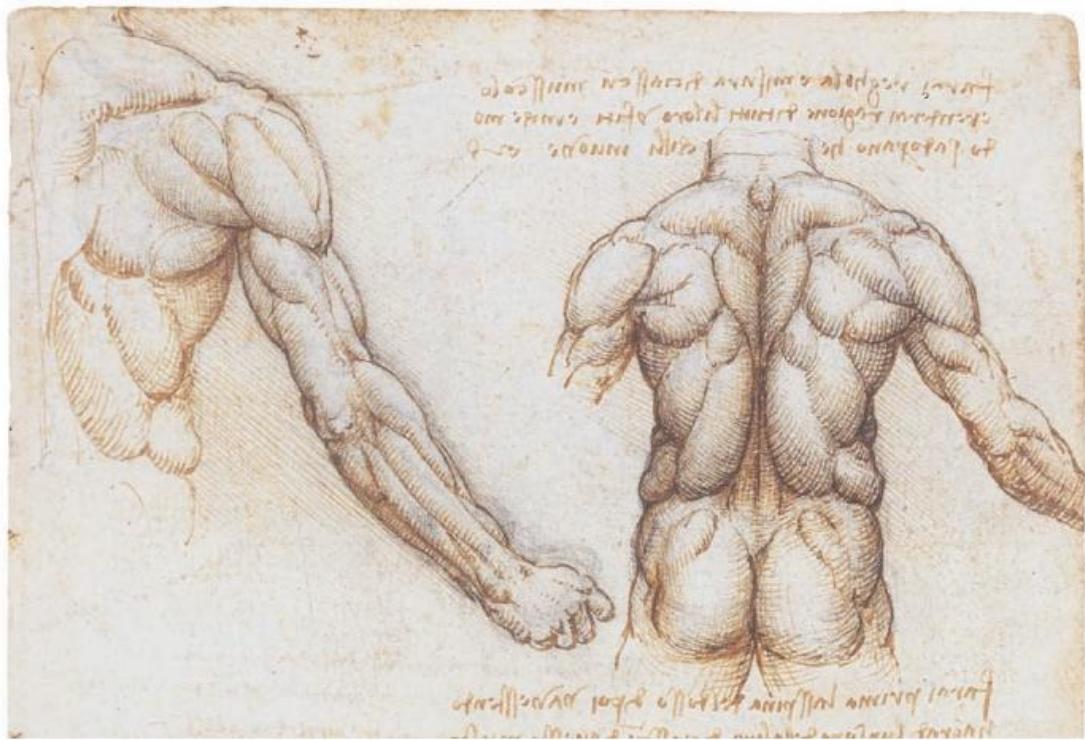


Skeleton Foot

These drawings of the bones of the foot are so skilled that they appear in every book of Leonardo's anatomical work. The care with which he has shown, from several angles, the way the structure works and its relationship of bone to bone are some of the best pieces of anatomical drawing ever. He shows the foot from underneath as well as from both sides and from above. He also shows it on the end of the leg and how the two bones of the lower half of the leg fit into the structure of the ankle.

There is, oddly, a drawing of the shoulder and its musculature in the middle of all these feet drawings, which is a puzzle: possibly these drawings were not done at the same time and the paper, with only one drawing, could not be wasted.

The notes describe exactly how the bones fit together.



Muscles of the Back

These drawings of the muscles of the back, from 1508–9, were probably drawn to enable artists to differentiate between the various shapes seen on the back of a figure. The drawings are not directly from a living model because they follow the methods of Leonardo's drawings of his dissections of the body. In the drawings of the arm, for example, the divisions of the deltoid muscle have been exaggerated slightly due to Leonardo's methods of dissection: when muscles are put back together after dissection, the divisions remain rather more distinct than is normal.

This type of carefully outlined muscle structure was followed by Michelangelo in his drawings, which resulted in the wonderful realism and solidity of the great figures on the Sistine Chapel. Although Michelangelo could be critical of Leonardo's achievements, he must have been keenly aware of the enormous strides Leonardo had made in the depiction of the human body according to scientific knowledge rather than by observation only.

These drawings must have been of immense value to the artists of the time who had the chance to see them.

Muscles of the Torso, Side View

Again, this view of the muscles of the torso seen from the side are obviously informed by dissection, even though these are superficial muscles which show clearly under the surface of the skin. In the lower sketch Leonardo shows some of the deeper layer of muscles as they work under the superficial ones.

His handling of the tonal values in the drawings makes the most of the roundness of the muscles and gives a clear picture of the way the musculature lies across the ribcage and around the gut. His notes give an indication of how the muscles attach to the skeleton and to each other.



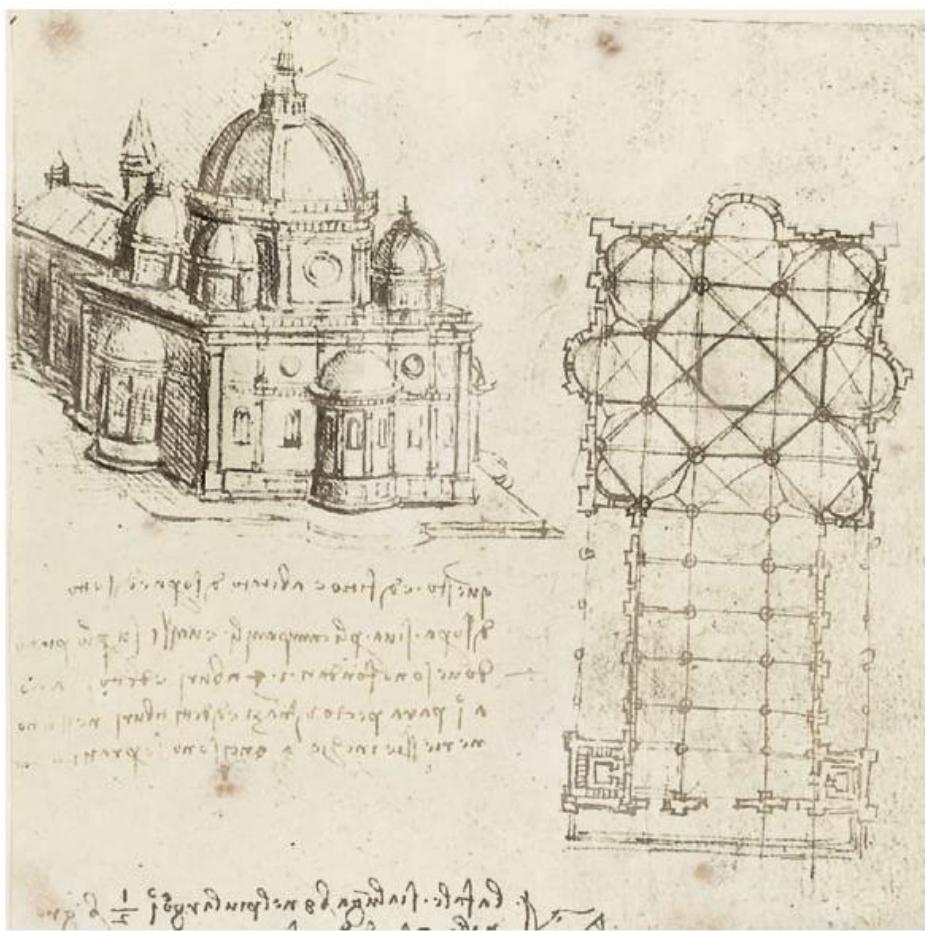
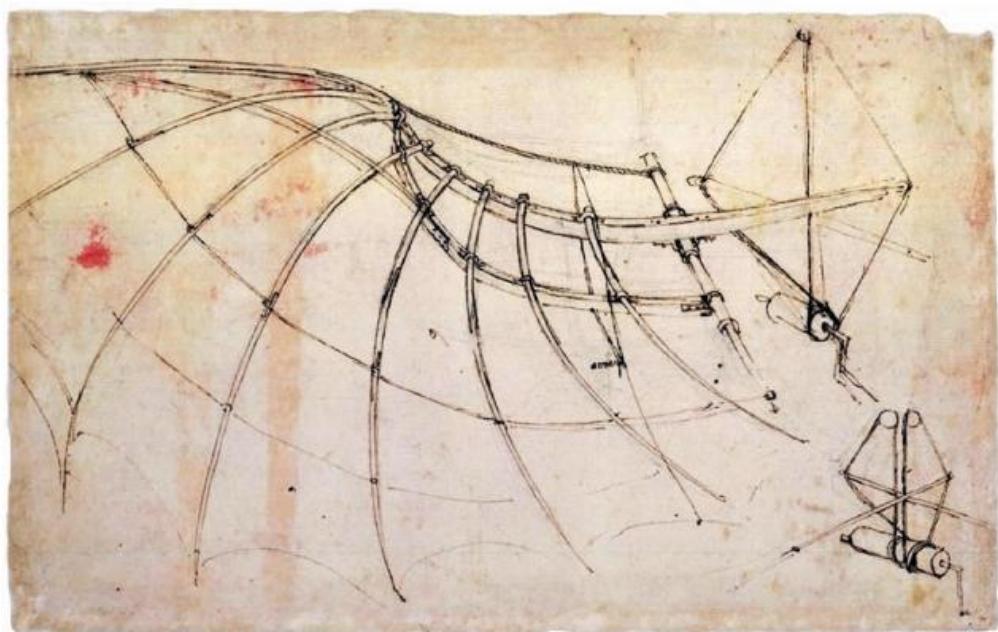
Shoulders and Head of an Elderly Man

The faces on this sheet of drawings, which is dated to around 1511, are of an elderly man, and look like portraits taken after death. Leonardo's interest in the shoulder area and the stringy quality of the neck would appear to have been overtaken by his interest in the cadaverous face, with its hooded eyes and sunken mouth and cheeks.

At this time, the dissection of corpses in order to gain knowledge of the structure of the body could be carried out only in places where the breath of Humanism had allowed permission for such scientific practices to take place. In many parts of Europe this activity would have been liable to prosecution by church authority, which was not always well disposed to scientific advance.

These drawings show perfectly the effect of old age on the flesh of the face, where the bone structure becomes pronounced as the flesh loses its vitality.





Wing Construction with Engineering Design

Leonardo studied the flight of birds with his customary zeal, and it is well known that he was designing a flying machine. Diagrams of constructions like the one opposite were the result of exhaustive observation of the movements of birds to examine how the wings achieved flight.

There is a folio of Leonardo's entitled *Flight of Birds* and in these drawings he seems to have accurately recorded how the flow of air supported the birds and how their balancing movements depended on the currents of air passing across the wings. In this diagram's design, Leonardo has stuck very closely to the anatomy of an actual bird wing.

Design for a Church

This design of a basilica, with its ground plan, perspective and a many-domed tribune, is a fairly conventional version of a Renaissance church with a long nave and the area of the transepts converted into a square, with bay shapes around the sides. Leonardo was, however, a great exponent of the centralized design of churches, drawing many versions of circular or star-shaped basilicas with no nave at all.

This design is more conventional in shape, but Leonardo has created the tribune as a centralized design added onto the long nave. The intersecting lines of the spaces under the dome resolve themselves into harmonious patterns of squares, rectangles and semi-circles. From the outside the cube-like shape of the tribune is softened by the three bays of the chapels on the flat walls of the church and the dome above on its drum, surrounded by four smaller domes on the four corners of the cube. This has similarities with the great Duomo in Florence, the Santa Maria del Fiore, which was a familiar sight to Leonardo.



Map of Imola

This beautifully drawn map, c.1502, seen as though from a bird's-eye view, is an exceptional piece of geographic science, and shows just how intensive the energy that Leonardo brought to work of any kind was. This was probably a military map for Cesare Borgia and shows distinctly the buildings of the town, the square and roads all in different colours, with the blue waters of the moat around the fortifications. There is also a view of the river swinging between its banks and the main roads outside the city.

Its detail is so telling and clear, it resembles a map produced by modern methods of aerial photography. The lines intersecting across the centre of the drawing give the centre of the city, and on the circumference are the names of the winds associated with those directions. The notes outside the circle refer to the city of Bologna, another place where Cesare Borgia had military interests.

3

T H E
H U M A N
C O N D I T I O N

Faces, bodies, anatomy and sketches for compositions

Leonardo was certain that below the surface of the physical form was the soul, and it was in portraying this inner world that he excelled. Leonardo's work, perhaps more than that of any other painter, portrays the inner spirit of his subjects in immense depth and profundity.

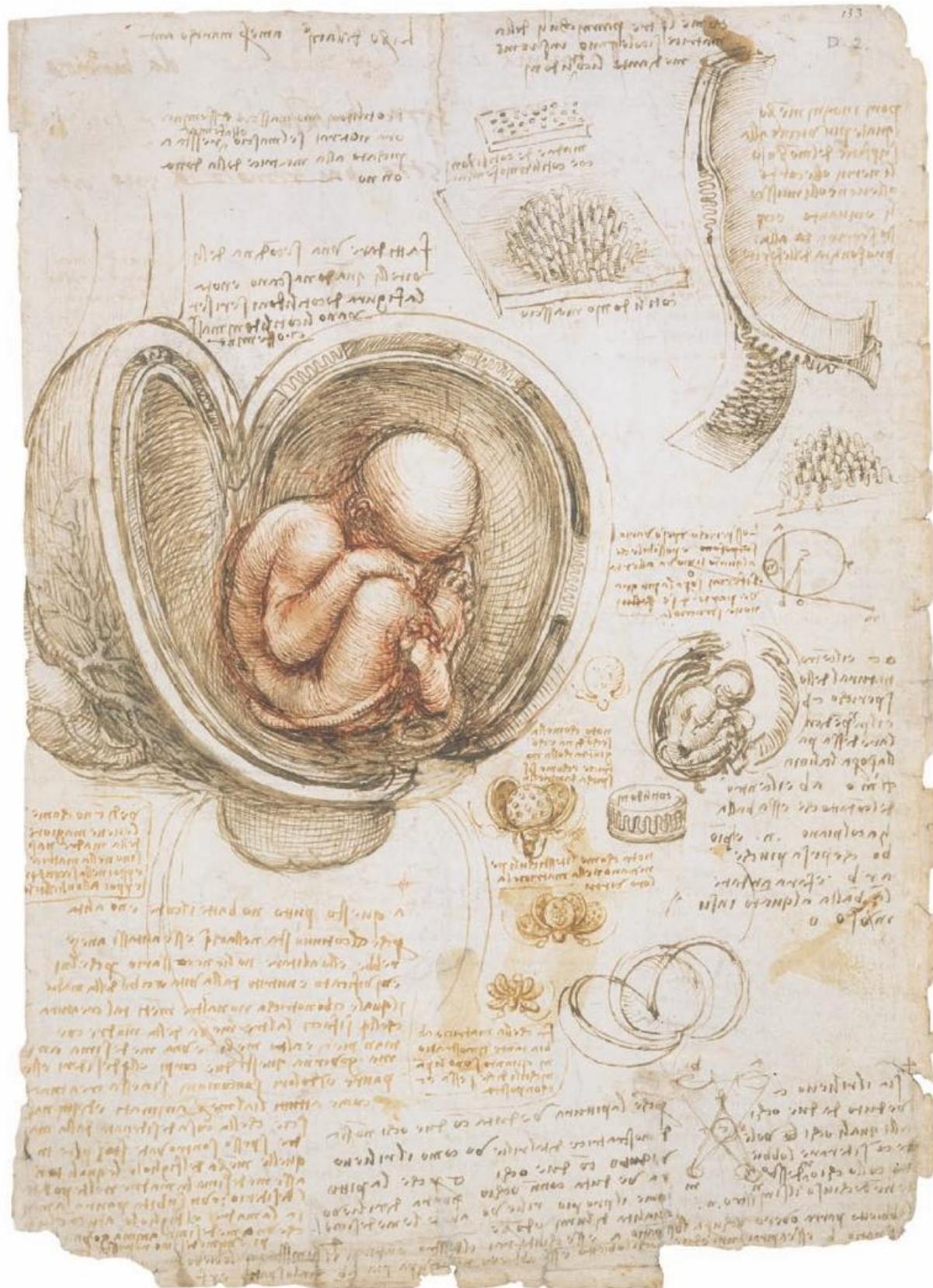
In the notes he prepared for a proposed book, *The Artist's Course of Study* – in which he examines in detail the varied skills required of an artist – he discusses the importance of proportion in the body. His famous drawing of a man with outstretched arms and feet enclosed in a square and a circle, the Vitruvian Man (see page 192), shows how the proportions of the human body relate to fundamental geometric principles. The notion that man carried in the proportions of his body a universal template; that in the microcosmic world was reflected the geometry that governed the whole of creation, fascinated Leonardo:

Man is the measure of all things.

Leonardo spoke in detail about the importance of creating harmonious concord, and this was the reason why he studied the proportions of the various limbs. He brought to his students' attention the importance of knowing the human body from the inside out, of the awareness of its structure and the universal laws that governed that structure. And lying behind this awareness of the body as a harmonious and exquisitely designed machine was an awareness of the body being the outer expression of the emotional world inside.

A good painter has two objects to paint, man and the operation of his soul; the former is easy, the latter hard, because he has to represent it by the attitudes and movements of the limbs... In painting, the actions of the figures are in every case expressive of the purpose in their minds.

Harmony, proportion, unity, divinity: these were the qualities that informed his work.



The Baby in the Womb

This extraordinary drawing of an unborn baby in the womb, from around 1510–12, is derived partly from Leonardo's knowledge and partly from hypothesis. The covering of the foetus is based on what he had observed and does not strictly correspond with what occurs in the human womb. Nevertheless, his vision of the shape of the child curled up in the uterus is realistic and is a well-drawn version. His notes also shed light on the knowledge of the time: for example, although he knew the foetus did not breathe as such, he also believed that the heartbeat he could hear was only that of the mother, and he shared the assumption that the soul of the foetus was indistinguishable from that of the mother. The rest of the details on this sheet show other versions of the details of the foetus; at the bottom is a small diagram and notes on the binocular vision of the eyes.





Figures in Coition

This cutaway scientific drawing, from around 1492–4, is Leonardo's only study of figures having sexual intercourse. As a drawing it has no erotic or romantic overtones, being purely the mechanics of the internal parts of the act, in which Leonardo as a scientist was most interested. Leonardo appears to have thought that the act of coition not only transferred the sperm to the female egg but also transferred, from the spinal cord, the spirit or soul to the future embryo. However, in his notes Leonardo seems sceptical about this traditional notion.

Young Child

This beautiful drawing of a putto, or child, naked but perfect in its chubby form, with bracelet-like creases at the wrists, the curly vitality of the hair, the curiosity in the face showing attention to something of interest, the soft dimpled limbs and the handling of the shading or tone to give the roundness of form that any well-fed child shows, is a good example of Leonardo's ability to show what many had shown, but with his own added precision and reality. Although the drawing, dated to around 1505–6, could be recognized as decorative, it is more than just an idea of a child; it is an image of all children of this age, with its innocent vigour and its vulnerable softness of form. Leonardo drew many such figures and they all give an accurate impression of a baby's shape and its actions.



*H*ands Clasped

These beautifully linked hands, c.1496, are possibly related to hand studies for the Mona Lisa although they were not the ones that were used for the picture. Probably this interlacing of the fingers did not look right for the serene portrait that Leonardo finally produced and so remain just a footnote. The beauty of the joined fingers, however, is well observed and like all of Leonardo's sketches shows a subtlety of perception that few artists ever achieve. Although this might not have been the right joining of hands for the Mona Lisa, the gentle clasp is accurately portrayed.



Study of Arms and Hands

These hands, dated to around 1474, in silverpoint on prepared paper heightened with white, were possibly for a portrait (that has since been lost) called the Lady of Lichtenstein portrait. The drawing of these elegant, loosely held hands is probably the most exquisite drawing of hands in the history of art. Every detail of the long fingers and the beautifully modulated shading produces a convincing effect of reality so that one can almost know the person from these hands. The foreshortened forearm of the left hand is swiftly and simply drawn and one can easily visualize these arms moving in conjunction with the body; an exercise in how to draw human hands at its best.



*S*tudy of Drapery for the Virgin's Sleeve

As part of Leonardo's perceptive investigations of the human being, particularly necessary for both his portraits and his religious paintings, there are a large number of drawings of drapery and clothing which can often be connected with some of his well-known works. This one is connected with St Anne and the Virgin in the Louvre.

The beautifully observed sleeve, wrinkled and swathed around the arm, shows clearly how Leonardo succeeded in suggesting the form of the human body under the clothing, and is interesting in its precision. The tonal changes across the folds of the cloth, with the deep shadows in the sharper folds and the brilliant touches of highlight on the upward-facing ridges of cloth, means the viewer does not doubt the solidity of the flesh beneath the elegant drapery.

*S*tudy of a Sleeve

This bent arm with the elbow jutting towards the viewer, is clearly indicated by the realistic folds of the material of the sleeve. One can easily understand the position and view of this detached arm, where the hint of a bent wrist at one end and the shadow of the armpit at the other suggest how the torso must be tilted forward to show the arm, with wrist on hip, at this angle.

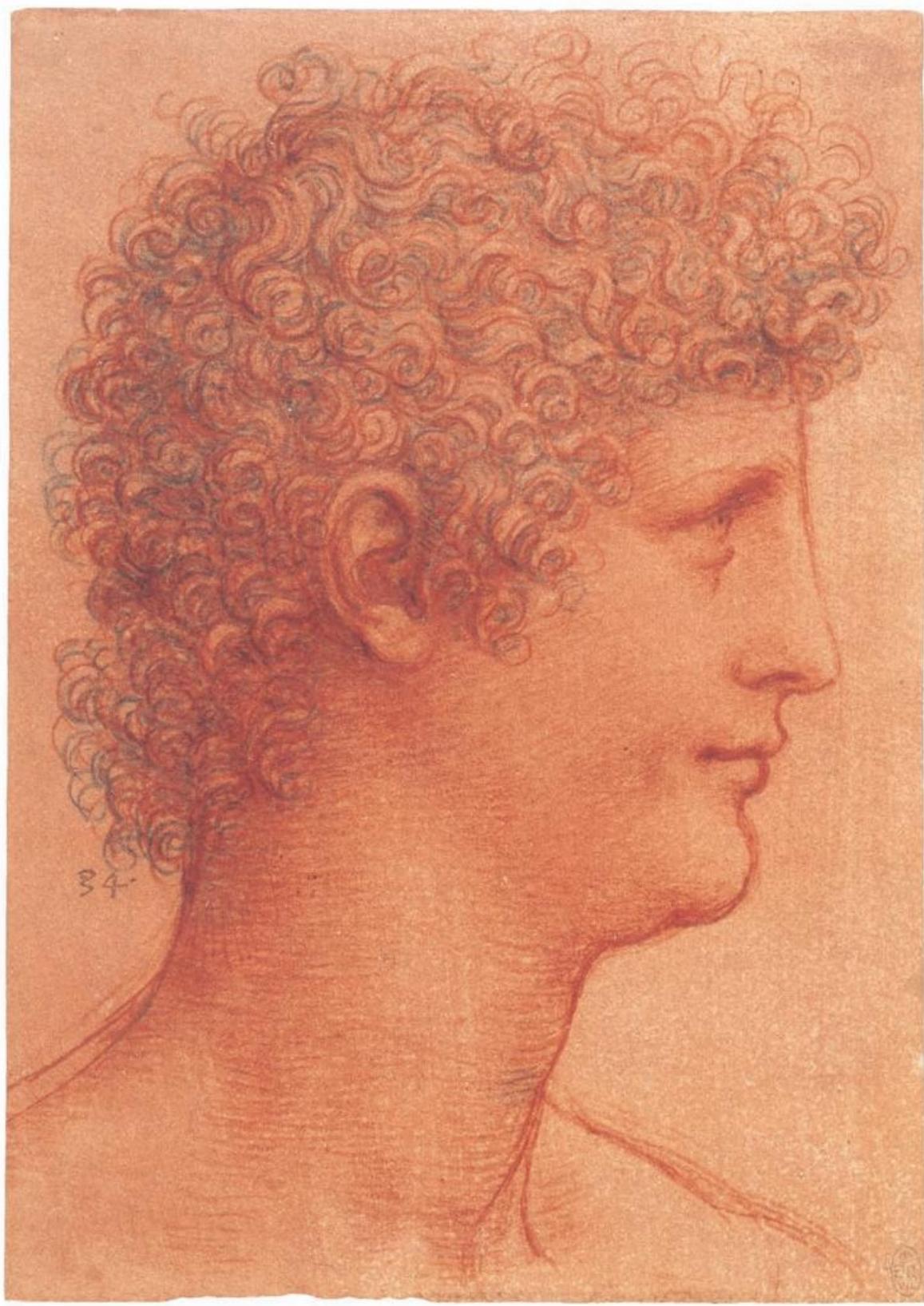
Leonardo never leaves one in any doubt, in his drawings of drapery, about what is happening beneath the soft materials of the clothing his models wear. There are many examples from various drawings of drapery that are obviously drawn for a particular painting, but this one is probably early and not directly connected with a piece of work.



Head of a Woman

This pure profile of a young woman, drawn with great economy, is in the style of early Renaissance profile portraits, particularly those of young women. Leonardo has carefully shown enough of the hairstyle and bust to give a clear idea of the final effect but concentrated most of his efforts on the outline of the features and just a little section of the hair nearest the face. The well-modulated tonal marks give a good impression of the fullness of the cheeks and neck, and help to show the veil over the back of the head. Could this have been intended for a portrait or just a sketch to define the face he wanted for a religious painting? Whatever the reason for it, it is one of his pieces of work from between 1485 and 1490.





*S*tudy From the Antique: Head of a Youth in Profile

This sanguine drawing, from about 1510, of the profile of a young man's head could easily be an extrapolation of an antique Roman statue, turned into a living being. There are also qualities about it that remind one of the profile drawings of one of Leonardo's favourite pupils. Maybe this was just Leonardo noting the similarities between his young friend and an ancient stone head, producing a drawing that links the two together.

As a drawing of a youth, it is effective in suggesting the easy-going amusement of such a character in the smile and the alert eyes.



Nude Back View of a Man

This drawing of the back view of a naked young man in red chalk is arguably one of the most subtle and understated life drawings in existence. Dating from around 1505, it is only about 28 cms high, and was probably drawn sight size. It is a comprehensive study of the musculature under the skin, with just the right amount of emphasis that makes most life drawings look either overdrawn and exaggerated or flimsy and undefined. Every ripple of the muscle is indicated in the most economical way by the accomplished touches of tonal hatching, which allow the eye to fill out the form. The muscles of the back are particularly difficult to draw clearly without over-emphasis, but Leonardo succeeds with the lightest touch, exhibiting the results of his exhaustive research into the human body. The flowing outline is well defined and yet does not hinder the movement of the eye around the form, allowing the viewer to imagine the form continuing round to the front of the figure. The hands and one leg are less defined than the rest of the body but this does not detract from the main effect of the realistic, flesh-covered look of this youthful male figure. The underlying skeletal structure is visibly in place, indicated by the areas where the bones come close to the surface. This is a magnificent piece of life study.



Head of St Anne

The Head of St Anne is a preliminary drawing for the painting of St Anne and the Virgin and Child in the Louvre. Leonardo produced this about 1509–10, and one can see the transition from the beautiful freshness of the drawing of a tender human face to the more idealized version that is produced in the final painting. The mysterious smile is wistful and maternal as the saint looks down at her daughter and grandson and St John (who is in the National Gallery, London drawing but not in the painting). The depiction is emphatically that of a mother and Leonardo has caught the tenderness implicit in her gaze.

The subtle handling of the *sfumato* technique of shading appears natural and convinces the viewer of the real presence of the woman.



*H*ead of a Man in a Helmet

These sketches of heads wearing mask-like headdresses are possibly part of the Paradiso Festival for which Leonardo designed the costumes (see pages 184 and 186).

The left-hand sketch could allude to truth hiding behind falsehood, or it concerns personality, or the mask of character. The odd thing about this sketch is that the characteristics of the mask face and the face beneath it don't seem all that different. Perhaps it was just a personification of the two-faced god Janus, god of doorways and coming and going. Or perhaps it referred to Gemini, the twins, who are also two-faced.

As drawings they are remarkably effective whether or not we know what their role was intended to be.

*H*ead of a Man

This vigorous drawing, obviously from life, of a man wearing a typical Renaissance headdress, from around 1485–90, is powerful in its rapidly drawn ink lines and minimal shading. The head somewhat resembles the profile of the all-powerful Lorenzo de Medici, but it would be unlikely, although Leonardo did know Lorenzo.

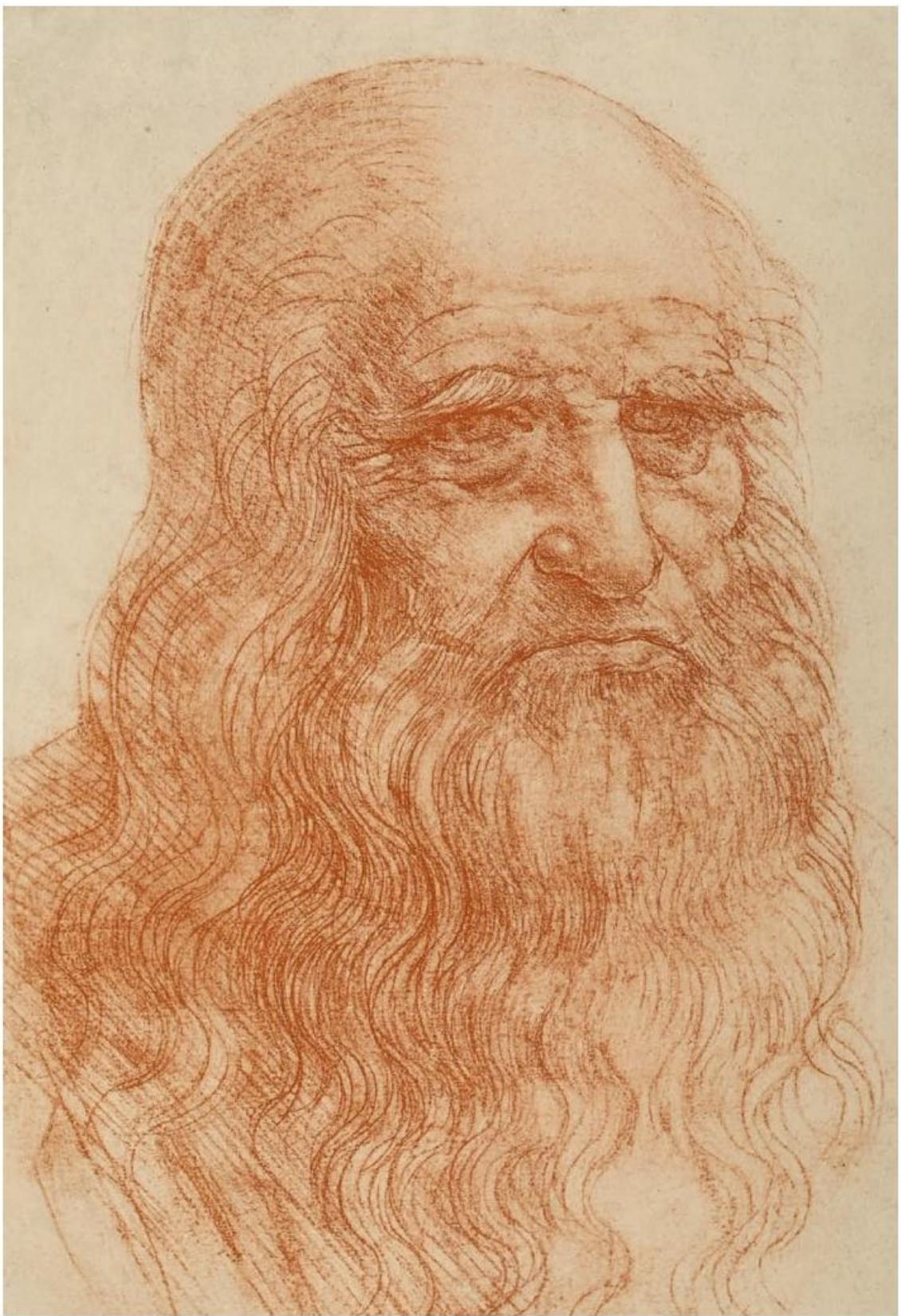
Its merit is that although it is a fairly small drawing, the lively character of the person is immediately seen in the expertly drawn profile. Many of Leonardo's drawings like this are scattered among his notebooks and other sheets of drawings and it cannot always be worked out for which works of art they were intended. Often they are simply the instant sketches of a consummate artist who would draw anything that caught his interest.

This sort of instant sketch brings the life of fifteenth-century Florence wonderfully close to us.



*H*ead of an Elderly Man in a Hat

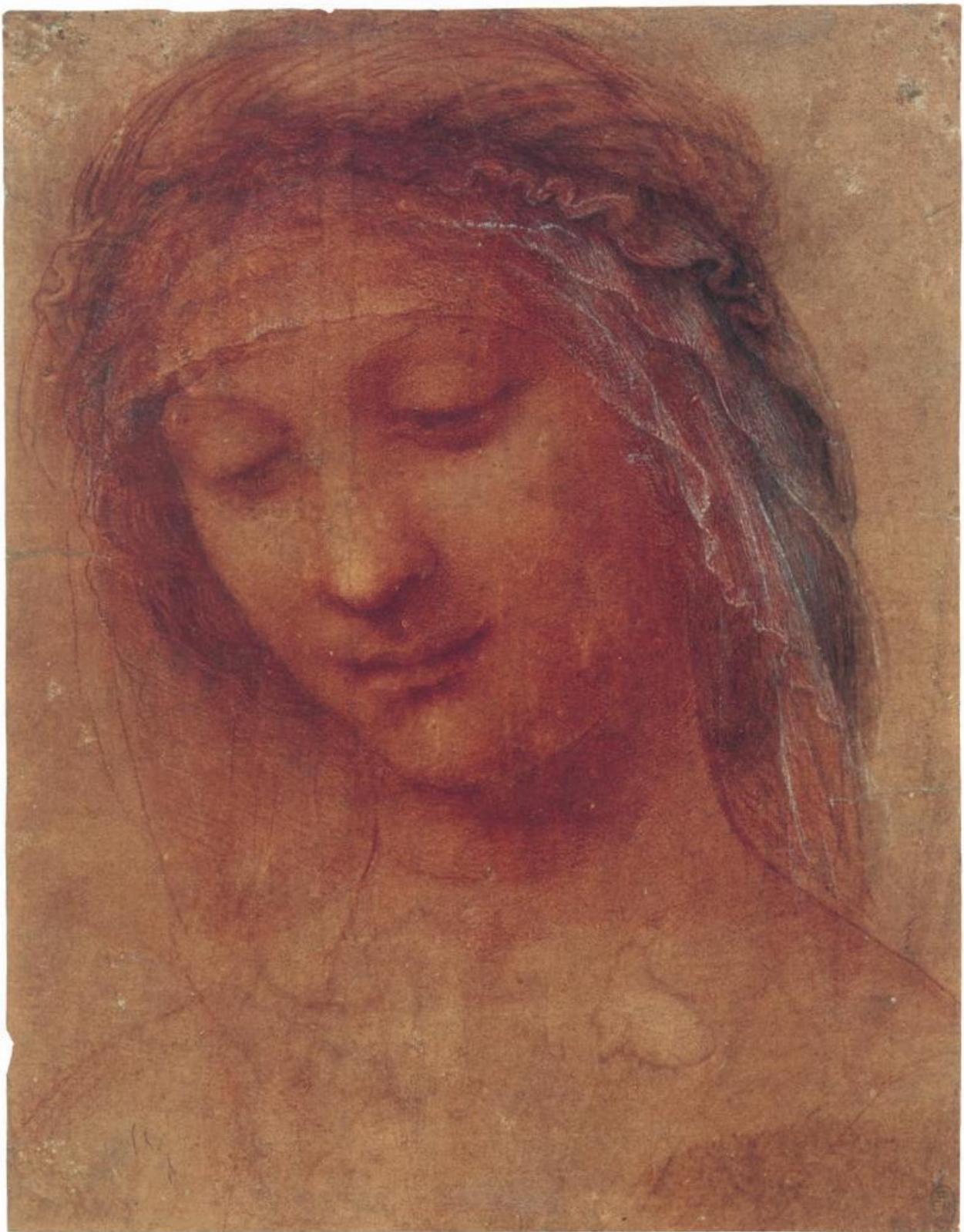
This remarkable old greybeard, with a large-brimmed pilgrim's hat, is beautifully caught with Leonardo's flowing lines; one wonders whether he was aware of being drawn. It does not look as though the subject was posed, because then the drawing would have been more deliberate and in greater detail. It looks instead like an instant sketch during a ceremony or similar event where citizens are gathered together. The obvious speed of the drawing is evident in the confident, loosely drawn lines, all rendered with the minimum of hesitation or deliberation. The face somewhat resembles Leonardo's own face in old age, which is included in this section overleaf. Perhaps he was considered for a small part in one of Leonardo's bigger paintings, or this could be just a spontaneous sketch made for the artist's own delight.



Self-Portrait of **Leonardo da Vinci in Older Age**

This dramatic elderly face with its balding head but long beard and side hair gives a compelling insight into the qualities evident in Leonardo's work. The penetrating gaze tells of his observational powers and his confidence in the powers of his intellect to interpret accurately what he sees. There is also a hint of warmth and humanity in the eyes looking out from under the ledge of the jutting eyebrows. The long Florentine nose and the firm down-turned mouth give some idea of his scepticism and refusal to take what appeared on the surface as necessarily the truth. The manifest intelligence in the face underlines his great inventive powers that could foresee inventions that technically were not able to be constructed until hundreds of years later, when technological advances finally caught up with the brilliance of his investigations.

Finally, the technique of the drawing shows his ability to concentrate on the most essential qualities first and indicate the rest precisely but economically. The features reveal the character behind the face by using emphasis effectively.



Head of a Woman

This Madonna-like head of a woman, c.1510, has resonances with his drawings of St Anne and the Virgin in the marvellous cartoon in the National Gallery, London. Of course, Leonardo would have been called upon to portray the Virgin Mary often, but it appears that in drawings like these he is trying to develop a type of face that will show beauty, grace and a certain power of wisdom through suffering. Not the mystery of the Mona Lisa with her alluring smile, but a more devout face with an inner poise and calm that produces an effect of holiness and quietude.

The gently inclined head, the headdress (often associated with the Madonna), the lowered eyes and the smile of gentle calm of a mother looking at her child, is the epitome of the universal maternal ideal.



*S*ketch for the Adoration of the Magi

This sketch shows the central part of the great Adoration of the Magi, which never progressed past the underpainting form. In the background is shown the beginnings of the architectural staircases which in the final piece would be built on the opposite side of the composition, taking the main part of the story out from under the stable roof. The frame of the stable was rejected for the final design, but here resembles Piero della Francesca's version of the stable in his depiction of the event. Whether Leonardo used the Piero idea knowingly or not is uncertain, but the depiction of a small, ruined stable was traditional.

There are figures hovering on the stairs and in and out of the arches, which in the later version became further augmented by horsemen caracoling at the bottom of the stairways. A complex system of arches penetrates through and under the stairs, with various groups of people and animals gathered in the spaces. All the worshipping figures clustering about the Mother and Child produce a frame with their deferential figures; in the more finished work this is even more clearly stated.

The drawing is hastily executed in fluid lines with some energetic toning and overlaying in order to correct first thoughts.

4

E X T R E M E
E X P R E S S I O N

Caricature, expressive faces and extremes of nature

According to Vasari, Leonardo often drew the people he saw in the streets and in taverns from life, in a notebook he always carried at his waist. It was also claimed that he followed those that particularly interested him in order to capture in memory their characteristics. He recommended to his pupils that:

...when you have well learnt perspective and have fixed in your memory all the parts and forms of objects, you should go about and often as you go for walks observe and consider the circumstances and behaviour of men as they talk and quarrel, or laugh or come to blows with one another; and the actions of the men themselves and of the bystanders, who intervene or look on.

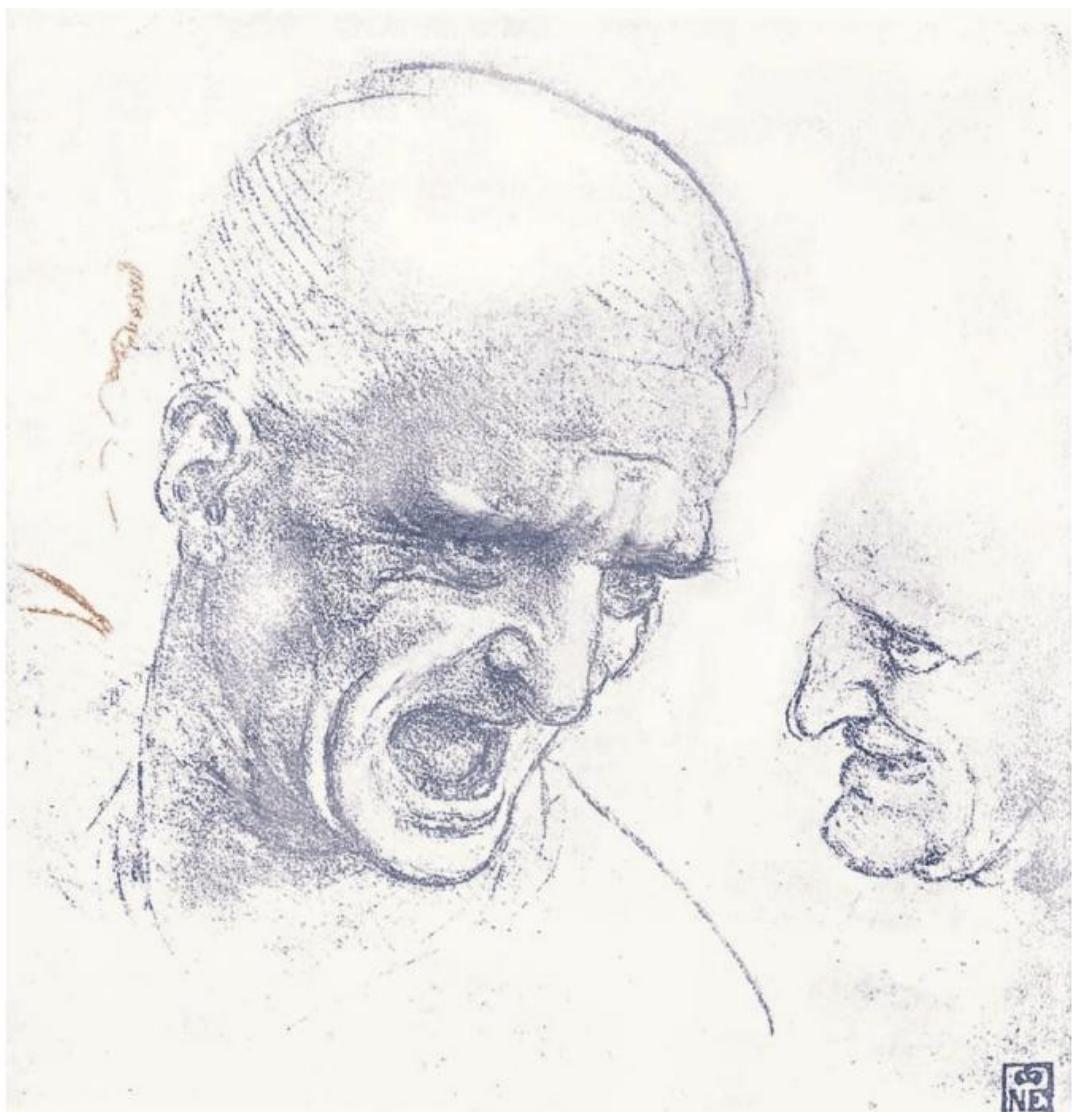
There is no doubt that Leonardo had a feeling for the rude comedy of life. Here, for example, is one of his *facitie* – humorous tales of ribald nature, full of human character:

...a woman washing clothes had very red feet from the cold. A priest who was passing nearby asked her where the redness came from. In answer the woman replied that this result came about because she had a fire ‘down below’. Then the priest took in his hand that member which made of him more a priest than a nun, and coming close with sweet caressing tones begged her to be so kind as to light that candle.

In a more serious vein, Leonardo wrote concerning the composition of a group of men listening to an orator:

...make some of the old men in astonishment at what they hear; with corners of their mouths pulled down, drawing back the cheeks in many furrows with their eyebrows raised where they meet, making many wrinkles on their foreheads.

He was concerned as much with human absurdity as he was with mankind at its most divine, and a highly perceptive understanding of the human condition in all its variety is to be found in his work. His awareness of psychology is evident as, in a few deft strokes, he captures and portrays the inner workings of the mind. The nature of man, from the most elevated of souls to those characters found in the odd corners of life, were Leonardo's concern, and they are to be found peopling the corners of his notebooks and, of course, his great paintings.



Niccolo Piccinino, Warrior Head

This powerful drawing – supposedly of the famous condottiere Niccolo Piccinino in full shout – is part of the sketches for the central part of the Battle of Anghiari, entitled The Fight for the Standard. In the copy Rubens made of Leonardo's initial drawings on the wall of the Palazzo Vecchio in Florence, this face is that of one of the central figures on a rearing horse, in ferocious combat. Leonardo portrayed the terror and chaos of war, in which men behave with ferocity, brilliantly, choosing particularly to echo these themes in the warriors' faces.

The face in this portrait is distorted by rage and belligerence: this man would not be easy to confront. The expression is menacing and one can almost hear the shouts that come from his throat.



*G*rotesque Heads Taunting an Old Man with Oak Leaf Wreath

This picture, dated to about 1493, of four grinning, taunting grotesques surrounding a dignified elderly man with a wreath of oak leaves around his head, is not known to be for any particular picture. Leonardo did several more examples of grotesque heads, included in this section, so the piece may have been an idea he was experimenting with. It is not known who the man crowned with the oak leaves is.

The extraordinary faces surrounding him have expressions of extreme emotions and extreme forms to match: the wide-open mouth of the man at the back, his head tilted back and his tonsils showing; the undershot jaw of the man at his left shoulder with his cruel-looking eyes; the man with a pendulous lower lip and hooked nose with his heavy eyelids; while the last man looks grimly intent. That the central figure seems to be ignoring his tormentors suggests that either he considers himself above their level or conversely that he is being deceived by their conduct and simply does not comprehend what is going on around him. An interesting and unusual piece of work.



Bust of Warrior (in Antique Armour)

This beautiful, elaborate drawing of a grim-looking warrior in a highly decorative helmet and armour is a real *tour de force* of the young Leonardo: the invention and decorative work interleaved around the helmet are of the highest quality. It has some resemblance to the mighty sculpture of the great Venetian condottiere Colleoni, but the armour is so fantastic that it might have been impossible to make, or fight in. However, the power of the face is obviously based on a real portrait, with the jutting lower lip and the unequivocal stare conveying the quality of a mature warrior.

This is an early drawing, made when Leonardo was probably still in Verrocchio's workshop as a young assistant. The drawing, in silverpoint, has a softness of tone that graphite lacks.

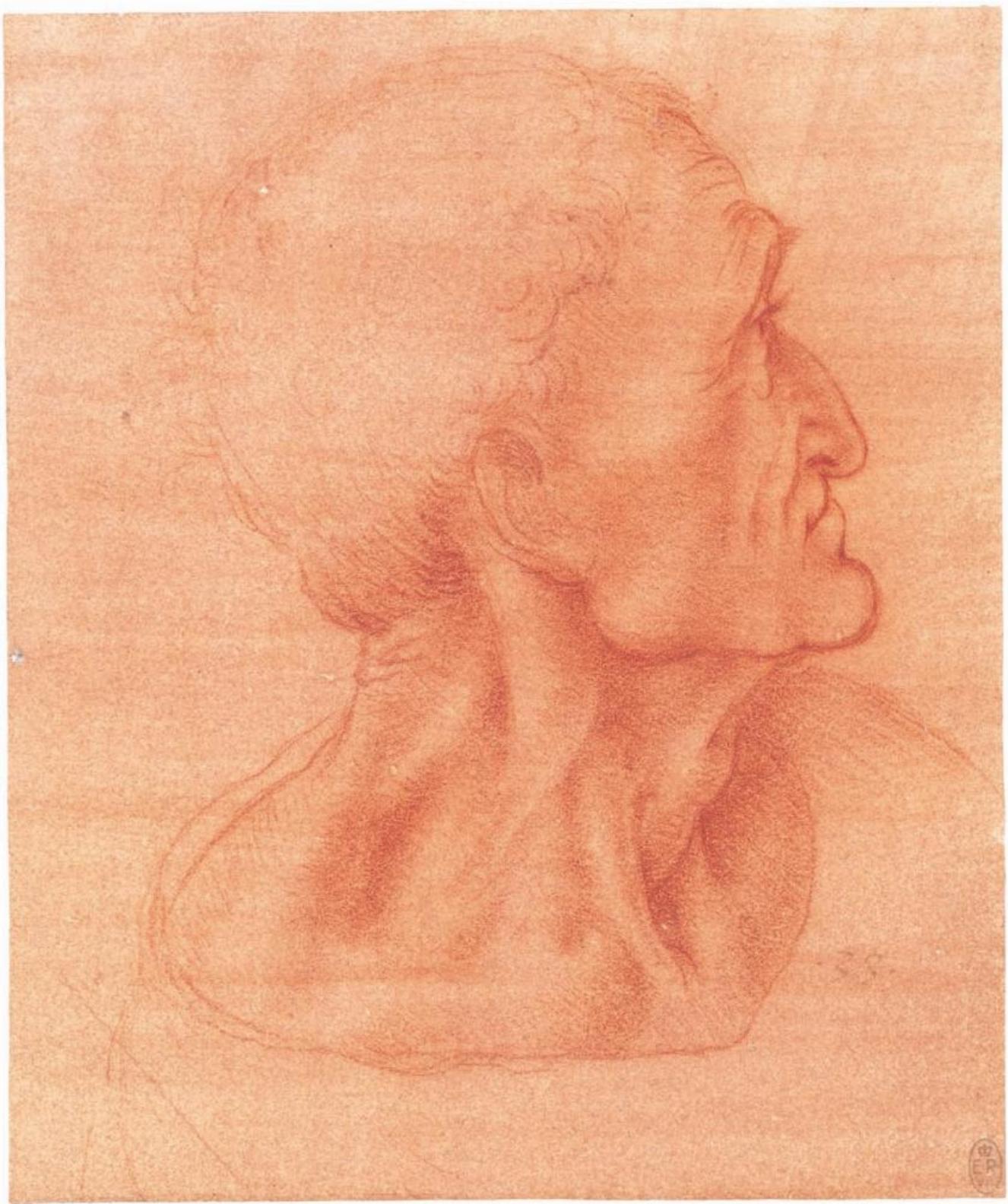
The subject matter would have been a favourite one at this time because art workshops needed to produce model drawings of this kind that could then be copied into paintings, both on fresco and panel. The bravura of this soldier has all the Renaissance swagger that the Italian warrior might show when displayed in his full battle armour. This type of figure was much used by Verrocchio, but Leonardo brings it right up to date so that there is no doubt that although he is an 'antique type' of warrior, he looks very much alive and of the moment. Again, Leonardo's genius takes this image out of the run of examples used for repeated commissions in Florentine workshops at the time, and introduces a more closely observed, realistic style.



*G*rotesque Heads

This page of grotesque heads, dated to around 1490, is rather like a catalogue of all the possible distortions available to the human face. The central figure is not exceptionally ignoble but his flapping, loose cheeks give a curious look to his head. Of the three heads at the top, the one on the left has an enormous nose and crunched up chin and brow; the middle one has a flattened nose and pendulous lower lip; and the third has a pig-like nose, enormous upper lip and soft folds around the chin: all are far from attractive. The lower two heads, which look as if age has taken away their dignity and left them with only the worst features of senility, are slightly malevolent in look.

Leonardo was obviously fascinated with these exaggerated features and seemed to be testing how far he could take the distortion without straying too far from reality. One of the powerful features of his grotesques is that they are only slightly exaggerated from those one might readily see in a crowd.

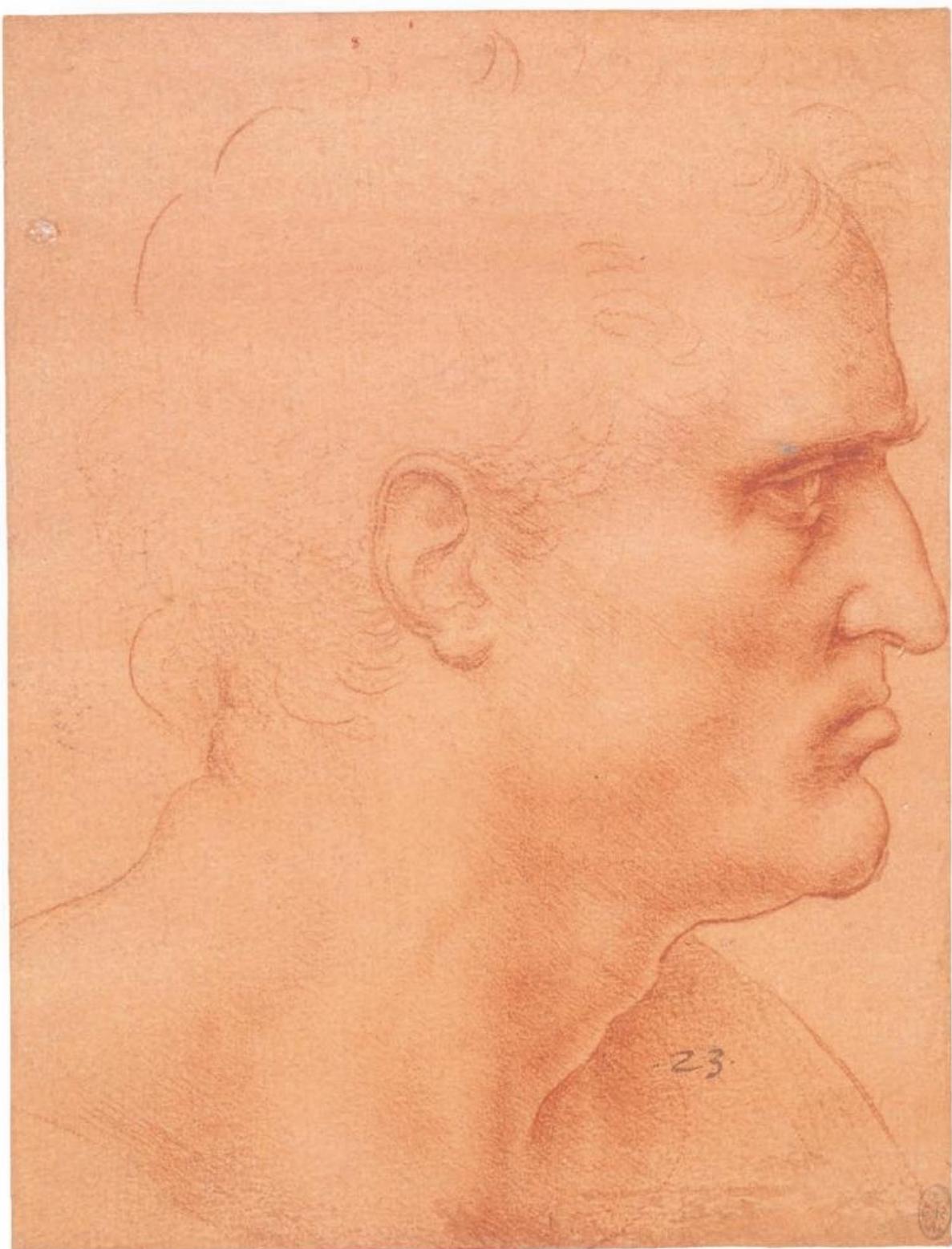


Head of Judas, Last Supper

This sombre portrait, from around 1495 or later, of the betrayer of Christ is that of a man with good intentions who, for egotistical reasons, decided to betray his friend and master. The look on the face is uneasy. The strain in the expression shows disbelief and a grim determination to carry out a disloyal act as if it were justifiable.

Leonardo's drawings of the apostles around the table in the great fresco of the Last Supper at Santa Maria Delle Grazie, are among the most powerfully emotive faces ever used for this theme. Many of the lesser artists of the period did not achieve the quality of reality that Leonardo achieves, often descending into caricature. But here there is no doubt about the dark thoughts in this man's head. They show, subtly, on his upturned face.





*H*ead of Apostle – St Bartholomew

Another portrait of an apostle, from around 1495. St Bartholomew is in profile drawn in red chalk on prepared paper. The stern visage is full of consternation at Jesus' words – that one of the Twelve will betray Him – but calm and steady, reinforced by the physical form of the head and neck. Here is a strong, solid-looking head, intelligent, perhaps intellectual, but powerful and charged with determination. Although troubled, he knows he is not the traitor.

The modelling of the powerful neck and jaw and the overhanging brow is beautifully modulated to suggest the tension of the muscles under the skin. The intensity of the tone around the eye sockets and along the line of the profile produces an effect of brooding power. Everything in Leonardo's drawings of faces, including the type of hair, the subtle shaping of the features, and the positioning of one feature against another conveys a definite type of physiognomy familiar in real life. The characterization of his figures is masterly.



*H*ead of Apostle – St James the Great

Another apostle's head of the same date, from the fresco of the Last Supper, is this time of the leading teacher-apostle, St James the Great. This drawing in red chalk and pen and ink displays the reaction of disbelief and shock in the most sensitive and perceptive of the disciples of Christ. The recoiling of the body and the open mouth are reminiscent of the reaction of Mary shown in many pictures of the Annunciation. In the final painting St James' arms are outstretched to either side in a gesture of surprise and openness, as though caught in a cry of, 'How can this be?'.

The drawing of the face is in vigorous, corrected lines where the wiry pen line and the soft chalk produce an effect of youth, refined grace and beauty. The way Leonardo has shadowed the eyes as they look upwards from the tilted head makes the power of the gesture ever more telling. You can almost hear St James' gasp of horror at the suggestion of betrayal.



*R*earing Horse

Another red chalk drawing of great vigour and activity, dated to around 1503–4. This time the expression is all equine with the magnificent steed lifting its forelegs, rolling back or turning its head, and tensing its hindquarters as it almost throws the barely drawn figure outlined faintly on its back. This drawing is probably for one of Leonardo's sketches of the Battle of Anghiari, although he did many similar for one of his monumental statue projects.

The restless movement of the horse is emphasized by the way Leonardo has left in some doubt how he wanted the horse's head and neck to be drawn. There are two distinct variations; one with the head thrown upwards and back in an effort to release itself from its restraining harness, and the other where the head is twisted to the left as though under the power of the rider's grip, trying to settle its front legs back to the ground. Either version would work well, and it is as though Leonardo is happy to leave both versions of the drawing before he makes up his mind. The extra front and back legs also give indications of how the drawing can be altered to either possible position without losing the quality of the moment. It is part of Leonardo's genius that we accept all the variant poses within the one pose and interpret its meaning, rather like a photograph with a timed image showing different parts of the movement in blurred sequence.



*P*risoner Costume

This study for a costume is for either a *Sanseverino* tournament to celebrate the wedding of Lodovico Sforza to Beatrice d'Este in 1491 (a serious dynastic marriage for the duke), or for a court fete called the Festival Paradiso in honour of Francis I of France in about 1516. Whichever the drawing was for, it is an effective piece of work showing the figure of a wild man or robber perhaps, dressed in ragged clothing with a water flask and knotted club, but also shackled by the wrists, neck and ankles in order that his wildness does not disturb the party.

The black charcoal drawing indicates, with softly drawn lines and sooty shadows, the muscular body under the ragged clothing and the curly unkempt hair and beard. The bent knees and gesture of the left hand describe a sort of begging posture, such as a prisoner might adopt.



Self-Portrait (detail) In Old Age

Believed to be a self-portrait dating to around 1513, this drawing portrays an expression of age that has given up striving and expectation. The head held in the hand as the seated figure leans on his staff, engrossed in thought or meditation, has a serious and cryptic expression that suggests a lack of hope for the future of mankind. The down-turned mouth and melancholy eyes seem to regard the future without much enthusiasm. Whether or not this is a self-portrait, the feelings of the figure are clear.

The technique of the drawing is confidently and crisply executed in pen and ink with light touches of tonal hatching, which give enough shadow but not over-heavy detail. This looks like a work of imagination; when Leonardo drew a man of his own age it would tend to be of a physiognomy similar to his own, and without being from life. All artists tend to draw themselves into their characters; more so when from memory.



Battle Between Horseman and Dragon

This energetic drawing in pen, ink and wash, c.1481, is only about 14 cms high and obviously drawn with speed. However, everything in the picture is as clear as can be; the muscular hindquarters of the horse, its swinging head and neck, the shouting energy of the rider and the dragon's voracious jaws and grappling claws.

The dragon's wings and tail are flicked in without any detail but with enough detail to show what is going on. This sort of drawing, associated with the great unfinished work of the Adoration of the Magi, is a strange piece of symbolism to place in the background of such a religious setting. There are many opinions as to why this sort of activity could fit into the great work, but there is evidence of Leonardo's continued fascination with this subject in his great projects for equine sculptures and the Battle of Anghiari series. Thus, this drawing is an early version of what was to be a continuing theme in his work.



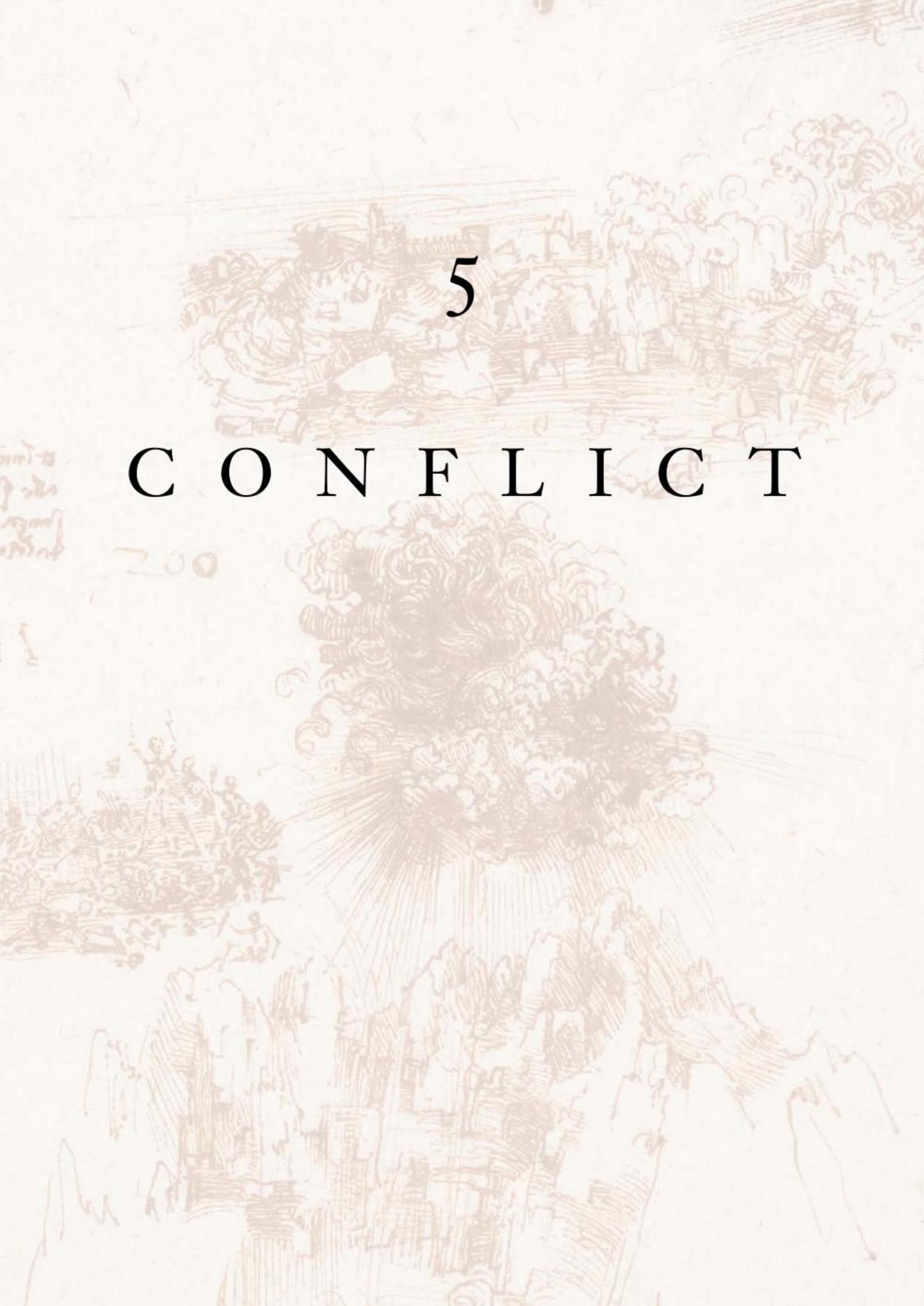


*H*urricane

This pen and ink over charcoal drawing of a great storm or hurricane, dated to around 1515, has clouds sweeping across the mountainous landscape and swirling waters, great waves and floods. The suggestion is that everything will be swept away by the power of nature let loose across the landscape. In the bottom corner there is a desperate struggle between horsemen who are also affected by the storm, which has torn down the trees on the border of an expanse of water. It is as though the horsemen struggle both against each other and the turbulent wind.

The fascinating details of this drawing include Leonardo's favourite subject of water patterns, which he observed and used in his more imaginative projects. The repeated curls and undulations of water and cloud here are helped along by the gesture of aerial figures; the gods of wind and tumult letting forth the elements. The drawing of the broken trees lying across the ground is detailed enough to show their structure and how they have been shattered. Small figures cling to the trees, which are bending with the blast. A truly apocalyptic scene of which Leonardo drew many variations.





5

CONFLICT

War machines, battle scenes, sublime expressions of nature

In his *Artist's Course of Study* Leonardo describes at length how best to represent a battle:

Make the conquered and beaten pale, with brows furrowed with pain; the sides of the nose with wrinkles going in an arch from the nostrils and ending where the eye begins...and the teeth apart as with the crying out of lamentation...Put all sorts of arms between the feet of the combatant, such as broken shields, lances and broken swords.

Leonardo goes on to suggest a creative process in which the artist is encouraged to sketch out his ideas until he has in mind the movements of the figures drawn in such a way that:

...the mental motions of the protagonists, are clearly visible.

Leonardo wrote about the cruelty of men:

...their desire to deal out death, affliction, labour, terror...Nothing shall remain on the earth, or under the earth, or the waters that shall not be pursued, disturbed or spoiled.

Ironically, these are the words of one of the foremost military engineers of the time, for in Leonardo's notebooks, alongside designs for great battle scenes which are both heroic and terrible, are many beautiful sketches and more fully realized technical drawings covering many aspects of military engineering – the scientist meets the artist.

In his successful application for employment in the service of Duke Lodovico Sforza, Leonardo described his abilities to make:

...covered cars, safe and unassailable...cannon, mortars and light ordnance, catapults, mangonels, 'trabocchi' and other engines of wonderful efficacy and general use.

He also mentioned his abilities as a bridge builder and as a mining engineer. Leonardo lived up to his claims, adding to the list the design of forts and defence systems. Such were his fertile powers of invention it took the rest of mankind many centuries to catch up.



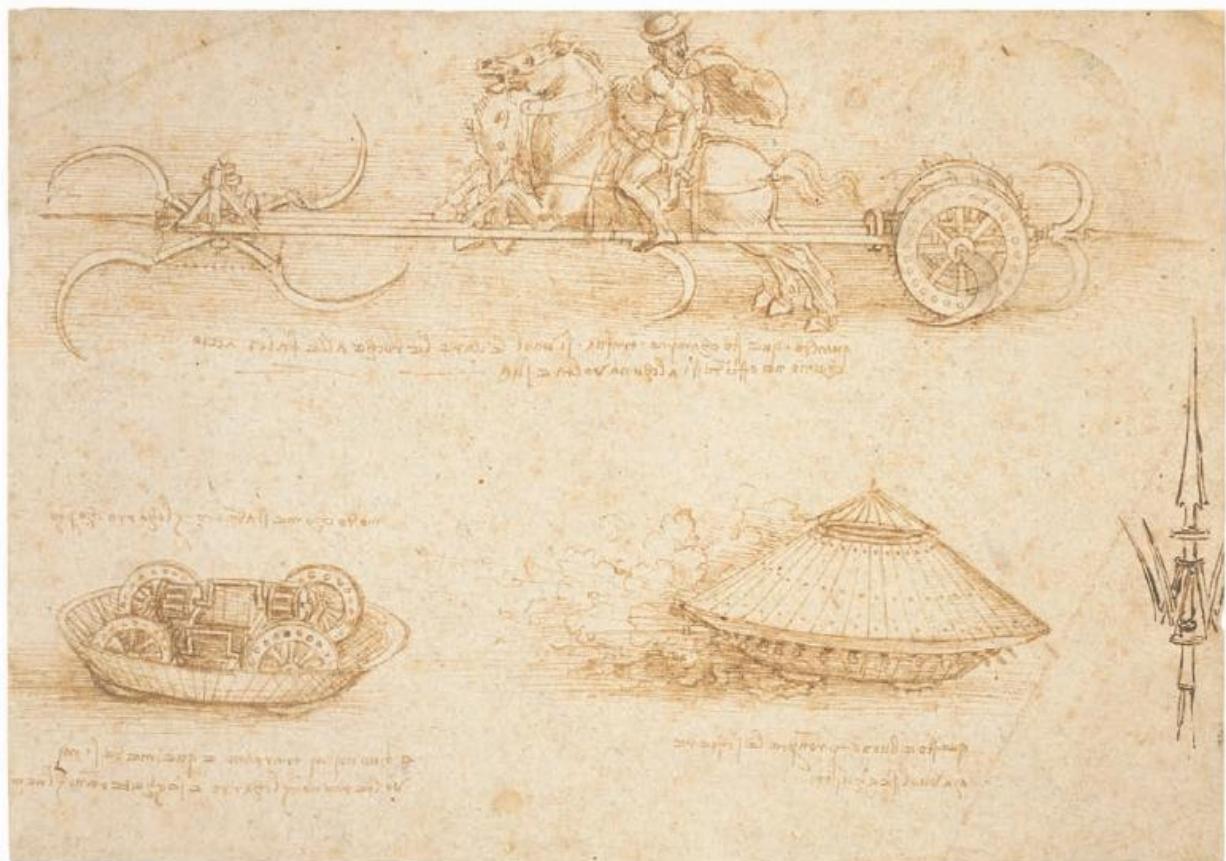
*H*ead of Young Warrior, Shouting

This section on conflict opens with the simple expression of this young warrior, from the drawings associated with the Battle of Anghiari. The highly finished face of the warrior is carefully drawn and must be from a life model. Leonardo has shown the smooth curve of the cheek as it is stretched by the open jaw, gradating the tone from the depth of the shadow by the ear and on the jaw line to the relatively light surface of the front of the cheek near the nose and the lower eyelid. The beautifully controlled sanguine tone drawn with light, angled strokes, repeated so close together that they become one tone, is evidence of his control of his *sfumato* technique. The barely drawn edges of the brow and nose contrast with the strongly defined lines of the mouth and chin. The eye glares out from the shadowed eye socket and the creases in the turned column of the neck are deeply etched. As he left out the top of the head except for a bare outline, Leonardo was probably concerned here with a facial type for one of the main warriors in The Fight for the Standard. One of his more highly finished drawings for this great battle piece.



Cannon Foundry

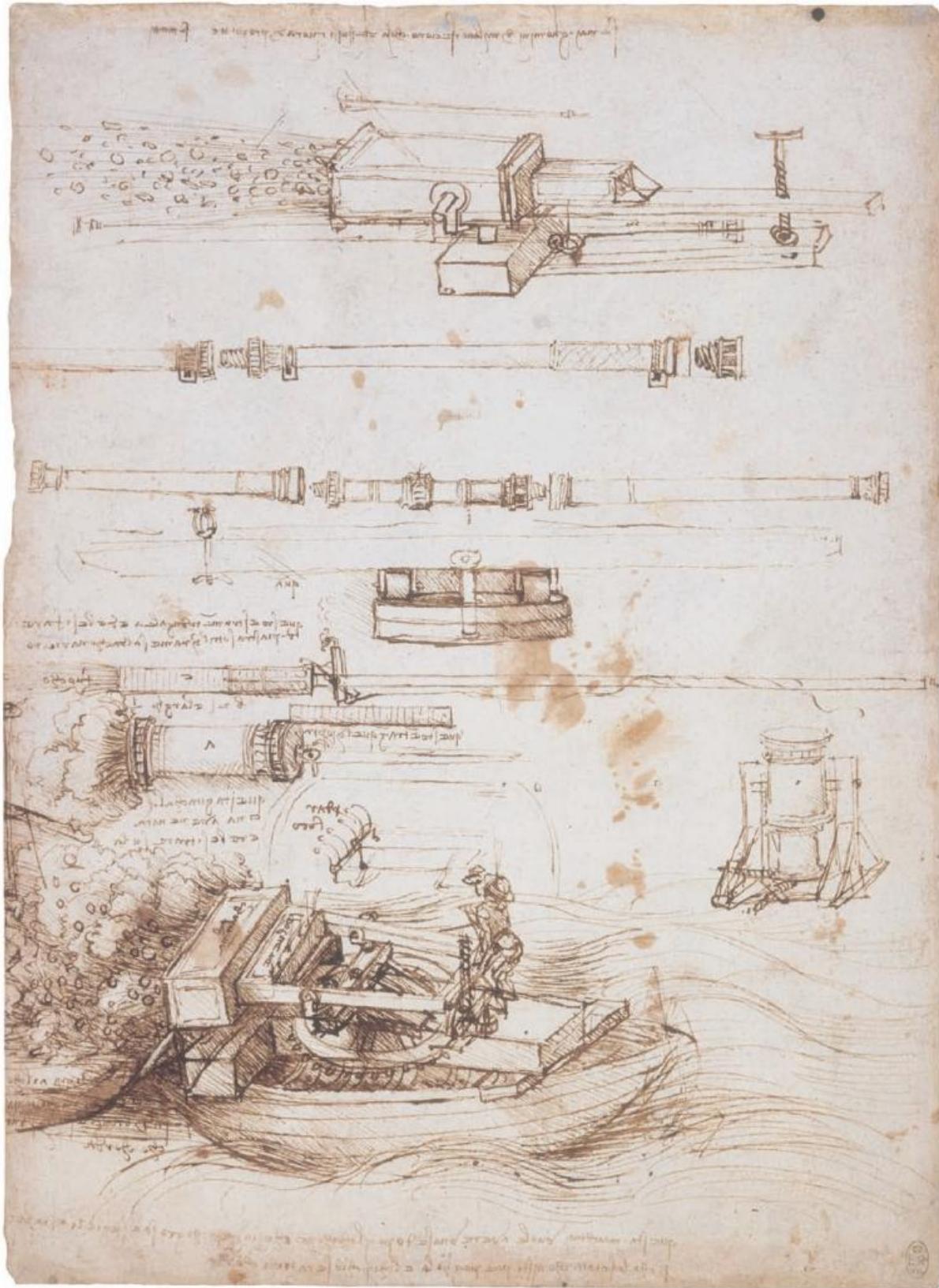
The pen and ink drawing from around 1487 shows the interior of a foundry for casting cannon from bronze, and shows how a hoist might lift the great barrels of a cannon and place them onto the gun carriage. All the beams and ropes of the hoisting mechanism were thought out and designed by Leonardo in his capacity as advisor on military engineering for Duke Lodovico Sforza. These drawings were probably produced to explain the process to the workmen in the arsenal who had to produce the results. Leonardo must have been able to study all the hoist and crane mechanisms which the great Brunelleschi had designed for the building of Florence's cathedral over a generation earlier; devices which were, and still are, kept in the Opera (works) of the Duomo for all to see. His drawing gives a good idea of the layout of the space where the moulded tubes of the cannon were stored, with all the necessary beams, ladders, joining pieces and gun carriages. The swarming groups of figures give some idea of the manpower involved in an activity such as this at this time.



Scythed Chariot and Armoured Vehicle

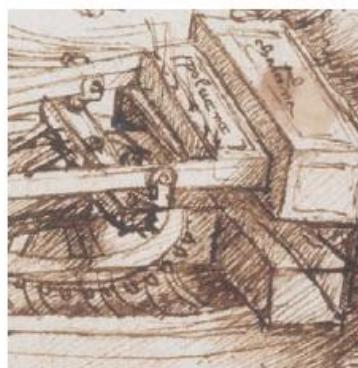
This is one of Leonardo's most famous war machine drawings, in pen and ink and wash, which foresees the advent of the tank or armoured car. The scythed chariot is reminiscent of Boadicea and her chariots but vastly more sophisticated. The four whirling scythes at the front of the horse would render infantry ineffective to attack or stop the chariot. The wheels and scythes behind would wreak havoc and protect the rider from attack in the rear. Quite a deadly war machine, but it was probably never made.

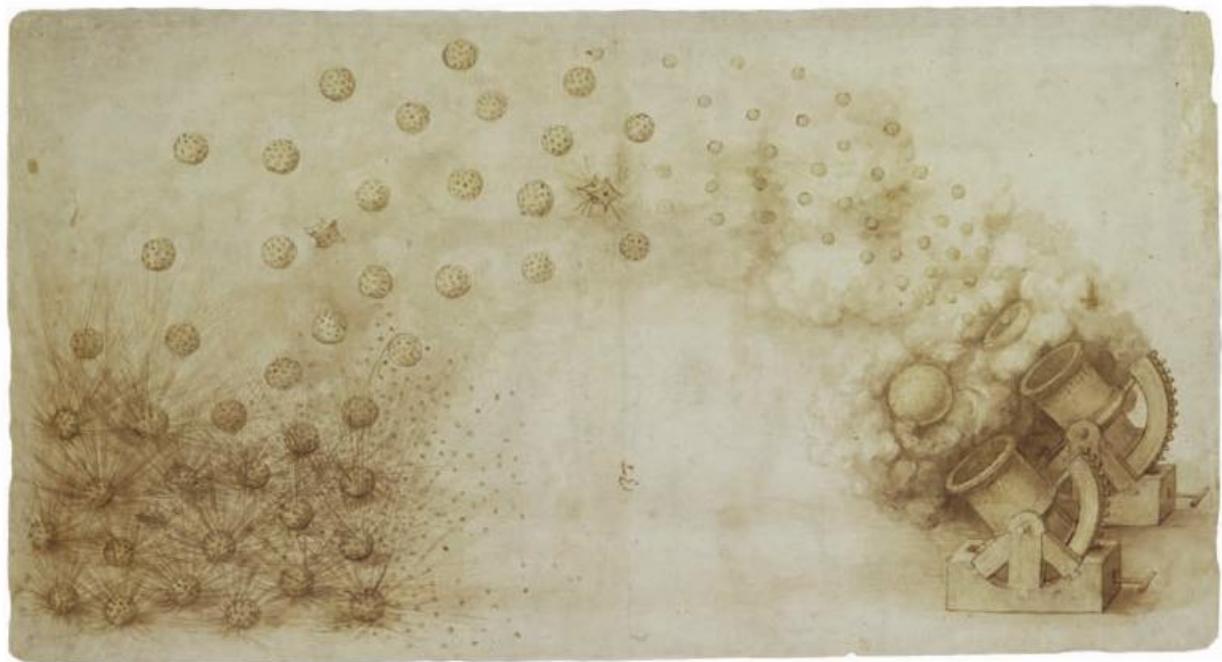
The tank is even more fascinating. The sloping armour would stop missiles from affecting the machine and as there is room for eight men underneath to drive it and fire through the portholes, it would be difficult to stop, and almost impossible to attack the crew. It was designed to break up enemy formations, which no doubt it would have succeeded in doing. This particular form of armoured car did not revive in military interest until the First World War. Once again Leonardo puts new ideas together that reach out to the future in his understanding of how to harness knowledge for practical purposes.



One-Man Battleship

This extraordinary sketch of a device, dated to around 1485, would have made the Duke of Milan's navy a world beater, if it had ever been produced. It was designed to fire incendiary missiles at the enemy ships, and as it required only one man to manoeuvre and fire it, imagine if a fleet of these machines had been produced! Again it is highly likely that nothing was ever made of the design, but Leonardo's imagination in the field of military endeavour was so fertile that if the technology of the time had been a little more advanced, and if the duke had been able to afford to take up his ideas, the history of European warfare might well have been altered. However, it was not to be; despite Leonardo's inventions being carefully preserved, they were not, as far as we know, put into practice.

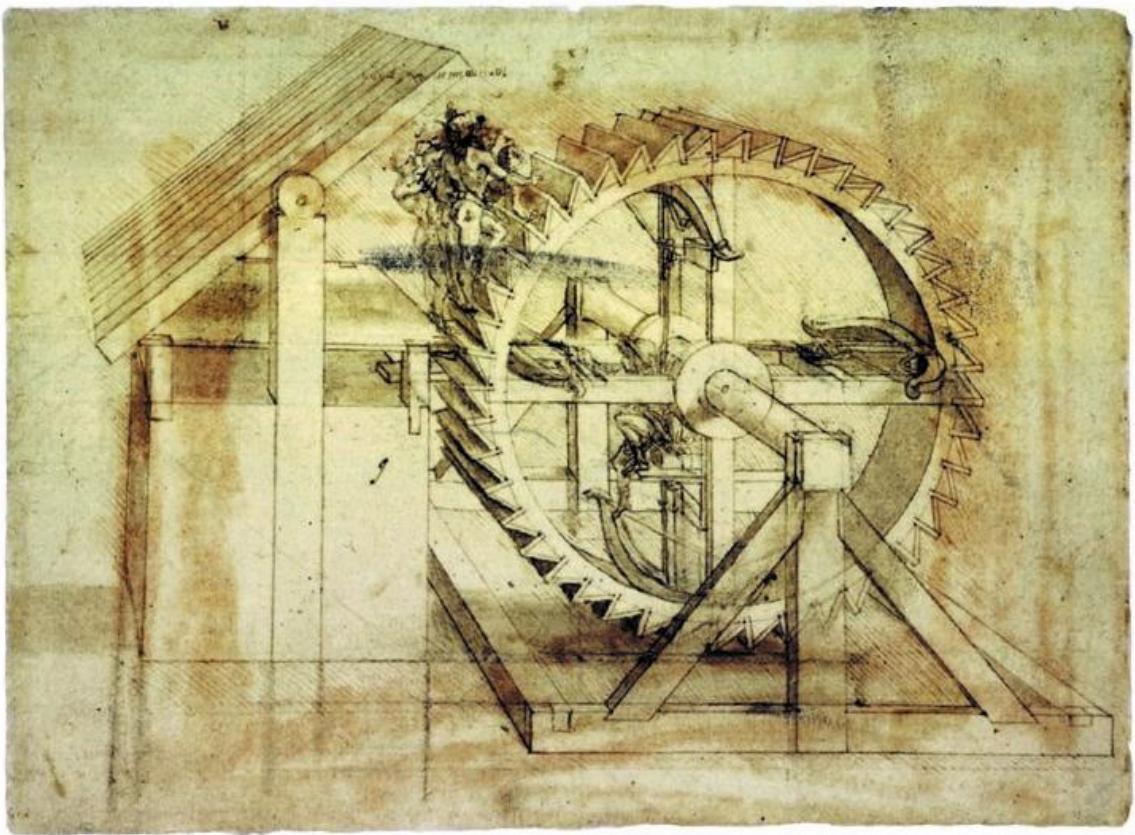




*H*uge Mortars with Explosive Projectiles

Warfare in Leonardo's lifetime had taken a big step forward with the introduction of firearms, but larger weapons were still in their infancy. What is remarkable is that Leonardo so understood the principles that their use was based on, that many of his inventions connected with them anticipated the sort of innovation not actually produced until the nineteenth and twentieth centuries.

Leonardo's understanding of artillery was such that this drawing of mortars firing explosive shells that scatter shot or shrapnel are similar to those employed in the American Civil War. The firing of multiple shells against the enemy would have revolutionized fifteenth-century warfare as he had also realized that traditional fortresses would not be able to cope with this kind of attack. As a result Leonardo had designed fortresses that were low-lying with huge curved shelters, but it was several hundred years before the idea was put into practice.



*M*achine Gun

Leonardo's designs for weapons are particularly interesting in hindsight, because all the ideas he had for weapons and other machinery are very much the ideas that exercised engineers and inventors during the nineteenth and twentieth centuries. He foresaw the importance in warfare for heavy and light artillery, breech-loading firearms and multi-firing mechanisms to increase the rate of shot, all of which emerged in the latter half of the nineteenth century. With his interest in flying machines and parachutes he also foresaw what would come about in the twentieth century. The only thing that prevented him producing modern weapons in his own time was the too primitive technology and, more probably, the conservatism of the military leaders of the time.

This version of a machine-gun is a remarkable invention given the problems of production. How well it would have worked is difficult to say, but theoretically everything has been thought through to an extraordinary degree. Leonardo's responsive mind obviously saw the advantage of firearms in battle, and he could see the problems of the contemporary weapons. His immediate response was to search for ways to improve their efficiency and their range of powers.



*F*igure on Horseback Trampling Prostrate Foe

Duke Lodovico Sforza, the son of Francesco Sforza, wanted to commission an enormous statue of his father to place in the square in front of the Ducal palace in Milan, to show the Milanese the splendour of his house and his family's powerful position.

Leonardo produced many drawings for this statue (this one is dated to around 1488–90) and even got as far as the clay full-sized original that was destined to be cast into bronze.

This drawing, in silverpoint on a prepared blue surface, shows the active shape of this proposed monument with the figure of Francesco seated, indicating a movement forward while the rearing horse tramples his foe. The prostrate figure would have been partly used to support the front legs of the horse to ensure the bronze would stay erect as the back legs, even strengthened with inner metal, might not have kept the full weight of the metal statue from collapsing.

*H*orsemen with Standards

In charcoal on paper, and another drawing for the Battle of Anghiari, this picture of horsemen with standards flying shows the lengths to which Leonardo would go to ensure that he had enough preliminary work to plan the completed painting. Because it was to be a mural painting he had room to manoeuvre his figures, and as the wall space in the Palazzo Vecchio was large he could build up his picture of conflict with various groups of soldiery, both fighting and waiting to fight. This group would have been one of the latter, getting ready to bring their force to bear where the need was greatest. The drawing probably dates from 1503–4.



Horse Studies

The projected painting of the Battle of Anghiari gave rise to many drawings which give a good idea of the behaviour of horses in the arena of conflict. This particular sheet of drawings, dated to around 1503–4, concentrates on the features of a horse's head with two complete horse figures, and a comparison of a lion and a man whose features are shown in a similar state of ferocity.

How graphically Leonardo draws the mouth of the horse with nostrils flared, lips drawn back from the teeth and the eyes in a state of staring fervour! War-horses were trained to fight with teeth and hooves but must also have suffered from terror as well, as they are not natural predators.

The way Leonardo lines up for comparison the profiles of horse, lion and man, with their distorted grimaces, displays how he was considering showing this ferocious battle scene. The caracoling horse rearing and tossing its head to one side, and the galloping horse swerving in the fight, both give some idea of the activity and movement he was bringing to the composition. The horse's head studies are remarkable and have been used repeatedly since his time for the quality of rage they illustrate.

Horsemen Galloping

These galloping horses, beautifully observed but roughly sketched in chalk, stretch across the paper and must have been drawn while Leonardo was watching horses being put through their paces. Dated to around 1503–4, he has achieved the two stages of the gallop, when the legs stretch out and when they curl up under the horse's chassis before the next bound. They show how Leonardo would make study after study in order to get the right effect in his compositions. The soft, loose lines show the practised hand of the master of the instant sketch.



*A*rezzo and the Chiana Valley

A topographical relief map of the valley and city probably done in 1502–3 while Leonardo was serving with Cesare Borgia as a military map maker and engineer. These sorts of map, not general in Europe until the seventeenth century, were an advantage to the military commander, and both Borgia and the Duke of Milan were aware of their value. Borgia was fortunate to have his maps produced by one of the foremost artists ever, although one wonders how far he was aware of the honour.

This map drawn in pen and ink and bistre chalk shows Leonardo's skill in visualising and probably measuring geometrically the locations of the various parts of the country that he mapped out.





*E*arthquake, Fiery Rain, Resurrection of the Dead and Explosion

Probably from around 1511–12, this drawing sheet, full of powerful disaster studies including one of the dead coming out of their tombs, emerged from Leonardo's interest in extreme conditions, both natural and man made. The earthquake is natural enough, but the rain of fire seems more apocalyptic and could be connected with man's refusal to obey God.

The large drawing of an explosion in the middle of the sheet was probably from Leonardo having seen missiles explode. No doubt, as a military engineer, Leonardo was around when explosive devices were tested and this drawing certainly has a look of authenticity about it. A clear understanding of what an explosion looks like is implicit in the drawing, even if Leonardo has used a somewhat exaggeratedly artistic method of drawing to depict it. Undoubtedly he trained his memory visually so that he could draw accurately from memory.

6

T H E
D I V I N E
S P I R I T

Spiritual and religious images

Leonardo's philosophy was one of unity:

Every part is disposed to unite with the whole, that it may thereby escape from its own incompleteness.

To Leonardo, the Creation was a united whole, beautiful and harmonious. It is little wonder, therefore, that in the contemplation of his great religious works the feelings that one is left with are harmony and peace:

Do you not know that our soul is composed of harmony?

Despite the frustrations of his own life Leonardo was certain of this fact. He painted out of the spirit of love, uniting with his subject in all its depth.

The lover is drawn by the thing loved, as the sense is by that which it perceives, and it unites with it, and they become one...When the lover is united to that which is loved it finds rest there.

When he wrote about the role of the painter, Leonardo not only described painting techniques, he also wrote about how religious paintings are imbued with the power to bring to people health and happiness:

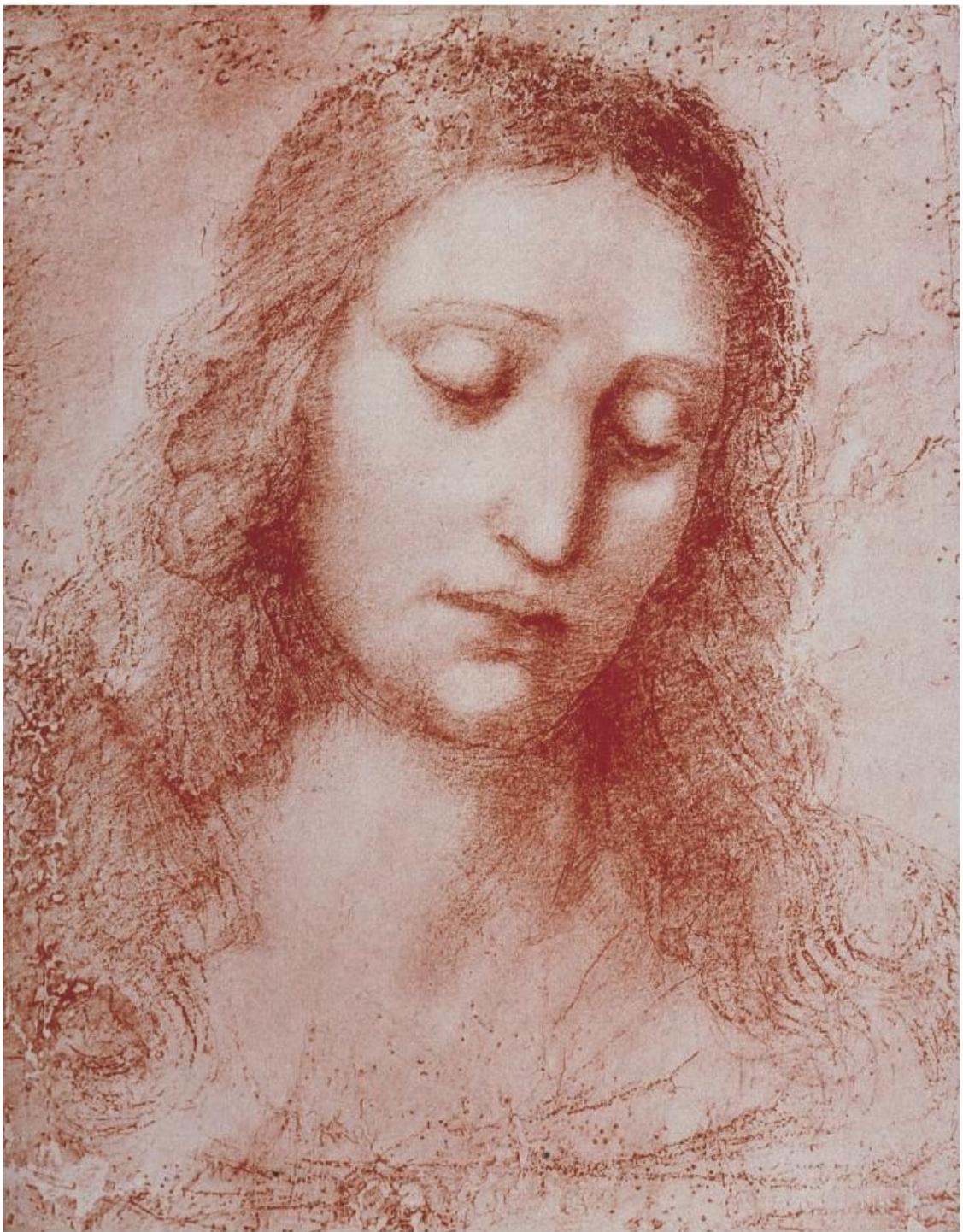
...as if the Deity were present in person... You surely will agree that the image of the Deity is the cause, and no amount of writing could produce the equal of such an image either in form or in power.

This was true in his own day when people would gather in multitudes to view a new work by the great Leonardo, and it is equally true in our own time. Though we may not share the religious imperative that once drove people to journey in search of spiritual revelation, we are still acutely aware of the genius of these paintings and the spiritual nourishment they provide.

In the portrayal of the physical world, Leonardo regarded painting as a science which brought:

...philosophy and subtle speculation to bear on the nature of all forms.

With these words he asserted that the role of the artist was not merely to represent physical forms, but also to connect with the world both in its outer form and in its essence.



*S*tudy of the head of Christ for the Last Supper

It is essential to include this image of Christ for the Last Supper in this section. Although it is disputed that this study is an authentic work by Leonardo, it does have many qualities of his work and it resembles his final mural painting as far as can be seen. The original drawing has tempera retouching that may have been done by a student or assistant; common practice at the time of this work. Even so, it is a beautiful and eloquent head that captures the moment when Christ foresees his own betrayal and death. The face is sorrowful, and at the same time calm and somehow dispassionate. The chalk lines of the features and hair are expertly drawn and the tonal shading is masterly.



Studies of Profiles for the Adoration of the Magi

A group of drawings of profiles which are thought to be for the unfinished Adoration of the Magi painting. These elegant portraits crowded together on the page throw light on Leonardo's work on preliminary drawing when he was engaged in a major work. For the Adoration there would be many figures around the Virgin and Child, and figures also in the background. Leonardo needed a number of portrait profiles to populate his crowd scenes; he never drew groups of people with similar features. The variety of the human form and face interested him and for a large devotional painting such as this he needed many types of face as material. These drawings are dated 1478–80 and are drawn in pen and ink.



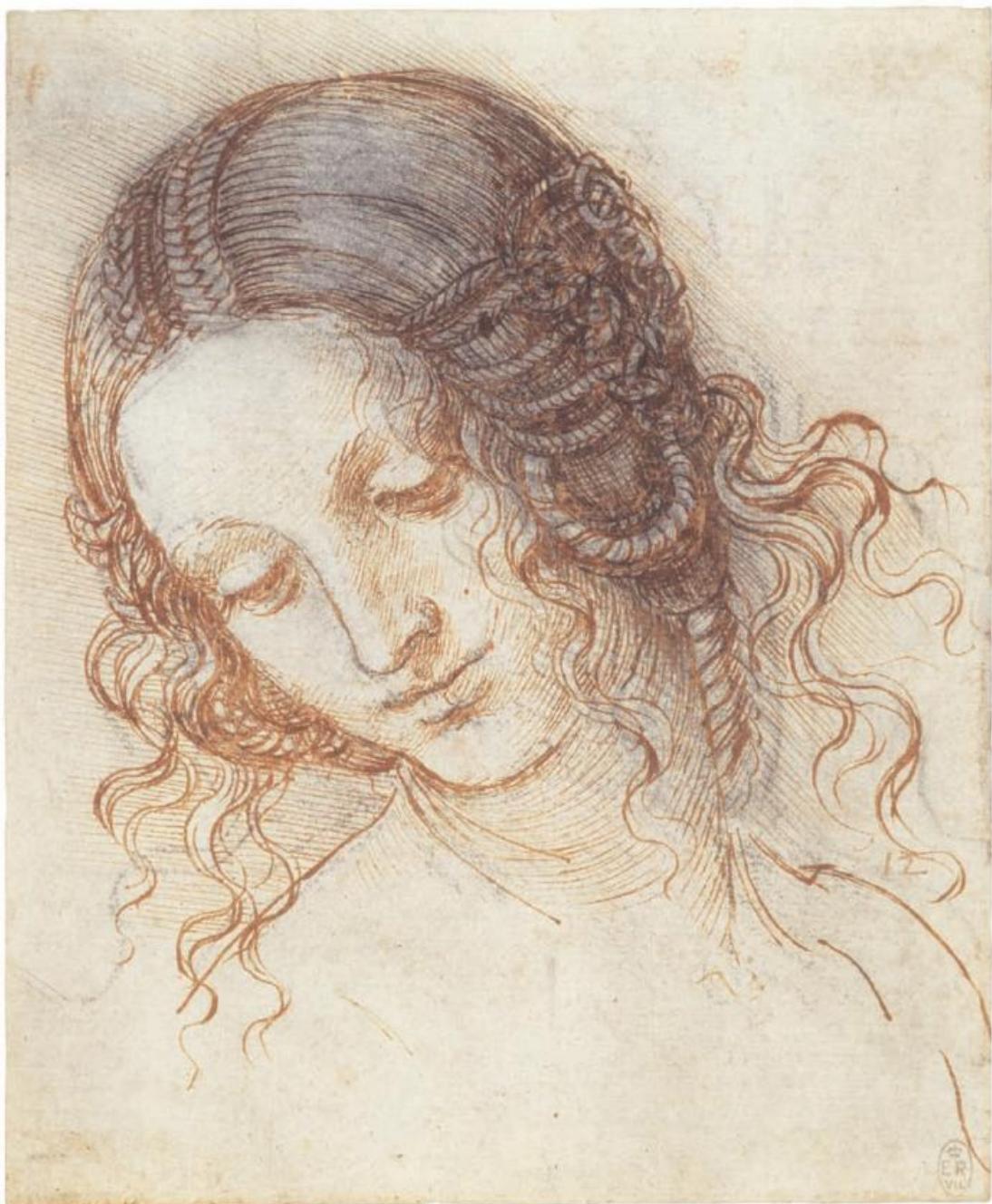


Study for Suckling Madonna

Another pen and ink drawing dated to around 1478–80, here the Madonna suckles her child, surrounded by other sketch drawings of figures, profiles and infant figures: all preliminary drawings for the Adoration of the Magi painting.

This sort of multiple drawing accompanied any project that Leonardo undertook; he was a keen investigator into the possibilities of the visual world. His development as both a scientist and a philosopher depended heavily on the perception and recording of his experiences which took him further into the world of ideas and principles, and to the spirit within himself. His drawings have an intelligence informing every mark, the very reason people have loved and collected them.





Study for Head of Leda

This study of the head of Leda, dated to around 1497, for a painting of Leda and the Swan, shows the pains Leonardo took to transcend the simple portraiture of a character. When he was seeking a spiritual dimension in the final painting, as in this drawing, he would refine the features so that only the purity of the expression was left. This drawing shows a young woman with the tenderness of a mother as well as the modesty of virgin. By a process of simplification and refinement the final result is a profound image of the beauty, purity and tenderness of womanhood.

Leda and the Swan is the legend of Zeus, king of the Greek gods, who descended from Mount Olympus and took the form of a swan in order to impregnate Leda beside the River Eustas, from which union she laid eggs which hatched to produce Castor and Polydeuces, and Helen and Clytemnestra. These studies of Leda's head, with their complex hairstyles reminiscent of the patterned diagrams of the flow of water (see page 42), associate the nymph with the river and the aquatic creature who seduced her.

The beautiful modelling of the main head with its classical proportions and intricate hairstyle displays the pains Leonardo would take to produce a final piece of work that left nothing to chance in the design.



Bust of Infant in Profile

A beautiful red chalk drawing of the head of a child in which the age and tenderness of the infant is rendered in the sensitive strokes of hatching. The plump firmness of the cheeks and shoulders is clearly shown and the soft curling hair reproduces the finest baby hair. The sketch is a preliminary sketch for the Virgin of the Rocks painting in the National Gallery, London, where the profile of the infant Christ is almost exactly the same as in this drawing. The eyes in the painting look up more and the hair has been taken a stage further in development, as has the soft shadow that defines the three-dimensional qualities of the baby's head, but the likeness is so exact that it is clear this drawing is connected directly with the final work. Leonardo refines the natural purity and essential goodness of any infant to become a true image of the infant Christ.





Drapery Study for Angel for Madonna of the Rocks

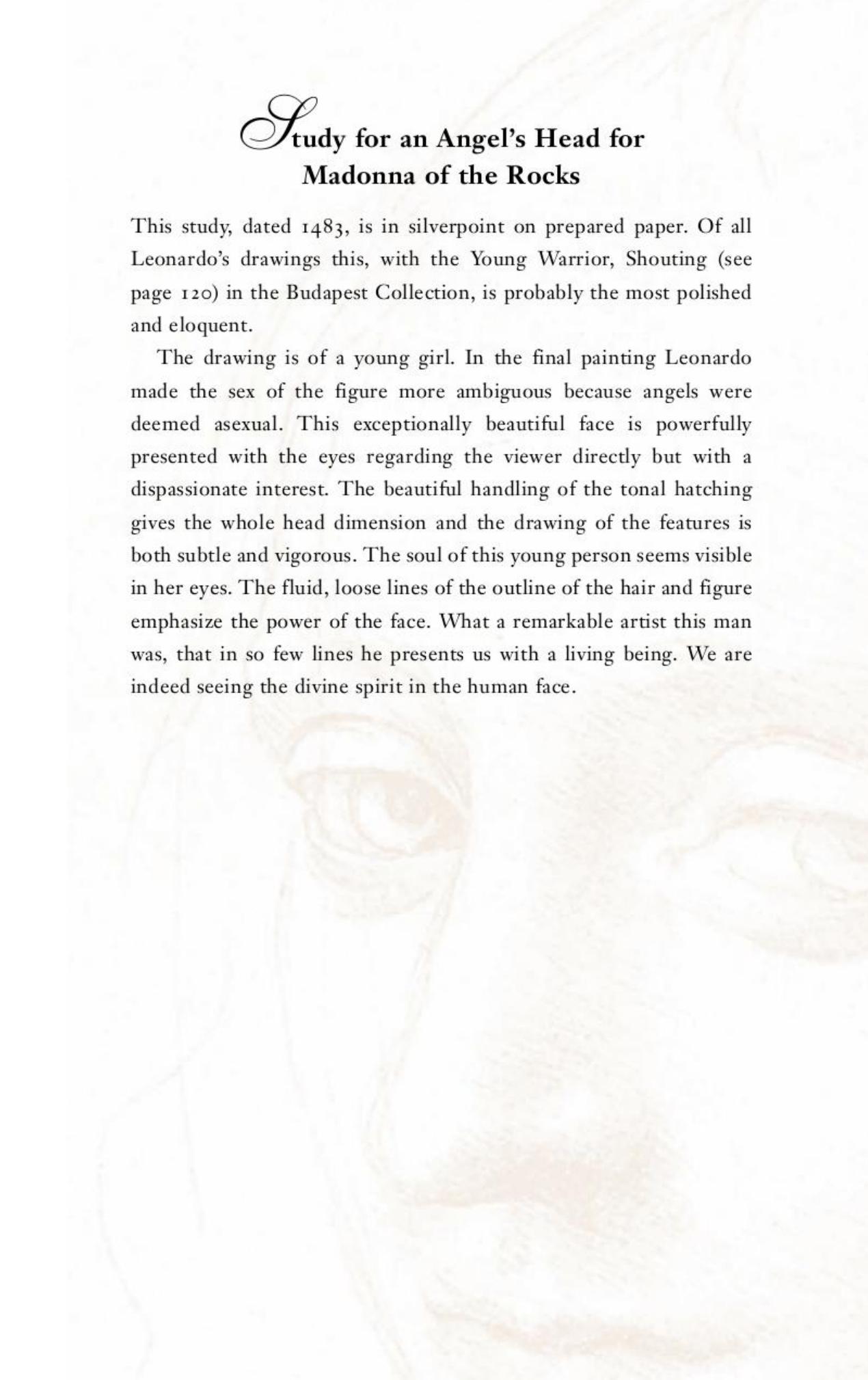
Here we see the first complete drawing from about 1495 for some of the drapery of the garments for the angel in the *Madonna of the Rocks* painting. Kenneth Clark refers to this drawing as one of the preparatory drawings for the London version of the picture: certainly a comparison between this drawing and the finished picture upholds this idea.

And how do we know that this drapery is for an angel? One reason is the beauty and softness of the cloth, which clearly portrays silk of the finest kind. The smooth folds of cloth have no jagged creases but cling around the figure beneath in the smoothest way. It is this attention to detail that lifts Leonardo's work from a line-up of the merely great painters, to that of the greatest.

Pointing Hand for *Madonna of the Rocks*

Also from around 1495, the softest quality of *sfumato* drawing gives this depiction of the angel's pointing hand purity and tactile conviction. This angelic hand points towards St John, who is kneeling to the left of the Madonna, and indicates to the infant Christ what he is asked to do, that is, to bless St John. The drawing in charcoal is sensitive in emphasis, giving it a suitably ethereal quality. The elegance of the hand has a feminine appearance, more evident in the Paris version than in the London one. It is interesting how Leonardo carefully formed the components of his compositions, each part in great detail, before assembling everything in the final cartoon. This is no ordinary finger pointing but, essentially, a manifestation of the thought of God.





Study for an Angel's Head for Madonna of the Rocks

This study, dated 1483, is in silverpoint on prepared paper. Of all Leonardo's drawings this, with the Young Warrior, Shouting (see page 120) in the Budapest Collection, is probably the most polished and eloquent.

The drawing is of a young girl. In the final painting Leonardo made the sex of the figure more ambiguous because angels were deemed asexual. This exceptionally beautiful face is powerfully presented with the eyes regarding the viewer directly but with a dispassionate interest. The beautiful handling of the tonal hatching gives the whole head dimension and the drawing of the features is both subtle and vigorous. The soul of this young person seems visible in her eyes. The fluid, loose lines of the outline of the hair and figure emphasize the power of the face. What a remarkable artist this man was, that in so few lines he presents us with a living being. We are indeed seeing the divine spirit in the human face.



*F*igures for the Last Supper

This pen and ink drawing dated to c.1496 is an early study for the Last Supper composition. In this version Judas sits with his back towards the viewer rather than the traditional placing on the opposite side of the table from Jesus. Part of the lower sketch shows Jesus and John, with Judas standing and stooping forward to put his hand in the plate at the same time as Jesus. Thus, in the one series of sketches Leonardo has two versions of how to place Judas and Jesus. Eventually he moved Judas to the same side of the table as Jesus and made the disposition and facial expression imply that Judas was the man about to betray Jesus.

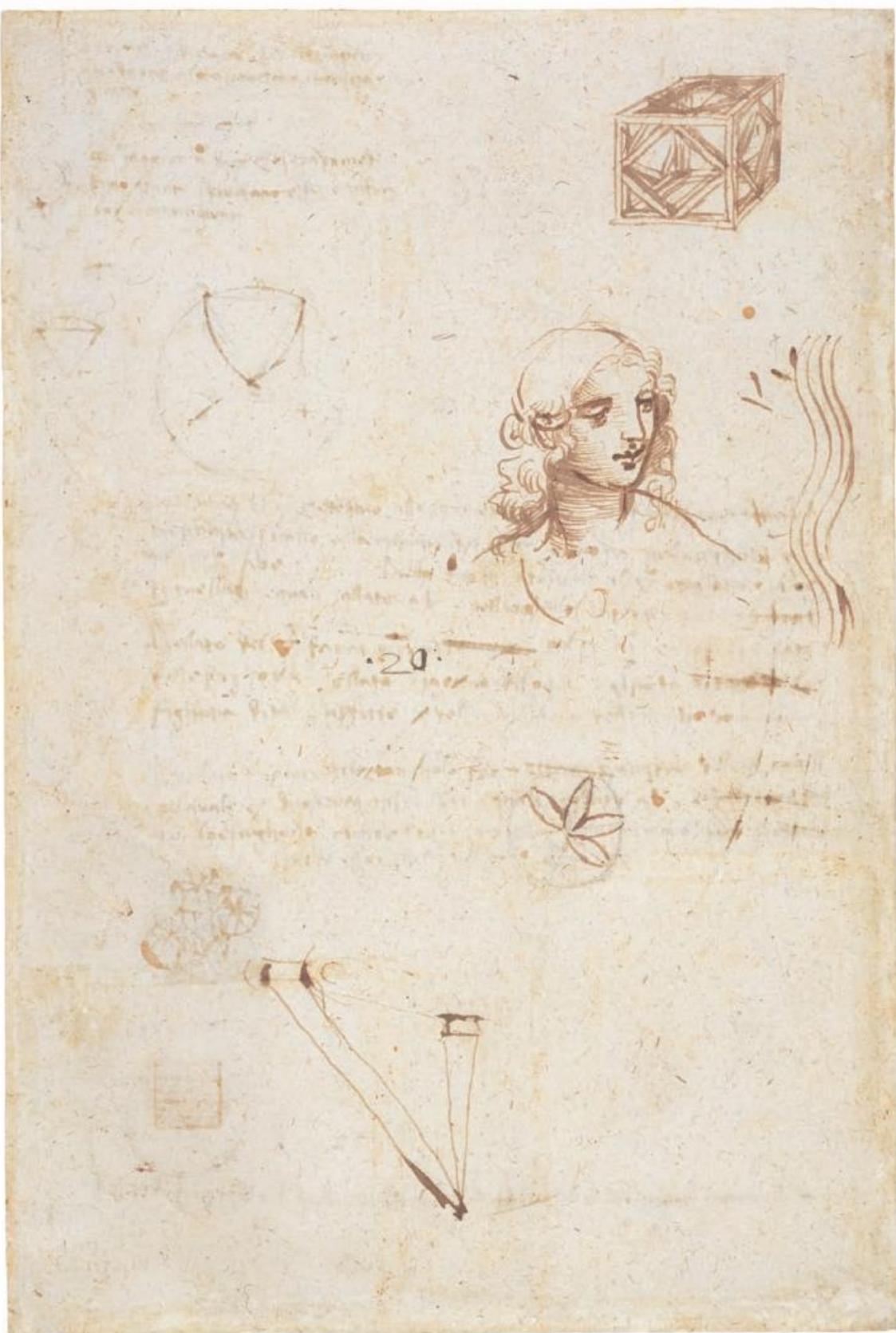
This was not the traditional rendering of the Last Supper: even after several Renaissance painters had made excellent versions of it, the traditional arrangements still held well. Leonardo chooses here also to break with the traditional composition of the Last Supper: as ever, the figures are sitting on one side of a table facing the viewer, but the animation and the realism of the scene produce a revolutionary interpretation of the story. Neither did Leonardo place haloes over the heads of the figures: their very faces identify them as saints. The picture was designed to fit the actual space available in the refectory of Santa Maria delle Grazie, so that the group of disciples appeared to be eating their meal in the same place as the monks ate theirs. The light in the painting also coincides with the direction the light falls in the hall from the windows.



*H*ead of Apostle – St Philip

St Philip in the Last Supper mural is the third figure from Jesus to the right; he stands, indicating himself with both hands, as if asking if he could possibly be the one to betray his master.

The face of the drawing, dated to c.1495, has the longing, adoration and sorrow of a young man faced with this dreadful prospect: that the perpetrator of the betrayal might not be aware of his impending crime. It is one of the most sensitive of Leonardo's drawings, without aggressiveness and redolent of the poetic gentleness of the lover. None of the other apostle drawings has this tenderness and simple adoration. It is a measure of Leonardo's greatness that he could take many faces of different character and imbue them with different traits and emotions without repetition.



Head of a Woman

This interesting drawing of a woman's head in pen and ink is reputed to be Leonardo's last drawing. It lacks none of his fluid expertise. The minimal toning and vigorous pen strokes that form the features and hair do not seem like the work of a man at the end of his life, although at this time he must have been suffering from the partial paralysis that he is reported to have succumbed to in old age. Leonardo made his last will and testament on April 23rd, 1519, leaving his documents to Melzi, his vineyards to his followers de Vilani and Salaino, and clothing and money to his maid Maturina. A sum of money deposited in Florence was left to his step-brothers. He spent his last days as the court artist and friend of Francis I of France at Amboise and is supposed to have died in the king's arms on May 2nd, 1519. A royal end to a kingly man.



7

S Y M B O L I C
T H E M E S

Mythological themes, allegories and designs

For someone of an Aristotelian frame of mind – one actively seeking to follow effects back to their causes in the laws that underpin the physical world – it was inevitable that Leonardo saw those causes as manifesting themselves in all that he contemplated. He explored these manifestations mathematically, scientifically and artistically, and perceived everything as part of a connected and unified whole: the outer form manifested the inner principle. This is true for the composition of his paintings and it is also abundantly evident when Leonardo came to explore and portray symbolism and metaphorical subject matter.

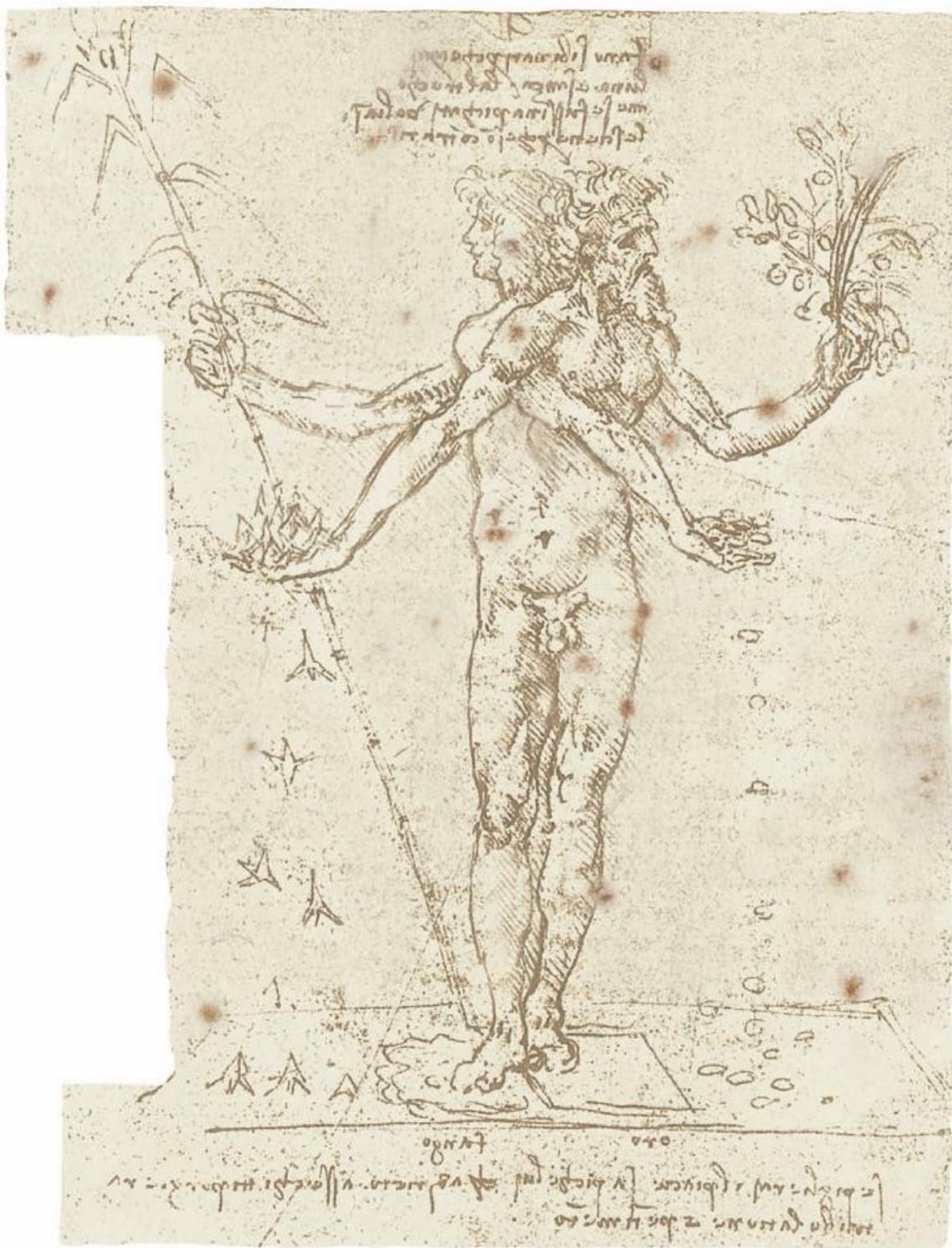
Religious symbolism was of central concern in medieval art, and with the rebirth of classical learning a whole new symbolic vocabulary was discovered. Although Leonardo was an empiricist, taking nature as his subject, the power of symbolism could not be avoided and it may be that the interplay of light and dark for which Leonardo was renowned as a painter, and about which he wrote so extensively, had a symbolic significance.

The Vitruvian Man (see page 192), is the image that seems to sum up everything Leonardo stood for, and is to be found in a variety of traditions as a portrait of the ‘Celestial Man of Light’ – the ultimate goal of humanity, balanced and in perfect harmony, a conscious being. Light is the hallmark of consciousness, and if there was any painter most conscious of, and skilled at portraying, the glowing beauty of the world’s outer expression and its inner causes, it was Leonardo.

Whether in his religious paintings, his interior design or in designs for court entertainment, symbolic imagery was either an overt or implied presence. Again, Leonardo was acutely aware of the inner qualities that everything possessed and was intent on portraying the interplay of these qualities.

Truth – the sun. Falsehood – a mask.

Truth in the end cannot be concealed.



*S*ketch for an Allegory

Here, in this strange figure, Pleasure and Pain are represented as Siamese twins: they share one body up to the middle of the torso, but have two pairs of shoulders and arms and two heads. Their arms entwine and the side representing Pain holds a large spiky plant and scatters caltraps (metal dart-shaped objects), which were used in battle to immobilize horses in the field. Pleasure, on the other side, holds a long flowering staff and distributes with his other hand what look like rose petals on the ground. One of the figure's feet is in water and one on a square pavement. The head of Pleasure is a beautiful youth with long, curly hair, and the head of Pain is a gaunt, stricken-looking old man with wild hair and a scrawny beard. The youth's head has an expression of delight and the old man's one of misery. The hatching of the tone on the well-built body gives the figure solidity and strength, and the firm undulating lines of the outline give life and movement to the figure.



*W*oman and Unicorn

This drawing of a young woman with a kneeling, docile unicorn, which she has attached by a lead to a tree, is known to be an early piece and there is not a great deal of information about why Leonardo drew it. The legend of the fleet and ferocious unicorn is that it cannot be caught by men, but when approached by a pure maiden will immediately settle down and place its muzzle in her lap or hands. Thus, the trusting beast is caught only by purity or innocence. The medieval tradition continues that hunters would take a maiden along with them in order to deceive the animal, and when she had gained its confidence and tethered it the hunters would emerge to capture it. The unicorn's horn was supposedly valuable for its various properties, and it may also be symbolic of the tradition that only a woman can deceive nature into giving itself into captivity.

This exquisite drawing in pen and brown ink is small, but as ever Leonardo contrives to include everything needed to create a lively and attractive picture.



The Pointing Lady

This study, dated to around 1513, is sometimes thought to represent a masquerader, similar to those of other of Leonardo's drawings from life. This, however, is unlikely as the sketch includes a landscape setting, and is not an artificial background. The foreground and background are connected by the stream, which curves round into the depths of the space. It is a beautiful representation of a garment being folded and ruffled by the breeze like turbulent water. The posture, probably inspired by antique models, imitated the:

...Greeks and Latins in the manner of revealing the limbs when the wind presses draperies against them.

The figure is directly related to the landscape by the suggestion of the wind which blows against her as she points into the distance. What she is pointing to while gazing at the viewer is not known. This sort of gesture in a work of art was intended to convey the connection between the viewer and the event in the painting. The prominence of her position suggests that she must be either a goddess or an allegorical figure.

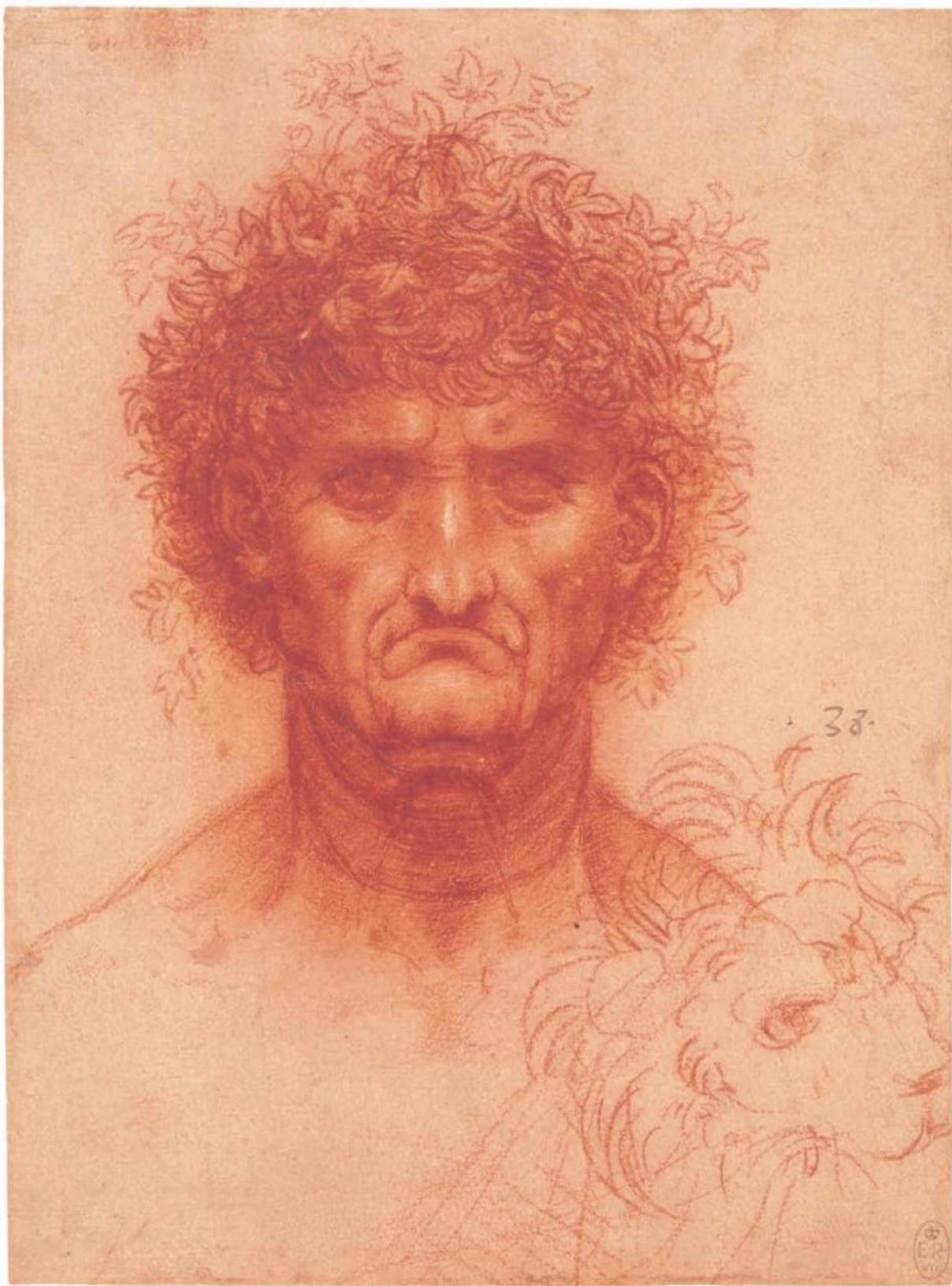




*T*hree Dancing Women

This remarkably vivid design of three dancing women is sometimes believed to represent angels dancing at Christ's nativity. But it is also associated with the drawing of the Pointing Lady, and one wonders whether this could be connected with the Three Graces, a popular image during the time of Leonardo's youth. The figure furthest to the left also has a drape held above her head in an arc, which was often associated with the goddess of fortune, or the night. So this may be, rather, a drawing connected with the symbolism of the ancient world: the three figures symbolising the beauty of heaven, the desire of that beauty, and the then active desire to return to the source of the beauty. Leonardo probably knew of Botticelli's Primavera painting, which figures the Three Graces prominently, and he may have been experimenting for his own version of a similar design.





*H*ead of a Man with Lionskin

Dated to around 1503–5, this red chalk drawing in great detail, and well modelled, has the powerful, aggressive face of a warrior, although the vine leaves in his hair might suggest Bacchus or a follower. The suggestion of a lionskin over the man's left shoulder could indicate a connection between the man's physiognomy and the lion's head or it could refer to an image of the demi-god Hercules, although the man's age would suggest otherwise. The man's face is definitely leonine in quality and the lionskin highlights this characteristic. Is this a symbolic representation of a character type or a representation of one of the gods of classical mythology? Or merely a sketch that started as a bust or portrait, became Bacchus when some vine leaves were added, and then Hercules with the rough sketch of a lion's head on the man's shoulder? We can only speculate that Leonardo liked to build up pictures as the mood took him as much as other artists, and his notebooks would have been the ideal place for such creativity.



*N*eptune Guiding his Sea Horses

Another piece of Renaissance symbolism, this picture is dated from about 1503–4. These beautiful, rearing, vigorous sea horses, with equine heads and forelegs and bodies tailing off to fins and curling fishes' tails, are moving in four different directions, in the centre of which is the great figure of the god of the oceans, Neptune, wielding his trident and grasping an attachment between the horses' heads. Presumably these figures would have been rearing up out of waves, though there is no indication of the sea in the drawing. This might have been a set piece for a design for a fountain like the great Neptune fountain in the Piazza Signoria in Florence by Ammanati. But usually Leonardo would also sketch the workings of such devices with the designs so this may have been for some other figure in a painting with mythological themes. The beauty of the drawing in black chalk is partly in its baroque vigour and partly in the flowing ease of expression in the loosely drawn lines and tonal modelling.

*A*llegory: Boat, Wolf and Eagle

The extraordinary symbolism of this picture, dated to around 1513–16, probably refers to the wolf as the Church, which is in charge of the boat with its living tree and compass. Does it suggest that the wolf – a rather negative image for the Church – is given (too much) direction over the life of man? The Pope and the German Emperor were great rivals for power at this time, and in Italy the great families and political leaders were divided between the two. The shining eagle may be suggesting that the Emperor is a leading light in the world. And why is the church sailing towards the land and what is, presumably, the German Empire? Either way, it cannot be difficult to second-guess where Leonardo's own sympathies lay.





An Angel Placing a Shield on a Trophy

These drawings in ink and brown wash show two vigorous figures, with the direction of the flow of air in opposition. The upper figure of the angel with its large wings has its hair and clothing blown back, away from the direction of flight, which suggests that the figure is still moving forward. The second, lower, less finished figure has no wings and its clothing and hair are blown forward in the direction of its movement. The particular reason for this series of studies of angels is not clear, but the symbolism of a shield being placed on a trophy is clearly some indication of a victory. Perhaps it was connected with the Battle of Anghiari and was to be incorporated in that painting. The interesting comparison between the two figures shows that the angel with wings was obviously worked on more extensively than the angel without, but of the latter angel there is the extra study of the head with the hair being blown forward. The immediacy of the drawing with its stylish rendering of floating draperies and curling hair caught in the breeze gives an intimate quality to this work. One is observing the development of the great man's thoughts about a design he was in the process of planning.



*D*esigns for St George and the Dragon

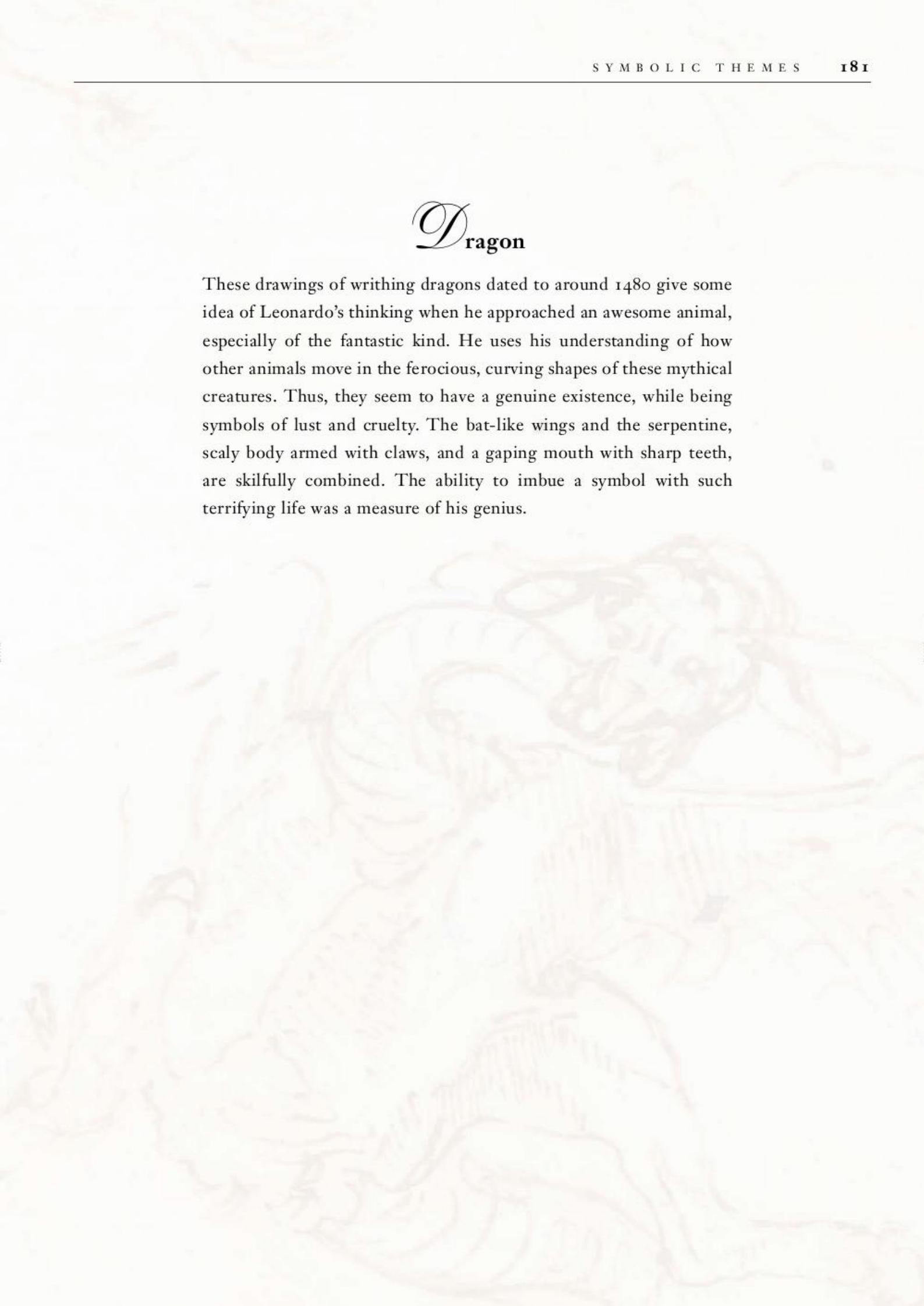
Dated to around 1513–14, this sheet of horse drawings is of horses and dragons fighting, with St George as the rider of the main horse in the centre. The liveliness with which Leonardo has made the action of the beasts mingle and writhe around each other produces an effect of maximum aggression and ferocity. The horse trampling the dragon, or the dragon's head curving round to bite the horse, make great use of the movement that Leonardo observed and recorded in his drawings of horses and other animals, particularly cats, from life.

These pictures communicate how the symbolic fight between good and evil was viewed in Leonardo's day and one is left in no doubt that this was a fight to the death.



Dragon

These drawings of writhing dragons dated to around 1480 give some idea of Leonardo's thinking when he approached an awesome animal, especially of the fantastic kind. He uses his understanding of how other animals move in the ferocious, curving shapes of these mythical creatures. Thus, they seem to have a genuine existence, while being symbols of lust and cruelty. The bat-like wings and the serpentine, scaly body armed with claws, and a gaping mouth with sharp teeth, are skilfully combined. The ability to imbue a symbol with such terrifying life was a measure of his genius.





Horsemanship on Triumphal Arch

This study, dated to around 1508–11, is for the monument to Gian Giacomo Trivulzio, which was commissioned on the capture of Milan by the French, Trivulzio being one of their leading soldiers. The French marshal commissioned Leonardo but it never got to the point of being realized in clay because the French were expelled from Milan. However, when they returned in 1506, the project was resumed, from which time this drawing is dated. There are other similar studies.

The vigorous, dimensional effect of the *sfumato* drawing with the gallant rider and horse trampling their foe was the symbol used time and time again for the victorious party. Although there are many drawings associated with this symbol of French power over Milan, the final work never reached completion because, as with so many of Leonardo's projects, other commissions took over.



*C*ostume for Festival Paradiso

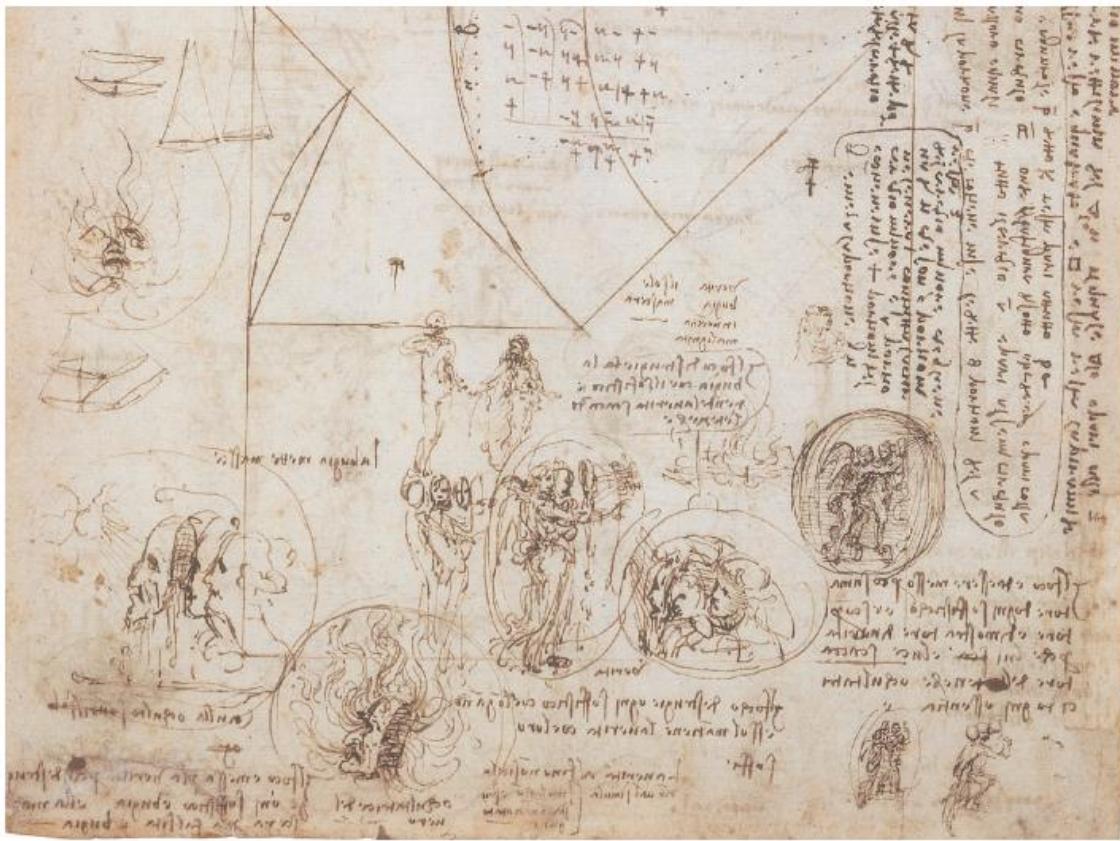
Leonardo produced costume designs for the wedding of Lodovico Sforza to Beatrice d'Este in 1491. The symbolism of the costumes is not precisely understood, but this young man with a lance in a stylish Renaissance costume, with long draped sleeves, a spotted and slashed doublet and a feather in his headdress, is one of the figures that has survived. No doubt the images were symbolic of the great prowess of the duke or the illustrious forebears of the new duchess.



*C*ostume for Festival Paradiso

Another costume design for the masque that Leonardo produced for the Duke of Milan. This time the youth is wearing a bodice of interlaced ribbons, which must have taxed his costume-makers somewhat. The details of this decorative allegorical costume are beautifully drawn and display not only the construction of the costume but also the effect it is intended to produce. Nobody knows what the precise symbolism of these costume designs is, because the actual knowledge of the event has been lost in time. However, it does show Leonardo's prodigious ability to portray not only the costume but also the pose of the person wearing it.





Allegory

Dated to around 1490, this strange figure of a dog-headed creature riding a horse and blowing a horn, or apparently playing its nose, has a symbolic connection with music and was possibly a figure for a procession or masque.

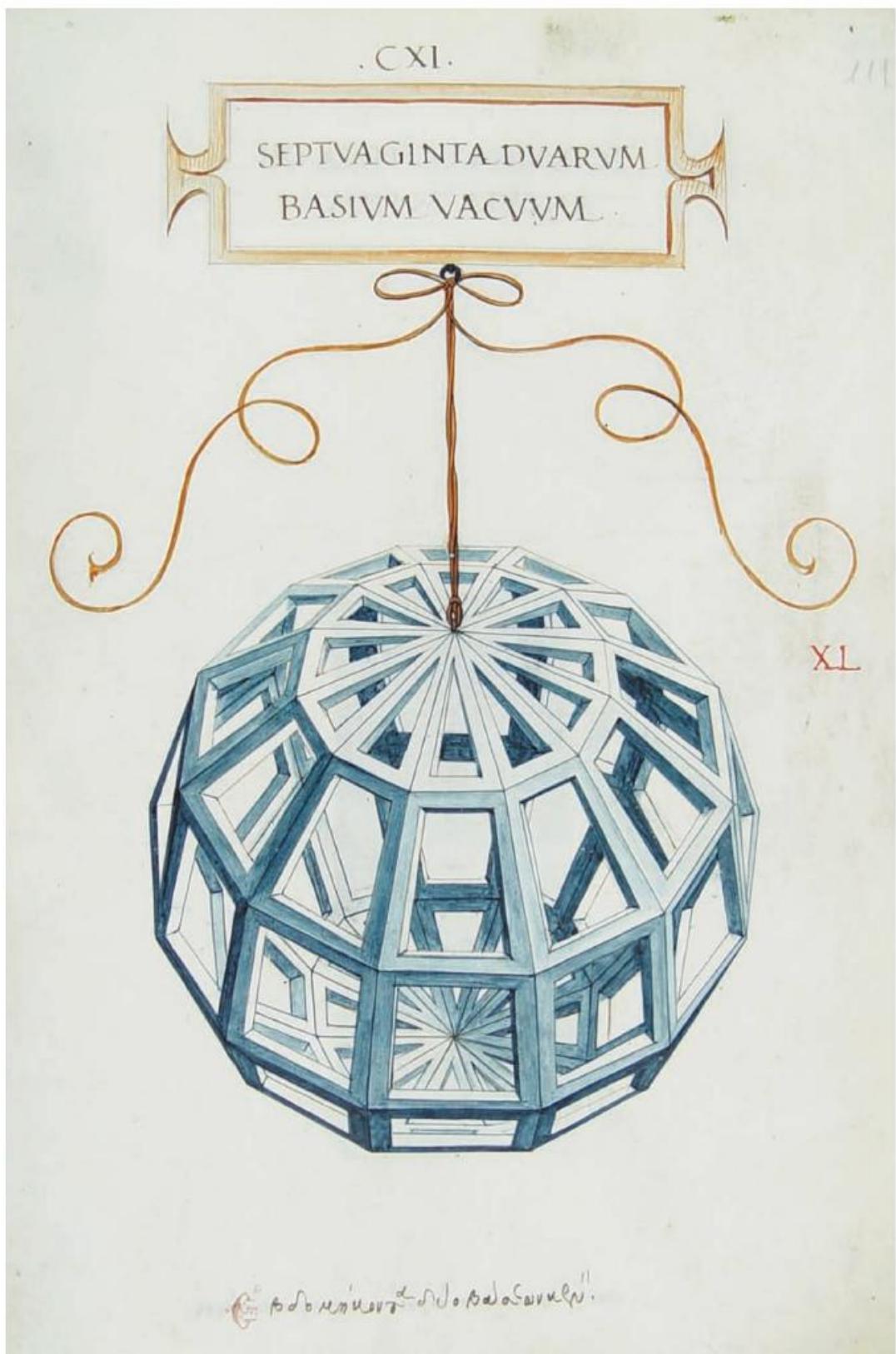
According to Emmanuel Winteritz (an eminent Leonardo scholar) the whole figure on the horse is a man-bagpipe. That is, the fat belly of the rider is the bag and the chanter is his nose, while a drone appears above his head.

Leonardo's interest in music was well recorded and he would no doubt have been able to invent a plausible instrument to create an amusing figure for a masque.

Masks

Masks as a symbol of the personality ('persona' means mask) have fascinated artists for centuries and Leonardo was no exception. He shows in these drawings masks that appear to drip and run with an old, grim appearance, placed in front of a young, smiling face which is in the process of taking it off or putting it on.

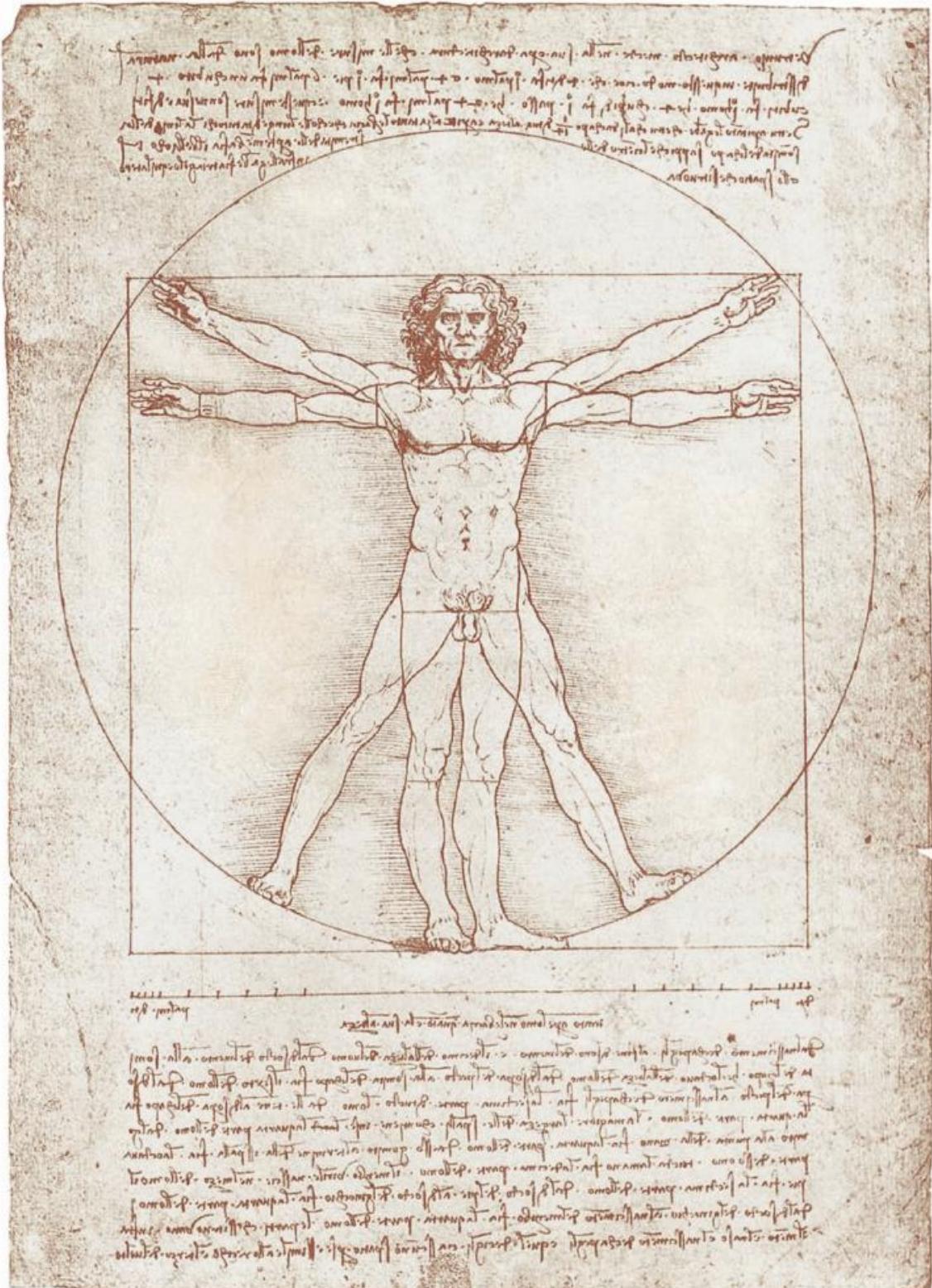
The other mask is suffused in flames and again is a craggy facial type of mask almost like an animated skull. The fiery lines coming off the mask seem to be almost the opposite of the previous mask, but this time there is no younger face involved. These allegorical drawings in ink have an intensity that Leonardo managed to pack into a very small area, and though small, they are by no means insignificant.



Septuagintaduarum

The drawings of polyhedra that Leonardo produced to illustrate Fra Luca Pacioli's book *On Divine Proportions* are intriguing. This is a beautiful form of a geometric solid enclosing a space, with radiations across each surface. The way Leonardo has drawn it as though suspended from a cord suggests that he might have had it made in three-dimensional form, although he was eminently capable of designing this and other mathematical forms purely from a mental picture.

The greatest artists of this period were also the scientists and technicians of their age and many modern scientific methods have grown out of the artistic investigation of men of the Renaissance era; Leonardo, though, emerging as supreme.



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