



Leonardo

The story of an undisputed genius ...
One of the great visionaries of the civilised world

A three-part series for BBC ONE

“There is no more fascinating subject in the history of art than Leonardo da Vinci. More than 500 years after his death, he’s still best remembered as the artist of the *Mona Lisa*. His ambition was to make a painting quite unlike anything that had come before. And he succeeded. It is the first great psychological portrait. Like a magician, he makes the invisible, visible. By making us wonder what’s on her mind, he captures an instant *and* an eternity.

For all of us, of course, Leonardo’s paintings are the starting point but there is so much more.

For me, the opportunity to make this series, and in particular to confront his original drawings and notebooks for the first time, has been a revelation. It’s only when you immerse yourself in these astonishing pages that you begin to understand the scope of this one man’s imagination. The curiosity and immediacy with which he seems to capture everything he sees is quite startling. It’s as if you can see the workings of his mind, hear him thinking aloud ...

We’ve gone to his own writings and to contemporary sources to dramatise his life. We’ve used his original drawings to build and test his machines and some of the world’s leading experts on Leonardo have helped me find a way into the mind of this extraordinary Renaissance man.”

Alan Yentob, Presenter, Leonardo



Leonardo

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Leonardo

Alan Yentob presents an extraordinary new series for BBC ONE



The extraordinary story, amazing vision and unfulfilled dreams of Renaissance artist Leonardo da Vinci are brought to life in a revealing, new three-part series for BBC One.

Leonardo explores how the man behind some of the most famous paintings in the world was also an engineering genius, anatomical scientist and inventor of wonderful machines hundreds of years ahead of their time.

Presented by Alan Yentob, *Leonardo* is the BBC's first major biography of Leonardo da Vinci and marks the 500th anniversary of the painting of the *Mona Lisa*, which Leonardo began in 1503.

The films bring together his public face and the private thoughts, illustrations and ideas explored in his notebooks, to paint a revealing portrait of the artist's passion for knowledge, which both inspired and obsessed him throughout his career. The notebooks reveal a man with an incredible eye and hunger to understand the workings of the

natural world, which he was also desperate to mimic in machinery.

Filmed across Italy and featuring actor Mark Rylance in the role of Leonardo, the series uses Leonardo's own writings to re-enact the story of his life and work. Leonardo's inventions – a parachute, hang-glider, tank, underwater diving suit and robot – are built and put to the test for the first time, 500 years after he designed them. Artist Leo Stevenson demonstrates some of Leonardo's many novel painting techniques, and experts in Renaissance art offer their views on his creative genius.

But the brilliance of this ultimate Renaissance man was flawed: scandals dogged his private life; his devotion to his often bizarre experiments meant commissions were left unfinished; and a rivalry with fellow artist Michelangelo undermined his work.

Programme One, *Leonardo – The Man Who Wanted To Know Everything*, follows Leonardo from his illegitimate birth to the unveiling of his



Introduction

masterpiece, *The Last Supper*, in Milan. Learning his craft at the heart of the Renaissance movement in Florence, Leonardo survives arrest and possible burning at the stake (under suspicion of homosexuality) to win the patronage of the powerful Duke of Milan, Ludivico Sforzo.

Although much of his work was left unfinished, his notebooks reveal the incredible workings of his mind as he gains knowledge of the entire world through his experiments. He was the first to understand the way in which the human eye works; the first to properly dissect a human body; and he was a practical engineer. The programme tests his designs by building and trying out, for the first time, two of his inventions – an armoured vehicle for warfare and a parachute.

Programme Two, *Dangerous Liaisons*, follows Leonardo as he moves from Milan to the patronage of bloody warlord Cesare Borgia. To keep his tyrannical boss happy, Leonardo designs armoury, maps and war machines, rather than paintings.

Leonardo also becomes the bitter rival of Michelangelo, who is chosen over Leonardo to create a sculpture of the biblical David in Florence. Focusing again on his anatomical research, Leonardo dissects human bodies and makes discoveries about embryology and heart disease hundreds of years ahead of others.

With nature as his guide, Leonardo designs a glider and robot, and suggests a new arena for warfare with his underwater diving suit. With the help of experts, the programme attempts to build and test all three.

Programme Three, *Leonardo – The Secret Life Of The Mona Lisa*, tells the story of the world's most famous work of art – a work which has fascinated generations, provoked violence, inspired poets and produced countless imitations.

Alan Yentob uncovers documents which reveal who she was, explores the *Mona Lisa's* colourful history and explains how this legendary image, with her enigmatic smile, encapsulates Leonardo's fascination with the powers of nature.

An interactive website, giving viewers a chance to build their own Leonardo machines, is available through BBCi at www.bbc.co.uk/leonardo

Leonardo, a BBC co-production with Discovery for BBC One, is produced by Sarah Aspinall, Tim Dunn and Nick Rossiter, and the executive producer is Michael Mosley.

Programme Synopses

Programme One Leonardo – The Man Who Wanted To Know Everything



Leonardo da Vinci, one of the greatest painters the world has ever known, was also a self-made scholar, desperate to understand the laws of nature and engineering, from the workings of the universe to the most intricate systems of the human body.

He was a man centuries ahead of his time. Five hundred years ago, he found ways to take man to the bottom of the sea and into the sky. To Leonardo, engineering was the perfect union of art and science.

His life's work was recorded in notebooks filled with amazing and beautiful illustrations. Scattered and destroyed after his death, these have recently been discovered and pieced together.

In the first of a new series for BBC One, Alan Yentob presents a revealing portrait of this genius of the Renaissance – using Leonardo's own words to dramatise his life; his drawings to build and test his machines; and his private thoughts to help people understand his extraordinary vision.

Born illegitimate in 1452, Leonardo da Vinci had limited access to higher education, so from an early age he studied the world around him instead. He soon realised that much of what was taught as accepted truth was nonsense, and decided to rely on his own observations rather than writings that had come down from the Greeks and Romans. He came to Florence as a boy and was apprenticed to a master craftsman, Andrea del Verrocchio; fellow apprentices included Botticelli.

In his early twenties, Leonardo made a name for himself by painting an angel for a commission on the theme of the baptism of Christ. This is the first example of his painting and is remarkable for two reasons: first, the angel is extremely life-like, and, second, it is painted in oil, a medium virtually unknown in Southern Italy at that time. According to Leonardo's biographer, Vasari, Verrocchio was so impressed by *The Baptism Of Christ* that he gave up painting himself and told the other apprentices that from now on Leonardo would paint all the faces. Soon after this triumph, Leonardo's life almost came to a premature end when he was accused of committing sodomy, a crime punishable by death. He was acquitted, but this crisis seems to have sharpened his desperation to leave a permanent legacy. He left Florence for Milan, where he won the patronage of the powerful Duke of Milan, Ludovico Sforza.

Leonardo's time in Milan became the most productive period of his life. He painted *The Virgin Of The Rocks* and Sforza's mistress. He started to dissect and draw the human body, most notably the eye, and designed numerous war machines, including a covered vehicle of iron to allow soldiers to penetrate enemy lines – a 15th-century version of today's tank.

To test this particular vision, the programme creates a flat-pack kit based on the da Vinci design, and members of the Royal Armoured Corps set about building it. Despite obvious flaws, which some think are deliberate, the design comes together.

But Sforza never saw the tank in action and, by the 1490s, Leonardo was immersed in a major investigation of nature with his new companion, Salai. His skill at understanding perception, tested through experiments on real body parts, was realised in a new commission – the painting of *The Last Supper* in the church of Santa Maria della Grazie.

This time, however, Leonardo's determination to experiment with new painting techniques was to fatally undermine his work. Although the painting was inspirational and gave him the status he had always dreamt of, it began to deteriorate within his own lifetime and is now a pale shadow of its former self.

Leonardo was also fascinated with birds and their godlike view of the world. He drew up a parachute design in his notebooks – some 300 years before the first recorded parachute jump took place in France – but no one knows if he ever tried to construct it.

Adrian Nicholas, one of the world's leading skydivers, took up the challenge of building and testing Leonardo's design. Using cotton, pine and hemp – materials available in Leonardo's time – Adrian and his team translate the drawings into a contraption weighing 86 kilos.

In the dawn light of the Kruger National Park, Adrian is dropped from a hot-air balloon at 10,000 ft – will Leonardo's 500-year-old vision save him from crashing to the ground?

Programme Two Dangerous Liaisons

A diving suit, a glider and a robot are some of the revolutionary designs discovered in the notebooks of Leonardo da Vinci. The second programme in the BBC's *Leonardo* series follows this incredible Renaissance man as he searches for fame and

fortune under a patron who will give him the freedom to pursue his voyage of discovery.

Forced to leave Milan after the downfall of his patron, Sforza, Leonardo travelled to Venice, a city under siege by the Turks. It was here that he was to suggest a way of making possible a futuristic and unconventional means of attack – via an underwater army.

Alan Yentob discovers whether a diving suit made of pig's leather and based on Leonardo's drawings could actually have worked. Diver Jacquie Cozens tests out the suit, complete with a hood linked by cane hoses to an air supply, a cork float. It passes the test in a shallow swimming pool – but how will it fare in the water off the coast of Venice?

Rejected by the Venetians, Leonardo won the patronage of ruthless warlord Cesare Borgia. Presenting himself as a military architect and engineer, Leonardo was given special privileges. Borgia introduced him to the brilliant but scheming Niccolò Machiavelli, with whom he would later plan to transform Florence into a first-class seaport by moving the River Arno and digging a canal to Pisa. It was an ambitious project and, within months, the first trenches began to collapse.

Under Borgia, Leonardo also produced a detailed map of the town of Imola. This was a long and painstaking task, which once again demonstrated his passion for flight – and a longing for man to be able to look down on the earth from the sky. His notebooks from this time are full of experimental designs for flying machines, including sketches of the world's first hang-glider. In this design, Leonardo seems to have been inspired by the movement of falling leaves, or maybe paper.

Using the skills of inventor Simon Sanderson and paraglider Robbie Whittall, the *Leonardo* team produces a model of the glider, and tests it in the countryside of Tuscany. After numerous crashes, it is time to return to Leonardo's notebooks for inspiration.

In 1503, Leonardo returned to Florence and began to paint the *Mona Lisa*, a commission which would take over 10 years to complete and which he would keep by him till he died. He achieved fame

once again by drawing a cartoon of the Virgin and Child with St Anne; but he made himself a bitter rival in the deeply driven and religious Michelangelo. When the council of Florence wanted a huge statue of David, the giant-slayer, Leonardo assumed he would get the job. But his reputation for not completing projects may explain why Michelangelo was chosen instead. *David* would go on to become the world's most famous statue.

The rivalry intensified when both artists were asked to paint frescos of famous Florentine victories in the town hall. Determined to achieve special effects, Leonardo decided to experiment when painting the Battle of Anghiari. But his materials were poor and the painting started to run.

Neither painting was ever finished. Despite this, Michelangelo was invited to Rome by the Pope – an offer that would lead to the spectacular painting of the ceiling of the Sistine Chapel.

Leonardo immersed himself in his life as a scientist, studying the inner workings of the human body. Believing that humans were, in fact, complicated machines, Leonardo designed a humanoid robot using cables and winches to mimic the workings of the limbs. Using a virtual-reality model, robotics expert Mark Rosheim demonstrates how Leonardo's robot would have worked, and then sets out to create a three-dimensional version, dressed in a 16th-century suit of armour.

Called to Rome, where Michelangelo was now a colossus, Leonardo spent time dissecting bodies, making extraordinary discoveries about blood and ageing. But the Vatican put a stop to his experiments and he left Rome, depressed, to end his days in France.

Alan Yentob says: "Tragically, even his anatomy work was to be another heroic failure, lying undiscovered for centuries while the rest of the world caught up. But, unknowingly, Leonardo had already provided the world with his legacy – the *Mona Lisa*. She would carry his name through the centuries to a new audience."

Programme Three Leonardo – The Secret Life Of The Mona Lisa



Alan Yentob tells the story of the most famous work of art in the world – Leonardo da Vinci's *Mona Lisa* – and unravels the many mysteries of this iconic, magnetic and enigmatic image.

For 500 years, the *Mona Lisa*'s seductive charm has fascinated generations, provoked violence, inspired poets and produced countless imitations.

"So what's the secret of her fascination? Why has this, of all the images in the world, gripped the imagination of so many people?" asks Alan. He then sets out, with the help of leading experts, to answer many of the questions that have plagued scholars and enthusiasts for decades.

The story of the *Mona Lisa* begins in 1503, when Leonardo returned to Florence in search of new commissions. He worked on the portrait for over 10 years and took it with him when he moved to France towards the end of his life. Its French connections have been strong ever since.

Stolen from The Louvre in 1911, the portrait became an overnight sensation, hitting headlines around the world. But just when it seemed that the *Mona Lisa* had vanished for ever, it turned up in the



of Leonardo's growing realisation that the forces of nature cannot always be controlled.

Today, the *Mona Lisa* can be likened to a Hollywood star, with her own bodyguards and special security. She lives in The Louvre in a humidified, air-conditioned box, set in concrete and protected by triplex bullet-proof glass. The world's most famous painting is not terribly easy to see – but that does not deter the six million visitors who flock to see it every year.

possession of a Florentine house painter, who said that he was reclaiming his country's national treasures stolen by Napoleon. The Italian courts were sympathetic – but the painting went back to France.

Clues to the *Mona Lisa*'s identity are scarce, as Leonardo made no mention of who she was in his writings and put nothing to identify her in the picture. Suggestions have ranged from the Marchioness Isabella D'Este to Lisa del Gioconda, a silk merchant's wife – and even Leonardo himself, dressed as a woman.

Recently, however, the will of Salai, Leonardo's companion, was found to contain a reference to a portrait by an unknown artist, but with a value so high it had to be by Leonardo. It was called *La Gioconda* and experts agree that it identifies Lisa del Gioconda as the sitter for the *Mona Lisa*. Some also believe that she was pregnant at the time she was painted.

The *Mona Lisa*'s demanding gaze, highly unusual at that time, points to Leonardo's preoccupation with the human face, which he believed reflected a person's inner spirit. Experts hold her eyes responsible for the haunting "otherness" of the portrait, which seems to stay with people after they leave the gallery.

The programme also examines the background of the painting – a strange, primeval landscape with a river cutting its way through the mountains. The programme identifies the real locations that Leonardo used as inspiration for these scenes, and suggests the choice of background was a reflection

Where to find out more

www.bbc.co.uk/leonardo

Discover more about Leonardo da Vinci and his extraordinary world at the BBCi Science website.

Visitors to the site can get a flavour of the Renaissance by dropping into an interactive artist's studio to uncover fascinating insights into how artists of the day plied their trade. There are paintings in progress, a "gallery" of Leonardo's work, and a quiz in which visitors are challenged to detect Leonardo's paintings amongst works by other artists.

As part of the website, the BBC is launching a nation-wide survey of how people think. This is an exciting new venture which will be live on the site for one year. Few websites have the potential to reach as many people as the BBC's, and the data from the survey is likely to be hugely significant.

The website at www.bbc.co.uk/leonardo also offers links to travel and language sites, as well as to the Open University website.

Exhibition: Leonardo da Vinci – The Divine And The Grotesque

For those who would like to see some of Leonardo's work, there will be an exhibition at The Queen's Gallery, Buckingham Palace, London, between 9 May and 9 November 2003.

This ground-breaking exhibition is the first to examine Leonardo da Vinci's lifelong obsession with the human form. Through his drawings and notes, Leonardo attempted to define perfect or "divine" proportion. At the same time, he delighted in distorting the human face to explore the comic potential of the "grotesque". These were among his most influential works and were largely responsible for the supreme Renaissance master's reputation as a bizarre genius. The exhibition looks at Leonardo's work in the context of contemporary ideas of

beauty, notions of perfection and popular imagery. The selection includes studies for his masterpiece, *The Last Supper*, portraits of Leonardo and his circle, and rare examples of his designs for festival costumes.

The Open University

The Open University is introducing a short course, website and postcard set to encourage viewers to take their interest beyond the programmes. The 12-week *Perspectives On Leonardo da Vinci* course will be offered from November 2003 and takes a multidisciplinary approach to Leonardo's life, examining him as an inventor, artist and scientist, in the historical context of Renaissance Italy. The course can be taken for its own sake or as part of a degree. It is open to everyone and does not require any educational prerequisites. More details on the course can be found on the Open University website at www.open.ac.uk or by calling 01908 653231 (after 16 April).

The associated Leonardo website can be found at www.open2.net. Viewers can also call 08700 100878 for a free set of postcards featuring Leonardo's artistic and scientific achievements.

Leonardo's Inventions

The hang-glider



Leonardo is famous for designing ornithopters (machines with bird-like wings), but he soon realised that men could never flap like birds and turned instead to gliders. In the early Sixties, a design by Leonardo for a hang-glider was found by accident in a fragment of a document in Madrid. At the time, it was largely ignored, partly because the hang-glider had not been invented. For the first time, *Leonardo* builds a full-scale version, puts a man on board and flies it.

The first parachute

In his Codex of 1485, Leonardo da Vinci sketched a design for a parachute. He suggested what size parachute would be needed to allow a person to fall safely from a great height. But it is unlikely that he ever tested a full-scale model. (The first successful parachute jump was made from a hot-air balloon in the late 18th century.)

Leonardo shows the first-ever jump using a parachute based on Leonardo's design and built from materials available at the time.

The first robot

In 1495, before he began work on *The Last Supper*, Leonardo designed and allegedly built the first

humanoid robot. This armoured knight was designed to sit up, wave its arms and move its head via a flexible neck, while opening and closing its anatomically correct jaw. Powered by springs, its movements could be predetermined by a mechanical, programmable controller within its chest.

Using authentic materials, Mark Rosheim, a robotics scientist, has re-created this robot from drawings in Leonardo's notebooks.

War machines

The first tank



Leonardo's many military inventions included a design for an armoured vehicle. Four soldiers sitting inside could turn cranks to move the wheels. Its turtle-like cover was intended to deflect enemy fire.

"These," wrote Leonardo, "take the place of elephants. One may tilt with them. One may hold bellows in them to spread terror among the horses of the enemy."

In Programme One, a full-scale working tank is built to Leonardo's design. In the course of the exercise, a number of apparently deliberate design errors are discovered, put in by Leonardo to prevent plagiarism.

The first scuba diver



In 1500, Leonardo arrived in Venice just as the Venetians came under threat from the Turkish fleet. He had a number of suggestions for repelling the fleet, from floats which would allow men to run over the water, to diving suits with which they could attack the Turks from under the water.

His diving suit was to be made of pig's leather with a leather mask and glass lenses (the Venetians being masters of glass). Cane hoses enabled the diver to breathe, and steel spirals were inserted into the joints to prevent them collapsing under water pressure. Breathing tubes made of bamboo and leather were combined with a floating device that had surprising properties.

In *Leonardo*, experts build and test the suit off the coast of Venice.

Twenty Things You Didn't Know About Leonardo da Vinci

1. Leonardo da Vinci was illegitimate – the bastard son of a lawyer and a peasant girl. Because he was born out of wedlock, he had a limited education.
2. Leonardo wrote backwards in a form of mirror writing – possibly because of secrecy or simply because he was left-handed.
3. As a young man, he was accused of consorting with a notorious male prostitute. The penalty for sodomy was to be burned at the stake, but strings were pulled and the charges were dropped.
4. Leonardo worked as an apprentice on Andrea del Verrocchio's *Baptism Of Christ*. The angel he painted was so beautiful that his master is said to have abandoned painting for ever.
5. Leonardo was obsessed with flying, and studied the flight patterns of birds, making detailed sketches that have only been bettered by specialist cameras.
6. In Milan, Leonardo was used by his patron, Ludovico Sforza, largely as a handyman. As well as being a painter and decorator, he did the plumbing and organised spectacular parties. He got the job by presenting himself as an engineer and designer of spectacular weapons, rather than as an artist.
7. Leonardo was notorious for not completing projects. He was nearly 70 when he died, but fewer than 20 completed paintings survive.
8. During the 20 years he spent in Milan, Leonardo was constantly badgered by Sforza to complete one particular commission – that of an enormous bronze horse. Although he built a huge clay model, the statue was never finished. The bronze set aside to make the horse was eventually given to Sforza's chief military engineer to turn into a cannon.
9. There are two versions of *The Virgin Of The Rocks*. Sforza liked the original so much he bought it from Leonardo. The monks who had originally commissioned it had to wait over 10 years for Leonardo to make a copy. The original is in The Louvre, and the copy in the National Gallery in London.
10. Leonardo's notebooks were full of lists of intellectual challenges – ranging from how to square the triangle to analysing the movement of the woodpecker's tongue.
11. Leonardo's masterpiece, *The Last Supper*, was flawed because he rejected the usual fresco technique and began experimenting with different types of plaster. The experiment was disastrous – the painting began to deteriorate in Leonardo's own lifetime.
12. Leonardo was one of the first artists in Italy to use oil paints. Most artists at that time used tempera – a mixture of egg yolk, white-wine vinegar and pigment.
13. Leonardo carried out his own dissections on human bodies to study anatomy. He discovered the valves of the aorta and the way blood flows. He also drew couples in the act of sex; dissected the brain to work out what role it played in human emotion; and even cut open the bodies of women who had died in childbirth, and drew the foetus in the womb.
14. He drew a series of spectacular maps by walking around towns and measuring them carefully. His map of the town of Imola looks like a modern aerial map.
15. He never married and never had any children. Instead, he had a long-standing relationship with a younger man called Giacomo Caprotti, who was his companion for 29 years.



Did you know..?

16. The *Mona Lisa* was stolen from The Louvre in 1911 and ransomed two years later by a house painter, who signed the blackmail note “Leonardo”.
17. Some people have suggested that the *Mona Lisa* is a portrait of Leonardo in drag – the features of the woman can be overlaid with a Leonardo self-portrait.
18. In 1962, the *Mona Lisa* was sent on a tour of America, becoming the first blockbuster exhibition. Each visitor was allowed just 10 seconds to view the portrait. She was seen by one-and-a-half-million people in less than two months.
19. The internet has created *Mona Lisa* mania – she has spawned over 100,000 web pages, many of which focus on the cause of her smile.
20. Leonardo spent the final years of his life, not in Italy, but in France, at the court of the King, Francis I. Upon his death in 1519, he left a phenomenal number of notebooks – over 20,000 pages.

Executive Producer – Michael Mosley

Michael Mosley hopes that *Leonardo* will inspire viewers to discover more about Leonardo da Vinci and his amazing achievements.

“Leonardo da Vinci led an extraordinarily rich life, and I hope our series will make people enthusiastic about the Renaissance and about the man himself. He is considered one of the greatest artists the world has ever produced, and even though he completed relatively few paintings, because he had so many other interests, he revolutionised art.

“Before him, all paintings were incredibly stylised. Leonardo literally spent years on the streets studying real faces to draw. He was one of the first people in Italy to use oil paints, which enabled him to get depth and real expressions in his images. He also invented the half-turn pose instead of painting people sideways or straight on – a pose that has been copied by every painter and photographer since.

“He was passionately interested in studying nature and was the first person to dissect the human body in order to find out how it works. He cut up an old man and a young child, and, by comparing their arteries, was able to describe the process of atherosclerosis (hardening of the arteries) hundreds of years before anyone else. His anatomical drawings have never been bettered.

“The tragedy is that, while all this wonderful work is recorded in his notebooks, he never published any of it. He wrote so much and it’s very rare for an artist to reveal so much of his inner thought. The notebooks lay undiscovered in boxes for hundreds of years after his death, mainly because the people he left them to didn’t appreciate what they had.

“The Queen has the largest collection of Leonardo notebooks in the world, followed by Bill Gates, and the collection at Windsor Castle is now worth an estimated £3bn. We gained access to her collection and have used them to present an authentic biography.”

As well as demonstrating the painting techniques used by Leonardo, the series builds and tests some of his machines, using detailed drawings and information gleaned from the notebooks.

“All of our machines work, although some of them needed a certain amount of tinkering,” Michael continues. “I think people will be surprised at how many of his inventions do work.

“Hopefully, after the series, people will want to go to the National Gallery and see Leonardo’s paintings there. They’ll want to go to the Uffizi in Florence. And, when they join the six million other who go to The Louvre every year to see the *Mona Lisa*, they’ll know a lot more about her and the man who painted her.”

He adds: “I hope viewers will be moved as well. Despite a rich and interesting life, at the end Leonardo died wondering if he’d ever achieved anything. The answer is a resounding ‘yes’ but, if he had been less secretive, he could have had an even bigger impact on the world than he did.”



Producer, Leonardo's Machines – Tim Dunn

Tim Dunn's fascination with Leonardo's machines started when he was living in France as a teenager.

"I used to live in the Loire Valley, near to where Leonardo spent his last years at Amboise. There is a place where they've built little models of his machines. I visited a few times and became really interested in them. I've always wanted to know if they would really work."

Tim jumped at the chance to work on the BBC's *Leonardo* series but admits he was far from convinced that the 500-year-old drawings could produce working models.

"I was sceptical about every one. I thought his ideas might be just visual boasting or fantasy. But we brought in experts for each of the builds and they really rose to the challenge."

"The glider is one of my favourites, because we must have had 30 or 40 crashes before it flew. Simon Sanderson, who normally makes world record-breaking sailboats, made a scale model, which turned out to be remarkably aerodynamic. We then took a full-scale model on a framework of bamboo to Tuscany, where paragliding star Robbie Whittall put it to the test."

"Unfortunately, it didn't work, so we went back to Leonardo's words. He'd written about how birds use their tails to control their flight. We added a tail on the back of the glider and gave it one more go. Robbie stood on the edge of the hill and took off – and it flew beautifully. We were ecstatic."

More success was achieved with the parachute, built by champion skydiver Adrian Nicholas.

"The parachute is built of traditional materials – cotton, pinewood and hemp rope. It weighs more than 80 kilos, as much as a man, whereas modern parachutes weigh only a few kilos. Adrian has been working for a few years to try to get over the various safety issues. Eventually he took the

parachute to South Africa, where it dropped quite successfully. It's really dramatic footage."

Another invention, Leonardo da Vinci's diving suit, was designed as a secret weapon for the Venetians to use against the invading Turks.

"Our suit was built by Scott Cassell," continues Tim, "a former counter-terrorist officer with the US Army, who is the world record-holder for the longest dive. We made a pig-leather suit and the breathing apparatus was a cork float with two bamboo tubes."

"We first tested it in a swimming pool with Jacquie Cozens, a real enthusiast who dives with man-eating squid. It worked in shallow water but you couldn't take it below a certain depth. Scott went away and did some research on Leonardo's drawings and came back with some ideas."

Tim and his team took the diving suit to Venice and achieved what Leonardo had intended – walking on the seabed.

Another military design – a tank – was put together by a team of soldiers, led by Major George Fletcher and tank historian David Fletcher.

Tim explains: "The Royal Armoured Corps put it together and, after some adjustments, it did go along at quite a speed, using simple and effective mechanics – six men pumping cranks inside. The tank is shaped like a tortoise, showing again how Leonardo was always looking to nature."

Other machines were simply ideas to entertain Leonardo's patrons, such as the robot, which was built for the series by Mark Rosheim, an American inventor who has previously designed robots for NASA.

"Many of the drawings have been lost and Mark has done a lot of research to piece them together. Inside a suit of armour made up in the style of the

period, Mark put together mechanical workings, pulleys and cables, to replicate how the body works,” says Tim.

“The knight stands up, raises its arms and the visor opens and a light comes on. It’s quite amazing, especially as even the very latest robots can only just about walk.”

All the designs required slight modifications, but Tim believes that this is very much in the spirit of Leonardo’s ongoing experimentation.

“Throughout Leonardo’s work we found mistakes and we wondered if these might have been deliberate. Certainly with the diving suit he expressed his fears about his ideas getting into the wrong hands and creating murder on the seabed.

“Wherever we adapted the inventions, we took our lead from Leonardo and used his notebooks as our inspiration. We have tried to be creative, taking the baton on from Leonardo and making his dreams come true. The most impressive thing is that instinctively he came up with workable ideas which astonish people who are at the top of their fields today.

“Before we started I wasn’t convinced about Leonardo’s genius but by the end I was amazed that he had a mind that was so fertile,” adds Tim. “His drawings are probably the clearest exposition of his genius. He was a brilliant artist but his art had a real purpose.”



Renaissance Timeline

The Renaissance was a revolution in culture and the arts reflecting a great age of discovery around the world. Inspired by the art and learning of Ancient Greece and Rome, the centre of this drive for knowledge and creativity was the region we now call Italy. The Renaissance was also marked by intense rivalry between city states and bloody conflict.

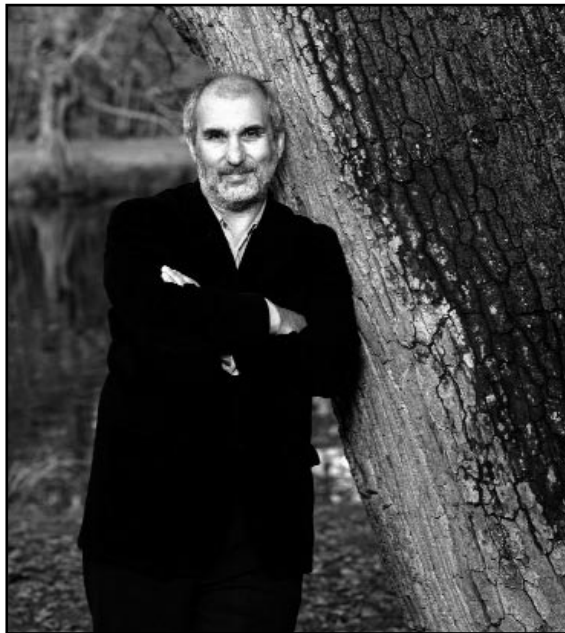
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| <p>1307-1321 Dante Alighieri writes <i>The Divine Comedy</i> in Italian.</p> <p>1315 Albertino Mussato's play, <i>Ecce homo</i>, is the earliest Italian humanist drama.</p> <p>1317 Giotto di Bondone paints frescos in the Bardi Chapel, Florence.</p> <p>1347-1351 Bubonic Plague, the Black Death, sweeps through Europe, killing between a quarter and a half of the population.</p> <p>1348-1353 Giovanni Boccaccio writes the <i>Decameron</i>, stories set against the Black Plague, in Italian.</p> <p>1366 Petrarch produces <i>Canzoniere</i>, a model for sonnet form, written in both Latin and Italian.</p> <p>1374-1400 Jean Froissart writes the <i>Chronicles Of The Hundred Years War</i>.</p> <p>1378-1417 Great Schism.</p> <p>1381 Peasants' Revolt in England.</p> <p>1387 Geoffrey Chaucer writes <i>The Canterbury Tales</i> in English.</p> <p>1412 Filippo Brunelleschi writes <i>Rules Of Perspective</i>.</p> | <p>1417 Lorenzo Ghiberti paints Siena Cathedral reliefs.</p> <p>1419 Filippo Brunelleschi designs the octagonal ribbed cupola of the Florence Cathedral.</p> <p>1425 Thomas à Kempis writes <i>Imitation Of Christ</i>.</p> <p>1429 Discovery of 12 unknown plays by Roman comic playwright, Plautus.</p> <p>1431 Joan of Arc burned at the stake.</p> <p>1432 Jan Van Eyck paints <i>Adoration Of The Lamb</i>.</p> <p>1433 Donatello's sculpture, <i>David</i>, unveiled in Florence.</p> <p>1434 Cosimo de' Medici becomes ruler of Florence.</p> <p>1450 Francesco Sforza conquers Milan.</p> <p>1452 Leonardo da Vinci is born.</p> <p>1453 Constantinople, centre of the Eastern Church, falls to the Turks. Scholars flee to Italy, bringing Greek manuscripts.</p> <p>1455 Johannes Gutenberg, a German, prints his <i>Mazarin Bible</i> using moveable type.</p> <p>1455-1485 The Wars of the Roses.</p> <p>1463 Venice begins a 16-year war with the Turks.</p> <p>1470s Portuguese navigators begin to explore the African coast.</p> <p>1472 Leonardo da Vinci paints <i>The Annunciation</i>.</p> |
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- 1478** Andrea del Verrocchio paints *Madonna And Child With Saints*.
- 1478** Spanish Inquisition.
- 1484** Sandro Botticelli paints *Birth Of Venus* for the Medici.
- 1485** Leonardo da Vinci paints *The Virgin Of The Rocks*.
- 1486** Publication of *De Architectura* by Roman architect Vitruvius.
- 1486** Mirandola's *Oration On The Dignity Of Man* published.
- 1490** Leonardo da Vinci paints *Lady With Ermine*.
- 1492** Christopher Columbus, an Italian, sailing for the Spanish Crown, discovers America.
- 1494** Giovanni Pico Della Mirandola publishes *The Dignity Of Men*, considered a major statement of Renaissance humanism.
- 1494** Charles VIII, the French King, invades the Italian peninsula.
- 1494** Dominican friar Girolamo Savonarola leads an uprising to expel the Medicis. In 1498 he is excommunicated and hung.
- 1498** Leonardo da Vinci finishes *The Last Supper*.
- 1498** Vasco da Gama reaches India.
- 1498** Latin edition of Aristotle's *Poetics* published.
- 1503** Nostradamus is born.
- 1504** Michelangelo Buonarroti's statue of *David* completed.
- 1503-1505** Leonardo da Vinci starts to paint the *Mona Lisa*.
- 1508-1512** Michelangelo Buonarroti paints the ceiling of the Sistine Chapel.
- 1512** Medici restored to power in Florence.
- 1513** Giovanni de' Medici is elected Pope Leo X and becomes a great patron of the arts.
- 1513** Raphael paints the *Sistine Madonna*.
- 1513** Niccolo Machiavelli writes *The Prince*.
- 1515** Sir Thomas More writes *Utopia*.
- 1517** Leonardo da Vinci paints *St John The Baptist*.
- 1517** Martin Luther posts his 95 Theses in Wittenberg.
- 1519** Leonardo da Vinci dies.
- 1520** Corregio paints *The Ascension Of Christ*.
- 1522** Magellan's ship returns from circumnavigating the globe.
- 1523-1534** Michelangelo Buonarroti paints the Medici Mortuary Chapel.
- 1527** Rome is sacked by troops of the Holy Roman Empire. Medici is expelled from Europe.
- 1528** Castiglione's *Book Of The Courtier* is published.
- 1530** Medici restored.
- 1532-1548** Rabelais's *Pantagruel* and *Gargantua* published.
- 1533** Separation of the English Church from Rome.
- 1536** Calvin's *Institutes Of The Christian Religion* and Guicciardini's *The History Of Italy* published.

- 1543** Vesalius's *The Fabric OfThe Human Body* published.
- 1545** Sebastiano Serlio's *Architettura* is the first to describe contemporary scenic practices and to illustrate representative designs.
- 1546** Titian paints *Christ Crowned With Thorns*.
- 1550** First appearance of *commedia dell' arte* companies.
- 1585** Teatro Olimpico, Vicenza, designed by Andrea Palladio and Vincenzo Scamozzi, opens with a production of *Oedipus Rex*.
- 1588** Defeat of the Spanish Armada.
- 1594** *Dafne*, the earliest opera, written in the belief that it followed Greek theatrical form.
- 1607** First performance of *Orfeo* by Claudio Monteverde, often considered the first modern opera.
- 1618** Completion of Teatro Farnese, Parma, designed by Giovanni Battista Aleotti.
- 1637** Teatro San Cassiano, the first public opera house, opens in Venice.
- 1638** Nicola Sabbattini writes the *Manual For Constructing Theatrical Scenes And Machines*.

Biographies

Alan Yentob



Alan was appointed director of Drama, Entertainment and Children's in April 2000. Alan is at the creative helm of the BBC and has overall responsibility for BBC drama, entertainment and all aspects of the BBC's children's output across all media.

He is responsible for a significant film division and is the focal point for talent management across the whole of the BBC. Alan also acts as Greg Dyke's deputy on the Cross Media Creative group, the forum for decision making about BBC programmes and services; and takes a seat on the Executive Committee.

A celebrated and award-winning programme maker, Alan quickly came to personify the creative spirit of the BBC. He joined as a general trainee in 1968, taking his first job in the World Service. From 1973 to 1975, he was a producer/director with *Omnibus*, where his films famously included *Cracked Actor* with David Bowie. In 1978, he created the mould-breaking arts series *Arena*, and was editor until 1985. During this time, *Arena* produced influential

programmes including *The Private Life Of The Ford Cortina* and *My Way*.

In 1985, he became head of Music and Arts and stayed in the post until 1988, when he was appointed Controller of BBC Two. Under Alan's five-year stewardship, BBC Two was re-vitalised, and introduced many innovations in programming including *The Late Show*, *Have I Got News For You*, *Absolutely Fabulous* and Wallace and Gromit's *The Wrong Trousers*. Factual programme successes included *Troubleshooter* and *Video Diaries*.

He was appointed Controller BBC One in 1993, significantly improving its content and share. He then became director of Television, from May 1997 until April 2000, when he started his current post.

Alan was born on 11 March 1947. His outside responsibilities include sitting on the South Bank Board and chairmanship of the ITC and the ICA.

Mark Rylance (Leonardo)

Mark is the artistic director of Pheobus Cart and Shakespeare's Globe. He is also an associate actor of the RSC and friend of the Francis Bacon Research Trust. The Citizen's Theatre (Glasgow) gave him his first job in 1980 and, since then, he has worked with the RSC, Royal National Theatre, Royal Opera House, Scottish Ballet, Shared Experience, Bush Theatre, Tricycle Theatre and London Theatre of the Imagination. Mark has also worked with Contact Theatre, Oxford Playhouse, Project Theatre (Dublin), Mermaid Theatre, Royal Court, American Repertory Theatre (Boston), Theatre for a New Audience (New York), Pittsburgh Playhouse and Thelma Holt, after whose production of *Much Ado About Nothing* he received the Olivier Award for Best Actor.

In 2003, Mark will play the title role in *Richard II*, which has a preview run at Middle Temple Hall (17 April to 4 May), before transferring to The Globe.



His television credits include: *The Grass Arena*, *Love Lies Bleeding*, *In Lambeth* and *Loving*. His film credits are: *Prospero's Books* by Peter Greenaway, *The Institute Benjamenta* by the Brothers Quay, *Angels And Insects*, *Hearts Of Fire*, and *Leonardo* for BBC One. Mark completed a run of *Life x 3* by Yazmina Reza at the Old Vic in 2000. He also starred as Jay in Patrice Chéreau's film, *Intimacy*, in 2001.

Born in England, but raised in America from 1962-1978, Mark trained at RADA under Hugh Cruttwell and at The Chrysalis Theatre School, Balham, with Barbara Bridgmont.

Adam Croasdell (Michaelangelo)

Adam has a number of diverse television credits, from Channel 4's *Smack The Pony* to the BBC's 2002 drama, *The Project*. He has also featured in many films, including *Lenny* (Channel 4 Films), *Tarzan – The Lost City* (Warner Brothers) and *Fly Fishing* (Shooting Pictures).

His theatre credits include: Menecrates in *Anthony & Cleopatra* at the Royal National Theatre; Haemon in the Bristol Old Vic's production of *Antigone*; and Frances Archer in *Faithful Dealing* at London's Soho theatre.

James Faulkner (Duke of Milan)

James has numerous feature film credits, including the title role in *Le Loup De La Cote Quest* (Gemini Films); Nick Farrell in *The Piano Player* (Martinex Films); and the odious Uncle Geoffrey in *Bridget Jones's Diary* (Universal).

Theatre credits include playing Lenin in *Lenin In Love*; and he recently played the title role in the acclaimed television drama *Big Man Small Country*.

Paul Brook (Abbot)

Paul's television credits include Tommy Lascelles in *Bertie & Elizabeth* (Carlton); Duncan Orloff in *The Scold's Bridle* (BBC); and Sir Rex Willoughby in *Under The Sun* (BBC).

Film credits include playing Mr Fitzherbert in *Bridget Jones's Diary* (Universal); Mr Pitt in *The Sky Falls* (Parus Films); and Father Domremy in *Jeanne D'Arc* (Leloo Productions).

Che Cartwright (Sallai)

Che has featured in a number of TV dramas, from the BBC's *Doctors* to Carlton's *Crime Stalker*. Theatre credits include *Comedy Of Errors* for Carlton Studio and *A Midsummer Night's Dream* at the MAC.