

**TRO**

**life**

magazine feb/2013



**Museum air.**

The art of handling art.

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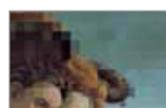
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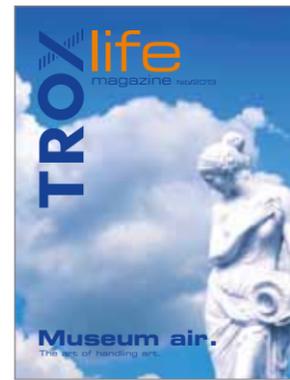
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## viewpoint

### The art of handling art.

In line with our slogan, we turn to the arts or much more, their place of collection or assembly. For in recent decades, very impressive museum buildings have been erected: The Guggenheim Museum in Bilbao, the Tate Modern in London, the Acropolis Museum in Athens, the Museum Folkwang in Essen or the very recent National Museum of China in Beijing.

Visit with us the world's most beautiful, most interesting and most famous museums where we offer insight into the ventilation characteristics of museum buildings.

We have also „met“ a fascinating person generally regarded as the universal genius par excellence: Leonardo da Vinci. He is the forefather of fluid dynamics as is evident from his sketchbooks, which were only rediscovered in the 60s of the last century. Scientists of our time have duplicated, for example, a diving suit and a flying glider from his sketches and proven that his technical inventions work.

And last but not least, read some news about TROX. With the acquisition of the TLT building fans, the line of ventilation systems comes full circle for TROX. We can now offer our customers the heart of ventilation technology, the fan.

Have fun reading!

Lutz Reuter  
Chairman of the Board of Management of TROX GmbH



# Museum buildings.

A cross section of high-profile architecture.

Explore with us high-profile examples of museum architecture. Reliable TROX technology ensures the conservation of valuable art treasures.





*British Library,  
London, Great  
Britain*



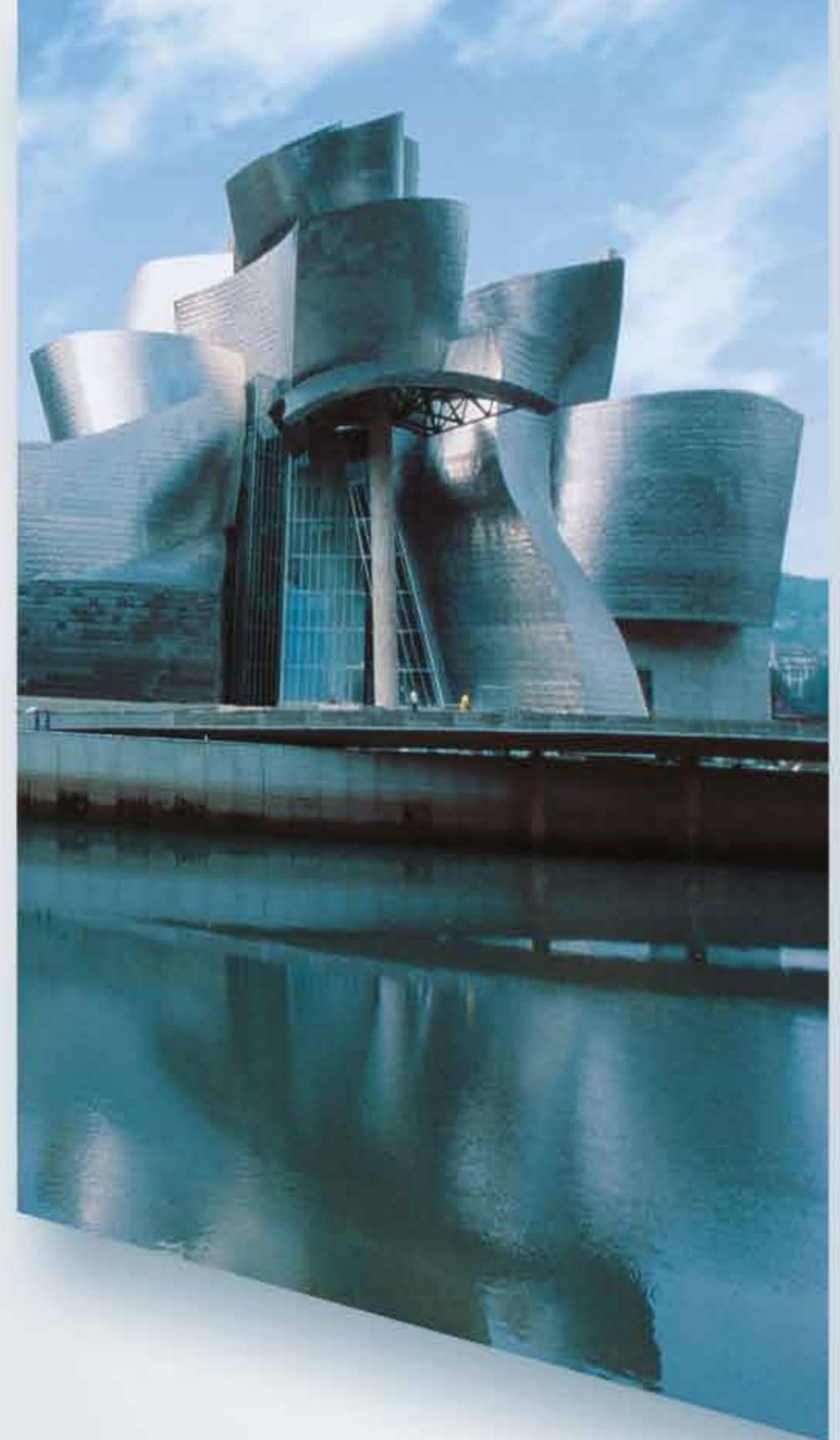
*Museo del Teatro Romano,  
Zaragoza, Spain*



*National Museum, Prague,  
Czech Republic*



*Porsche Museum, Stuttgart, Germany*



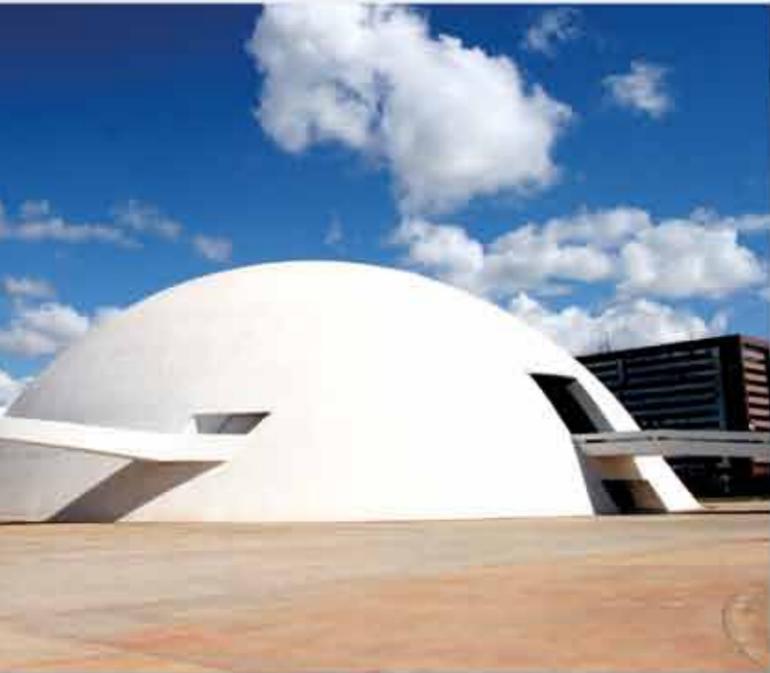
*Guggenheim Museum, Bilbao, Spain*

**Examples of outstanding architecture.**

The landscape of museums has become diverse and varied. It is not just the art and cultural collections anymore that enrich our cultural map. Four automobile museums have recently been erected in Germany alone. With the Museo Ferrari in Modena, the Italian cult brand has also had its museum

showcase since March of this year. Unusual and very interesting museum designs have been and are popping up around the globe such as the CosmoCaixa Science Museum in Barcelona, Spain and the Phaeno Science Center in Wolfsburg, Germany. Museums are even devoted to the sport of football.

The DFB Football Museum in Dortmund, Germany will open its doors in 2014. We want to briefly introduce you to impressive museum buildings whose walls veil the pioneering ventilation and air conditioning technology of TROX.



Museu da República, Brasília, Brazil



MARTa, Herford, Germany



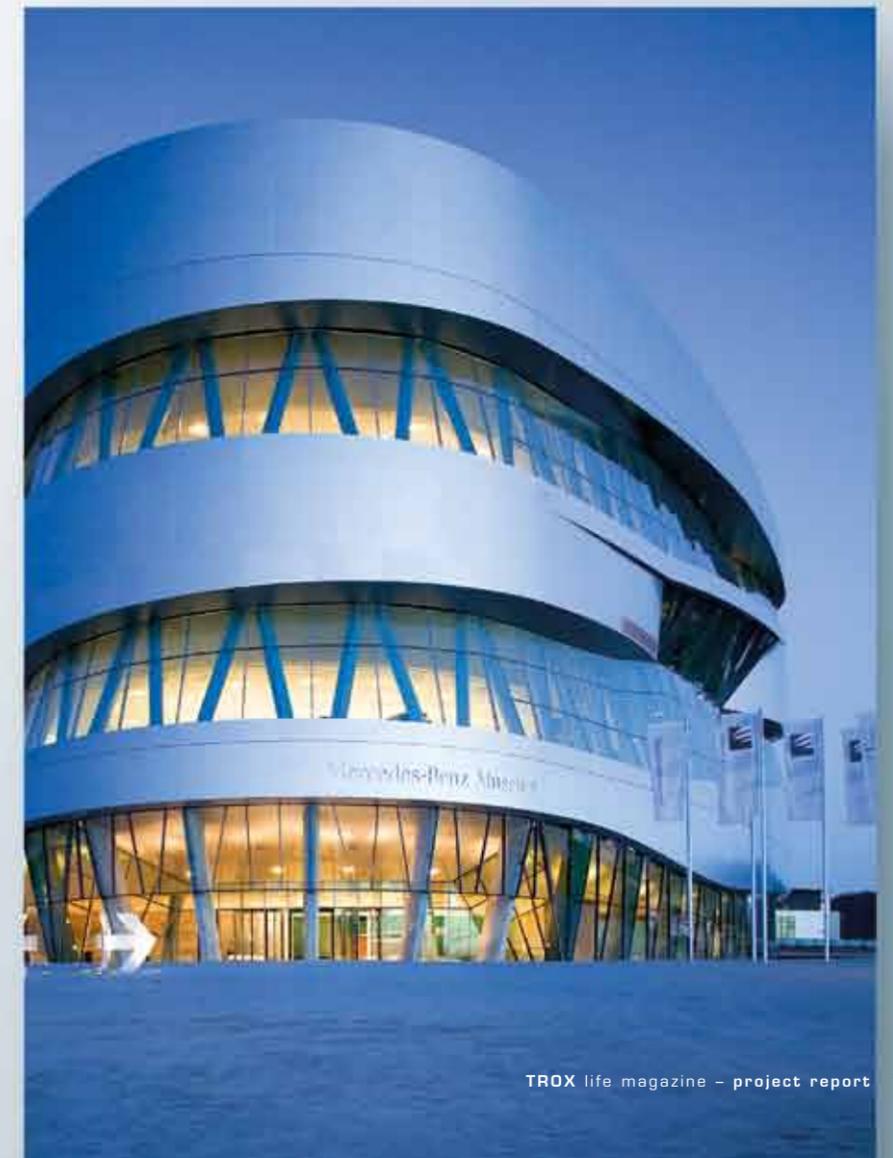
Acropolis Museum, Athens, Greece

**Star architects.**

It is normally the big names in architecture who enrich the museum scene worldwide. Recent examples? The Kolumba in Cologne, Germany, a Diocesan museum, was designed by Pritzker laureate Peter Zumthor and is a model of energy-efficient buildings. Frank O. Gehry designed the deconstructivist architecture of the Guggenheim Museum in Bilbao, Spain. Zaha Hadid is responsible for the futuristic design of the MAXXI, museum for art and architecture in Rome.

Both architecture and ventilation technology must protect the precious objects of cultural value above all. Reliability and security are the highest priority for the museum planner. Innovative technology must ensure a constant protective climate. In addition, it must ensure the safety of people and objects of cultural value in the event of a fire.

Mercedes-Benz Museum, Stuttgart, Germany



# Art pour l'art.

Perfect air  
for perfect art.



Room air conditioning usually aims at creating comfortable conditions for people. In museums, however, it is first and foremost the exhibits that count. The aim of room air conditioning in museums is preservation, the preservation of priceless works of art.



**Air parameters.**

Places where many people meet are usually subject to safety regulations that ensure safe and comfortable conditions; for example, only a limited number of persons may be given entry at any one time. Museums are a different matter, though. When a museum is built or refurbished, the primary aim is to provide the perfect climate for the exhibits. It is of utmost importance that parameters such as temperature, relative humidity and air movement are kept at constant levels. The perfect

climate in a museum depends, eventually, on the quality and condition of the exhibits. It is clear that paintings, on which we will concentrate in this article, are much more sensitive than, say, cars when it comes to any changes in the surrounding air. This is not to say, however, that the odd automobile can not also be sensitive; just think of the material of folding roofs or of the leather seats of classic vintage cars.

**60%**  
FOR WOOD OR  
OIL PAINTINGS



**Ideal temperatures.**

The ideal climate in a museum is not based on the absolute temperature alone. What artefacts don't like at all are temperature fluctuations. Or worse, frequent or sudden temperature changes. Not only the room temperature has to be taken into account but also the temperature at the surface of the exhibits. Yet another critical factor is the size of large exhibits, which may extend as far up as the ceiling, i.e. beyond the occupied zone that ends at about 1.70 m.

**Balanced humidity.**

While temperature is important, the relative humidity has a much greater influence on preservation. The air conditioning system must dehumidify the air when many visitors are present. For the better part of the year, fresh air is in many parts of Europe too dry, and the humidity must be increased as a consequence. Generally accepted levels of relative humidity are:

- 40% for graphic designs
- 50% for mixed exhibits
- 60% for wood or oil paintings



**40%**  
FOR GRAPHIC  
DESIGNS



**50%**  
FOR MIXED  
EXHIBITS

**No turbulence.**

The air is never void of dust particles, no matter how good the filters are. A considerable amount is brought in by the visitors. The higher the airflow velocity and the level of turbulence, the higher the dust drift that threatens the works of art. This is why airflow velocities and levels of turbulence must be kept to a minimum.

The ideal airflow velocity is 10% of the generally accepted comfort level. Since temperature and relative humidity must be constant across the height of the room to avoid climate changes at the surface of the exhibits, the quantity of air cannot be lowered indefinitely. A sufficient airflow is required to dissipate heat loads from the lighting or from visitors.



Time has taken its toll on centuries-old master pieces.

**Bottom line: constant climate.**

Even fluctuations of just 1 to 2 K may pose a problem if they occur frequently. Constant climate means that sensitive materials must 'work' less. The carrier material, the paint, and the frame of a painting must adapt to each change in temperature or relative humidity.

An additional problem is that climate changes do not affect the whole object homogeneously but from the outside to the inside. Tension in the material may lead to hairline cracks, which can often be seen on paintings by Old Masters.

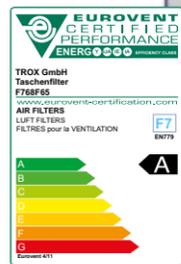
**Ideal air conditioning  
(maximum requirements for preservation)**

- Room temperatures
- Heating: 20 °C
- Cooling: 20 to 24 °C
- Relative humidity 50%
- Large fluctuations should be avoided

**Air in its purest form.**

Most museums are located in city centres and on streets with a lot of traffic where the outside air is heavily polluted. Not only fine dust and soot particles from traffic can be a serious threat to priceless works of art but also ozone and carbon, sulphur or nitrogen compounds. This is why high-quality filters are a must.

An important criterion for selecting a filter is its efficiency since filters affect the energy consumption of an air conditioning system considerably. TROX has put much effort into the research of filters, is constantly working to improve filter efficiency, and has filters certified by the independent Eurovent organisation. The energy label shows clearly to which energy efficiency class a filter belongs.



**Custodians of good climate – the requirements.**

To meet the preservation requirements of museums intelligent building management systems are a must – because they monitor, record, and control important air conditioning parameters such as temperature and humidity. Volume flow controllers ensure that a setpoint value is maintained, e.g. by controlling the supply air flow accordingly.

**Redundant air conditioning components.**

In a museum with expensive exhibits a total failure of the air conditioning system, e.g. because of maintenance work or defective components, must be avoided at all costs. In other words: Redundancy must be part of the design; if all principal air conditioning elements failed simultaneously, the works of art might be damaged beyond restoration by the sudden change of climate.

**Compromise between comfort and conservation.**

As mentioned above, works of art need climatic conditions that are totally different from those for people. The room temperature, for example, should be as low as possible, which is clearly not what visitors and staff want. A highly variable air conditioning system is therefore essential, and it depends not only on external factors but also on the architecture of the museum, the type of exhibits, and the individual part of the museum.

And last but not least, the type of air conditioning system depends on whether a museum is newly built or refurbished.



# Ventilation in museums.

## The options.



Displacement flow

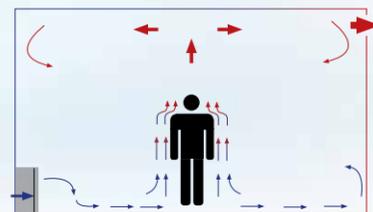
Different ventilation and air conditioning strategies are required depending on the type of building, type of exhibits, and number of visitors at any one time.

### Displacement flow ventilation in combination with component activation/chilled ceilings.

Filtered fresh air and recirculated air is supplied to the rooms as a displacement flow, e.g. using displacement flow diffusers along the walls and close to the ground. The displacement flow also helps to create the relative humidity that is required to preserve the valuable exhibits. Draughts and the stirring up of dust are largely avoided due to the much reduced airflow velocity. Component activation of walls and/or ceilings dissipates thermal loads and minimises temperature differences between the air layers.

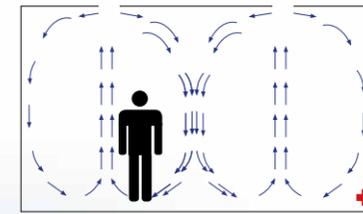
### Displacement flow with air-water systems.

If a room is equipped with an induction type displacement flow diffuser with heat exchanger a central air conditioning system can be added later. As thermal loads in such a system are dissipated with water, and not with air, the diameter of the ducts can be reduced. Induction type displacement flow diffusers can be installed under a sill or next to the window. The high impulse of the primary air being discharged creates a negative pressure. As a consequence, there is a continuous room



Displacement flow air distribution

air intake near the ceiling. This room air flows through the heat exchanger and is heated or chilled in the process. The secondary air is mixed with primary air and led back into the exhibition room as a displacement flow.



Mixed flow air distribution

### Mixed flow ventilation.

Mixed flow air distribution creates a homogeneous flow and hence a homogeneous temperature distribution and air quality. The drawback are higher airflow velocities such that mixed flow air distribution alone is an option only if the higher airflow velocities have no negative effect on the exhibits.



Mixed flow with swirl diffusers



Decentralised ventilation systems

This is why air conditioning systems in museums do not normally rely on mixed flow air distribution alone. Local mixed flow air distribution ensures a better mix of the air but without the negative effects on the exhibits.

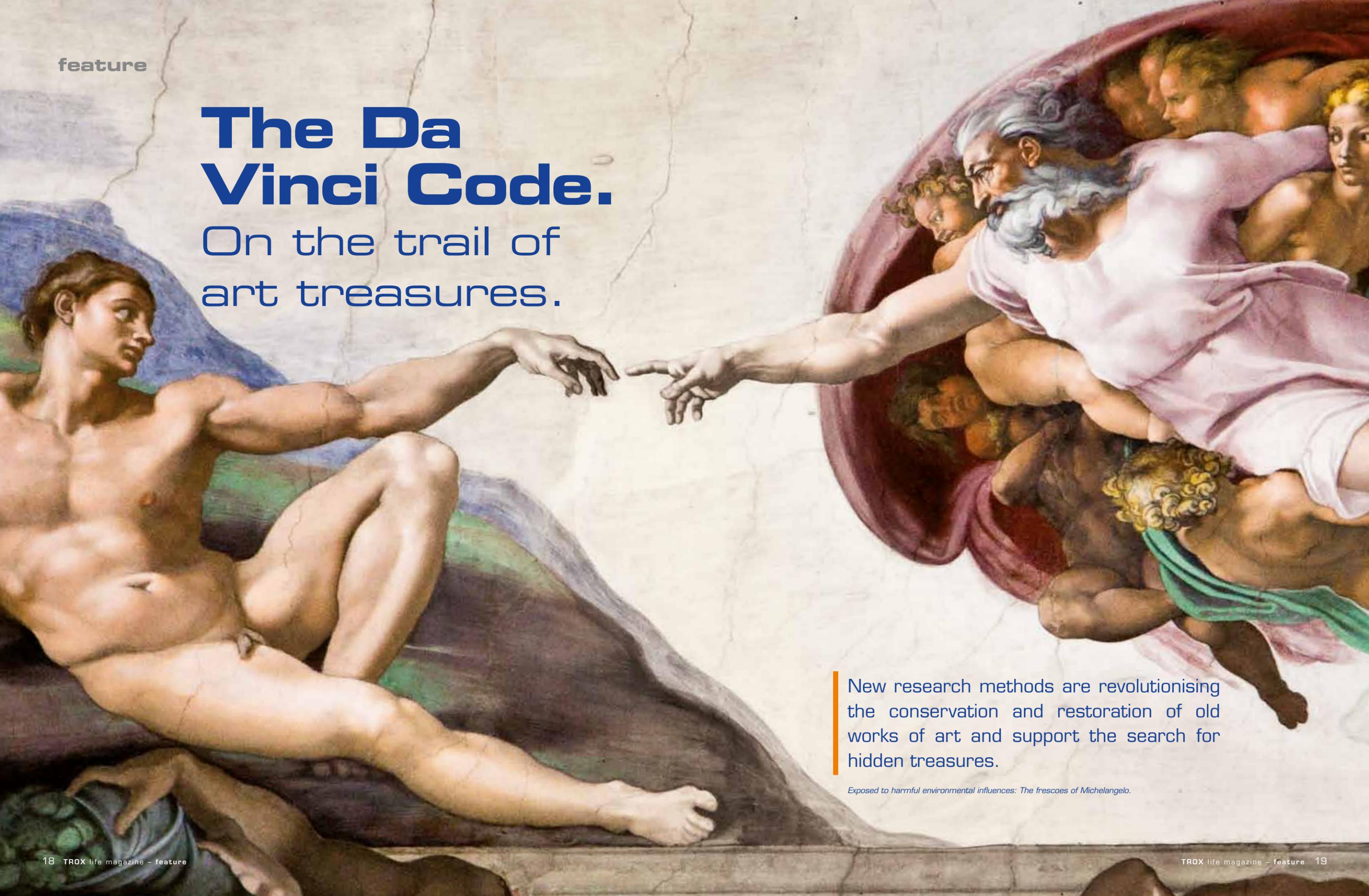
### Decentralised ventilation systems for refurbishment projects.

Refurbishing an old museum usually means retrofitting an air conditioning system. In most cases, however, extensive ducting can not be integrated into an old building. This is why decentralised ventilation systems are ideal for listed buildings as they can be installed under sills or in window recesses. Moreover, fresh air can be supplied without making many changes to the façade.

Decentralised ventilation systems are typically a combination of mixed flow and displacement flow systems. Near the unit the supply air is discharged with a velocity of up to 1 m/s. Induction ensures that the air being discharged is mixed with the room air; airflow velocity and temperature differences decrease, while the displacement flow that is created in the occupied zone ensures a comfortable climate.

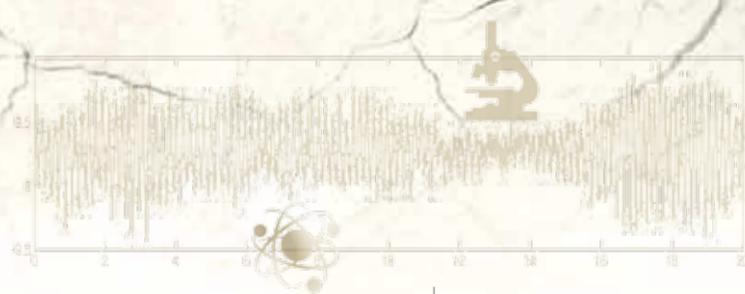
# The Da Vinci Code.

On the trail of art treasures.



New research methods are revolutionising the conservation and restoration of old works of art and support the search for hidden treasures.

*Exposed to harmful environmental influences: The frescoes of Michelangelo.*



**The ravages of time.**

The importance of constant climate conditions for the preservation of great art has already been discussed in detail. Changes or even destruction have causes well in the past and they normally lie outside the control of innovative ventilation and air conditioning systems.

Quickly showing cracks, the „Last Supper“ in the Convent of Santa Maria delle Grazie was already showing signs of wear within Leonardo’s lifetime. Over time, paint even began to flake off because of the excessive moisture of the damp monastery

walls. Nonetheless, the portrait defied the climate, candle smoke and bombs of war. Unfortunately, Leonardo did not paint it in the more durable „al fresco“ technique, rather in „secco“ with tempera and oil. Da Vinci worked on his piece for four years (1495–1498). The complex restoration 500 years later took nearly five times as long. To preserve its current state, a complex airlock system now ensures a consistently dry climate free of contamination.

Just as Michelangelo’s frescoes in the Sistine Chapel, the „Last Supper“ must above all measure up to the onslaught of tourists. The human breath alone is poison to the art. For this reason, no more than 25 visitors can be in the refectory at any given time and the unique piece is accessible by appointment only.



*Masterpieces hide beneath some paint or a layer of plaster.*



*Only approved for 25 visitors: Da Vinci’s „Last Supper“.*

The frescoes of Michelangelo were also subject to a makeover. Under the layers of dirt built up over centuries reappeared the frescoes painted in the period between 1508 and 1512 in their original brilliance and vibrant colours. The now high-contrast play of colours sparked fierce controversy because the usual muted colour palette had suddenly evolved into a bright colour palette. However, the artistic and philosophical models, which Michelangelo had used as reference, prove this choice of colour and technique. This revived the old controversy of conservators and restorers: Should art be restored to its original state or rather wear the patina of years?

**Hypertechnologies for art.**

Hypertechnologies are relied on in both the restoration and analysis of artwork. Terahertz scanners, also generally known as full-body scanners, help to reveal spectacular findings, for example. In this way, masterpieces painted or plastered over through the course of time have been uncovered.

A research group directed by Bianca Jackson from the University of Michigan also relies on state-of-the-art scanner technology. In their initial attempts, scientists were able to expose pencil drawings under paint and plaster layers. The team now wants to scrutinise the walls of the Church of Saint Jean Baptiste in French Vif under the scanner. Frescoes from the 13th and 14th centuries hidden under five layers of plaster were recently discovered there. However, the



*Gigantic streams of visitors in the Sistine Chapel mean higher humidity, which of course causes the frescoes to wear.*



*Beneath five layers of plaster, frescoes from the 13th century were rediscovered in the Church of Saint Jean Baptiste.*

restorers had to stop after the initial attempts to uncover the frescoes and are now waiting for the help of cyber technicians.

The so-called „T-rays“ penetrate the plaster, part of which is reflected again by the underlying layers. The T-rays are reflected at different speeds depending on the type of material researchers encounter. The characteristic signal of different pigments then allows researchers to convert the data into an image hidden under the top layer.



Rembrandt: Self-portrait and „The Sacrifice of Isaac“.



**Is the Rembrandt real?**

Another old master, who always ends up in the headlines as it should be, is Rembrandt. Hundreds of pieces were painted in his studios. Many of his docile pupils were the artists rather than Rembrandt himself. Appropriately, many paintings are extremely difficult to differentiate from a Rembrandt and are repeatedly subject to wild speculation. Martin Bijl is considered the foremost Rembrandt scholar and restorer. He also relies on state-of-the-art technology when it comes to checking the authenticity of a painting or exposing hidden masterpieces as the great master had painted over sketches and paintings like many of his time. Thus, Bijl uses neutron activation autoradiography. In the particle accelerator, the X-ray fluorescence spectrometer reveals the chemical compounds of hidden layers of paint. Bijl has used this technique to rediscover pieces of great value and to the delight of the owner! One



Source of many legends: Genghis Khan.

painting by a supposedly unknown master sold in the 4-digit range turned out to be a Rembrandt painted over, now with a value in the high 7-digit range.



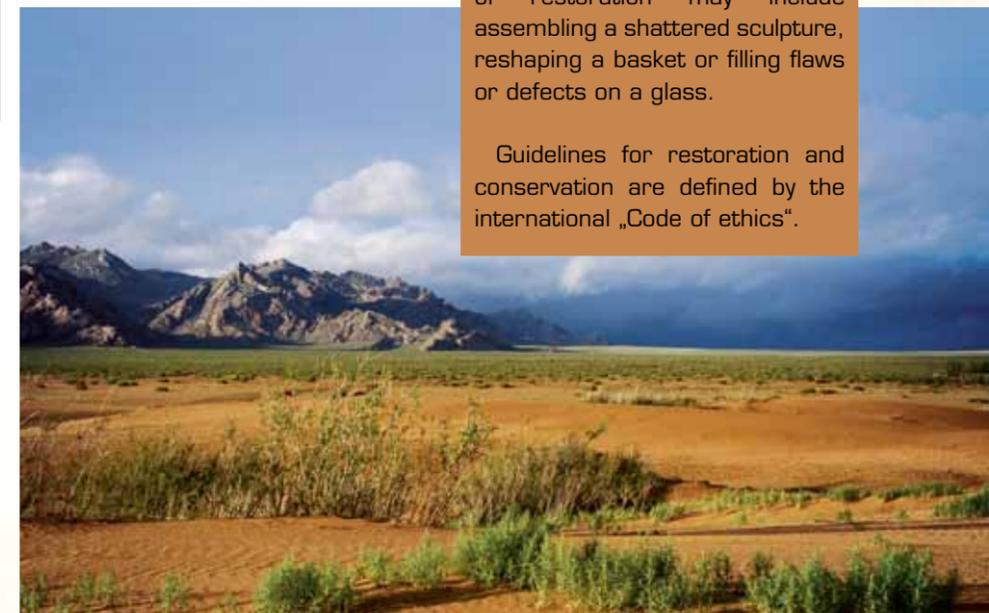
**High-tech archeology.**

High-tech tools are also used in archeology in addition to a spade and shovel. Supercomputers, ray guns and special cameras help to recreate the past in virtual worlds. GPS is first used to determine places of discovery. A stereoscopic camera then captures stones and broken fragments. Researchers then generate a digital image from the volumes of data. Entire pitchers emerge from clay fragments, the complete image of an ancient site from wall remnants. Researchers can also take a virtual tour of the ancient sites far away from the place of discovery using a cyber helmet to analyse their findings unhurriedly.

On the hunt for lost treasures, state-of-the-art military and aerospace technology offers archaeologists unimagined possibilities. Entire landscapes are scanned by radar or remote-controlled drones, and satellite images are systematically searched for minute traces that point to



ancient sites. The hope is to also find the resting place of Genghis Khan in this way. This is a difficult undertaking because according to legend, horses first trampled on the grave of the Mongol leader, then a river was redirected over the grave mound and finally all aids were put to death to prevent the peace in death of the great Mongol leader from being disturbed.



Somewhere under the Mongolian steppe: The grave of Genghis Khan.

**Conservation and restoration.**

Conservation includes all measures to stabilize the state of an object and to slow down the occurrence of future damage. This can include the desalination of ceramics, deacidification of paper or removal of dust layers on paintings.

„Restoration“ is defined by the International Council of Museums (ICOM) as: All acts that promote the awareness, appreciation and understanding of the object. Such actions are then only performed if an object has lost part of its significance or function due to past changes or destruction. The principles of respect for the original and its history, as well as reversability apply. Examples of restoration may include assembling a shattered sculpture, reshaping a basket or filling flaws or defects on a glass.

Guidelines for restoration and conservation are defined by the international „Code of ethics“.



# Museums.

## The basic human instinct to collect.



Museums are generally seen as an invention of modern times. However, collecting things has always been a basic human instinct. The grave goods of the Chinese emperors are regarded as a museum prototype so to speak. The inhabitants of the afterlife should get an impression of the alien culture in this world that is as positive as possible. Best example: The world-famous Terracotta warriors of the Chinese emperor Qin Shi Huangdi from **210 BC**. Even the medieval collections of monks are considered precursors to today's museums.



### Ancient sites as open-air museums.

Strictly speaking, ancient sites are not really museums. However, more and more efforts are emerging to convert them into large open-air museums. For their protection and to stem deterioration, sites such as Pompeii and Luxor are being raised to museum size.

### The oldest museum.

Amongst historians, the British Museum is viewed as the world's oldest. It has one of the largest and most significant collections. In **1753**, the English scholar Sir Hans Sloane bequeathed his comprehensive collection of antiquities, fossils, stones and coins to the State. The parliament decided to make the collection accessible to the public and to gradually expand it. And the British Museum came to being.

Per parliamentary decree, admission to the museum is free of charge today as it was then. No wonder that **4.5 million** visitors flock to this imposing structure year after year and enjoy the great exhibits.



### The mother of all museums.

The Egyptian Museum in Cairo is considered the mother of all museums, the world's largest museum of Egyptian antiquities. In **1835**, the Egyptian government founded the „Service des antiquités de l'Egypte“ to prevent further looting of archaeological treasures by both native and foreign treasure hunters. Thus emerged the first collection of Egyptian works of art collected by the Egyptian government.

### FAMOUS ANCIENT SITES

Pompeii | Luxor, Karnak, Valley of the Kings | Acropolis, Olympia, Delphi | Pont du Gard | Carthage | Damascus | Troy, Pergamon  
Ephesus | Maya: Tikal, Palenque, Copan, Uxmal, Chichen Itza | Inca: Machu Picchu | Angkor Wat | Mueang Boran | Qin Shi Huang Mausoleum



# Museological.

## Information about the cultural sites.

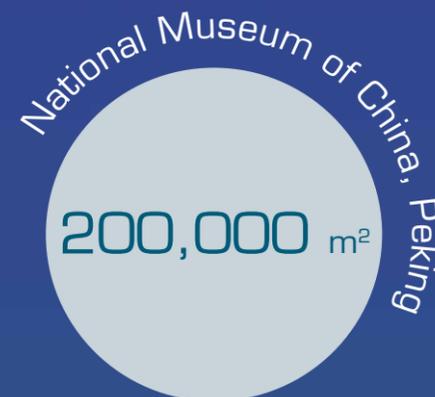
**Museums in the web.**

- [www.britishmuseum.org](http://www.britishmuseum.org)
- [www.deutsches-museum.de](http://www.deutsches-museum.de)
- [www.guggenheim.org](http://www.guggenheim.org)
- [www.hermitagemuseum.org](http://www.hermitagemuseum.org)
- [www.louvre.fr](http://www.louvre.fr)
- [www.museodelprado.es](http://www.museodelprado.es)
- [mv.vatican.va](http://mv.vatican.va)
- [www.tate.org.uk](http://www.tate.org.uk)
- [www.uffizi.firenze.it](http://www.uffizi.firenze.it)

**Famous museums.**

Amsterdam	<b>Rijksmuseum</b>	Art
Athen	<b>National Archaeological Museum</b>	Archaeology
Berlin	<b>Alte und Neue Nationalgalerie</b>	Art
	<b>Pergamon Museum</b>	Archaeology
Chicago	<b>The Art Institute of Chicago</b>	Art
Detroit	<b>Henry Ford Museum</b>	Technology
Florence	<b>Uffizi Gallery and Pitti Palace</b>	Art
London	<b>National Gallery, Tate Gallery and Tate Modern</b>	Art
	<b>British Museum</b>	Archaeology, Art history
Madrid	<b>Prado</b>	Art
Moscow	<b>Tretyakov Gallery</b>	Art
Munich	<b>Alte und Neue Pinakothek</b>	Art
	<b>Deutsches Museum</b>	Technology
New York	<b>Metropolitan Museum of Art</b>	Art
	<b>Guggenheim Museum</b>	Art
Oxford	<b>Ashmolean Museum</b>	Archaeology, Natural history
Paris	<b>Louvre Centre National d'Art et de Culture</b>	Art
Philadelphia	<b>Franklin Institute</b>	Technology
Rome	<b>Vatican Museums and National Gallery</b>	Art
St. Petersburg	<b>The State Hermitage Museum</b>	Art
Washington	<b>National Gallery of Art</b>	Art, National history
Vienna	<b>Albertina und Kunsthistorisches Museum</b>	Art

**The largest museums.**



Until 2011, the „Met“ had topped the list until in Peking with the National Museum at Tiananmen Square, the now world's largest museum in terms of exhibition space was created after its reconstruction.



**Gastro-tip: Art and enjoyment.**

Supporters of the Art of Slow Food definitely get their money's worth in the „Fast Times“ of the ISH. At the TABLE, a restaurant in the Schirn Kunsthalle in Frankfurt am Main, Germany, the involved restaurateur Michael Frank focuses exclusively on quality products from local producers.

TABLE | Römerberg | 60311 Frankfurt am Main  
Phone: 069/219 99 952 | eat@table-schirn.com

# Art at its best economically.

**THE WORLD'S MOST EXPENSIVE PAINTINGS.**

**\$ 140.0 MILLION**  
JACKSON POLLOCK, „NO. 5“

**\$ 137.5 MILLION**  
WILLEM DE KOONING, „WOMAN III“

**\$ 135.0 MILLION**  
GUSTAV KLIMT, „ADELE BLOCH-BAUER I“

**\$ 119.9 MILLION**  
EDVARD MUNCH, „THE SCREAM“

**\$ 106.5 MILLION**  
PABLO PICASSO, „NUDE, GREEN LEAVES AND BUST“

**\$ 104.2 MILLION**  
PABLO PICASSO, „BOY WITH A PIPE“

**\$ 95.2 MILLION**  
PABLO PICASSO, „DORA MAAR AU CHAT“

**\$ 87.9 MILLION**  
GUSTAV KLIMT, „ADELE BLOCH-BAUER II“

**\$ 86.6 MILLION**  
FRANCIS BACON, „TRIPTYCH“

**\$ 82.5 MILLION**  
VINCENT VAN GOGH, „PORTRAIT OF DR. GACHET“



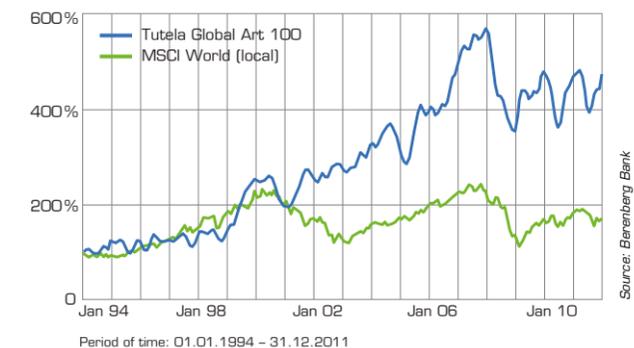
Erich Gluch, ifo-Institut

In times of uncertain economic trends, the remaining values come back into the focus of investors. They know to value real property again. This is why in the aftermath of the Euro crisis, the economic activity in residential and non-residential construction is likely to pick up again throughout Europe.

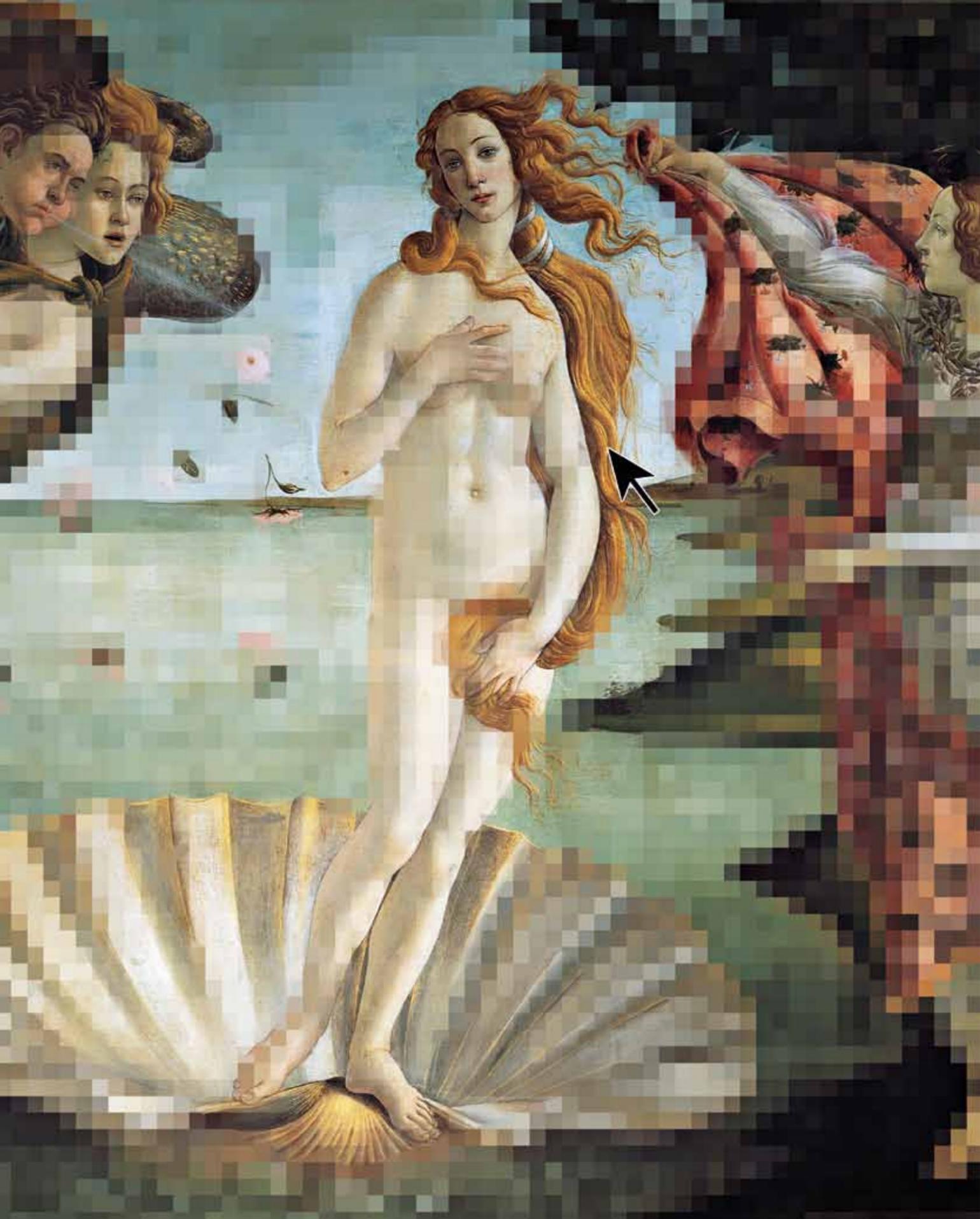
What real property is to the middle and upper class, art is to the super rich of this world. The super rich invest in works of art in uncertain times. And so the hammer fell at Sotheby's last year at nearly \$120 million. An unknown, however wealthy art lover purchased a pastel version of the world famous „The Scream“ by Edvard Munch from the year 1895 for this horrendous sum. That beat the magic mark of one hundred million dollars at Sotheby's for the first time. However, many don't know there are four versions of the same picture, all of which painted by Munch. The version at Sotheby's was the only one privately owned as the other three hang in Oslo museums. Two of them had been stolen, but have reappeared.

Art prices are exploding, sheiks and oligarchs provide plenty of demand for the great masters. This in turn will fuel museum construction activity. Unique buildings are popping up all over the world to provide a worthy setting for the acquired treasures. The Louvre of the Middle East will soon be erected in Abu Dhabi.

Comparison of Tutela Global Art 100 Index vs. MSCI World (local) Index



Art auctions, a market of entirely distinct character. Works came under the hammer in 2012 for more than USD \$12 billion and counting.



**lifestyle**

# In the museum at the click of a mouse.

## Tour virtuel du Louvre.

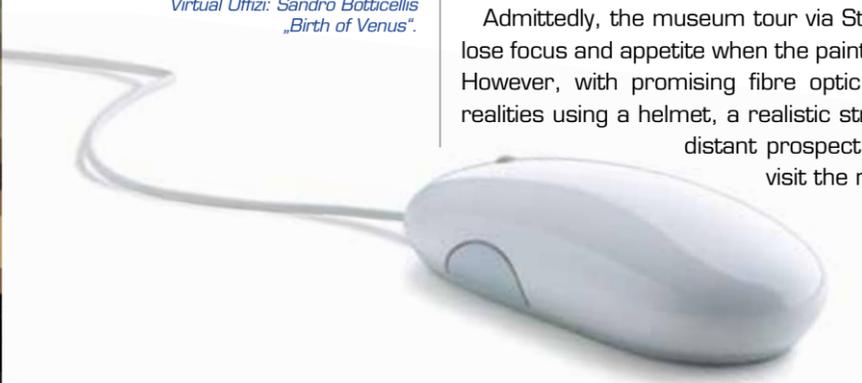
In 2011, the Louvre had nearly nine million visitors. That means more than 30,000 visitors stream through arguably the most famous museum in the world every day. With such a large number of visitors, one may only get as close as the second row to see Leonardo's Mona Lisa.

For whom it is too exhausting or for whom a trip to Paris is too expensive, a virtual tour of the Museum on the Seine is now also available. There is a guided film tour on the Louvre website. You could not otherwise experience the Mona Lisa up as close as you can on the Internet. The Louvre has saved the most famous paintings in high resolution, allowing any virtual visitor to zoom into the individual brushstrokes on the masterpiece. Even the smallest blemishes and hairline cracks in the beautiful lady become clear and visible to all.

Google has also started a virtual museum tour with its Art Project. Seventeen museums worldwide have been photographed using Streetview cameras. And even there, large masterpieces are literally „put under the microscope“. Unfortunately, only one painting per museum is saved on the Google server in high resolution (7 GB), including Botticelli's Birth of Venus, which hangs in the Uffizi Gallery or Édouard Manet's „Young Lady“ in the Met. The rest of the over 1000 photos of paintings and objects must be left to simple observation.

Admittedly, the museum tour via Streetview is still a bit cumbersome. One can quickly lose focus and appetite when the paintings take too long to load due to a slow connection. However, with promising fibre optic technology or innovative developments in virtual realities using a helmet, a realistic stroll through the halls of a museum are no longer a distant prospect. A virtual tour always increases one's appetite to visit the real museum.

*On display on the Internet in the Virtual Uffizi: Sandro Botticelli's „Birth of Venus“.*



# Booty disappeared in the air duct.

Spectacular art heist.

This is how enthusiastic crime fans envision a spectacular art heist: As the perpetrator escapes over the rooftops after setting off the alarm, the million-dollar booty slumbers in the ventilation duct of a neighbouring building to be quietly „disposed of“ at a later time.



PARIS, 1911

**Paris was probably robbed most often of its treasures.**

In reality, the most spectacular art heists are much less spectacular as it is commonly imagined.

Paris, 21 August 1911: The 31-year-old craftsman Vincenzo Peruggia hides in a closet overnight. He knows that the Louvre has no special security precautions nor an alarm system. He calmly lifts the world's most famous picture, the Mona Lisa, from its frame and under his coat, takes it from the museum the next morning without being noticed. Perhaps the most famous art theft in history is not cleared up until two years later. Peruggia is taken into custody when

he tries to sell the painting and sentenced to seven months in prison. According to him, he only wanted to take the painting „home“ to Italy.

The supposedly easy money tempts people to do unbelievable things again and again although famous masterpieces cannot actually be sold and only bring about a tenth of their value on the black market. A ransom demand appears to be the easiest way for the perpetrator to get money. But it is also the most risky as the pressure of the manhunt is greatest shortly after a theft.

We go to Paris again to the 16th arrondissement. An art thief hits the



PARIS, 2010

jackpot there in 2010. Paintings valued at more than 100 million Euro – based on catalogues and valuations of similar pieces, one can easily come to 500 million Euro – were stolen from the Museum of Modern Art. Completely unnoticed, the thief gained access through a smashed window, cracked a padlock and from five paintings, left behind only the frames from which he had cut them. He is now in possession of a Picasso, Braque, Modigliani, Leger and Matisse.

In the 1980s in Berlin, thieves had little trouble in stealing two pictures by Carl Spitzweg „The Love Letter“ and „The Poor Poet“. Disguised as disabled persons, they came into the museum rooms of the Charlottenburg Palace, knocked out a guard and left behind a wheelchair with the inscription „No problemo!“ To this day, the paintings and thieves are still missing.



NO PROBLEMO!



National Museum and escaped in a speedboat. In an attempt to sell, the paintings showed up again five years later.

Incidentally, the idea that the theft of paintings is commissioned by a rich, but criminally art obsessed belongs primarily to the movies. This is the most unlikely case - in the past 20 years it happened just twice according to statistics.

In 1991, however, thieves encountered bad luck in Amsterdam. On the run with twenty van Gogh's from the van Gogh Museum in the boot of their car, they got a flat. They had to leave their getaway car and paintings behind.

Even more sensational was a heist in 2000 in Stockholm. Armed with submachine guns, thieves succeeded in taking a Renoir (Luncheon of the Boating Party) and a self-portrait of Rembrandt valued at 30 million Euro from the Swedish

STOCKHOLM, 2000





## interview

# Fiction of a universal genius.

## A conversation with Leonardo.



*With his observations of nature, Leonardo was the forefather of fluid mechanics.*

His Mona Lisa is the world's most famous and beheld painting. More than 20,000 people every day pilgrimage to the Louvre to take pleasure in the picture of the mysterious dame. The picture measures 77 cm x 53 cm. Leonardo painted almost ten years on this portrait and could never part with it. Only after his death did it land in the hands of the French king and later hang in Napoleon's bedroom.

We visited the universal genius in his studio, which is operating again in Florence – it is the time after 1500. His friendship with the mathematician Luca Pacioli, with whom he wants to square the circle, also encourages him to turn more towards natural sciences than art. We meet Leonardo deeply engaged in work, hunched over a strange suit. In the immediate vicinity, we see an impressive bridge model.

He turns out to be truly talkative\* and patient, obviously pleased with our insatiable curiosity about the many interesting apparatuses, drawings and sculptures. Impressive evidence of the fact that Leonardo was ahead of his time. The universal genius is evident in the course of conversation however irritated if the language and expressions of a distant future, with which he, the all-knowing, could not be familiar, of course.

**Monsieur\*\* Leonardo, we see you working on a peculiar suit at the moment ...**

*... for you, perhaps. I have offered this diving suit to the Venetians for work under water. These dilettantes were, however, completely ignorant of the significance of my invention. They could have warded off the threat of enemy ships from the North in underwater combat much more efficiently. Quite apart from the possibility of working under water on the pile dwellings.*

*\*Interview with original quotes and prophecies of Leonardo.*

*\*\*Form of address for a man of upper-class standing at the time.*

**And what's sparkling there on the table?**

*That is the fiery mirror. If you think that the mirror was indeed cold but radiates heat, I reply that the beam is coming from the sun, i.e. must equal its cause on its way via the mirror.*

**They use the energy of the sun.**

*Energy? I do not know this word. My mirror can gather so much power in a single point as to heat water in a heating tank as used in dyeing works or water for a swimming pool.*

**Interesting! And this wood structure here ... ?**

*It should span the Golden Horn on the Bosphorus. But Sultan Bayezid II of the Ottoman Empire, this fool would rather spend his money on wars.*

*I also have plans for very light, but strong bridges, which can be transported easily and with which one can pursue the enemy and also sometimes flee. But Ludovico Sforza (editor's note: Duke of Milan) was not interested.*

**You called war a „bestial stupidity“?**

*That it is! If you have seen the marvelous works of nature and you think it's a heinous act to destroy them, then think about how infinitely abhorrent it is to take a man's life.*

**Back to the bridge. That seems familiar. A Norwegian has since taken possession of your idea and recreated it in Oslo.**

*Yes, yes. I have to continuously fight against people who would steal my ideas. But the pathetic pupil who does not surpass his master.*

**You are spied on?**

*Constantly. Even the painting of the young lady Lisa here was copied.*

**Yes, but to our knowledge by one of your docile pupils. Incidentally, the copy hung for centuries in Madrid without anyone realizing its value.**

*I painted over parts to keep the picture from being confused with the original.*

**But computer tomography has now revealed the secret.**

*Tomography, what is that?*

**Tomography can be used to look inside the body.**

*I had to fiddle with corpses to do that, which I find very disgusting admittedly. But my creative curiosity, my restless urge and the experimental passion are far greater. I definitely want to explore everything about the human anatomy.*

**But it will definitely make you happy, Master, to have come to later fame in medicine in our midst.**

*Oh yeah?*

**A cardiac surgeon from England drew inspiration from your sketch of the heart for an innovative, minimally invasive surgical technique.**

*Yes, how could one describe this heart without filling an entire book! I am a visionary in many things. I am convinced there will be carriages that will not be pulled by animals and will travel at unbelievable speeds.*

**Cars?**

*Never heard of such a thing!*

**Monsieur, let's discuss a private matter here about this small painting in conclusion.**

*The Monna Lisa.*

**Monna?**

*Yes, the short form of madonna.*

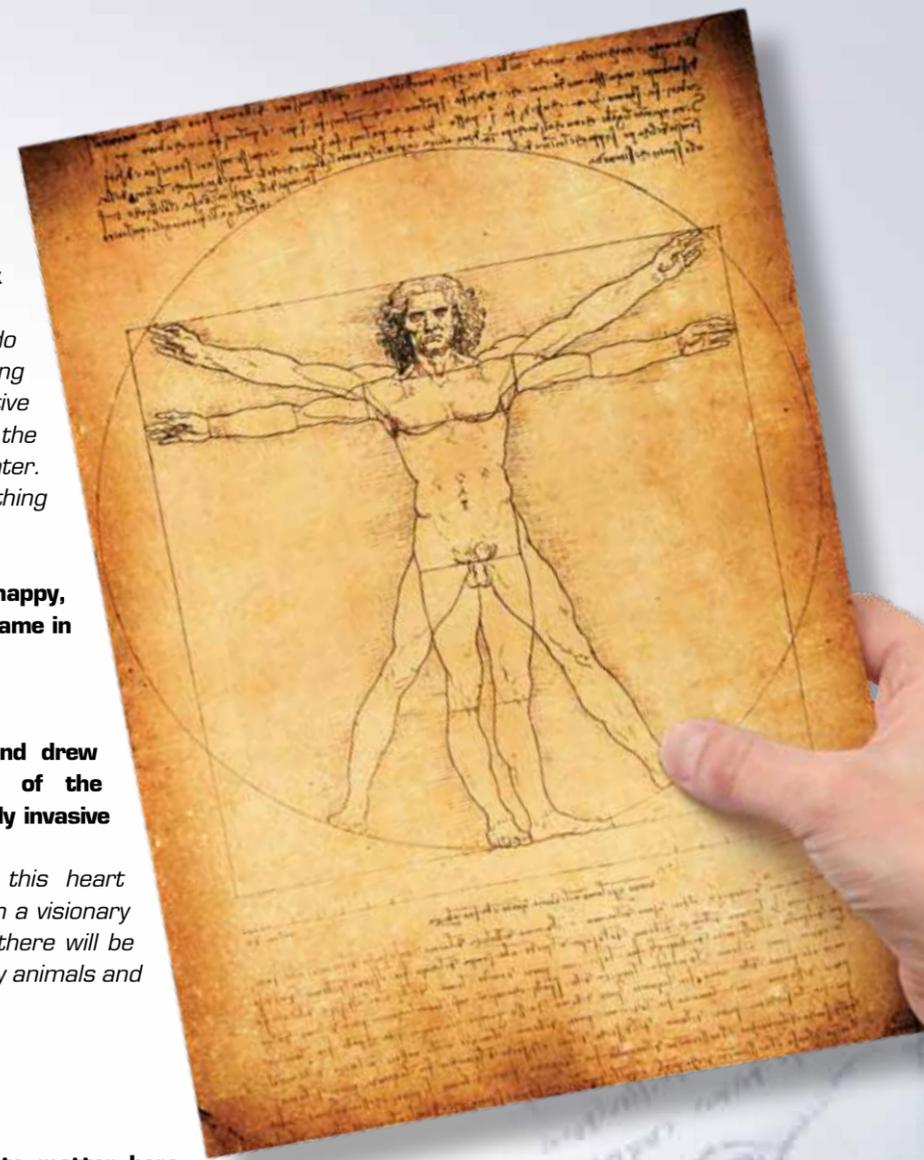
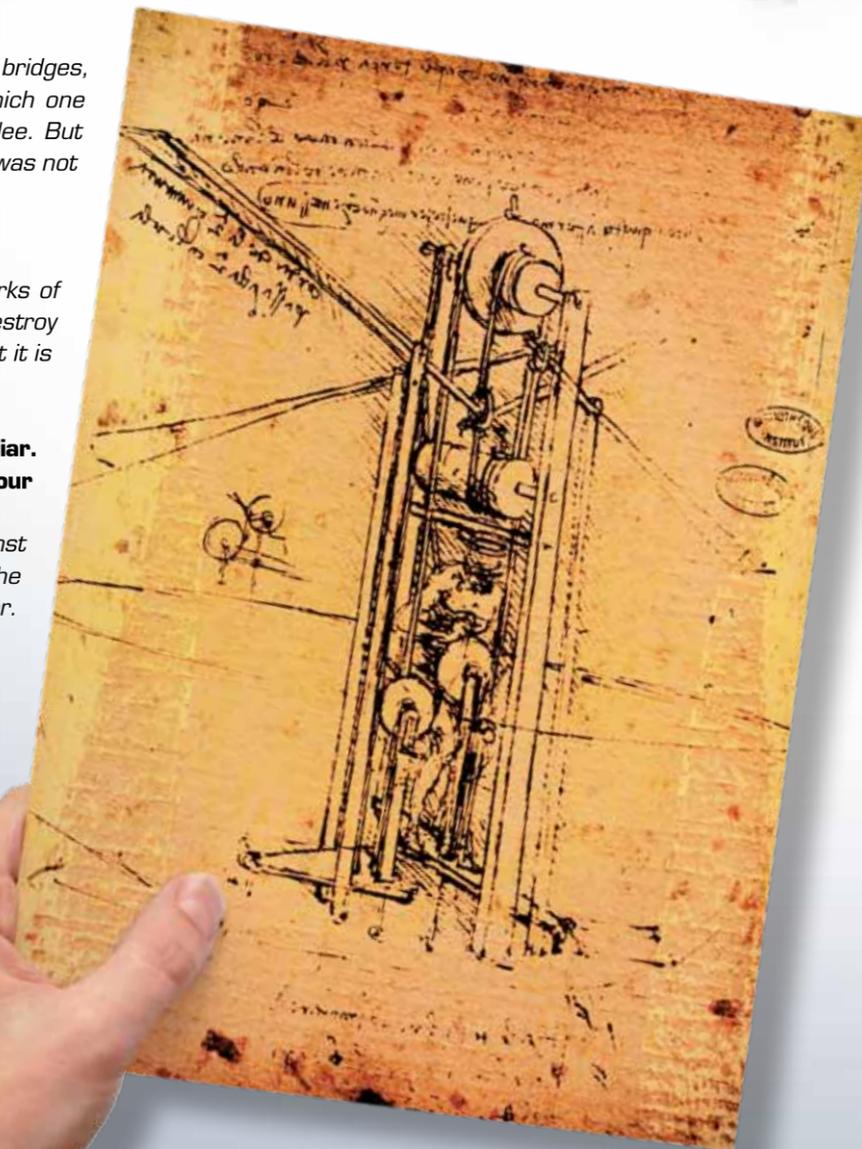
**There are rumours, Mona Lisa is an anagram of „Mon Salai“, her young companion. The somewhat masculine traits of the portrait speak for it.**

*All a bunch of lies from ...*

**... the tabloids.**

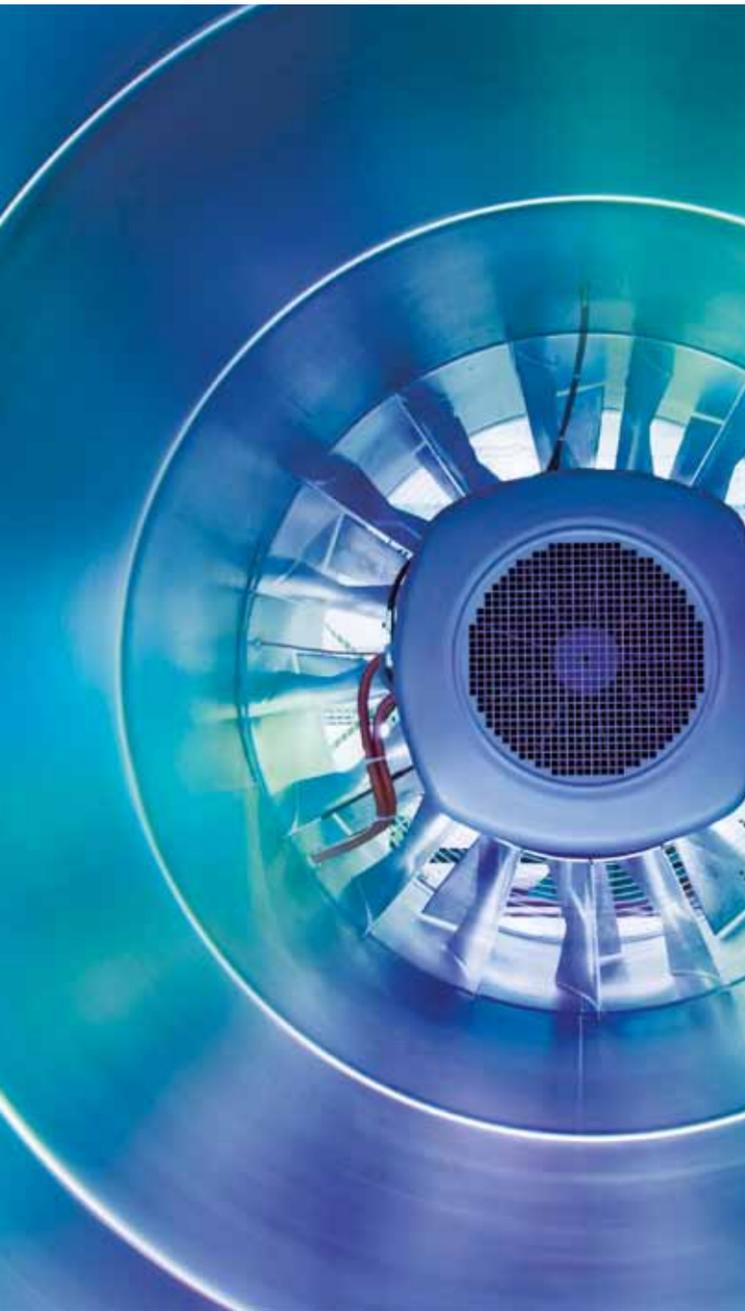
*Tab ... what, should that make sense to me?*

**No, no offence, Master. A worthless product of our time. Monsieur Leonardo da Vinci, thank you for speaking to us.**



Air is life.

**X Fans Building fans.**



*Axial fan with guide vanes*

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But it's not just on the product side that the future partners complement each other. „One finds pleasing harmony even within the corporate culture, which is one of the prerequisites for a promising integration,“ explains Udo Jung, TROX TLT Managing Director. The focus of both is to offer the customer first-class engineering, high-quality, energy-efficient products



*Axial fans with self-regulating closure flaps*



*Frankfurt am Main Airport:  
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and comprehensive service through highly motivated, innovative employees.

Therefore, the TROX Chairman of the Board, Lutz Reuter, is also committed to „resolutely carrying on the strategic direction of the TROX GROUP as a complete full-service supplier with this acquisition.“ As a result, TROX customers experience a high degree of planning reliability, organisational facilitation and perfectly coordinated systems. „If the air handling is the lung of ventilation



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and air conditioning, then the fan is the heart of the whole system“, says Lutz Reuter.



*Exhaust fans at the Düsseldorf International Airport.*

# Where does art begin?



... and where does it end? Many art aficionados have probably asked themselves this question especially when it concerns abstract paintings or objets d'art that are not immediately identified as such. A baby bathtub „Ohne Titel“ (untitled) was part of a travelling exhibition with works from Beuys. A tablet offers an explanation. This vessel was once used to bathe the infant Joseph Beuys. „Apparently too hot,“ as supplemented by humorous peasants.

The artist always seemed to have an intimate connection to bathtubs. The „Bathtub with adhesive bandages and gauze“ also went down in art history. In ignorance, the objet d'art was misused at an SPD celebration in the Morsbroich Museum. Previously thoroughly scrubbed, glasses were rinsed in it in the absence of a kitchen. To the dismay of artist and collectors, the city of Wuppertal had to pay 40,000 D-Mark in compensation as the borrower. In 1986,



a similar fate befell his „Fettecke“ (Fat Corner) at the Kunstakademie Düsseldorf (Arts Academy), which was removed by a cleaner.

If not so well-versed in the arts, it can be difficult to recognize the true artist. Need a small test? Which of the artists with reproductions of their styles here is trading at its highest?

Correctly appraised?\* Abstract art can often deceive as the following anecdote illustrates. In 2005, three works of an unknown artist sold for € 21,600 at a London auction. As it turned out, the artist was a monkey and more specifically, a chimpanzee who was hailed as the „Cézanne of ape world“. Art experts classified his work as artistically valuable. Well, I'll be a monkey's uncle.

The behavioural scientist Desmond Morris had staged this charade. He gave the monkey paints, paper and brushes, then later sugar and let him paint to his heart's



content. The works were actually quite creative and aesthetically expressive. However, the treats that he handed to him as a reward achieved a contrary effect. The pictures got more boring and worse. After a short period of time, the monkey painted only as much and as well as required to receive a reward.

Perplexing? Rather frighteningly human! People only do the minimum for the money. Work to rule, so to speak. When money is not in play and it comes to greater values, human beings and great apes perform incredible feats. Is that the reason why so many artists remained penniless? During the period of his life, Van Gogh never sold a single painting.

\* Explosion: The artists and their record sales  
Jackson Pollock (left): \$140 million  
Picasso (top): \$106 million  
Kandinsky (right): \$9 million

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