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The Art of Making the Palaeolithic Come to Life

It's hard to know just which piece of art in the exhibition's gallery to focus on first.

On one side there's a painted panel of horses with their grey coats and black manes fading in and out, offering visitors the illusion of movement. Further along the wall there is a mosaic of red dots arranged in an abstract pattern. Multiple illustrations of now-extinct rhinos (from the genus *Megaceros*) line the gallery walls. An owl, its unpainted outline traced with the artist's fingers, stares out at visitors, and warm-coloured lights showcase the gallery's underlying yellows and oranges. At the end of the gallery visitors encounter a 12m (39ft) long fresco of lions. There are hundreds of Pleistocene-age animals in the exhibition, representing something like 15 different species. Photographs are not allowed.

Welcome to the Caverne du Pont d'Arc – a replica of the Palaeolithic Chauvet Cave, a UNESCO World Heritage Site. The gallery is cool, dark and feels just a little bit clammy – very much like a cave. It's a cross between an art museum, a living history exhibition and the world's most expensive copy of an archaeological site.

For most, the replica of Chauvet is as close as they will ever come to setting foot in the cave.

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On 18 December 1994, French cave specialists – speleologists – Jean-Marie Chauvet, Eliette Brunel Deschamps and Christian

Hillaire discovered an extraordinary Palaeolithic cave in southeastern France. The discovery was made as part of a survey of the Ardèche region's caves. This particular one overlooked the River Ardèche near the Pont d'Arc, where the meandering river had cut out an arch from the surrounding limestone – itself an iconic bit of French geography. The first of the three cavers to squeeze through the cave's small tunnel entrance, Brunel Deschamps, shouted out, 'They have been here!'

'They' were *Homo sapiens* from the end of the last Ice Age, people who lived in Europe tens of thousands of years ago. The cave that Chauvet, Brunel Deschamps and Hillaire had discovered, like so many other Palaeolithic caves in France, was full of artefacts and fossils that contemporary archaeologists use to piece together Palaeolithic life, one artefact, one painting, one site, at a time. But something about this one was different.

This particular cave had footprints of the people who had been in the cave millennia before. There were hearths and the remains from fires last lit during the Pleistocene, and knapped pieces of flint, from people making stone tools, were scattered around the floor. There was even a projectile point made of mammoth ivory, some 30cm (12in) in length, found later near one of the cave's hearths. A step had been deliberately made in the cave's floor, in one of the cave's high-traffic areas. The lower parts of the first chambers were carpeted with bones, as the skeletal remains of animals had been transported there by water for tens of thousands of years. (Archaeologists would eventually catalogue more than 170 bear skulls, from the now-extinct *Ursus spelaeus*, in the cave.) Tracks from bears, dogs and even an ibex crisscrossed the different chambers. Stalactites dripped from the roof of the cave and calcite deposits continued to grow on all of the cave's surfaces as they had since the Pleistocene.

But most exciting of all – and what separated this discovery from the hundreds of other Palaeolithic caves like it – was the cave’s phenomenal, breathtaking art. This art was what Brunel Deschamps saw that first December afternoon. These were not just a few pictographs or an isolated painted panel, like ones the speleologists had found at the nearby archaeological sites of Chabot, Le Figuier, Olen, La Tête-du-Lion, Les Deux-Ouvertures and Ebbou. This cave had hundreds and hundreds of pictures that spanned thousands of years.

The walls were painted with animal and human images over two distinct periods, separated by roughly 5,000 years – the first 30,000–32,000 years ago and the second 26,000–27,000 years ago. (The question of the cave’s dates has been highly contested, with some archaeologists arguing that the dates were much too old for art this sophisticated. Subsequent dating of charcoal and even some of the faunal remains from the cave has confirmed the date ranges.) Lions, mammoths, rhinoceroses and cave bears make up the majority of painted animals, but others feature as well. Some panels feature red dots and the stencilled outlines of handprints. For more than 20,000 years, the cave was undisturbed – its art and its artefacts just as they were when the last Palaeolithic artist left the cave. ‘Suddenly, we felt like intruders,’ the speleological team reflected, reverently taking in the galleries of art that surrounded them. They were not the first to be there.

It’s not easy to discover an archaeological site – it involves both skill and luck. And to a large extent that luck and skill depend on an area’s landscape – whether a place’s geography was conducive to ancient peoples using it long ago, and if that same place can be discovered as an archaeological site today. Landscapes are not static, and how a cave looks to us today isn’t necessarily how it would have looked to people 30,000 years ago. Due to its karstic

geology, the Ardèche region where Chauvet, Brunel Deschamps and Hillaire spent their time caving is honeycombed with limestone *grottes* where water has weathered away the cliffs' dark grey rock, leaving hundreds of caves behind. For years, the three had explored this area; they and countless other experts had walked by this particular cave without suspecting that it was even there.

Even when explorers think they've found a cave, accessing it can sometimes be the most difficult part. Many ancient entrances to caves have been filled in or blocked over time, and it requires speleologists with extensive caving experience to seek out alternate ways to get in. To find new entrances, the team of cavers would test for air passing through scree and rubble around the cliffs – such draughts were good indicators of a possible way into a cave hidden well beneath the ground. ('Jean-Marie likes to use the back of his hand, while Christian and Eliette prefer to expose their faces to them,' they note in their monograph about the discovery.)

Once inside a discovered cave, it is long and tedious work to clear ducts and to systematically follow passages. 'If we find archaeological material, we leave absolutely everything in place so that the scientists can study the site exactly as we found it, and sometimes just as prehistoric people left it several thousand years ago,' the speleologists explain in the introduction to their book, *Dawn of Art: The Chauvet Cave*. 'If no protection can be ensured, the objects are collected and deposited in the regional museum of prehistory at Orgnac.' But they are quick to point out that finding art – that is, Palaeolithic art – is certainly the exception rather than the expectation for any sort of archaeological survey, including theirs.

Around three o'clock in the afternoon on the cold, wintry Sunday of 18 December 1994, the cavers followed an old mule path that offered a spectacular view of

Pont d'Arc, until they discovered a narrow opening, about 80cm (31in) high and 30cm (12in) wide, and all of them wriggled through it. Once inside, they could just barely stand up, but the cave soon opened up to massive chambers in which they could easily walk around. As they walked further in, they knew they would need ladders and other equipment to safely explore the entire cave with all of its chambers. It was the cave's art that was truly exceptional. Nowhere else in France – indeed, nowhere else in the world – had Palaeolithic art like it been discovered.

After their initial exploration that evening, the cavers carefully re-blocked the narrow entrance passage with stones to ensure that no one could enter the cave and cause any sort of damage to the art. They ended up going back later that same night to show the cave to Brunel Deschamps's daughter; over the next week, they revisited the site with another group of three cavers. 'This first visit had lasted only an hour, but we were in a state of shock because of our discovery,' they recall in *Dawn of Art*, 'both moved and, in a way, crushed by the weight of such a responsibility.'

In their subsequent visits the explorers carefully moved from painted panel to painted panel, taking in what they saw and photographing the art – everything from horses, hand stencils and red dots, to rhinoceroses and reindeer. The sheer volume and enormity of the discovery began to sink in, as did the responsibility they felt for the preservation of the cave. Having surveyed hundreds and hundreds of caves in the region, and finding ones with art to be very rare, they were more than primed to understand how to care for the art in the cave and to introduce conservation measures as soon as they stepped into the dark limestone chambers and saw what they'd discovered.

The cave – that came to be known as Chauvet Cave – quickly became an icon of Palaeolithic art, one of the most

significant sites discovered in over a hundred years of palaeo-research in France. On 22 June 2014, Chauvet was put on UNESCO's World Heritage List.

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Before Chauvet could become iconic, its paintings had to be authenticated. While Palaeolithic fakes are rare, they are not unheard of. Consequently, after the cave was discovered, the first step towards its preservation and scientific study was proving that its paintings were genuine Palaeolithic art.

'I was travelling abroad on 18 January 1995 when the news of the discovery of Chauvet Cave hit the media, and my initial reaction on seeing the first pictures of the amazing rhinos and big cats was that this might be a fake,' prominent British archaeologist Paul Bahn recalled in *Return to Chauvet Cave*. 'They were simply too stunning and too unusual to fit the picture we have built up of Ice Age cave art over the past century. But as soon as I learned who had found the cave, I realized that it must be the real thing.'

The discovery of Chauvet Cave was potentially so significant that the Ministry of Culture was able to pry Jean Clottes, the renowned French Palaeolithic archaeologist, away from his family's Christmas celebrations the following week to ensure that the cave was immediately vetted properly and that official conservation measures were outlined. The authentication couldn't even wait until after the Christmas and New Year holidays because the question of preservation and conservation of the paintings was so pressing. On 29 December 1994 – just 11 days after the cave's discovery – the three cavers met with Jean Clottes, Jean-Pierre Dugas, regional curator of archaeology, and Bernard Gély, who was in charge of DRAC, the regional archaeology service for the Drôme, Ardèche and Isère areas.

These officials were all there to authenticate the cave's paintings.

Before actually shimmying down into the cave, Jean Clottes was mischievously sceptical, suggesting to the group that he fully expected to see some fakes; in other words, what Chauvet, Brunel Deschamps and Hillaire claimed to have discovered defied the then expectations of Palaeolithic cave art. Brunel Deschamps reassured Clottes that when they all left the cave that afternoon they would want to drink the champagne she had brought to celebrate. And celebrate they did, as it was quickly clear to all the experts that the motifs and paintings were the Real Thing. The initial authentication has been upheld through decades of study and a plethora of radiocarbon dates, putting the paintings' charcoal pigments in the two different late Pleistocene periods.

It turns out that Palaeolithic cave art is actually rather hard to fake, or at least, it's hard to fake well. Historically, phony ice age artefacts crept into museum collections and art markets as soon as real Palaeolithic artefacts began to be discovered in Europe in the 1860s. In south-west France specifically, Palaeolithic artefacts that were easy to dig up and carry away – like carvings – popped up in the art market for over 150 years, at a time when labourers were often paid by the find and systematic, scientific methodology was scant. (Some of the nineteenth-century excavations were, for example, routinely 'supervised' without even bothering to be on site. This not-uncommon practice has led to problems in sorting out proveniences of artefacts, casting doubt about the legitimacy and interpretation of several significant finds from digs.) Many of the portable pieces of art that were carved from materials like stone or genuine fossil ivory were, and still are, impossible to authenticate as genuinely ancient. With so little control over an artefact's provenience, forgers found themselves

with a new, lucrative scheme, and copies of Palaeolithic artefacts began to infiltrate that particular niche of the art and antiquities markets.

Faking or forging paintings on cave walls, however, is much more difficult to pull off. Unlike other forgeries of portable Palaeolithic art, one can't simply conjure up a cave the way one can source other media; nonetheless, faking cave art, however, isn't unprecedented. As early as 1909, Palaeolithic archaeologists Henri Breuil and Jesús Carballo examined some cave paintings in Las Brujas Cave in Spain's Cantabria region – an area with well-documented, authentic Ice Age cave art – and determined that they were out-and-out hoaxes. The styles didn't match other Pleistocene art in the region, the motifs were wonky – all the signs in fake art that tip off experts were present in Las Brujas. (These fakes were destroyed in 1960.) Over the course of the twentieth century, other more convincing faux cave paintings took to intermingling fake motifs with the real thing – say, introducing a bison into a genuine Palaeolithic scene where there wasn't one before. But these are rare.

Perhaps the most famous example of faked Palaeolithic cave paintings occurred at Zubialde, a cave in the Basque region of Spain. When photographs of the cave's art hit the European press in March 1991, 'most specialists immediately smelt a rat', as Paul Bahn put it in *Journey Through the Ice Age*. To begin with, the animals featured in Zubialde's paintings – rhinos and mammoths – were highly unusual motifs for Spain. The bison were 'very ugly and clumsily executed', as were the stencilled handprints. But most problematic were the parts of the paintings that suddenly appeared in the time between the cave's initial photographs by the young 'discoverer', amateur speleologist Serafin Ruiz, and when specialists examined the paintings. The Zubialde forger, suspected to be Ruiz, did not use carbon-based pigments (which could be directly radiocarbon dated)

in the cave's paintings. However, subsequent scientific analyses of the paints showed that they were modern – they contained highly perishable materials like insect legs, biotic material that would never have survived from the Pleistocene to today. The pigment also contained synthetic fibres from modern kitchen sponges.

It took long and very detailed studies by Basque Palaeolithic specialists Ignacio Barandiarán, Juan María Apellániz and Jesús Altuna to discredit the Zubialde hoax, and before the cave's paintings were debunked they received a lot of media attention. Because of fakes like Zubialde, when caves with spectacular or unexpected motifs, like Chauvet Cave, are discovered, there is more onus on them to be proved genuine.

A few months after the Zubialde episode, a different Palaeolithic site, Cosquer Cave, was discovered in 1985 along the southwestern coast of France. The entrance to Cosquer Cave is now around 37m (121ft) underwater due to how much sea levels have risen since the Pleistocene, and archaeologists must actually dive to get into the cave, where intricate cave paintings were found above the water levels. When the first photographs were published in 1991, they strained archaeological credibility – the site included epically spectacular Palaeolithic art, with unusual animals like great auks, as well as other motifs. It was hard to believe, as Paul Bahn recalled, that the cave's art was authentic 'with its unprecedented geographical location, its entrance beneath the Mediterranean – so reminiscent of the plot of Hammon Innes' novel *Levkas Man* – and its unusual drawings'. With high-quality photographs, however, doubts about the legitimacy of the Cosquer's paintings were quickly put to rest. It was bizarre and beyond unexpected, everyone agreed, but it was authentic.

Less than three years after the discovery of Cosquer Cave and the Zubialde incident, France's Ministry of Culture

announced the discovery of Chauvet and released a series of photographs of some of the cave's art. Consequently, archaeological audiences were primed to be sceptical, but Chauvet was the real deal. 'For all sorts of reason, primarily a conservative tendency among us all when faced with the new, every great discovery has aroused its share of controversy and doubt,' Jean Clottes offered in the first extensive publication of Chauvet Cave's art. 'It happened with Altamira at the end of the last century, Lascaux in the 1940s, Rouffignac in the mid-1950s, and Cosquer in 1991 and 1992. Only Chauvet Cave seems to have escaped these suspicions.'

With sites like Zubialde and Cosquer in mind, Clottes joked about expecting to find fakes before he saw Chauvet painted panels – but the authenticity of the cave's art has never been in doubt. The original cavers took too many precautions and were simply too good at what they did to have their discovery called into question.

Chauvet Cave extends for something like 500m (1,640ft). A succession of four chambers contain painted and engraved figures, and ceilings stand anywhere from 15m to 30m (49–100ft) tall. In the two weeks between the discovery of Chauvet Cave and its authentication, the original cavers took precautionary measures to ensure that the cave remained as undisturbed as possible, to preserve the integrity of the site and to prepare it for archaeological study. They put down hundreds of metres of black plastic sheeting – about 50cm (20in) wide – wherever there might be a walkway, and marked off delicate areas with fluorescent ribbons to keep from treading on fossil teeth, skulls, bones and Palaeolithic hearths. The cavers walked in single file, often in their socks to limit their own footprints in the cave.

After the cave's art was authenticated, and before it was introduced to the world, officials wanted to make sure that the site was secured. The entrance to the cave was on private property, located in the commune of Vallon-Pont-d'Arc. Once the landowner was informed of the cave's discovery, he was agreeable to installing a gate to guard the entrance and help limit the curious from traipsing through the cave.

On 14 January, 27 days after the discovery of the cave, the three speleologists got the go-ahead from the French government and, with the help of Monsieur Brunel, Eliette's father, made a high steel door, roughly 1.25m (4ft) high, to block the limestone opening, having carried sand, water and cement to the entrance to put it in place. The entrance used by the three cavers was roughly a foot tall, slanted downhill and went on for something like 7m (25ft). Photographs of cavers using that entrance to Chauvet Cave show the soles of their shoes disappearing through the opening with very little space left around them. (They entered the extremely narrow cave chute head-first). That entrance has since been widened and is guarded by the door. The entrance used by the Palaeolithic artists is now blocked by scree, while the original Pleistocene entrance was blocked sometime before 12,000 years ago. Everyone took care to make sure that the entrance had the same ventilation as it had before its discovery to avoid changing the cave's equilibrium and causing damage to the cave's art.

For the next couple of days, French gendarmes watched the cave day and night until electronic alarms and video surveillance were installed along with the door. On 18 January 1995, the team held a press conference organised by the Ministry of Culture, at which minister Jacques Toubon made the official announcement of the cave's discovery. And then all science and heritage conservation broke loose.

Following the announcement, other conservation measures were undertaken over the next year to facilitate scientific study of the art and archaeology of Chauvet Cave without destroying it. Narrow metal walkways were installed throughout the cave, taking care to use the smallest area possible. The walkway between the cave's Gallery of the Megaceros (the panel with paintings of the extinct Irish elk) and the gallery at the very back of the cave was equipped with handrails for navigating down a tricky incline. Electric cables were installed. A multi-year interdisciplinary archaeological study was commissioned, headed by Jean Clottes.

While archaeologists would be allowed to undertake scientific studies, systematically mapping the cave, documenting its art, and collecting charcoal and pigment samples, it was abundantly clear that Chauvet Cave would be open to scientific study only under strict supervision and that the cave would never, ever be open to the public.

Concerns about limiting access in order to preserve Chauvet Cave's paintings were well founded, based on the destruction of Palaeolithic art in Lascaux Cave half a century before.

Lascaux Cave was discovered in 1940 by local teenager Marcel Ravidat (and, purportedly, his dog), soon after France fell to the Axis invasions. More than 400km (250mi) west of Chauvet Cave, Lascaux is a natural limestone cave located on the left bank of the Vézère River in the Dordogne region. Smaller than Chauvet, Lascaux is roughly 250m (820ft) long and has more than 6,000 images of human figures, animals and abstract symbols painted in reds, yellows and blacks. The images that wend their way along the cave walls date to 17,000 years ago.

The cave's most famous panel is the Hall of Bulls, depicting 36 different species, including one 5.2m (17ft) long bull that appears to be in motion. After supposedly visiting Lascaux, Pablo Picasso is said to have announced that 'We have learned nothing in twelve thousand years.' (Archaeologist Paul Bahn thoroughly investigated Picasso's rumoured quote, concluding that yes, Picasso's paintings, like the lithograph series of *The Bull*, resembled Lascaux's bovid-based motifs. However, there is little to no evidence that he actually visited Lascaux or ever physically stood in awe of the Pleistocene's artists. But, like so many things, the story has taken its own place in history.) Regardless of whether or not Picasso actually ever commented on Lascaux's art, just the rumour of it helps cement the site's modern cultural cachet.

In the 1940s, the entrance to Lascaux was enlarged considerably, making it easier for visitors to navigate their way into the cave. Second World War-era construction shored up the path leading to the cave and lowered the floor of the cave to aid visitor access. 'In 1947 alone, they dug out 600 cubic meters of sediment to make an entrance and concrete path and installed lighting for the public,' Jean Clottes points out. This was equivalent to removing eight 12m (39ft) shipping containers of sediment in order to pave the way for tourists. Although archaeologists and Palaeolithic art specialists have studied the paintings at Lascaux, providing dates and some context to the discovery, the cave was turned into a tourist site and conceptualised as an important part of the *longue durée* of French history, reaching all the way back to the Pleistocene. Lascaux was opened to the public on 14 July 1948.

As early as 1955, however, researchers noticed that some of the Palaeolithic art at Lascaux was beginning to deteriorate. Mould, fungi and bacteria had started to grow on the walls, obscuring some of the paintings and eating

away the pigments from others. They traced this horrifying set of burgeoning growths to the carbon dioxide breathed out by the hordes of Lascaux's adoring visitors – sometimes as many as 1,000 per day, year after year. This increase of carbon dioxide, combined with visitors' body heat, warmed the cave and inadvertently offered an ecosystem for things to grow. Moreover, as visitors exhaled their acidified water vapour, their breath corroded away the rock faces, which in turn carried away pigment from the cave walls' surfaces. Essentially, Lascaux had been turned into a veritable petri dish.

Artificial ventilation was installed in 1958, the temperature was fixed at 14°C (57°F) and additional electric lighting was connected for use during established visiting hours as conservators began to battle the cave's problematic budding biota. The stubborn algae ignored these efforts to safeguard the paintings, and within a few years green patches of *Bracteacoccus minor* were growing along the cave's walls. Lascaux's conservators repeatedly treated the unsightly and destructive splotches with formaldehyde before discovering that this was doing more harm than good.

Lascaux closed in 1963 in an effort to combat the mould, fungus, lichens and such that continue to plague the cave today. Additional environmental controls were installed in 1966, and by 1979 the cave's climatic environment was considered stable. But by March 2000, conservators were facing mats of bacterial and fungal colonies. In the summer of 2001, they found white fungal growth on the floor and the backs of the walls of the Hall of Bulls. By May 2012, a new species of fungus, *Ochroconis lascauxensis*, had been found in the cave and named after Lascaux. ('Life finds a way.')

In addition to the constant biotic growths, the complexity of further conservation efforts at Lascaux has been compounded. When Lascaux's air-conditioning and percolating water-recovery systems were replaced in early

2001, for example, amid intensive rain, water pooled while the entrance to the cave was open and the systems were shut off for their replacement. Workers reported ‘significant thermic and hygrometric disturbances’ as they worked to combat these logistic issues. All of these efforts were to mitigate damage from previous decades. By 2007, UNESCO had threatened to place Lascaux on its World Heritage in Danger list.

Today, conservators have limited the total number of hours of human contact – that is, human presence – to 800 hours per year in the cave, and those 800 hours have to account for maintenance as well as academic research. Visitors wear sterile white coveralls, hairnets, gloves and booties over their feet. (Earlier conservation measures had actually required visitors to dip their toes in fungicide, but this caused too many problems as the fungicide destabilised the floor of the cave.) The entrance to the cave is guarded by two airlocks as conservators at Lascaux battle the Sisyphean task of trying to stave off further damage to the paintings and the cave. It goes without saying that tourists simply do not visit Lascaux any more, and haven’t for decades.

But simply closing the site to the public didn’t stop the destruction of the cave; the effects of hundreds of thousands of visitors in the twentieth century meant that Lascaux had, in effect, been spent. We cannot get it back.

Two hundred metres from Lascaux, however, a replica of the cave receives some 300,000 tourists a year. This replica was built in 1983 as a small-scale copy of the original cave, and an alternative way for tourists to ‘see’ the cave’s stunning and iconic art. It quickly came to serve as a tourist and educational stand-in for a famous archaeological site. Known as Lascaux II – or sometimes derisively as the ‘faux Lascaux’ – it was hardly the first replica of a Palaeolithic site to open to tourists.

Altamira Cave, a Paleolithic site in the Cantabria region of Spain, underwent a similar story of discovery and tourism overuse. Discovered in 1879, Altamira closed to tourists in 1977 and reopened with limited access in 1982. The first replica of Altamira was built in the 1960s; a copy of the cave's painted ceilings was installed in the Deutsches Museum in Munich. This replica established methods of creating silicone moulds of the Palaeolithic cave, utilising the then-new stereo-scanning technology. A subsequent replica of Altamira was built in 2001 in Spain. But Lascaux II forcibly solidified the concept that building a replica was a good and reasonable way to negotiate balancing tourism and research access with preservation, particularly on site.

Today, there are three replicas of Lascaux: the 'original' copy of the cave from 1983, and an even 'more authentic' replica, known as Lascaux IV, built in 2012–2016. 'Inside the cave facsimile, the atmosphere is damp and dark, re-creating the humidity within the caves. Sounds are muffled; the temperature drops to about 16 degrees Celsius,' Lascaux IV's website boasts. 'This sequence is dedicated to contemplation, allowing people an experience of the sanctuary that once was. Lights flicker just as the animal fat lamps of Paleolithic times did, revealing the layers of paintings and engravings on the surface of the walls.' The third replica – Lascaux III – was built in 2012 as a mobile travelling set of replica panels that can move from exhibition to exhibition, bringing Lascaux to a variety of museum visitors.

Just as the destruction of Lascaux served as a cautionary tale for the preservation of newly discovered Palaeolithic cave art, building a replica has begun to be an accepted – perhaps even expected – method of providing visitors the opportunity to 'experience' and 'see' a site without tourist-ing it to death. In a bit of anthropogenic, modern irony, however, vehicle exhausts as a result of visitors parking their cars at

Lascaux II have added to the issues of conservation for both the original and the replica of the site.

With all these lessons to be learned from history, opening Chauvet to visitors was simply out of the question – and, to be honest, wasn't really ever an option that was on the table. (Recall that one of the first things conservationists did upon the discovery of Chauvet Cave was to physically barricade it from visitors and even monitor how much monitoring the cave could tolerate.) 'One absolute requirement is to make sure that the cave, its walls, climate and floors are preserved,' Jean Clottes explains in *Return to Chauvet Cave*. 'We must leave our successors an intact cave in which all kinds of research are still possible.'

In 2014, almost 20 years after its discovery, UNESCO added Chauvet Cave to its World Heritage List, thus cementing Chauvet's status as an icon of Upper Palaeolithic art and an important piece of humanity's deep cultural and evolutionary history. 'It is a welcome official recognition of the outstanding importance of the Cave in particular and of cave art in general. For preservation reasons, the cave will never be opened to the public,' French Minister of Culture Aurelie Filippetti declared at the press conference celebrating Chauvet's addition to the World Heritage List. 'An ambitious replica (called Caverne du Pont d'Arc – Ardèche) is however being built ... It will allow all those interested to visit the reconstructed main panels as if one were inside the cave.'

This isn't just political glad-handing. The statement is a significant transition about what counts as 'the cave'. It begs the question of what, exactly, people are talking about when they talk about Chauvet. Certainly, the UNESCO listing applies to the tangible limestone *grotte* that Chauvet,

Brunel Deschamps and Hillaire discovered, affirming that the Palaeolithic art and the cave that it's in has the same cultural importance as the Vatican City or the Taj Mahal. But unlike many of the other sites on the UNESCO list, this protected World Heritage Site cannot – ought not – be seen.

To that end, Filippetti's statement is also an acknowledgment that what we mean when we talk about 'Chauvet Cave' extends well beyond just the physical cave and its paintings. For twenty-first-century audiences, to talk about Chauvet Cave in terms of heritage is now also to implicitly refer to the cave's replica, the Caverne du Pont d'Arc, as this is how audiences see and experience the cave's art since they can't see the originals for themselves. To date, it's the only replica of a UNESCO-recognised World Heritage Site.

So what does it mean to create a copy of an archaeological site? What makes a copy good or bad? Can a replica really stand in for the original thing, or does it have its own cultural cachet? And do these copies of archaeological sites themselves evolve over time?

Speaking about Chauvet Cave specifically, British archaeologist Nicholas James ponders if such replicas of Palaeolithic paintings can be authentic enough 'so as to let visitors recognize, understand or experience something of the ancient way of life and thought?' In an op-ed for archaeology's leading journal, *Antiquity*, he pushes the question even further. 'Does replication distract or detract from the original? However faithful to the original, a replica is "heritage", not an archaeological resource.'

Replicas of any archaeological site pose both technical and ethical questions. First, building a replica – a good replica, that is – isn't just slapping together a diorama and corralling tourists through it. For all intents and purposes, an archaeological replica involves creating an exact

three-dimensional copy at full scale. This concept is hardly new. For close to 200 years, classical archaeologists have made casts of important artefacts, allowing copies to help facilitate professional study and augment museum collections. (Numerous Roman statues that have been cast for modern collections were in fact themselves copies of earlier ancient Greek works, making it even less clear just where and how to separate off an original from its copy.) Today, many museums opt to display replicas of artefacts for a plethora of reasons – an original artefact may be considered too culturally sensitive to display to audiences, for example, or including replicas can help augment objects that are on display. Making a copy of an entire archaeological site pushes that question even further and is a highly complex project that draws on expertise from engineers, artists and archaeologists.

Planning for the replica of Chauvet Cave began in 2007, when the Rhône-Alpes Region and the Department of Ardèche – with the support of the French State and the European Union – partnered with public and private funders. In 2013–2015, 500 artists, engineers, architects and special-effects designers built a copy of Chauvet based on 3D models created from 700 hours of laser scanning of the original cave. It took five years of research and assessment to model the replica, followed by a solid 30 months of construction, involving 35 different companies.

To begin with, the panels for the cave were made in the towns of Montignac and Toulouse, by Arc et Os as well as both the artist Gilles Tosello and the Guy Perazio firm. The teams used rock-coloured landscape mortar and resin, moulded over robust metal scaffolding, as the basis for the panels. In all, the replica used 130km (81mi) of handmade metal rods and 14,000 hangers for fixing and stabilising all of the panels. (This was a change from the design and engineering of earlier replicas. Engineers at Lascaux II used pneumatically placed concrete, and the Altamira ceiling

panels made in the 1960s were resin. Moreover, suspending the replica of the Altamira ceiling at the Deutsches Museum was no easy task, as engineers had to work with the already built building's specs.) For the replica of Chauvet, the company, Deco Diffusion installed the panels on site and sculptors place-integrated the painted panels amid the rest of the replica. Photos of the installation show artists and technicians in white, all-covering Tyvek suits, trowelling the mortar-resin compound on to the replica walls and integrating the art with the replica's architecture. Based on the artists' outerwear and tools, I had to look at the pictures twice to check if the photos were of people excavating the original archaeological site or building its replica.

The panels represented 52 different types of rock – the decorated panels, of course, but also the 'blank' parts of the cave as well as the geological elements around the paintings. After all, Chauvet Cave isn't just the paintings. It's like a modern sculpture or art installation, where a work's composition and space are just as much part of the object as the obviously identifiable art.

The French press was permitted to see parts of the replica as the installation went up. For example, on 17 December 2014 – almost 20 years to the day after the original's discovery – the press was invited to see the 'Lion Panel' in the replica. (The contemporary 'Lion Panel' was actually drawn on polystyrene, which is a synthetic resin.) Ultimately, Chauvet's reproductions were vetted by the International Scientific Committee, a committee chaired by Jean Clottes and including Jean-Michel Geneste (prehistorian and archaeologist), Jean-Jacques Delannoy (geomorphologist) and Philippe Fosse (palaeontologist), all scientists who had studied the cave in the mid-1990s. Linkage to such expertise is a way to authenticate a replica as legitimate – Jean Clottes, as well as others, had thus authenticated both the original and its copy.

The air inside the replica is cool and moist, and the temperature sits at around 11°C (52°F) to offer a comparable environment to Chauvet Cave. ‘It feels, and even smells, like a journey into a deep hole in the earth,’ Joshua Hammer reported in *Smithsonian* magazine in 2015. ‘But this excursion is actually taking place in a giant concrete shed set in the pine-forested hills of the Ardèche Gorge in southern France.’ The Chauvet replica is two and a half times smaller than the original cave and cost €55 million.

The replica opened to the public on 25 April 2015 and was called the Caverne du Pont d’Arc. In its first two years it attracted more than a million visitors from 90 countries. More than 50 per cent of these people travelled to the Ardèche region for the sole purpose of seeing the replica. (The Caverne is about a kilometre from the original cave, a short drive from the village of Vallon.) Almost 30 per cent had come to the Ardèche for the first time, and 45 per cent had not been to the region for more than five years.

On average, visitors now spend three hours at the site, and the Caverne du Pont d’Arc has had over 24,000 guided tours. This has boosted tourism in the region, generating €25 million since the Caverne opened. Fabrice Tareau, director of the Caverne du Pont d’Arc, points out that in addition to that regional income, €100,000 – part of the royalties paid to the Syndicat Mixte and the Ardèche Department – was invested in the preservation of otherwise unprotected rural Ardèche heritage. Visitor tours rely on knowledgeable guides to take them through the replica cave and to interpret the Palaeolithic, helping to explain how archaeologists know what they do.

In addition to booking tours and trip planning, the Caverne du Pont d’Arc website contains a link to an impressive online model of Chauvet Cave, for web-based tourists to meander through while at home. Virtual visitors travel along the cave’s metal walkways – with helpful

arrows directing them from one room to another – and 360 degrees of images, stitched together. With people included for scale, the model is so much more real and understandable than simply seeing photographs of the cave in books. The experience is rather like Google Streetview. But instead of tooling through a neighbourhood, web-based visitors tour Chauvet Cave and are able to zoom in on clusters of bones, look up and see the cave's stalactites and, thanks to a small navigational map superimposed on the model of Chauvet Cave, see just where they are relative to the rest of the cave. It's almost as if the Caverne du Pont d'Arc is inviting visitors to verify for themselves that the physical replica they see is a faithful model of the original.

The Caverne du Pont d'Arc isn't only the recreated art panels or the replica of Chauvet – it also has an additional Aurignacian Gallery, school workshops, the 'La Terrasse' restaurant and the centre's shop, all a few minutes' walk from each other and all integrated into the landscape over the site's 12ha (30 acres). The centre has partnered with other Palaeolithic caves that are open to visitors, so Caverne tourists can see more of the archaeology of the Ardèche region. This model is not unlike sites in the Cantabria region of Spain such as the Tito Bustillo Cave, which use replicas as a bridge between parts of the cave that are open to visitors and parts that would be too environmentally sensitive to view.

The Caverne's Aurignacian Gallery is billed as a 'discovery centre', a place where visitors can learn more about the environment and lifestyle of humans living 36,000 years ago. The gallery has over 100 'experimental' archaeological artefacts, a theatre that seats 65 people and five life-sized Ice Age human models. The school workshop spaces offer cave-painting workshops to schoolchildren, and photos show casts of hominin ancestors from Africa that predate the

Ardèche regional story by millions of years. There's also story-time. ('How did prehistoric people light their fires? Younger children can discover the answer by listening to the story of the brave and curious Naly, who goes looking for this mysterious secret. Scenography and projected silhouette figures combine with the storyteller's words to create a timeless tale of discovery.') In 2017, the Caverne added a mock outdoor hunting area to its currently developing Palaeolithic Camp, boasting a new shaded canopy to make the experience more pleasant in the hot summer months. It even hosted the European Science Festival Spear-throwing Championships that autumn.

'There's something very deeply set, I think, in humans that makes us seek out the authentic, that direct physical connection to past people,' Palaeolithic archaeologist Natasha Reynolds suggested when I interviewed her about the cachet of replicas of Palaeolithic sites. 'But there's plenty of genuine worth to the replicas. If you can suspend your disbelief, you can gain a lot of understanding from them that you can't get in any other way.'

To go to the Caverne du Pont d'Arc isn't just to go and see the art – it's to participate in all of the trappings of France's Palaeolithic heritage.

This brings us to some tricky ethical questions about archaeological replicas. What makes a replica good? Can a replica really be authentic? What responsibilities – if any – do replicas have to an original archaeological site? Can a replica ever really, truly stand in for the genuine thing?

Ever since its opening, the Caverne du Pont d'Arc has billed itself as the new standard for archaeological replicas for the Palaeolithic, especially with the re-replica-ing of Lascaux in 2016. The Caverne du Pont d'Arc also set an

impressive set of expectations for what a replica of a site ought to look like and how it should be scientifically vetted.

But critics of the Caverne du Pont d'Arc and other archaeological replicas ask: isn't this just Disney-fying archaeology and history? Hosting spear-throwing contests? Advertising a site's restaurant with organically grown and locally sourced meals? Isn't this really, critics complain, akin to taking Plato's Allegory of the Cave and pretending that the shadows on the wall are real objects? To put it bluntly: where does the history stop and the pandering start?

These questions boil down to maintaining the integrity of an archaeological site, forcing audiences to think about the question of *why* a site ought to be replicated, not just on the technical problems of actually doing it. Is it more valuable to know that a resource is preserved? Or is it, as archaeologist Nicholas James asks, more important to know that perpetual preservation cannot be guaranteed and that visitors who enjoy seeing the 'real thing' do it while spending that very site that they're coming to view?

'It is a veritable museum,' Chauvet, Brunel Deschamps and Hillaire said of the original cave in *Dawn of Art*. 'Wherever one looks, one is gripped by the beauty of the mineral forms or the drawn figures.' Unlike the Metropolitan Museum of Art or the Louvre, however, Chauvet Cave is a museum where even the simple act of observing the paintings destroys them and, because the paintings' galleries are part of the cave's architecture, the art is impossible to move.

How to balance heritage tourism with conservation constitutes a never-ending act and is completely dependent on the archaeological site in question. In Virginia, for example, the Colonial Williamsburg Historic Area is an open-air museum of eighteenth-century colonial life, employing re-enactors, craftspeople, historians and curators to both provide historical research and reach tourists. Part

of what makes Colonial Williamsburg authentic – and a point that Colonial Williamsburg emphasises – is the ongoing research, archaeology, education and restoration that are inherently part of the site. In Honduras, casts of Classic Maya stelae are at the site of Copán; as so many tourists visit Copán, certain stelae have been moved to the site museum for protection and preservation. Visitors see replica stelae, but they see them as part of the original site. While museums have long presented ethnographic rooms or street scenes, they're generally generic reconstructions. They're platonic 'types' of scenes that one could expect to see; however, there aren't any claims about one specific site's authenticity. They're real, but they're removed from their originals in several ways.

'It is no longer a question of imitation, nor of reduplication, nor even of parody,' French philosopher Jean Baudrillard argues as he tries to tease out just when a copy of an object – a simulacra – becomes its own real, original, authentic thing. 'It is rather a question of substituting signs of the real for the real itself ... Never again will the real have to be produced: this is the vital function of the model in a system of death, or rather of anticipated resurrection which no longer leaves any chance even in the event of death.'

Back at the Caverne du Pont d'Arc, however, for all of the 3D scanning, modelling and cast making, there are significant differences between the original cave and its copy. The building's plan and size, for example, differ from Chauvet Cave's topography. (Recall that the replica is much smaller than the original cave.) Where Chauvet Cave is a one-way geologic feature, the Caverne allows for the traffic flow of visitors to work their way through. At the risk of sounding flippant, the original cave is not equipped with emergency exits or designed to facilitate hundreds of thousands of visitors, as is the Caverne.

While every panel is brilliantly copied, it's clear that exactly copying the cave isn't conducive to the goals of the Caverne. By changing the layout of the site, it treats the cave as a platonic entity, rather than as the singularity of culture and geography that it is. Where the original Chauvet Cave has been posited to be a site of shamanistic ritual (or at least of artistic reflection), the purpose of the Caverne is to tell visitors about the Palaeolithic, have them marvel at the art and then to move them along. These differences highlight the difficult trade-offs that makers of archaeological replicas, especially those that copy entire archaeological sites, have to reckon with.

Replicas, reproductions, simulacra and copies have long held a reputation for being nothing more than inauthentic knock-offs. The art critic Jonathan Jones said as much in his *Guardian* review of the Caverne du Pont-d'Arc. 'No art lover wants to see a replica Rembrandt, a fake Freud or a simulacra [sic] of Seurat,' he sniffed, his distain palpable. 'Why then is it considered perfectly reasonable to offer fake Ice Age art as a cultural attraction?' While acknowledging that yes, viewing Palaeolithic art could damage the cave panels, Jones simultaneously refuses to see the Caverne du Pont-d'Arc as anything but a faux Chauvet. The replica, Jones argued, did nothing to really connect the viewer with the original art. (He generously allowed, however, that Werner Herzog's 'beautiful film', *Cave of Forgotten Dreams*, could be an acceptable alternative to experiencing the authenticity of Chauvet, a claim that moves beyond irony as one is still looking at pictures of the real thing and not the cave paintings themselves.)

But this assessment of archaeological replicas assumes that the only point of a replica is to inelegantly mimic the original work of art. It also assumes that the 'art' of the replica can't, itself, evolve and change. The Caverne du Pont d'Arc takes aim at these assumptions.

Both of these claims are at odds with the cultural cachet that replicas are beginning to accrue. It's clear that the sensory experience of Palaeolithic art underscores the aesthetic and engineering decisions about the Caverne du Pont-d'Arc even more so than those of Lascaux – that it's trying to recreate as much of the original cave as possible. A replica of Altamira Cave in Spain has had good tourism success, despite battling many of the same concerns about replicas and authenticity that front Chauvet and Lascaux.

There are numerous other reproductions of smaller and less iconic caves. ('Following the lead of France and Spain, rock art can be meticulously reproduced in settings that are open to the public, affording better protection for the actual sites,' Jean Clottes argues in his scholarly publications on the topic. 'Local communities must be afforded an economic stake in any programs to preserve rock art or increase cultural tourism.') And beyond Palaeolithic caves, sites like Tutankhamen's tomb have introduced replicas to reduce the wear and tear on original sites. More and more museums are offering virtual reality tours to their patrons, as cost-effective, visually stunning ways to 'see' a site without having to physically recreate it.

Dismissing replicas completely assumes that all art and artefacts can and ought to be viewed the same way, regardless of their material and context – it presumes that you should look at a panel of lions at Chauvet Cave in the same way that you look at the *Mona Lisa*. But this simply isn't the case. 'With Paleolithic cave paintings, the art is fundamentally, physically part of the gallery,' Palaeolithic archaeologist Aitor Ruiz-Redondo explained to me. 'We can't just create an environment to put around it to preserve it. This art, unlike Paleolithic artifacts that are portable, is in its own environment.'

When Jonathan Jones recounts his adolescent disappointment at Lascaux's replica, he suggests that deception is forever at the essence of a replica. ('What a farce, to promise cave art and deliver only a simulation.') But such an argument assumes that replicas themselves are static things, forever stuck with a mindset that they can only ever be poor approximations. This is demonstrably untrue. But it does require replica makers to be upfront about what a replica can and cannot do and be, and for tourists to be aware of this while visiting. 'Rather than thinking of replicas as knock-offs,' philosopher Erich Hatala Matthes proposes in an *Apollo* magazine essay, 'we could conceive of them as akin to maps or models. They offer us a vantage point that is often otherwise unavailable.'

Caverne du Pont-d'Arc is generations removed from the first Lascaux and Altamira replicas, showing that the art and engineering of copies is quietly and successfully claiming artistic space of its own. Lascaux IV, for example, used methods and models from the Caverne, as the Chauvet Cave replica had already shaped visitor expectations about the technological and aesthetic evolution of Palaeolithic replicas – no one would confuse Lascaux II with Lascaux IV. To that end, the differences between Lascaux II and Lascaux IV illustrate the evolution and cultural cachet that replica sites carry.

Interestingly, however, although Lascaux IV has evolved technologically, and modelled itself after the Caverne in terms of facilitating visitors' experiences and interpretation of Palaeolithic art, it has failed to attract visitors in the numbers that it had hoped. 'The world's most famous archaeological replica, Lascaux II was replaced in December 2016 by Lascaux IV. IV deserves to inherit the replication, but it is already struggling to cope as it seeks to outdo II's tally of visitors,' Nicholas James

points out in his *Antiquity* articles. ‘The ironies are manifold.’

Consequently, the Caverne du Pont-d’Arc is more than just a replica of Chauvet Cave – it is the Caverne du Pont-d’Arc. It offers something the original can’t, an opportunity to see and experience art. (The art critic and philosopher Walter Benjamin claimed that a work ‘becomes “authentic” only after the first copy ... is produced.’) It is a good, authentic replica because it is completely honest about the trade-offs it is making between conservation and access.

On 2 April 2018, *The Art Newspaper* reported that a ‘historic’ legal compromise had recently been reached – one that guaranteed the three discoverers of the famous Palaeolithic Chauvet Cave in southern France a cash settlement as well as a percentage of tourist-charged admission. The French government had already paid the Chauvet Cave discoverers roughly €137,000 apiece as a reward for their discovery, but this recent financial ruling wasn’t about rights to the original Chauvet Cave. This was about financial compensation regarding the Caverne du Pont d’Arc.

The three speleologists have an important tie to the modern history of Chauvet Cave, and it’s this historical connection that they are receiving financial and legal compensation for. In order to fold the story of Chauvet’s discovery into the Caverne du Pont-d’Arc, ‘the association of the Caverne du Pont-d’Arc will now pay the three speleologists €50,000 for the image rights and the Chauvet name,’ *The Art Newspaper* noted, ‘and they will receive 1.7% of the admission fees to the replica cave.’

Awarding financial compensation and image rights to the Chauvet Cave discoverers (all of whom are and have been extremely invested in the region's palaeo-heritage) for the Caverne du Pont-d'Arc is a new step in the world of archaeological replicas – perhaps a part of the replicas' own cultural evolution – making the copy all the more Real.