

Ice age EUROPE

NETWORK OF HERITAGE SITES *Magazine*

ISSUE 2 APRIL 2018

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Underground Theatre

British cave balances performances with conservation – page 16

Caves with Ice Age Art get UNESCO Label

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5 Years On

Ice Age Europe network celebrates – page 5

INTRODUCTION

Welcome to the second edition of the Ice Age Europe magazine!

After the successful launch last year we are happy to present the new issue, which is again brimming with exciting contributions. The magazine showcases the many activities taking place in research and conservation, exhibition, education and communication at each of the Ice Age Europe member sites.

In addition, we are pleased to present two special guest contributions: The first by Paul Pettitt, University of Durham, gives a brief overview of a groundbreaking discovery, which proved in February 2018 that the Neanderthals were the first cave artists before modern humans. The second by Nuria Sanz, director of UNESCO in Mexico and general coordinator of the HEADS programme, reports on the new initiative for a serial transnational nomination of Neanderthal sites as World Heritage, for which this network laid the foundation.

2018 marks the 5th anniversary of Ice Age Europe. The network was established in 2013 and represents 20 archaeological sites with rich Ice Age heritage and their affiliated museums or visitor centers as well as research institutions across 7 European countries. At these sites over 350 personnel are dedicated to the promotion of our common heritage – as scientists, managers, curators, educators or guides. The sites, among them many World Heritage sites, attract close to 2 million visitors per year from Europe and overseas.

You can follow our members at @IceAgeEurope on Twitter, Facebook and Instagram. If you are interested in becoming a member, a partner or have a press enquiry please contact our network office.

We hope you enjoy reading!



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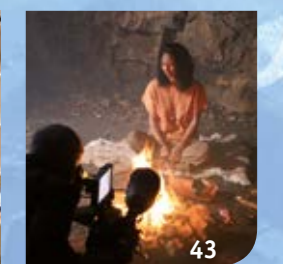
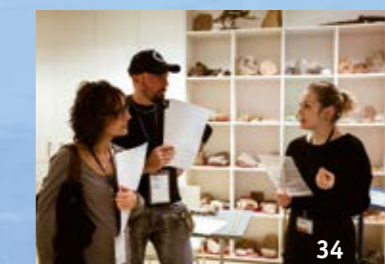
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Fashionable little sapiens © Fumane Cave

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Opening of the #IceAgeEuropeNow exhibition in La Bastide-Clairence, France; Exploring the Rock of Gibraltar; Tour of the Schöningen excavations, Germany; At the Prehistory Museum of Solutré, France, © Ice Age Europe

5 Years Ice Age Europe – Network of Heritage Sites

Katrin Hieke, Ice Age Europe Network Office
Gerd-Christian Weniger, Lead Partner Neanderthal Museum

The Ice Age is undoubtedly one of the most fascinating periods in human history. The foundations of our culture today were established during more than two million years. Their relicts are among the key testimonies of our cultural heritage and of human development. Some of the most important Ice Age heritage sites are in Europe, where human remains, rock art and many spectacular finds have been revealed.

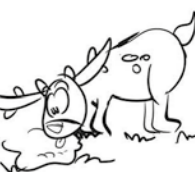
5 years ago, on the initiative of the Neanderthal Museum in Germany, the Ice Age Europe network was created to pool resources and collaborate across borders. Today it represents 20 archaeological sites and research institutions and their affiliated museums or visitor centres across 7 European countries (see map pp. 24-25). The sites, among them many World Heritage sites, attract close to 2 million visitors per year from Europe and overseas.

The network members work together in very different areas, and many joint projects have been implemented. Special interactive information terminals were developed and installed at the member sites, connecting guests at the locations and allowing them to discover Europe today and during the Ice Age through a game. New itineraries for group travel link the sites with other highlights of the regions and support tour operators in their planning, while at the same time paying attention to conservation issues. Our annual online magazine shares news from our members in many different fields to a broad audience in Europe and beyond.

“Sharing heritage”, the motto of the European Year of Cultural Heritage 2018, is at the very heart of the network and it contributed to the event with the outdoor touring exhibition #IceAgeEuropeNow. Since 2017 the exhibition has been installed in public areas across Europe to share our common heritage and fascination for the era of the Ice Age, which has left so many traces that shape us today.

The network, growing year by year, has also laid the foundation for a new project: the transnational, serial nomination of European Neanderthal sites as UNESCO World Heritage Site (see pp. 44ff). And so we are grateful for 5 exciting years of successful projects, great partners as well as the many encounters and friendships that have emerged, and look forward to the next 5 years!

Ice age
EUROPE



THE CHARACTER OF NEANDERTHAL ART

Author: Paul Pettitt, Professor of Palaeolithic Archaeology, University of Durham, UK

Visual culture is one of the defining traits of *Homo sapiens*. Alongside language – its biological equivalent – art translates transient messages into durable media, endowing the world with symbols and extending human agency from the transient face-to-face to the persistent. Is this what makes us human? For Palaeolithic archaeologists, the ‘symbolic capacity’

Over the last decade, modern excavations, and the re-analysis of old collections with new scientific techniques, has begun a slow revolution in our understanding of this enigmatic group. Sequencing of the Neanderthal genome reveals how some 4% of their DNA is found in our own genetic makeup, the result of occasional interbreeding when the two groups infrequently met.



Professors Paul Pettitt (below) and Alistair Pike (above) collecting samples for dating in Maltravieso cave. Tiny (less than 10mg) samples of calcite that form on top of cave paintings are dated using the radioactive decay of uranium. (Credit: C.D. Standish)

is often held to be the most profound trait on a list of ‘modern human’ behaviours. These have usually been seen as unique to our own species, and hence part of a behavioural package that separates ‘us’ from ‘them’.

In this case the ‘them’ are the Neanderthals – *Homo neanderthalensis* – Europe’s indigenous humans. Evolving from a common ancestor – *Homo heidelbergensis* – in response to the cold tundras of northern latitudes, the Neanderthals have until recently been seen as our poor, underachieving relations. Their story, however, is largely one of evolutionary success – survival for at least 300,000 years in the severe conditions of the last Ice Age – yet it is the knowledge with hindsight that they eventually became extinct that has coloured our interpretations of this large-brained sister group.

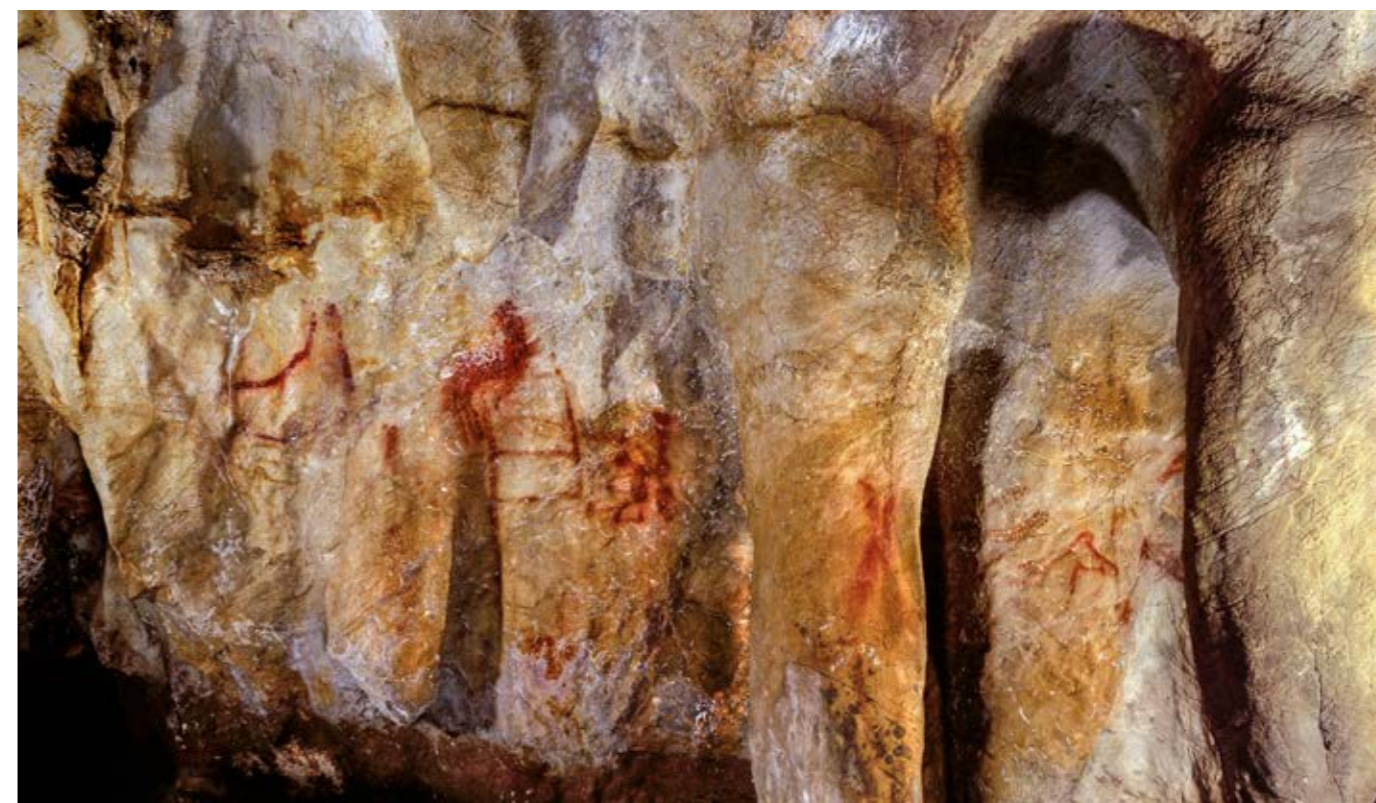
Increasingly nuanced pictures of their impressive hunting prowess have been balanced by indications of plant foods such as cereals, indicated by preservation of starch grains in dental calculus. Developmental patterns of their large brains have been reconstructed; these were as metabolically expensive as our own. But what were they used for? In many respects the quest to identify Neanderthal ‘cognition’ has amounted to little more than speculation; instead it is behaviour that it of most interest to archaeologists.

Since 250,000 years ago, Lower and Middle Palaeolithic campsites reveal that Neanderthals were carrying around lumps of haematite (‘red ochre’) and black manganese. In some cases these survive as droplets – showing that they were using the colourants wet, like a paint – and in others they were mixing them in mollusc shells over 100,000 years ago. But until now we had no idea what they were using these pigments for. Were they just colouring their skin? Or were they doing something more akin to symbolism as we define it?

Now we know. For the last few years our team has been working on the dating of art in several Spanish caves. Targeting examples of art we suspected of being relatively old (as it is relatively faded or overlain by younger art) we used the decay of uranium into thorium not to date the art itself, but to date the formation of calcite flowstones (‘stalactites’) that were sampled from locations directly on top of the art. As we could demonstrate a stratigraphic relationship between the art and the overlying flowstones, it is clear that the resulting date provides a minimum age for the art underneath. On this basis we have been able to show in three caves that art was created at least 64,000 years ago. Are these dates correct? We expected opposition from the more reactionary of our colleagues, who have been quick to

Christian Weniger and Spanish colleagues continue to excavate – they coloured stalactite drapes. At present, these examples of Neanderthal art were all produced directly by the hand, perhaps as a natural extension of an art on their bodies to the external landscape. This could be one of the most profound translations of visual culture in human history. Now we know what to look for we have much work ahead to add to this picture of what is now the world’s oldest art. Who knows what the Ardales team will find in their excavations?

The core team comprises Joao Zilhão, Marcos Garcia-Diez and Paul Pettitt (art/archaeology), Dirk Hoffmann, Alistair Pike, Chris Standish and Andy Milton (u-th dating). ■



La Pasiega. Scalariform (ladder shape) motif composed of red horizontal and vertical lines (centre left) dates to older than 64,000 years and was made by Neanderthals. (Credit: P. Saura)

criticise. Can’t uranium be mobile and therefore produce incorrect dates [no: we have defined methods to control quality]; can we trust the physics if the results haven’t been replicated in another laboratory? [yes we can; the technique has been used for half a century, it’s not cold fusion]; are the samples dated really overlying the art? [of course!]; are we running rampant around Europe with our drills? [no; our samples are miniscule and don’t go near any art]. Some colleagues simply don’t understand what is essentially relatively simple science. So, with art older than 64,000 years, who, therefore, was the artist?

Our earliest evidence for *Homo sapiens* in western Europe is 42,000 years ago; it would be stretching credibility too much to assume this underestimates our presence by over 20,000 years. The only humans present in Europe before 64,000 years ago were the Neanderthals, who we parsimoniously interpret as the art’s creators. In La Pasiega cave (Cantabria) they created rectangles using joined up finger dots; in Maltravieso (Extremadura) they left hand stencils; and in Ardales (Andalucia) – where Gerd-

“Now we know what to look for we have much work ahead to add to this picture of what is now the world’s oldest art.”





Cave ceiling of Altamira caves, © Museum of Altamira

THE CAVE OF ALTAMIRA IN THIRD DIMENSION: TO INVESTIGATE, DISSEMINATE AND PRESERVE IN 3D

Museum of Altamira / Author: Carmen de las Heras

Since its discovery in 1880, the cave of Altamira has been pioneer in many aspects, including the use of three-dimensional techniques.

In the elaboration of the Altamira facsimile by the Deutsches Museum in Munich (1957-1961), the team of Prof. Pietsch applied aerial photogrammetry inside the cave. This enabled a pioneer system to capture the ceiling relief and cracks and later

reproduce it in detail. It can be considered as a 2D system and a half, a preliminary step for the 3D system.

It was during the production of the Altamira Neocave (1997-2000) that the true 3D system proved all its potential. Neocave's more than 500 m² were the result of the most advanced technology at that time. The National Geographic Institute of Cantabria used high precision equipment,

monitored and controlled by calculation programs. This allowed a three-dimensional topographical mapping of enormous proportions for the time.

Currently, the cave of Altamira has a new three-dimensional model carried out with a millimetre-accurate high resolution laser scanner. It is a very sustainable and essential tool for the archeological investigation, the cave's conservation and scientific dissemination. From the information produced we may for instance obtain detailed mapping, special three-dimensional analysis, georeferenced locations for artistic representations and archaeological remains, and also we may create 3D Geographical Information Systems.

The use of 3D techniques is particularly relevant for the conservation of the cave and its artistic representations. It is

“The use of 3D techniques is particularly relevant for the conservation of the cave and its artistic representations.”

possible to integrate multiple data, such as the cave's interior and exterior geophysical prospection results or the location of the ceiling dripping points to determine the watersheds across the entire surface. As for biodeterioration, 3D micro-photogrammetry has allowed us to measure microorganism size and growth, providing data on their development patterns.

ABOUT THE MUSEUM OF ALTAMIRA, SPAIN

The Museum of Altamira is a place devoted to learning about, enjoying and experiencing the life of those who painted and inhabited the cave of Altamira. The museum's most attractive offer is the possibility of learning about humanity's first art, Palaeolithic art. The museum is in charge of a legacy of maximum value, the cave of Altamira, a milestone in universal art history whose discovery meant the discovery of Palaeolithic cave art and one of its most spectacular manifestations. The expertise of the artistic expression of the cave's inhabitants was recognised by UNESCO in 1985 when the site was registered on the World Heritage List.

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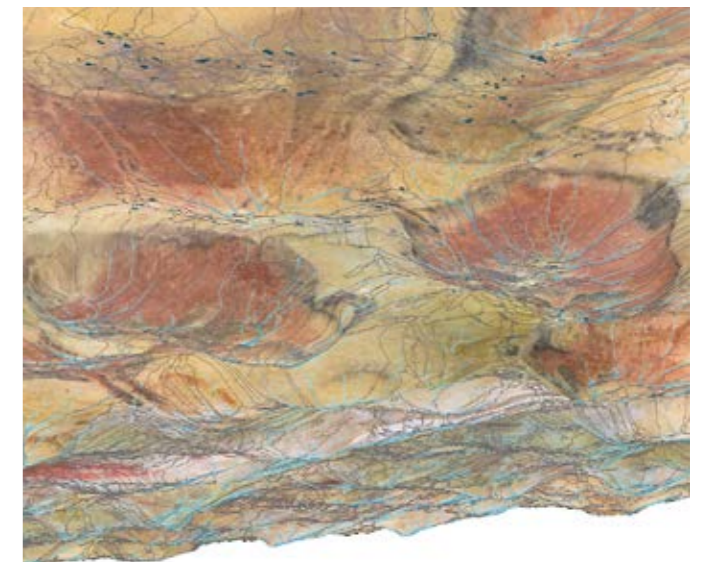
Undoubtedly, the best known aspect about 3D new technologies is the virtual reality development, mainly for VR glasses use. This tool was applied in Altamira to show the physical aspect of the cave right after its discovery and to facilitate visitors' sensory, experimental and personal access to the art of Altamira. ■



3D reconstruction of the landscape and the entrance of the cave before its collapse 13.000 years ago, © Museum of Altamira



Virtual reality development for VR glasses use, © 2017 Virtualware



3D reconstruction of ceiling watersheds, determined thanks to the dripping points location and analysis, © Museum of Altamira





BEYOND ARKEOLOGI MUSEOA AND SANTIMAMIÑE. RESEARCH ON ICE AGE SITES IN BISCAY (BASQUE COUNTRY)

Caves of Santimamiñe and Bizkaia Museum of Archaeology /
 Authors: Diego Garate, Iñaki García Camino

Research at the Arkeologi Museoa in Biscay is one of the lesser-known tasks of its activity, although of great importance for disseminating and transferring new knowledge about our past.

Arkeologi promotes research by making the collections it holds available to researchers (both the materials themselves and reports on their stratigraphic contexts) and various media including the conservation laboratory.

In the last few months, 4 new collections have entered the Museum from sites dating back to the period that interests us: the Ice Age. Research at 3 of them was the initiative of its promoters, who received technical support from the museum

and funding from the Provincial Council of Biscay (Aranbaltza, Bolinkoba and Santa Isabel). Other research in the cave of Atxurra was undertaken directly by the museum.

The research carried out at the Aranbaltza (Barrika) site by Joseba Ríos is providing data about the transition between the last Neanderthals and the first modern humans. In addition, it has also made it possible to recover evidence of an outdoor structured Neanderthals habitat from between 65,000 and 55,000 years ago, which is not very common, as most of our knowledge of the period is based on cave sites.

One of the oldest collections at the Arkeologi Museoa is from the Bolinkoba (Abadiño) cave, excavated nearly 100 years ago.

Recently it was excavated again under the direction of María José Iriarte using current techniques and methodology. The cave was occupied by modern humans from about 30,000 years ago until the end of the last Ice Age 10,000 years ago. As well as stone and bone tools, at various levels there are also elements related to social or symbolic aspects, such as a necklace of perforated, strung shells, carried from the coast.

Santa Isabel (Karrantza) is a cave site where only palaeontological remains have been recovered. The site has been known since the middle of the 20th century, but, in 2014, excavations were resumed under the direction of Asier Gómez Olivencia. More than 2,000 fossils of *ursus demingeri* have been recovered from the excavations, including the complete skull of a female bear, making this one of the most important collections on the Peninsula to include this species, which appeared on the planet about 2 million years ago and became extinct about 100,000 years ago.

As for the research undertaken directly by the museum, we need to highlight the research being carried out by Diego Garate in the Atxurra cave. In 2014, excavation was resumed and in 2015 a unique art collection was found. A first estimate identified about 1,000 representations of animals (bison, horses, deer...), almost all of which were engraved. They were



Skull of *Ursus demingeri* of the Cave of Santa Isabel (Karrantza, Bizkaia, Basque Country)

ABOUT CAVES OF SANTIMAMIÑE AND BIZKAIA MUSEUM OF ARCHAEOLOGY, BASQUE COUNTRY, SPAIN

The Arkeologi Museoa is in the Old Quarter of Bilbao with about 3,000 m² of exhibition area on five floors. It is a centre for heritage research and conservation that offers its visitors an interactive journey through the history of Biscay. The museum oversees the Cave of Santimamiñe which has galleries, rock paintings and carvings. The cave has a new interpretation centre giving visitors the opportunity to discover the cave's art in a sustainable and responsible way.

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Perforated and crimped shell necklace from the cave of Bolinkoba (Abadiño, Bizkaia, Basque Country)

mainly found in high, inaccessible places. The style, comparable to the French Pyrenean collections from the Magdalenian period, is very homogeneous.

Although some engravings are really eye-catching, others are extremely fine and intermingle, making the documentation work very complicated, requiring a combination of different techniques. The presence of intact soils and combustion areas with archaeological material at the foot of decorated panels, which is usually exceptional in these types of site, must be highlighted. ■

“Although some engravings are really eye-catching, others are extremely fine and intermingle.”



Cave of Atxurra (Berriatua, Bizkaia, Basque Country). Studying the rock engravings.





The eastern cliffs of the Rock of Gibraltar at dawn, © S. Finlayson

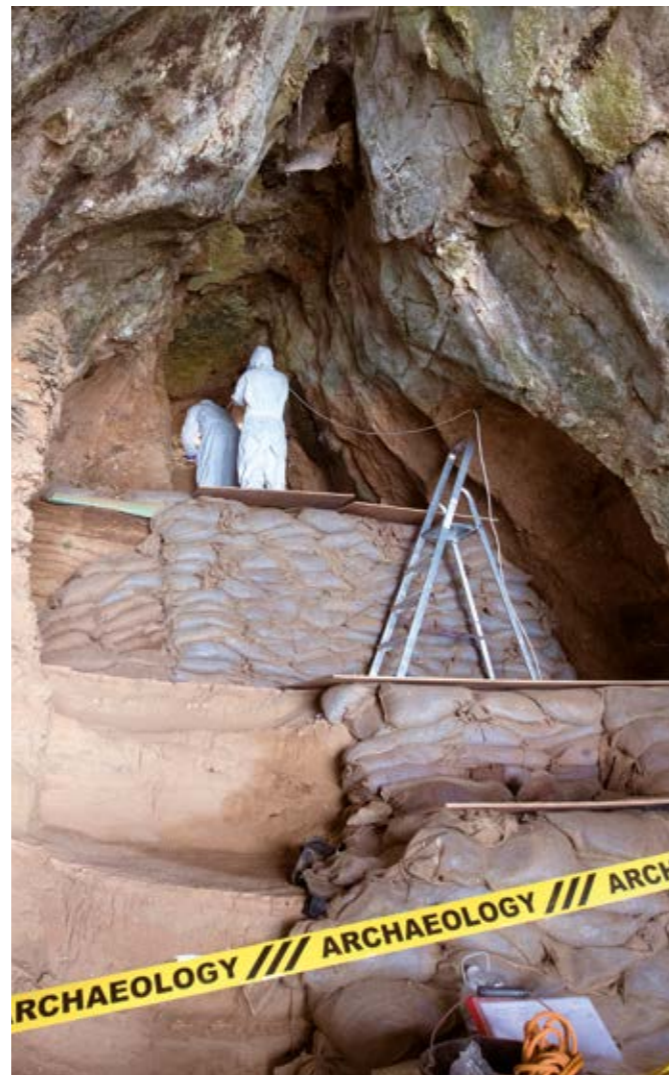
THE VANGUARD CAVE CHILD. THIRD NEANDERTHAL FOSSIL DISCOVERED IN GIBRALTAR'S NEW WORLD HERITAGE SITE

The Gibraltar Museum / Authors: Francisco Giles Guzmán, Tyson Lee Holmes

A hunger for adventure and an element of chance tend to be factors that surround many discoveries within the worlds of archaeology and palaeontology. Proof of this was the discovery of the first near complete Neanderthal skull in Gibraltar as early as 1848 during the extraction of limestone rock at Forbes' Quarry when society was yet unable to recognize the existence of human ancestors with morphological features different from our own.

The general public perception of the sciences that study our past, as a result of pure chance, is rather far from reality. Today, the teams of researchers that work to bring us closer to the true knowledge of our evolution as a species, operate within complex international projects where their combined efforts are devoted to the achievement of results or new finds. Within this context of thoughtful planning, study, perseverance and strenuous work spanning decades, the discovery of a new Neanderthal fossil was announced in Gibraltar during the 2017 summer archaeological excavations at Vanguard Cave.

This cave is located just a few metres north of the well-known Gorham's Cave, which gives its name to a large area of the karstic Rock of Gibraltar formed by a landscape of cliffs and cavities where Neanderthals lived for close to 100,000 years and which was declared a World Heritage Site by UNESCO in 2016. Research has been carried out by the Gibraltar Museum within the Gorham's Cave Complex since the 1990s under the remit of the Gibraltar Caves Project, the results of which have significantly contributed to our knowledge of Neanderthal behaviour. These ancient sea caves, which today lie just metres away from the blue Mediterranean, were once privileged locations where one could have observed a coastal landscape of over 4 kilometres of dunes and sandy plains before reaching the waves, also containing wetlands and small forest habitats. Despite this landscape having long disappeared, the very



Sterile techniques employed at the archaeological excavation of Vanguard Cave to avoid cross-contamination of any surviving ancient DNA.

detailed information we have so far obtained is thanks to the archaeo-palaeontological evidence which the Neanderthals themselves brought back to the cave, later to be sealed by layers of sand blown in by the prevalent easterly wind locally known as the Levante.

“It was possible to detect a small milk tooth belonging to an infant child of no more than five years of age that lived approximately 50,000 years ago.”

Despite the knowledge of various moments of Neanderthal activity preserved in the different layers of sediment within the cave, the research team took the conscious decision (suppressing their craving for quicker results) to embark on a project that would allow a more extensive excavation in the future, as well as a greater geological understanding of the cave and therefore excavate from the highest levels, dated within the Middle Palaeolithic with a scarce presence of archaeological remains.



The upper right canine milk tooth found in Vanguard Cave in 2017, is the third Neanderthal fossil to have been discovered in Gibraltar and the first such find in nearly a century.

The excavations aimed at studying this part of the archaeological sequence are carried out using the same methodology as any other excavation within the Gibraltar Caves Project, pinpointing the coordinates of all finds in three dimensions and sifting all extracted sediment in search of even the smallest rodent or reptile bones that allow for the reconstruction of that missing landscape. It was thanks to this approach that it was possible to detect a small deciduous canine (milk tooth) belonging to an infant child of no more than five years of age that lived approximately 50,000 years ago.

Archaeological excavations on this level are still ongoing, so the discovery of further remains belonging to this young Neanderthal is not yet ruled out. On the other hand, a preliminary study is being carried out on the context in which the tooth was found within this section of the cave, which

ABOUT THE GIBRALTAR MUSEUM AND THE GORHAM'S CAVE COMPLEX, GIBRALTAR, UNITED KINGDOM

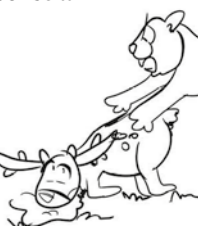
The Rock of Gibraltar at the southernmost part of the Iberian Peninsula, and in full view of North Africa, is a British Overseas Territory with a long tradition of work on Ice Age humans, fauna and geology which dates back to the 18th Century. It was in Forbes' Quarry that the Gibraltar 1 Neanderthal skull was found in 1848, eight years before the Feldhofer specimen. The Gibraltar Museum is a long-standing institution which was founded in 1930. The Gibraltar Museum's brief includes research and it carries out annual excavations in Gorham's and Vanguard Caves. Gorham's Cave is currently the last known site of Neanderthal survival, as recently as 32,000 years ago, and the site became a UNESCO World Heritage Site in 2016.

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seems to be related to the presence at the time of a hyena den, a very frequent animal in the Upper Pleistocene archaeological sites and that habitually take advantage of caves for shelter. The tooth still has its root attached which suggests that its carrier had not yet shed it as part of natural dental development to make way for adult teeth, and it is therefore possible that it reached the cave as part of the diet of these carnivores. These studies are still underway, as well as the excavation of the area of the cave where the tooth was unearthed, so we still have to be a bit patient before we can answer these pressing questions and hope that hard work and perseverance will once again present us with new discoveries that bring us closer still to understanding these Neanderthal populations. ■





Look in the mirror, © paläon

25 YEARS OF SUCCESSFUL EXCAVATION AND RESEARCH IN SCHÖNINGEN

paläon – Research and Experience Centre Schöningen Spears / Author: Jordi Serangeli

The year 2017 marked the 25th anniversary of research since the beginning of the Palaeolithic excavations in the opencast mine Schöningen. This offered the opportunity to discuss the current knowledge and perspectives of the research in Schöningen at a conference at Leiden University on September 20, 2017.

In the year 1992, during geological and archaeological prospection in the southern part of the opencast mine, the first Lower Palaeolithic site was discovered in Schöningen at a depth of 10 to 15 meters. Due to the composition of the sediments, it was clear that it represented a former bank of a lake that was repeatedly silted up.

Since that time, about 20 open-air Lower Palaeolithic sites around the former lake shore have been discovered within the mine, of which the Schöningen 13 II site is by far the most important. The 300,000 year old layers yield excellent preser-

vation of organic finds and enable unique insights into the central European environments of that time. Sediments containing pollen, seeds, wood, charcoal, remains of large and small mammals, fish, birds, fragments of egg shells, remnants of insects, as well as microscopic mussel crabs (ostracods), diatoms and larvae of midges (Chironomiden) make it possible to reconstruct in detail the environment and the climate during a warm period after the Elster and before the Saale glaciation. The numerous skeletal remains from the Schöningen sites include for example the remains of a total of well over fifty horses, nine elephants, three sabre-toothed cats, a water buffalo and a complete aurochs. Man-made flint, bone and wooden artefacts, as well as numerous bones with impact, cut and scrape marks allow new insights into the culture of the early humans of this time. They allow to study social and economic behaviour patterns at the end of the Lower Palaeolithic.

Schöningen, with its numerous sites from different periods of a warm interglacial can further be used as a case study to better understand the settlement history in northern Central Europe.

Among the many archaeological finds, the nine spears are one-of-a-kind. Not only are they unique objects but in addition an important proxy to investigate our ancestral abilities. The spears (with a length between 1.80 and 2.50 metres and a weight of about 500 grams) are not "simple" tools. Their production required planning depth, the ability of abstraction and experience. There are also other wooden artefacts such as a lance, a throwing stick, several modified branches that may have been used for hafting tools, a digging stick and other, not yet fully investigated wooden artefacts.

While the spears are finely worked and can be regarded as an indication of complex action, the stone artefacts seem to have been produced with little effort or with a short operational sequence and for immediate application. These are excellent scrapers, points, denticulated and notched stone tools.

ABOUT THE PALÄON, GERMANY

The finds from the approximately 300,000 year-old and unique archaeological complex of Schöningen allow us an essential and improved understanding of how our predecessor *Homo heidelbergensis* lived. They open a window into the Palaeolithic Age and are providing answers to the significant question: "Where do we come from?" The Schöningen Spears are among the most important Palaeolithic finds of humankind. The originals are on show exclusively in the "paläon – Research and Experience Centre Schöningen Spears" in Schöningen (Lower Saxony).

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Site Schöningen 13 II with the main levels, © J. Serangeli

Bones were also processed and used as tools by the hominins of that time, indicated by impact and scrape marks, as well as use wear.

Due to the quality and the large number of sites and finds, the excavations and the research of the unique and highly delicate Lower Palaeolithic objects has been an ongoing project from 1992. Since July 2016, the research area Schöningen is managed as part of the Senckenberg Center for Human Evolution and Paleoenvironment. There are several rooms in use for storage of the collections, restoration and research in the Paläon - Research and Experience Centre Schöningen Spears. ■

“The 300,000 year old layers yield excellent preservation of organic finds and enable unique insights into the central European environments.”



The participants to the Workshop "25 years of Palaeolithic Research at Schöningen (Germany)" September 20, 2017, © T. van Kolfschoten





The Rocky chamber, © Kents Cavern Ltd

RAISING THE AWARENESS OF CAVE CONSERVATION WHILE STAGING PERFORMING ARTS UNDERGROUND

Kents Cavern Prehistoric Caves / Author: Nick Powe



The caves and the neighbouring environment at Kents Cavern have the highest level of statutory protection imposed in the United Kingdom and the cavern is considered as by far the most important prehistoric cave in Britain. It has a remarkably long history of ancient human occupation contained in a sequence of geological stratification recording 400 million years of Earth heritage.

Since 1880 public and scientific access to the cave has been controlled by Kents Cavern within a framework that ensures the curatorial responsibilities are balanced with a viable strategy for commercial sustainability. This access enhances educational, scientific and cultural values, the importance of which was recently acknowledged when the cavern was designated a gateway geosite for the English Riviera UNESCO Global Geopark.

Visitors to Kents Cavern do not require specialist equipment and this type of cave is known as a showcave. In the last 20 years the management team at Kents Cavern has reengineered its public access procedures, placing conservation and protection at the centre of all developments aimed at enhancing the cave's attraction and appeal.

Encouraging visitors to return is often a challenge and none more so that in the cultural heritage sector; reasons to return need to be convincing and appealing. Kents Cavern has had



success in using performing arts to address this, putting on Ghost tours, Christmas festive seasonal events, Shakespeare plays and other classic theatre, themed tours, music and dance in the caves.

From an early stage close collaboration is established with the director and stage manager of the production company to set out and agree ground rules. The most fundamental of these are that all performances must follow the existing direction of the showcave route and that all audiences receive the same safety instructions prior entering the underground chambers. The normal daytime guided-tour warnings about low ceiling heights, not touching the cave formations and staying on the paths are given in the opening lines of the performance by the cast, a very effective theatrical technique.

Working with the cast, clear instructions are given on vulnerable areas of geological and archaeological sensitivity and the use of areas off the showcave path, identified as low risk. Briefings are given on limits to audience group sizes, use of warm and cold lighting, use of portable equipment and a total ban on fixing anything to the cave surfaces, regulations on the introduction of liquids or materials into the cave environment

ABOUT KENTS CAVERN PREHISTORIC CAVES, UNITED KINGDOM

This is a cave in South West England with an extensive labyrinth of spectacular and easily accessible caverns, open daily all year. The oldest human fossil ever found in northwestern Europe was found here. At 41,000 years old this makes Kents Cavern the oldest home in Britain. The cave has won many awards for its innovative use of social media and creative product development to support its future.

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and training in escorting visitors experiencing difficulty during performances.

The back-drop of the caves requires no excessive “decorating” or artificial scenery. If a production requires intrusive staging it is not suitable for the cave. The quality of acting and the use of costumes is all that is required to create scenes underground. This has no impact on the cave environment.

Significant improvement to the protection of the cave has been achieved by training actors to be more spatially aware. Performance art in caves is unique and popular, but this type of outdoor theatre is no more than a themed variation of the guided-tour and for Kents Cavern imposes no additional pressures on the future conservation and protection of the cave environment. ■

“Significant improvement to the protection of the cave has been achieved by training actors to be more spatially aware.”





Ekain's Great Panel - Zalde, © Ekainberri - Caperochipi

HAPPY TENTH BIRTHDAY, EKAINBERRI!

Ekainberri – The Replica of the Ekain Cave / Author: Team of Ekainberri

Ekainberri opened its doors in September 2008, two months after the UNESCO declared the Ekain paintings World Heritage within the Altamira Cave and Palaeolithic cave art complex of the Cantabrian Coast. This means that, in 2018, it is turning ten years old.

The process, starting with the decision to create this replica of the Ekain cave paintings, up until implementation, was fraught with complications, doubt and criticism.

Why preserve something you can't see? Is it worth it to spend so much on something that isn't authentic? For whom are we conserving the Ekain paintings? These are a few of the questions that Ekainberri had, and has to, answer.

We inaugurated Ekainberri at the beginning of a worldwide economic crisis, and we were forced to face a period of cutbacks in all fields. An infrastructure that had had a generous budget needed to be filled with content. Excitement and imaginative solutions were essential while taking the first steps.

We started off with just one tour model, but we saw that it wasn't the same to show Palaeolithic paintings to family groups, to members of a neighbourhood association, or to schoolchildren coming to Ekainberri to complement their class studies. So, creating different tour models perfected the Ekainberri experience.



Hartzei, © Ekainberri - Caperochipi

Experimental archaeology was undeniably a turning point in what this cultural experience had to offer. For the public, it transformed a passive experience, seeing and listening, into a totally active and interactive experience. In this way, school groups go from studying the theoretical part in the classroom to practising what they have read in their books.

Once settled into our work dynamic, we realised that many people in many different places are doing our same work: attempting to preserve millennial heritage, all while attempting to share it. Creating synergies and networks with these entities and institutions who strive to achieve the same goal is essential. Strength comes in numbers. Over these past ten years, Ekainberri has joined museum and tourist cave networks, locally, regionally, nationally and internationally.



Ekainberri Building, © Ekainberri - Arazi

Collaboration with other European entities, such as Ice Age Europe, allowed us to share the experiences and work methods of colleagues who have also become friends over time. We are convinced that these prosperous relationships will continue to bear fruit.

Ekainberri has been open for ten years. That's nothing in terms of prehistoric time periods, but it's an entire lifetime for many of the visitors we receive every day, and half or a third of a lifetime for those of us who work here.

As members of the Ekainberri team, we want to keep broadening horizons, sharing our artistic and cultural heritage and drawing new members into this "crazy family", crazy about prehistory. Because it is essential to discover heritage to love it, and it is essential to love it to guarantee its conservation.

Here's to many more, Ekainberri! ■

ABOUT EKAINBERRI, BASQUE COUNTRY, SPAIN

In the cave of Ekain is an exceptional example of cave art from the Upper Palaeolithic era with paintings and engravings created by the inhabitants of the cave between 14,000 and 13,000 years ago. The museum of Ekainberri, located 600 meters from the original cave, has reproductions of 85% of the art found in Ekain. Ekainberri offers an extraordinary adventure for visitors as they lose consciousness of spatial boundaries and walk through the cave discovering the magnificent paintings and creations.

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“Because it is essential to discover heritage to love it, and it is essential to love it to guarantee its conservation.”



Workshops in Ekainberri, © Ekainberri - Arazi





La Chapelle-aux-Saints Neanderthal burial site, © Musée de l'homme Néandertal

HAPPY BIRTHDAY! THE 110TH ANNIVERSARY OF THE DISCOVERY OF THE LA CHAPELLE SKELETON. A TEMPORARY EXHIBITION, JULY TO SEPTEMBER 2018

The Museum of Neanderthal Man La Chapelle aux Saints / Author: Véronique Simbille

Everything starts in 1905: the Bouyssonie brothers know the village of La Chapelle aux Saints because they have friends and relatives around. As they had learnt that the place named "les Bouffias" had many prehistoric remains, they came every summer holidays to dig and found what they expected: flints, bones, but more would come...

On August 3, 1908, the Bouyssonie brothers discovered a nearly complete skeleton in a pit dug within the deposits of la Bouffia Bonneval. It is not complicated for them to identify the man because remains of this type had been found previously in Germany and in Belgium. For them, this Neanderthal man is a human and on top of that, he had been intentionally buried!



With this discovery, the two brothers are in the middle of an ideological debate and their friend Henri Breuil advised them to send the skeleton to professor Marcellin Boule at the Muséum National d'Histoire Naturelle in Paris. This paleontologist described him as the missing link between Man and ape, following the ideas of the time.

The perception of prehistory will evolve, but for Neanderthal Man it will be very long and complicated. Many years passed before he is regarded as a proper human being.

To celebrate this 110th anniversary, the Man from La Chapelle aux Saints invites his ancestor, Homo Heidelbergensis, the Man from Mauer. During the summer holidays, the French museum will present two major discoveries in the history of mankind.

ABOUT THE MUSEUM OF NEANDERTHAL MAN, LA CHAPELLE-AUX-SAINTS, FRANCE

The museum was created in 1996 close to the village of La Chapelle-aux-Saints in Correze, France and presents the discoveries made by the Bouyssonie brothers, the importance of the site, and an exhibition based on the burial to show how sophisticated the Neanderthal culture was.

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Skull of the Man of La Chapelle aux Saints and human Mauer mandible

This exhibition will show the differences as well as the similarities between those two species in terms of discovery, location, place in the evolution line, tools, environment and more.

This exhibition is created together with the Reiss-Engelhorn-Museen Mannheim, Germany, supported by the French Institute in Mannheim, the Rotary Clubs from Brive and Mannheim and the honorary consul of France in Mannheim.

The exhibition will be available in three languages: French, German and English. ■



The 3 Bouyssonie brothers pose in front of the cave, 50 years after the discovery of Neanderthal skeleton.

“During the summer holidays, the French museum will present two major discoveries in the history of mankind.”





EVOLUTION FROM A GENDER BASED PERSPECTIVE. A TRAVELING EXHIBITION FOR VINDICATING THE ROLE OF WOMEN IN HUMAN EVOLUTION

Centro Nacional de Investigación sobre la Evolución Humana (CENIEH) /
 Authors: Joseba Rios-Garaizar, Chitina Moreno-Torres

The social perception of Human Evolution and the Paleolithic in general is deeply biased by an androgenic perspective, where men were the main actors of social and cultural life and women had only secondary roles in subsistence, symbolic behavior, etc. It is true that in Academia this biased view is being slowly rejected and a new paradigm, where women are key players of human evolution, is emerging, but these new perspectives are impregnating even more slowly the people's mentality.

Science is not neutral, it is a reflection of what society is, but it has the power to change social perception about relevant issues. Our societies, and also the Academic environment, are still heavily influenced by an androgenic view of the world. Palaeoanthropology and Archaeology are not an exception. Man is still the reference for the studies of Paleolithic, and most of these studies are made by men with a manly perspective.

We usually tend to oversimplify the image of prehistoric times, where man is the hunter, the leader, the maker and the artist; and the woman is the child bringer, the gatherer, the maid. However, the archaeological information collected over the last centuries is telling us that prehistoric societies were incredibly variable. In more than 2 million years of evolution, with more than 10 human species involved, four continents colonized, and hundreds of cultural entities identified, we must be aware that there was not a unique social structure, and thus the social and economic roles of both genders were probably also variable.

With these ideas in mind, the CENIEH decided to bring this issue up, and offer materials to stimulate the public discussion about the role of women in evolution. We proposed to the

scientific illustrator Eduardo Sainz to draw different scenes of the Paleolithic where women were the key players. Coordinated by M^a Amor Barros and Chitina Moreno-Torres, and with the scientific advice from Jose María Bermúdez de Castro and Joseba Rios-Garaizar, it was conceived as a traveling exhibition for touring as long as possible.



The exhibition itself is composed by 44 boards of different sizes with text and images, and a catalogue and a video complement the boards. In the video, Eduardo Saiz explains the documentation and creative processes that resulted in the magnificent and evocative images that animate the exhibition. These images recreate different prehistoric scenes. Some of these images are really powerful, like the woman giving birth helped by another woman in the loneliness of a big cave. Others are more provo-

cative, like the classic image of human evolution where only females are represented. Other images represent prehistoric women in the social and productive life: breastfeeding, making lithic tools, hunting, gathering, etc.

The illustrations were first displayed to the public in March 2015 at the University of Burgos, coinciding with the "IV Week of Woman and Science", and since then it has been traveling non-stop. So far it has been exhibited in universities (Barcelona, Córdoba, Valladolid, Zaragoza), high-schools (Madrid), city halls (Alicante, Ciudad Real, Segovia), and museums (Cantabria, Asturias, Orense, Talavera, Rock Art Research Center of Tito Bustillo). In the last three years more than 20,000 visitors have been confronted with this 'different' view of prehistory from the perspective of women.

The exhibition was designed by the CENIEH's Scientific Culture and Innovation Unit (UCC+i,) with the collaboration of Obra Social "la Caixa" and the Fundación Española para la Ciencia y la Tecnología (FECYT). Any institution interested can host the exhibition for free for 30 days, to ask for more information contact with comunicacion@cenieh.es. ■

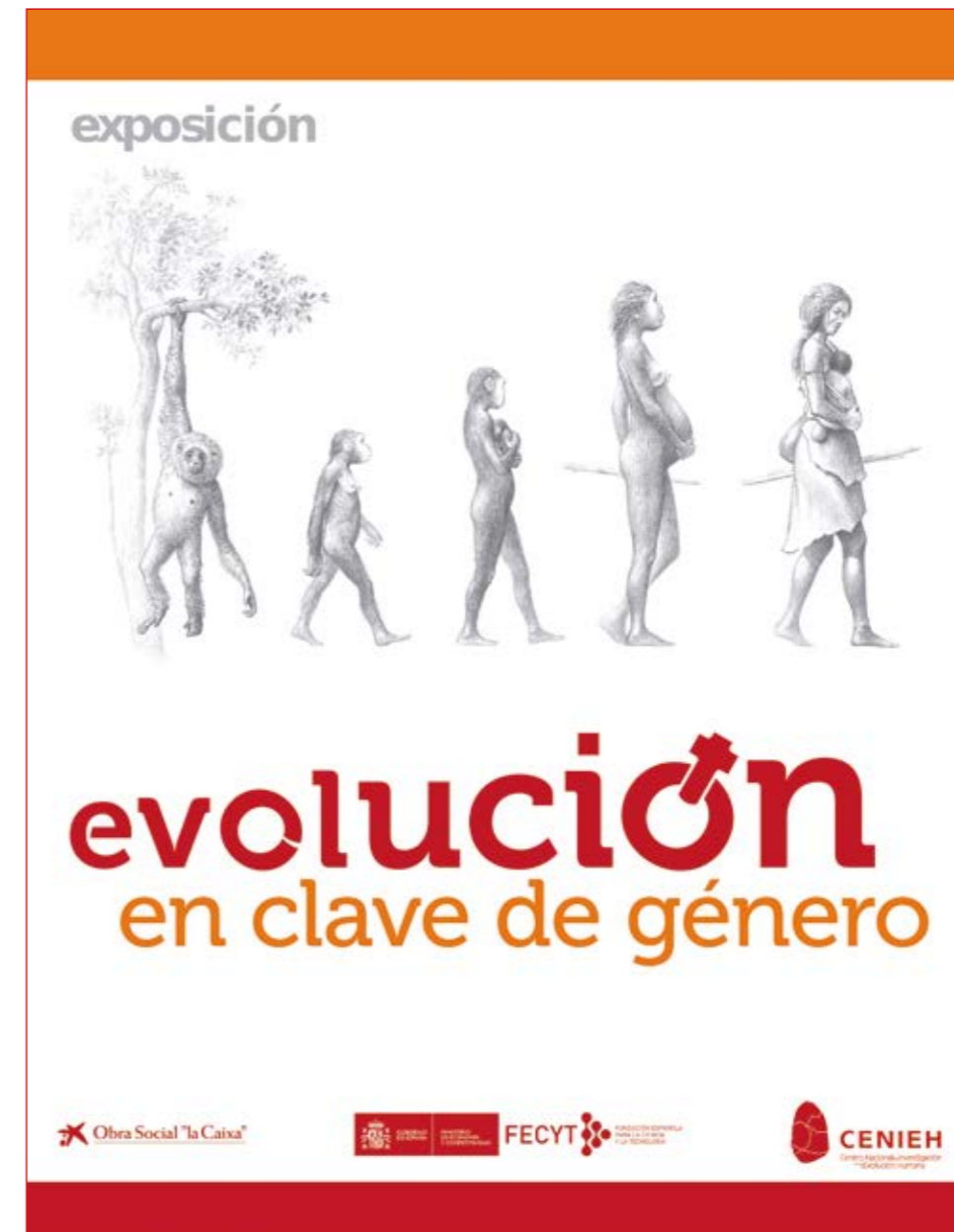
ABOUT THE CENIEH, BURGOS, SPAIN

The CENIEH is a research centre belonging to the national network of Unique Scientific & Technical Infrastructures (ICTS). It is open to scientific and technological use by the international scientific and technological community. Its research activities are mainly on human evolution during the Late Neogene and Quaternary, and include collaborative projects at excavations and deposits of these periods worldwide, in particular from Atapuerca.

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<https://www.youtube.com/watch?v=tzdRshPfpYI/>
<http://www.cenieh.es/en/node/1771>






“Science is not neutral, it is a reflection of what society is, but it has the power to change social perception about relevant issues.”



Ice age europe

NETWORK OF HERITAGE SITES

-  Europe's coastline today
-  Ice Age coastline
-  Maximum ice coverage



LOCATIONS

BELGIUM

- 1 PRÉHISTOMUSEUM - Flémalle

CROATIA

- 2 KRAPINA NEANDERTHAL MUSEUM - Krapina

FRANCE

- 3 PREHISTORY MUSEUM OF SOLUTRE - Solutré-Pouilly
- 4 INTERNATIONAL CENTER OF PREHISTORY - Les Eyzies-de-Tayac
- 5 ISTURITZ, OXOCELHAYA AND ERBERUA CAVES - Saint-Martin d'Arberoue
- 6 THE MUSEUM OF NEANDERTHAL MAN - La Chapelle aux Saints

GERMANY

- 7 MUSEUM OF PREHISTORY BLAUBEUREN - Blaubeuren
- 8 NEANDERTHAL MUSEUM - Mettmann
- 9 PALÄON - RESEARCH AND EXPERIENCE CENTRE SCHÖNINGEN SPEARS - Schöningen
- 10 ARCHÄOPARK VOGELHERD - Niederstotzingen-Stetten

ITALY

- 11 FUMANE CAVE - Fumane
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- 13 MUSEUM OF HUMAN EVOLUTION - Burgos
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- 15 NATIONAL MUSEUM AND RESEARCH CENTER OF ALTAMIRA - Santillana del Mar
- 16 CAVES OF SANTIMAMIÑE AND BIZKAIA MUSEUM OF ARCHAEOLOGY - Bizkaia
- 17 EKAINBERRI - THE REPLICA OF THE EKAIN CAVE - Zestoa
- 18 ESPAI ORÍGENS VISITOR CENTRE - Camarasa, Lleida

UNITED KINGDOM

- 19 THE GIBRALTAR MUSEUM - Gibraltar
- 20 KENTS CAVERN PREHISTORIC CAVES - Torquay





Neanderthal Museum, Mettmann, © Foundation Neanderthal Museum

TWO MILLION YEARS OF MIGRATION

Neanderthal Museum / Author: Melanie Wunsch

We are all Africans. This statement is valid in a wider evolutionary perspective and marks the starting point for a touring exhibition titled “2 million years of migration”, created by the Neanderthal Museum in cooperation with research institutions like the Collaborative Research Centre 806 “Our way to Europe” at Cologne University, the ROCEEH project and the Max Planck Institute for Human Evolution in Jena, Germany.

The exhibition was inspired by the current political discussion about migration and refugees in Europe. It connects archaeological, geoarchaeological, anthropological and palaeogenetic research and shows their relevance for the societal issues of

today. In times of increasing doubt on scientific research it is more important than ever that scientists provide scientific evidence on global migrations since the last Ice Age and take a clear position against racist movements. The basic idea of the exhibition is to cool down a sometimes overheated public discussion. Migration is an integral part of being human. Ancient human behavior is similar to modern human behavior when we compare push and pull factors for mobility, movements and migration.

The exhibition covers the space from Africa to Eurasia and Europe and the time span of two million years in four settings.



Insight into the exhibition “2 Million Years of Migration” at the Neanderthal Museum, © Please don't touch

The first setting informs about the instinctive movements of *Homo erectus* by broadening of circulating areas while searching for new resources up to leaving Africa for the first time moving to Eurasia, Southeast Asia and Europe. The second setting focuses on climatic changes, obstacles and setbacks in the dispersal of *Homo sapiens* out of Africa to the Near East and Europe. Furthermore it concentrates on encounters between *Homo sapiens* and other species like Neanderthals and the Denisovans. The third setting deals with Hunter-Gatherers and Early Farmers migrating from the Middle East to Europe after the last Ice Age and informs about contact strategies between these two groups. The fourth setting approaches the multicultural societies in the late Neolithic and the complex structures of the transition to the Bronze Age.

ABOUT THE NEANDERTHAL MUSEUM, GERMANY

One of the most popular and most modern museums of Europe is situated on the ground where the most famous German was discovered 150 years ago: the Neanderthal man. This world historic place gives reason for a time travel through the history of mankind – from the very beginning in the African savannah more than 4 million years ago until today.

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Interactive elements in the exhibition, © Please don't touch

“The exhibition gives the opportunity to take a new perspective on migration, and sometimes even change opinions.”

A mixture of interactive exhibits, illustrations, media, audio guides and special offers for kids creates a museum experience for different target groups. The Neanderthal Museum functions as a medium to close the gap between scientific research and the public. The aim is to show science in an attractive and comprehensible way. This enables the visitors to approach migration through scientific evidence without being affected by current events or opinions. By creating a space for knowledge transfer from science to citizens, the exhibition gives the opportunity to take a new perspective on migration, and sometimes even change opinions.

The touring exhibition will be on display in six German cities until 2021.

The selfie station at the end of the new permanent exhibition offers the opportunity to make a family picture in amongst the human family, including our ancestors and contemporaries.

This “update” was made possible by donations from the NRW foundation, the LVR, the municipality of Mettmann and the Neanderthal Society e.V. It was conceptualized and realized in cooperation with res d, Cologne and Blank Exhibitions, Düsseldorf. ■





FOSSIL REMAINS OF THE PLEISTOCENE ANIMALS EXPOSED IN KRAPINA

Krapina Neanderthal Museum / Author: Jurica Sabol

At the beginning of September 2017, the exhibition "Fossil Sites of Hrvatsko Zagorje and Podravina" was opened at the Krapina Neanderthal Museum. It is about the presentation of the most important fossil sites in Croatian Zagorje: such as Hušnjakovo, the richest fossil site of the Neanderthal man in the world; Radoboj, a well known fossil site of flora and fauna; Gaveznica (Kameni Vrh), the locality of semi precious stone agate; and Vindija Cave, another well-known site of Neanderthal man.

Particularly interesting finds in the exhibition were the fossil remains from Podravina, represented by the Pleistocene mammals such as woolly mammoth (*Mammuthus primigenius*),

steppe mammoth (*Mammuthus trogontherii*), steppe bison (*Bison priscus*), horse (*genus Equus*), woolly rhino (*Coelodonta antiquitatis*), beaver (*Castor fiber*), Euroasian elk (*Alces alces*), auroch (*Bos primigenius*), giant deer (*Megaloceros giganteus*) and others.

The fossil remains of these animals were also found and collected from the gravel pits along the Drava river, and besides of the museums they are also kept in private collections. The exhibition is the result of a cultural cooperation among the Krapina Neanderthal Museum, the Koprivnica City Museum, the Institute for Quaternary Paleontology and Geology of the Croatian Academy of Sciences and Arts, the Croatian Natural



Milk teeth of woolly mammoth, © Krapina Neanderthal Museum

“Because of their wide popularization, especially through the animated films, fossil remains of woolly and steppe mammoths are extremely interesting for children, the most numerous visitors of the Krapina Neanderthal Museum.”



Permanent molars of steppe mammoth (left) & woolly mammoth (right), © Krapina Neanderthal Museum

History Museum, the Slovenian Museum of Natural History as well as the private collectors Josip Cugovčan from Podravske Sesvete and Ivan Zvijerac from Torčec near Koprivnica.

The most interesting and valuable part of the exhibition are fossil remains of woolly and steppe mammoths. Because of their wide popularization, especially through the animated films, they are extremely interesting for children, the most numerous visitors of the Krapina Neanderthal Museum.

Attractive specimens of lumbar and thoracic vertebrae, ribs, thigh and shin bones make up only a small part of the paleontological collections of Cugovčan and Zvijerac. However, in the professional sense, the greatest value have the mammoth teeth. Five permanent molars of the woolly mammoth (*Mammuthus primigenius*), as well as a large tusk, then two permanent molars of the steppe mammoth (*Mammuthus trogontherii*), and three milk teeth of the woolly mammoth were exhibited. They are particularly interesting as only few museums in Croatia have teeth of baby and/or young mammoths in their collections. This

ABOUT THE KRAPINA NEANDERTHAL MUSEUM, CROATIA

The Krapina Neanderthal Museum is located near the world famous site of the Krapina Neanderthals, "Hušnjakovo", making this a unique visiting complex. The Museum's design and architecture evokes the habitat of the prehistoric humans: the semi-cave, the space, proportions and the front of which are a result of the analysis done on the appearance of the ancient Krapina semi-cave.

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The opening ceremony of the exhibition, © Krapina Neanderthal Museum

part of the exhibition thus had a great value and significance. Baby teeth are smaller in size (about 7 x 5 cm), and it is very difficult to notice them in gravels and sands during the Drava deposit exploitation. The permanent teeth of adult animals are larger in size (cca 25 x 15 cm), and weigh several kilograms.

Among the fossils which were presented at the exhibition, visitors could see the skull, teeth and jaws of the horses, skull of beaver, skulls and horns of the steppe bison etc. An interactive corner of the exhibition had been prepared for the youngest visitors, where the children could dig the fossils in the sand and explore them as well. The prehistoric times could be illustrated with natural paints and or by drawing like the first cave people of Europe. ■





Fumane Cave with some of its old patrons

LIGHTS! PREHISTORY! ACTION! FOCUSING ON PREHISTORY: THE FIRST MOVIE MAKERS

Fumane Cave / Authors: Anita Gubbiotti, Barbara Bussola, Niccolò Camilloni

Humans have always deeply felt the need to communicate, using many different means. A brand-new original workshop for kids combines the artwork of the Palaeolithic Caves and the modern invention of motion pictures, finding a new way to discover just how important it is for us humans to portray ourselves, our history, our environment. "The present is the key to the past" and vice versa.

This workshop is a part of Fumane Cave's contribution to a publicly funded, multi partner project of the Veneto Region Museums Direction that focuses on parallels between the search to illustrate motion and storytelling during the Palaeolithic and modern day movies.



Fashionable little Sapiens

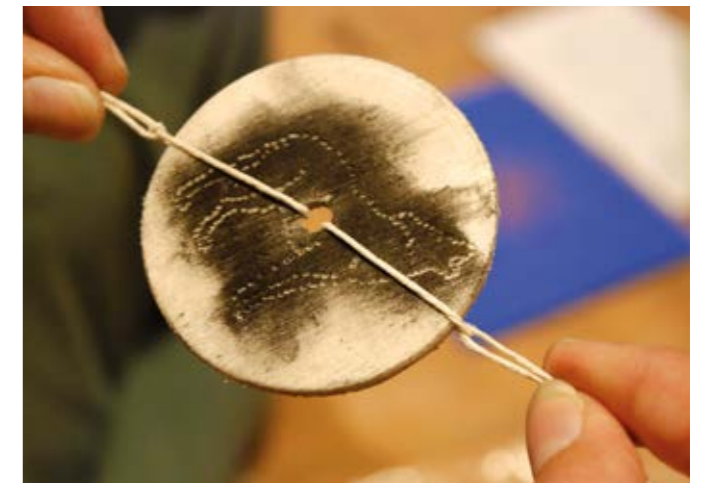
“The workshop aims to accompany children through the world of the prehistoric caves, giving them a glimpse of how important it was for the ancient people to tell their own, ancestral stories.”

huntress and her tribe in moment of great life changing difficulty: they must hurry and collect their things, everything that cannot be carried must be left behind. But what about the paintings of the animals on the cave walls and the stories that have been told about them around the fire for generations and generations? The Shaman of Fumane Cave has the solution: the cave wall's pictures can be engraved on both sides of a thin round bone disc that can be twirled, creating an illusion of movement. A pocket-sized, prehistoric video!

The idea comes from a number of artefacts found in some Stone Age caves in the South of France, in particular an exquisite bone disc from Mas d'Azil with an adult aurochs engraved on one side and a calf on the other. It seems to tell a story, as do other similar, albeit incomplete, engraved discs belonging more



Magic Lantern and Portable Ice Age Cinema (Thaumatrope)



The LIGHTS! PREHISTORY! ACTION! workshop aims to accompany children through the world of the prehistoric caves, giving them a glimpse of how important it was for the ancient people to tell their own, ancestral stories and to maybe represent them through pictures and portable artwork.

To do this, we have made up a story and we tell it to the children in the darkness, using just the candlelight of a Magic Lantern to catch their attention. The children meet an Ice Age

or less to the same Magdalenian period (late Upper Palaeolithic). Moving forward in time, Thaumatrope, spinning discs with two different pictures on each side, along with Magic Lanterns, Phenakistoscopes, Zoetropes and other optical devices were invented in the second half of the 19th century and are considered to be antecedents of motion pictures. ■





Fumane Cave - Pierluca Grotto, © Damir Fabijani

DRAWING PREHISTORY: A CONTRIBUTION TO THE FIRST MOVIE MAKERS PROJECT

Fumane Cave / Authors: Anita Gubbiotti, Barbara Bussola, Niccolò Camilloni, Chiara Zen

The Focusing on Prehistory project was conceived by the Veneto Region Museums Direction, the local organ of the Italian Ministry of Culture. The partners are both public and private and the aim is to create connections between different branches of knowledge, such as archaeology, anthropology, history, artistic expression and technology.

Fumane Cave has yielded some of the most ancient and powerful artwork yet discovered, belonging to the culture of the first Modern Humans that migrated to this part of Europe, simple and essential in colour and volume but universal.

The project guideline is a new interpretation of human history, staged in different manners and using different materials. With



Prehistoric huntress, © Chiara Zen



Magic Lantern

“Through archeocomics, archaeology becomes science that speaks a universal language.”

the help of modern media (videos running on multimedia stations, performances, artistic installations and workshops) the public can get a closer idea of what life might have been in caves 40.000 years ago.

Using modern pre-cinema technology, three videos have been made trying to imitate the attempts, sought in ancient times, to render motion in the artwork. The themes are intimately connected to those of prehistoric artwork: light and fire,



Zoetrope

ABOUT FUMANE CAVE, ITALY

Grotta di Fumane is a cave on the southern edge of the Veneto Pre-Alps, in the North of Italy. It has produced a dated sequence from the Middle to the Upper Palaeolithic. Excavations have been carried out at different times since 1988.

Thousands of flint flakes and cores, bones, teeth, charcoal, worked pebbles, bone hammers prove that Neanderthals made fire, manufactured stone tools, butchered animals and birds, and treated hides and pelts. Painted stone slabs and perforated sea shells testify to some of the first modern man artistic expressions in Europe.

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motion and colour. Light and Fire are mainly invoked using projection devices such as a Magic Lantern. Fumane Cave is the stage, the trembling light of the fire hides and reveals the painted figures which spring out of the darkness. Motion is achieved by representing pre-cinema devices such as the Zoetrope, with primitive animals and figures. In the other video the colours of the prehistoric paintings run into one another bringing the figures to life.

Some of the workshops, such as LIGHTS! PREHISTORY! ACTION! described earlier, were conceived focusing on the techniques of creating motion with special devices, the Thaumatrope, the Phenakistiscope and the Magic Lantern. The story unfolding on the page corners of this magazine in a flip book fashion, is also a way of creating the illusion of motion. This is how the artist, Chiara Zen, who specializes in archeocomics, describes her passion and her work:

“I think it is important to transmit archaeology and the results of scientific research to the general public and not only to “insiders”. Comics, the ninth art, is a language combining text and image, making difficult concepts easily accessible. In this way archaeology, through archeocomics (text and image conveying antiquity), becomes science that speaks a universal language”. ■





MURDER AT MUSE?

MUSE - Museo delle Scienze / Authors: Elisabetta Flor, Samuela Caliarì, Elisa Casati, Rossella Duches, Massimiliano Tardio, Stefania Tarter

A few days ago, a mysterious event shook up normal daily life at MUSE. A man, Augusto Nironi, a museum maintenance technician, was found unconscious outside the research laboratory on the first floor. His condition seems very serious. The man

was probably poisoned. Was it accidental or intentional? The investigators are giving nothing away and state that they intend to leave no stone unturned...



The investigations of two visitors focus on a weapon presumably used in the crime. © MUSE/Giulia Curti

This is the backstory that spurred visitors to MUSE, on the evening of Halloween, to investigate the incident that occurred to the museum employee, loved by many but with at least eight colleagues who, for various motives, could have had the nefarious idea of poisoning him. Who are these colleagues? What kind of relations did they have with Augusto Nironi? What are they hiding? With what poison could they have tried to kill him?

On 31 October 2017, MUSE – Museo delle Scienze staged the event ‘Murder at MUSE?’, a ‘scientific’ version of the ‘Murder by Death’ format, combining supper, a theatrical show and role playing, in which the audience becomes an active part of the story, playing the role of investigators called to solve the case. ‘Murder at MUSE?’ was attended by 600 people of between 19 and 78 years of age.



The promotional flyer for the event. © MUSE

In the first part of the evening, the visitors were offered an aperitif and a buffet supper, during which they acquired initial information about the story and how to gather useful clues for accusing or exonerating the suspects.

After the supper, the visitors were left free to roam around the entire museum, to inspect the scene of the crime, the provisional office of Commissioner Ferrini and various scientific work stations of researchers and educators possessing a lot of information useful for solving the mystery.

The scientific topics covered by the whodunnit were explained by researchers and educators from MUSE, who, like real actors, played the role of suspects or people with information on the facts. So, for example, archaeologist Rossella Duches was involved in research to provide information regarding one of the possible weapons used in the crime: a prehistoric poisoned arrow, which could have struck Nironi. This allowed the MUSE researcher to explain refined techniques for use-wear analysis on prehistoric arrowheads to the visitors/inspectors.

When the investigations were concluded, the audience was called to hand in their solutions, with the name of the perpetrator, the weapon used and the motive. The winners were around 5% of the total participants in the game.

ABOUT MUSE – MUSEO DELLE SCIENZE, TRENTO, ITALY

The MUSE (Science Museum) is an auxiliary body of the Autonomous Province of Trento. Its task is to interpret nature, starting from the mountains, using the eyes, tools, and applications of scientific research, taking advantage of the challenges of the contemporary world, stimulating scientific curiosity and the pleasure of knowledge, giving value to science, innovation, and sustainability. MUSE is an associate member of Ice Age Europe and a key partner of the Fumane Caves.

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Afterwards, Massimo Picozzi, psychiatrist, professor of criminology and writer of numerous books on the topic, explained how this modern science is based increasingly less on the simple intuition of a super investigator, as Mrs. Fletcher or Inspector Derrick would have us believe. Modern criminology relies on specialised scientific methods, developed in the most diverse fields, with highly technological content.

An evening of amusement, therefore, in the unusual setting of the Museum exhibition rooms, but with a solid scientific basis, in typical MUSE style! ■

“A ‘scientific’ version of the ‘Murder by Death’ format, combining supper, a theatrical show and role playing, in which the audience becomes an active part of the story, playing the role of investigators called to solve the case.”





Flint flakes, © PrehistoMuseum

ARCHAEOLOGICAL DEPOTS AND PROFESSIONS UNVEILED AT THE PRÉHISTOMUSEUM

Préhistomuseum / Author: Cécile Jungels

The Conservation, Study and Documentation Centre (CCED) is now open to scientists and the general public.

Since it reopened in 2016, the Préhistomuseum has a Conservation, Study and Documentation Centre (Centre de Conservation,

d'Étude et de Documentation – CCED) that houses the Museum's archaeological depots alongside the collection management and study rooms. It also contains the Documentation Unit of the museum, which is open to everyone.



“Visitors of the Préhistomuseum can see the archaeological depots at all times, and discover how the museum's team and researchers carry out their tasks.”

“The CCED”, explains Cécile Jungels, who is at the head of the centre, “sets out to conserve, study and disseminate the archaeological, natural and documentary heritage that is managed by the Préhistomuseum: the archaeological assets, and also the documentation and archives associated with it, the cave of Ramioul and the biodiversity of the forest – classified as Natura 2000 – that surrounds it. It maintains the links between the collections and the excavation archives that contextualise the archaeological remains and give meaning to the objects.”

In the Préhistomuseum, the hidden face of the CCED is highly visible. In this case, there are depots and an interactive exhibition on archaeology and the different professions working in this field. Visitors of the Préhistomuseum can see the archaeological depots at all times, and discover how the



ABOUT THE PRÉHISTOMUSEUM, BELGIUM

Located at the cave of Ramioul, an archaeological site in the heart of a forest, the Préhistomuseum extends over 30 hectares, in the valley of the Meuse, and is one of the largest museums of prehistory in Europe. It forms the link between the numerous archaeological sites which surround this river: from Engis, where the first bones of Neanderthals in the world (1829) were discovered to the splendid caves of Goyet.

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museum's team and researchers carry out their tasks. “This behind-the-scenes view of the institution means that we can place the collections at the heart of the Museum's mission, and create awareness among visitors around the preservation of our Heritage”, Cécile Jungels adds.

As well as rows of archives more than 220 metres long and a library (covering the period from Prehistory through archaeology and speleology, bio-speleology, geology and palaeontology), the CCED conserves around 500,000 archaeological items from the Prehistoric era to the end of the Middle Ages.

The specific nature of the link between such a centre and a museum is also seen in an exhibition on the different professions in the field of archaeology. It can be visited using an interactive tablet, allowing the visitor to discover evidence from different specialists: archaeologist, topographer, restorer, ceramics specialist, anthropologist, draughtsman, archivist...

“The visitor can discover archaeology beyond excavations”, says Cécile Jungels. “It is a rigorous scientific and multidisciplinary approach that is revealed through an exploration of the real and virtual spaces of the CCED.”

The CCED consists of:

- Collections and archives conserved for the future generations, and accessible to researchers,
- Archaeological depots visible to the public and an interactive exhibition on the different professions involved in archaeology,
- A Documentation Unit with admission to the general public free of charge. ■

More information: www.prehisto.museum/centres-de-recherches





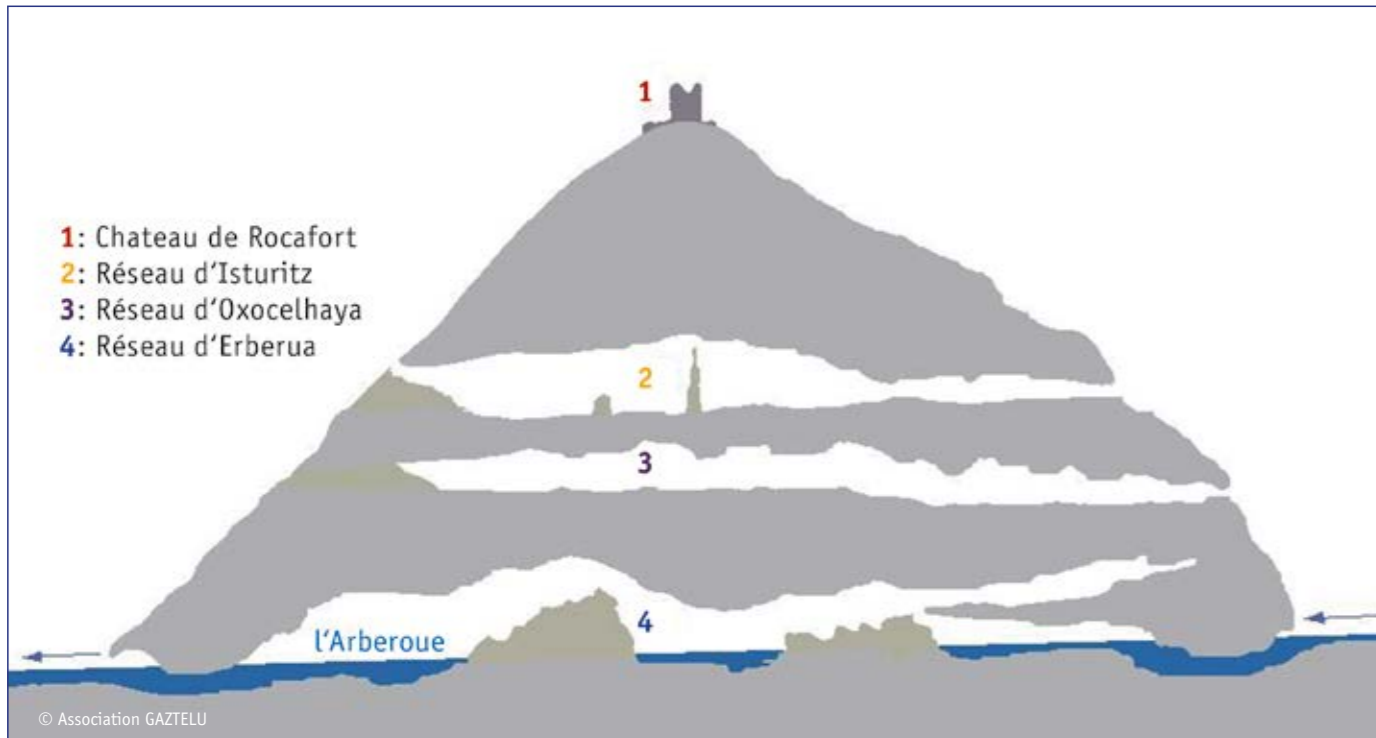
Prehistoric flutes from caves of Isturitz and Oxocelhaya. © Grottes Isturitz

THE EUROPEAN YEAR OF CULTURAL HERITAGE 2018 AT ISTURITZ & OXOCELHAYA

Isturitz, Oxocelhaya and Erberua Caves / Author: Joëlle Darricau

2018 is the "European Year of Cultural Heritage", and in fact it is the aim of our network Ice Age Europe, as we are celebrating "Sharing Heritage", the motto of the year, every day at our sites!

In March and April we will be pleased to present the photo exhibition #IceAgeEuropeNow in La Bastide-Clairence, a nice Basque village. At the same time, our Ice Age Europe spring meeting will be in the Basque country, touring France and Spain.



- 1: Chateau de Rocafort
- 2: Réseau d'Isturitz
- 3: Réseau d'Oxocelhaya
- 4: Réseau d'Erberua

l'Arberoue

© Association GAZTELU

"We are celebrating "Sharing Heritage", the motto of the year, every day at our sites!"

ABOUT ISTURITZ, OXOCELHAYA AND ERBERUA CAVES, BASQUE COUNTRY, FRANCE

From 1913 to the present day the superimposed caves of Isturitz, Oxocelhaya and Erberua have been an inexhaustible source of knowledge about ancient humans from Neanderthals to Homo sapiens as far back as 80,000 years ago.

Throughout the 20th century and into the 21st, the three caves have attracted experts from diverse backgrounds interested in the Upper Palaeolithic period between approximately 50,000 and 10,000 years ago.

CONTACT INFORMATION

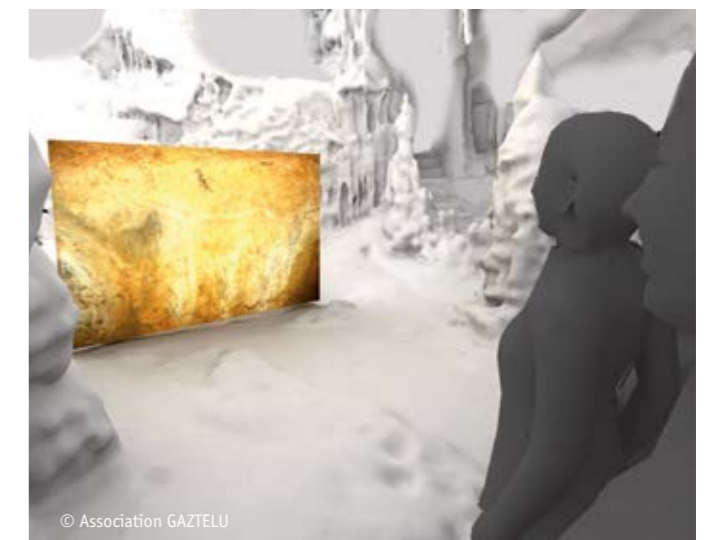
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Each year, worldwide, the show caves belonging to the ISCA network celebrate the International Day of Caves and Subterranean World in order to sensitize people of the important need to understand and protect this fragile and so special heritage coming from millions and thousands years. It allows us also to speak about our job and new ways of management. On this day, celebrated in 2018 on the 6th of June, we will be able to present in Oxocelhaya cave for the first time a project developed in collaboration with the Conseil Régional of New Aquitaine called I&O Virtual. It shows 3D rock art located in hidden galleries never seen before by the public.

On the weekends 13th/14th and 20th/21st of October 2018 the Isturitz meeting "20 years of discovery, a sharing adventure" will take place. The international research team with members from Canada, USA, England, Spain and France and under the direction of Christian Normand (SRA) and Diego Garate (Bilbao Archeological Museum) will present their fabulous discoveries regarding the transition between middle and upper Paleolithic, the older Aurignacian level, the relationships between the both sides of the Pyrenees, and rock art (engravings, paintings, drawings, red points and more). 46 different projects were carried out, including speleological prospection, inventory of the rock art and raw material, C14 carbon dating, palaeo habitat and bone industry analysis, traceology, palynology, stylistic and technological analysis of the graphic activity, plastic analysis, study of cave topography, prospection, raw material identification, paleontology, archaeozoology, sedimentology, study of prehistoric jewelry and mobile arts as well as bat research.

Research will continue to explore the exceptional level of Erberua Cave, only accessible by diving and awaiting another way of discovery and access.

The Gaztelu hill, hosting the 3 caves, has not finished to reveal its treasures. This group of caves, an important place for the history of Mankind, links the Pyrenees with Cantabrian regions. Our family history is far from being resolved. Sites like Isturitz & Oxocelhaya still hold keys to answers to scientific questions of the future. ■



© Association GAZTELU





View over the Archäopark Vogelherd. Photo: G. Bayerl, © Archäopark Vogelherd

CAVES AND ICE AGE ART OF THE SWABIAN JURA. THE NEW UNESCO WORLD HERITAGE

Museum of Prehistory Blaubeuren & Archaeopark Vogelherd /
 Authors: Stefanie Kölbl, Ewa Dutkiewicz

It's now over hundred years ago, in the late 19th century, that archaeological excavations started in the two river valleys of Ach and Lone at the southern rim of the Swabian Jura. A lot of clayey sediment was excavated with shovels and pickaxes. It was in the 1930s when the "wild horse" from

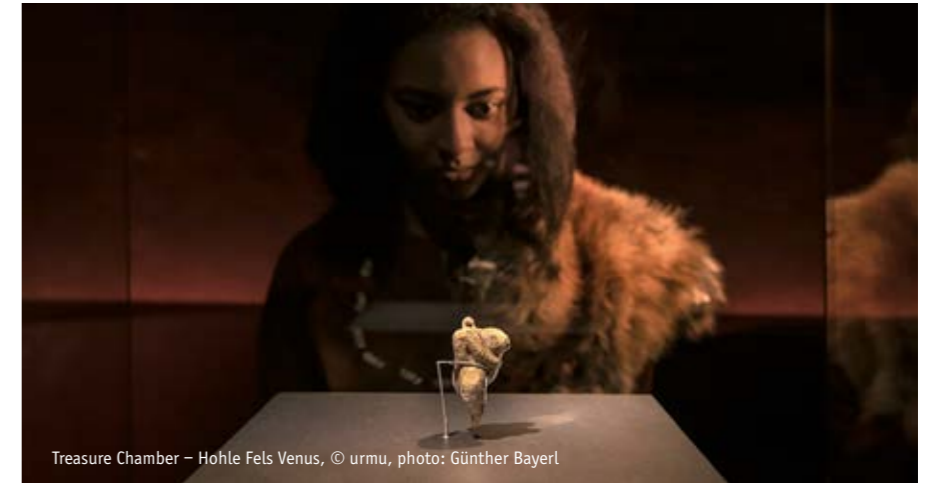
Vogelherd together with several other animal figurines, carved out of mammoth ivory, came to daylight. In the 1980s the development of modern excavation techniques took place and excavations got slower but very much in depth in details and richer on finds and findings.



Sirgenstein in winter. © urmu, photo: Günther Bayerl



Geißenklösterle. © urmu



Treasure Chamber – Hohle Fels Venus, © urmu, photo: Günther Bayerl

Especially the culture of the Aurignacian, which dates from 43,000 to 34,000 years ago in the region of the Swabian Jura, is documented very well with a lot of special objects. Adornments, figural art, music instruments and signs of symbolic thinking are the four innovative cultural achievements of the Aurignacian. The oldest examples of figural art and musical instruments of mankind originate from altogether four caves in the Ach and Lone Valley. The Venus of Hohle Fels, the Great Lion Man of Hohlenstein, the little mammoth from Vogelherd or the ivory flute from Geißenklösterle are only some named testimonials for the successful excavation work of the University of Tuebingen and the State Office for Cultural Heritage Baden-Wuerttemberg (Landesamt für Denkmalpflege Baden-Württemberg).

It started 17 years ago with a first letter of intent from the region to the former prime minister of Baden-Württemberg. It was proposed to the country to apply for UNESCO-World-Heritage. It took until 2009 when the state of Baden-Württemberg started with the concrete application procedure. In 2017, the UNESCO finally decided to inscribe the "Caves and Ice Age Art of the Swabian Jura" to the list of the World Heritage.



Inside the Vogelherd Cave. Photo: G. Bayerl, © Archäopark Vogelherd



Water bird – Hohle Fels, © urmu, photo: burkert ideenreich

Six caves – Vogelherd, Hohlenstein, Bockstein in the Lone Valley and Geißenklösterle, Sirgenstein and Hohle Fels in the Ach Valley – together with the surrounding landscape build one World Heritage. The finds of the caves are presented in a decentralized presentation concept. Two locations are members of the Ice Age Europe Network: the Archaeopark Vogelherd and the Museum of Prehistory Blaubeuren (Urgeschichtliches Museum Blaubeuren, in short URMU). ■



ARCHAEO PARK VOGELHERD

Located directly at Vogelherd Cave, the Archaeopark Vogelherd operates as an activity information center in the Lone Valley. The focus lies on paleo-ecology and the life of humans in the Ice Age environment. Beside the cave itself, two original artworks from Vogelherd are exhibited in the visitor center: the fully preserved mammoth figurine and another, changing artwork from Vogelherd. The large outdoor area offers many thematic places and activities to explore and experience Ice Age lifestyle. We provide many different visiting packages for adults, families, school and kindergarten groups, disabled people, and single visitors.

In July 2017, the decision about the UNESCO World Heritage status took place in Krakow. After many months and weeks of work, preparation and excitement, this was a big relief. There was a big interest from the media, and many politicians congratulated. After a short period of celebration, we had to get back to work. Many interested visitors came especially to see the Archaeopark and the cave sites in the Lone Valley. Our Archaeo-Guides were trained to give information about the UNESCO World Heritage status and everything that comes with it.

“The protection of the sites and sustainable tourism are crucial points.”

Because the Archaeopark Vogelherd is part of the large UNESCO World Heritage region in the Ach and Lone valleys, we are planning to design tours through the Lone Valley. Starting at Vogelherd, visitors will be guided through the Lone Valley to visit the sites of Hohlenstein and Bockstein.

ABOUT THE ARCHAEO PARK VOGELHERD, GERMANY

100,000 years ago the Vogelherd cave was one of the most sought places during of the Stone Age. Today it is at the centre of the Archaeopark and ranks as one of the important archaeological sites for Stone Age culture. Visitors can experience Stone Age activities and get a fascinating insight of the era of our ancestors.

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To make the Lone Valley more accessible to individual visitors, the municipalities that are within the UNESCO World Heritage region in the Lone Valley, Niederstotzingen, Asselfingen, Rammingen, Öllingen, and Herbrechtingen work together to build several hiking trails. The trails are designed in different lengths, difficulties, and thematic topics. Several activities and information points occur along the way.

Another important aspect is to bring the communities closer together to work on the UNESCO World Heritage. We are developing programs to explain the significance of this label to the local people. The protection of the sites and sustainable tourism are crucial points, as well as a broad acceptance in the region. Therefore good political decisions are necessary, as well as school programs and open information for the people who live in the area.



The complete mammoth figurine from Vogelherd Cave exhibited in the Archäopark Vogelherd. Photo: J. Lipták, © University of Tübingen

MUSEUM OF PREHISTORY BLAUBEUREN (URMU)

The URMU is the central museum in the heart of the World Heritage region and presents a collection of Ice Age art, music instruments, adornment and material aspects of the life of Ice Age hunters and gatherers. The highlights of the exhibition are the Venus of Hohle Fels, the Water Bird of Hohle Fels and the ivory flute of Geißenklösterle. Beside the presentation of the different objects, the museum offers an extensive program for school classes, adult groups, families, and science interested audience. To be the contact point to prehistory for a broad range of different interested target groups is the specialty of the museum. The museum is part of the State Museum for Archaeology of Baden-Wuerttemberg and partner museum of the University of Tübingen.



Filming at Sirgenstein, © urmu

We spend a lot of time before the date of the UNESCO meeting with thinking about “what if” and planned the case of emergency. It started already some weeks before with an increased interest by journalists of print and broadcast media. In detailed coordination with the county, the museum was the main contact for media requests. In several meetings for the media, we organized the visit of the whole region, the museum, and the ongoing excavations.

The homepage and social media channels were also prepared for the first seconds after proclamation to go online with the information you need to know to visit the new World Heritage Site. We designed some new museum tours to inform our guests in a better way about the caves and Ice Age art and we organized the training of new tour guides for the caves.

With the approval of the World Heritage in July, the number of visitors increased by a third. Above all, the number of individual visitors has risen significantly. Because of the rush of interested people, we increased the staff hours at the front desk and opened additionally on Mondays during summer holidays. In many personal chats, the visitors were told how to visit the new World Heritage Site in both valleys and a huge stack of leaflets with roadmaps and hiking plans went over the desk. Because of the great interest of our guests in prehistory, we offered until November on each opening day a guided tour through the museum under the aspect of the World Heritage. We will continue with this offer this year.

ABOUT THE PREHISTORY MUSEUM BLAUBEUREN, GERMANY

The cultural roots of Europe’s Upper Palaeolithic lay in the valleys of the rivers Ach, Blau and Lone. The caves at the southern border of the Swabian Alb belong to the some of the most important Palaeolithic sites in the World. Neanderthals and Early Modern humans lived here during the last Ice Age. 40,000 years ago, Early Modern humans not only developed new tool technologies here, but also created animal and human figurines made of mammoth ivory, the earliest known works of art. Other Ice Age art found here includes musical instruments and a large number of Ice Age ornaments that show how sophisticated these people were. The Prehistory Museum Blaubeuren (URMU) is part of the state museum for archaeology and is situated in the heart of the new World Heritage “Caves and Ice Age Art of the Swabian Jura”. It presents figurative art and music instruments in the original in the originate landscape.

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“The entire region is working together to advance the topic of Ice Age art.”

In addition, there will be an exhibition about special objects and findings from the caves of the World Heritage. The city of Blaubeuren wants to improve the hiking trails to the two caves on their territory, Geißenklösterle and Sirgenstein. Each cave will get a special thematic focus on one archaeological aspect. In this process, the museum provides the scientific input and the ideas for the didactic concept.

Altogether the interest in prehistory, the sites and their locations has increased significantly with the declaration as World Heritage. The entire region is working together to advance the topic of Ice Age art. ■

More information

www.iceageart.de / www.welt-kultursprung.de



ONGOING PROJECT: TRANSNATIONAL SERIAL NOMINATION OF EUROPEAN NEANDERTHAL SITES FOR THE UNESCO WORLD HERITAGE LIST. PRELIMINARY REFLECTIONS

Author: Nuria Sanz, Director and Representative of UNESCO in Mexico, General Coordinator of HEADS Programme, UNESCO Focal Point on Rock Art

More than a thousand sites in 167 countries are already inscribed on the UNESCO World Heritage list, yet only a handful of them are sites where human fossils were discovered from the Ice Age. In general, the cultural heritage of the Ice Age and early human history before the rise of urban communities have a very low visibility: in these ice age sites, no spectacular architecture rises into the sky, no impressive walls surround the area, but instead, a cave or the unspectacular surface of a small open-air site characterizes the place. However, the scientific significance of the finds that were made there can often be immense. Milestones of human development that had global consequences become tangible in many of those places. The HEADS program of UNESCO World Heritage (Human Evolution: Adaptations, Dispersals and Social Developments) has been able to convincingly document the extraordinary value and contribution of the early history of mankind to the current World Heritage. The program aims to do justice to the significance of these sites and the outstanding finds that were discovered there, as they often document landmarks of human development history with global consequences.

A collective vision of Neanderthals: prospect for International Cooperation

Neanderthal sites are of particular importance for the HEADS endeavor, starting with the discovery made in 1856 in the world-famous Feldhofer cave in the Neanderthal Valley near Düsseldorf, Germany. Here, an extinct fossil form of humanity challenged definitions and assumptions about our own humanity. A century after Darwin's 1859 *Origin of Species*, Louis Leakey's famous discoveries in Olduvai Gorge, Tanzania, of *Zinjanthropus* in 1959 and *Homo habilis* in 1960 attempted to re-define the origin and definition of the genus *Homo*, and a concept of humanity was conceived that was more ancient than had previously been envisaged. Today, we know that the evolution of our genus *Homo* and the evolution of our own species, *H. sapiens*, is far more complex and interesting than envisaged only a few decades ago. We know, for example, that Neanderthals and Denisovans (an extinct type of humanity recognised only in 2010) are cousins from the same genus, and archaeology and genetics have revealed a colossal overlapping in the behavior of Neanderthals and *Homo sapiens* that challenge notions of our own uniqueness.

We know that one million years ago, a new structure of the skull and body appears with the emergence of characters that we have traditionally associated with modern humans and the

Neanderthals: high-volume brain hominins. We must recognize a deficiency in the fossil record to understand the origin of these changes especially in regard to the end of the Lower Pleistocene and the early Middle Pleistocene. In order to explain the step in a linear model between *Homo erectus* and modern humans we should try to understand the change from a relatively small and flattened skull to a more voluminous and bulkier skull of the *sapiens* lineage along with the modifications of the face itself; however, we do not have a complete fossil record and the last common ancestor of large brained hominins – us and Neanderthals – continues being an *enigma*.

The central question is what would be the common ancestor of modern human and Neanderthal? What is the antiquity of the common ancestor?

A model with a prominent face and a facial configuration that fitted a human face led to talk about a new species. This predecessor could then be a precursor species of modern forms, and also the common ancestor of both *H. sapiens* and Neanderthals. The common ancestor could have given rise to two lines in Africa: the lineage of *H. sapiens* starts from the populations of a *Homo* ancestor who remained in Africa. The lineage of the Neanderthals would have its origin in some precursor populations that left Africa and arrived to occupy western Eurasia. Once in the Eurasian territory, the lineage evolved gave rise to the first ante-Neanderthals, called *H. heidelbergensis*. Already our knowledge about the number of populations or different species that were dispersed throughout Europe throughout the Pleistocene and Middle Pleistocene is still very embryonic, and the access roads to the continent are still a topic of debate.



Neanderthal Reconstruction, © Neanderthal Museum

Over the last 20 years numerous sites have been added in Europe and Asia to lists of sites related to Neanderthals. They document a fascinating history of development. Today, Neanderthals are a synonym for the people of the Ice Age – their way of life, their knowledge and their abilities. They are deeply rooted in western popular culture as “cave men” and our social memory. Our ancestors and their way of life are the subjects of a vast, worldwide research activity – the results of which, for example in the field of palaeogenetics, have a strong influence in academic contexts.

Between 1997 and 2010, the Neanderthal genetic sequence was reconstructed. In 2010, the Denisovans were first defined as a new genetically defined species. Since then, we have understood the Neanderthal genes that are shared with all modern non-Africans, around 1.5 or 6%, and that may have favored adaptation to some of the most dramatic climates and regions of the



Fogliazza, © Grotta di Fumane/Università di Ferrara

planet. A genomic commonality between the Neanderthal and us begins around 800,000 years ago, but the anatomical differences between us and them no longer fit simple uni-linear schemes. Mosaic evolution may be the dominant pattern: for example, the cranium of an individual may look “primitive” but its face may look “modern”. The fossil record needs to expand to explain if and in what way all these changes in anatomy interacted in producing the Neanderthal and sapiens physique.

Beyond the importance of identifying a common ancestor and beyond questioning the origin and basis of the species *Homo*, the relationship between Neanderthals and modern humans leads us to ask ourselves about the true nature of what it means

to be “human”. All the results obtained from older and more recent archaeological, paleo-anthropological or genetic research confirm an extinct form of Neanderthal humanity, and this places all the narratives concerning the process of candidacy for the World Heritage List in a very special position. With the European Neanderthals, we have the most complete data of any fossil human species. In addition to this certainty, they offer an extraordinary starting point for transnational nominations. Sites, laboratories, research and visitor centers, and collections in museums, make up an extraordinary mosaic that entails the strengthening of inter-institutional collaborations that demand a multi-lateral space of dialogue and collective vision.

The debate on affiliations goes on and this implies that the protocols on research and protection of the sites have to be robust and essential in order to continue generating knowledge. World



Neanderthal Reconstruction, © Neanderthal Museum

Heritage international protection guarantees that the debate can continue, covered by the highest standards of international preservation.

The history of the discoveries of 1856 in the Feldhofer cave gave rise to the forms of inquiry into our origins, our uniqueness, and our antiquity in the world. We cannot forget the case of Forbes Quarry, Gibraltar, where remains of Neanderthals were found in 1846. The Neanderthals initiated a social reflection about our development that was more civilization-related than scientific, three years before the publication of *The Origin of Species*. A new man, and the interpretation hypotheses of J.K. Fuhlrott,



or R. Virchow, or W. King; later the Belgian skeletons from Spy associated with the lithic culture of the Middle Paleolithic Mousterian provided a time horizon for the previous findings as well. Later in the early 20th century Marcellin Boule positioned the Neanderthal lineage as an extinct side-branch of humanity, and today most researchers would agree with that assessment. Since then, we have learnt a vast amount from archaeological sources about their behavior, particularly about their symbolic capacity as indicated by their burial customs, as shown by Ralph Solecki at Shanidar. Today I remember his contributions when I lay my hands on the New York Times article of February 22, 2018, discussing the first misunderstood artists in our history (<http://nyti.ms/2EWKp09>). Over the past five decades we have begun to confirm the existence of another form of humanity, of our humanity, without bringing it into our history with an inferiority complex. For 150 years the story of our humanity has been closely linked to the history of the Neanderthals. A candidacy process must give an account of the meaning of this global civilization-related interpretation. It is also one of the most significant and important debates in human paleontology.

landscape, ecologies and paleo-environmental diversities, as well as the need to track the individual and group behavior of the populations. If we try to embrace the entire temporal sequence we encounter a huge diversity of living contexts, climates and geographical obstacles that had to be overcome by Neanderthal populations. That very adaptation to diversity may undoubtedly be one of the most outstanding aspects to highlight. The geological context, fauna and flora, topography and climates (sometimes extreme) make *Homo neanderthalensis* an extraordinary case of adaptation to diversity and an extraordinarily important case study on the demography of pre-historic populations. Thanks to the amount of data we have, it is also the most significant case study of the contrasts and connections between the historical, archaeological, skeletal and molecular disciplines. The mitochondrial data profiles three regional groups: the northern Eurasian, the southern Eurasian, and the vast east Siberian. These are extinct human populations that lived in similarly vanished landscapes. The inclusion in the nomination file of all the scientific information on the excavations, as well as the canonical taphonomic documentation on the

investigations in Arabia, in China and the Russian Federation may be able to answer that dilemma.

An essential chapter for this file concerns the inclusion of genomic information. Since 1997 we have the genetic sequence of Neanderthal DNA, from the original Feldhofer site. Today we know that low genetic diversity is evident throughout the evolutionary history of the species. Advances in nuclear paleogenetics obliges us to provide, for archaeological sites with an abundant paleo-anthropological record, forms of protection that facilitate sampling without contamination and to prepare excavation protocols designed to avoid contamination between the nuclear DNA of Neanderthals and modern humans. This leads me to address a fundamental issue regarding the comprehensive conservation of prehistoric sites. The international community must continue to consider protocols that make it possible to guarantee the optimal excavation and preservation of fossil remains that in turn can continue to produce knowledge as methodologies of paleo-environmental, archaeological and genetic analysis are refined and perfected. In this sense, the methodologies applied

Faced with all the difficulties encountered in different pre-historic landscapes to define areas of occupation, what makes a nomination of Neanderthal sites truly interesting is the great amount of scientific information we possess today about their forms of spatial occupation, about the forms of systematic use of fauna and flora and about the spatial character of the exploitation and consumption of food. These elements provide important arguments to define a "site," as required by the World Heritage Convention. As we explained earlier, a serial nomination can account for more permanent occupation sites (seasonal but repeated) or places less frequently used but that have been scrupulously studied. The sites reveal a specialization in the use of space, related to collective tasks of systematic hunting of large herbivores (for example, current research in Schöningen or in the Crimean peninsula, Mauran, Les Pradelles, or Salzgitter, etc.), as well as the recurrence of their industries in Eurasia. Their settlements speak of planning, and of a broad knowledge of the geographies of the consumable fauna and flora. The series may incorporate a significant number of sites that prove one of the most important characteristics of behavior

“Beyond the importance of identifying a common ancestor and beyond questioning the origin and basis of the species *Homo*, the relationship between Neanderthals and modern humans leads us to ask ourselves about the true nature of what it means to be “human”.”

in the investigations of the Sidrón cave (Spain) undoubtedly lay the foundations of a promising pattern of intervention.

There are so many advances in research today that enable us to talk about the lives of groups and individuals. Through zoo-archaeology and the results of isotopic studies, we know that Neanderthals were avid consumers of animal tissues. We also know that from the evidence in many sites it has been possible to document gestation times, forms of growth, life expectancy, and diet. The series of sites chosen for a nomination can extensively justify, according to the current state of research, a whole series of forms of extinct life without leaving much room for conjecture. Now, these sites need to safeguard their conditions of preservation in order to continue producing new data that will complete the knowledge acquired so far, which is undoubtedly much greater than that of any segment of human evolution. The Neanderthals are the favorites when it comes to research into human evolution and that is why a solid OUV statement can be prepared today supported by a plural science in terms of methodologies and geographies.

Today there is already plenty of evidence about the cultural behavior of the Neanderthals. The sites illustrate their forms of territorial control, and the lithic industry since the Middle Paleolithic is the result of very predetermined techniques, refined and deliberate, and there is evidence of the use of fire in Europe contemporary with the Neanderthal occupation of those territories since 250,000 BP. A serial nomination could take into account the inclusion in the series of lithics Modes III and IV. The series could take into account the inclusion of sites where bone-working industries were found, places where there is evidence of the use of wood, shell-working, as well as rock art.

of Neanderthal populations: their wide-ranging mobility. Some archaeologists have even defined some regional patterns as radial Levantine mobility. In terms of structures delimiting habitat space, today we can at least infer it in the most important sites: Moldova I or Abri Romani. We also have important burial sites: Shanidar, La Ferrassie, with evidence of deliberate offerings, the worked dentalium or cardium shells or the ocher, hematite or manganese findings that suggest a symbolic behavior that should be referred to in the candidature file.

As I close these pages I receive the article *U-Th Dating of Carbonate Crust Reveals Neanderthal Origin of Iberian Cave Art*, published in *Science* 359, 2018 (pp. 912-915) and I wonder how many rock art sites already registered on the World Heritage List or its Tentative List should include in their OUV mention of the contribution of the Neanderthal lineage to the symbolic representations that appear on the rocky walls of caves or shelters, or found on archaeological items discovered at these sites, which today allow us to recognize the authorship of *our other* humanity.

More information: <http://www.unesco.org/new/es/mexico/work-areas/culture/heads/>



Attendees of the International Workshop #NeanderthalCluster, November 2017 at Neanderthal Museum, Germany

The national teams must decide whether the Neanderthal narrative begins with the early Neanderthals, descendants of the populations that arrive in Europe from the second half of the Middle Pleistocene (prior to 115,000 years ago, cases such as Mauer, Bilzingsleben, Steinheim, Swanscombe, Petralona, Atapuerca (Sima de los Huesos), Arago), or if it is the classic period (populations from the last glacial cycle in Western Europe during the last ice age, between 115,000 to when they became extinct ca. 30-40,000 years ago). They should also decide whether to include the Levantine Neanderthals (beyond the inscribed site of Mount Carmel) and other regions of Asia. The narratives of Outstanding Universal Value must justify the inclusion or selection of certain zones of dates and their geographies. It will be necessary to decide if the narrative of *Homo neanderthalensis* is focused on situating the OUV of the candidature in the populations that lived in the western end of Eurasia between 300,000 and 28,000 BP, or if another type of thematic or geographical narrative is accepted by collective agreement. The proposal for candidature could be related and limited to Ice Age Neanderthals as well, that means Neanderthals of the last glaciation and interglacial i.e. <125,000 years old.

In addition to the where and when of the phenomenon we must include how Neanderthals adapted to the Pleistocene

layout of the archaeological site are indispensable for the justification of their adaptive capacities. The sediments and archaeological strata are the guardians of the first forms of cultural and biological diversity of our humanity. In the case of a World Heritage candidacy, it is important to argue for the intrinsic relationship between the fossil record and the information obtained from the paleo-environment. Today the research on climatic, biomechanical, energy and even respiratory factors of the paleo-anthropological record confirm that the skeletal robustness of the Neanderthal is present in sites in both extreme and temperate climates. The archaeological and genetic material seeks to articulately clarify the patterns and relationships that govern the development and adaptation of the lineage in a huge number of contexts and environments over hundreds of thousands of years. The nomination file could support the selection of sites on the basis of the way the unique character of each place expresses the diversity of responses from a single lineage.

Another category of analysis when defining the inclusion of components in the series may be to pay attention to sites that have intermittent or continuous occupation. We are still unable to provide a full profile of the dynamics of expansion of the "Out of Europe" movement of the Neanderthals, but the new



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