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Palaeolithic Art & Neanderthals: were they clever enough? Part 1: Iberian Cave Art

"...the study of prehistory is a challenging undertaking. [...] our perception of prehistoric times, of the millennia of human development, is always changing... the image of the past that we see is one that we ourselves have constructed. It is one that is continually changing" (Renfrew, 2007, viii-ix)

Palaeolithic art and Neanderthals? Unless you have read recent research suggesting Neanderthals are responsible for the earliest parietal art in Europe this is not necessarily an association you conquer up. Western ideology has guided how we understand and interpret the past. This has led to an effect on our understanding of Palaeolithic art and the cognitive ability of Neanderthals. This article focuses on the cave paintings in Iberia that have recently been dated to before 40,000 years ago using Uranium Thorium(U-Th) dating method that extends the timeframe detected by C-14. Research results suggest Neanderthals may have created the first cave art in western Europe. It is no surprise that a debate ensues on the accuracy of the dating method and its results, while at the same time reprising the question of Neanderthals cognitive ability to create 'art'.

Several questions arise: Cognitively, what separates Neanderthals from *Homo sapiens*?, What does it mean to be human?, and Why does a Eurocentric context of 'art', 'cognition', and 'mind' still maintain a mindset among some researchers in archaeology and anthropology? Using a comparative literature review of U-Th dating of Iberian caves (Part 1), Svante Pääbo's DNA research, and recent publications on forms of Neanderthal symbolic material culture these questions will be explored (Part 2). Additionally, cognitive archaeology and Material Engagement Theory (MET) will further address how our perception of cognitive processes has been overshadowed by narrow thinking of what the 'mind' is and what it means to be fully human. It is up to the reader to decide whether the Neanderthal were clever enough to be responsible for some early European cave art and other forms of symbolic material goods.

This article is based on almost two years of independent research that began with the question, Is it really possible the Neanderthal had the ability to create parietal art?, which was inspired by *The Neanderthals Rediscovered: How a Scientific Revolution is Rewriting their Story* (Papagianni & Morse, 2022), which I picked up on a whim. From there I attacked the question like solving a jigsaw puzzle- first the framework then the bits and pieces that bring the picture to completion. There is a wealth of information on Palaeolithic art and Neanderthals; however, the goal of this article is to present an overview and hope the reader goes down his or her own rabbit hole(s). Part 2 will come online later in 2025 and published in *Adoranten* 2025 next year.

A Place in Time[1]

The Palaeolithic period (Old Stone Age) spans an age interval from circa 2.5 million

years ago to c. 10,000 BC when the Mesolithic (Middle Stone Age) began, which is the focus of this article. Early Neanderthals lived in Sima de los Huesos, Spain from 350,000 years ago (Meyer et al. 2016) and Classic Neanderthals until around c. 40.000 years ago, the generally accepted date of their extinction (Sykes, 2021; Djakovic et al., 2022). Research suggests Neanderthal's co-existed early on when *Homo sapiens* reached the Lavant and later as they moved westward during the Châtelperronian transition period (Paris Basin to northern Iberia) for a period of 1400 to 2800 years between 45,000 and 41,000 years ago (Djakovic et al., 2022, Gicqueau et al., 2023).

The Notion of "art" and "artists"

To begin, 'art' is a Western concept that is difficult to define; thus is it difficult to imagine that Palaeolithic cultures construed their aesthetic drawings as 'art' (Heyd, 2005; Gombrich,2006). Works of 'art' attract us—beauty is in the eye of the beholder—but the idea of what is beautiful is attributed socially and culturally. If Palaeolithic cave art is merely considered 'art', is there a risk the social and cultural role of the images is lost? (Blundell, Chippindale, and Smith, 2010). A point emphasized by Bruno David (2017), Palaeolithic cave art "is as much the product of *subliminal cultural* forces that shaped how people once saw the world as it is the intentions of individual artists. And what we see in those caves also reflects how we ourselves, as observers, have been conditioned to see", he continues:

> But as Indigenous communities remind us today, their cultures, their artistic practices, relate to their own way of doing things, to their own very particular histories, not to that of others with whom they have never had any direct or even indirect contact in other parts of the world (2017), 9.

Additionally, with Palaeolithic art there is no ability to do "informed" research, where first-hand knowledge is gathered from the actual artist or community elder (Taçon and Chippindale (1998). Since the people of the Palaeolithic period did not leave behind information on how we should "read" or "interpret" their culture, we have no way of knowing what the intended meaning was since the meaning would have changed with time. Well-known rock art researcher Benjamin Smith refers to David Lewis-Williams suggestion that the best we can do is "gaze and guess" without the knowledge of a community (Blundell et al., 2010, 2).

Representational European cave 'art' (i.e., Chauvet, Lascaux, Altamira) is often considered the beginning of a "Creative Explosion" or the "Great Leap Forward" (Shreeve, 1997, 273) associated with *anatomically modern humans*, not Neanderthals. Many researchers "cling" to this as a "litmus test for behavioral and cognitive modernity" (Zilhão, 2020, 87; Morphy 2005).[2] Paul Bahn (1997) is another researcher who refutes the idea that a 'creative explosion' began with Chauvet and suggests Palaeolithic art did not have a single beginning or end; each region and period would have had developed in their own timeframe:

> The development of Palaeolithic art was probably akin to evolution itself; not a straight line or a ladder, but a much more circuitous path—a complex growth the like a bush, with parallel shoots and a mass of offshoots; not a slow, gradual change but one punctuated with equilibrium, with occasional flashes of brilliance. One must never forget that art is produced by individual artists, and the sporadic appearance of genius during this time span cannot really be fitted into a general scheme (71).

Colin Renfrew (2007) questions how such an 'explosion' faded by the end of the Ice Age[3]. Why was such remarkable art limited to a specific period of time and did not appear elsewhere?[4] Was there is a gradual learning process of aesthetics that moved from etching in stone to simplistic abstract markings with red pigment to famous rep-

Figure 1: Klee's, 'The tight rope walker' (left), Cézanne's, 'Bend in the Road' (middle), Kirchner's, 'The Kiss' (right). All are considered 'art' but are they 'representative' of reality? Credit to National Gallery of Art, Washington, D.C.

resentative images of animals; thus, was it really an 'explosion' related only to anatomically modern humans? Archaeologists have uncovered numerous etchings on stone, palettes of pigment, decorated shells, and cave paintings of pigs from much earlier periods, i.e., the Blombos engraving, South Africa 77ka (Henshilwood et al., 2002); an engraved shell from Trinil, Java dated to 430-540 ka (Joordens et al., 2015); and the cave paintings on the island of Sulawesi, Indonesia dated to 51.2 ka (Aubert et al., 2014). How do the recent findings using U-Th dating change how we understand the development of Palaeolithic 'art' and the cognitive abilities of early hominins?

Consider for a moment, what percentage of the human population could create works of art like Michealangelo, Monet, Van Gogh, Rembrandt, Jorn? (Fig. 1) Recall back to your first attempt to draw—possible a scribble on a paper with a crayon, maybe a handprint using paint- it meant something to you, although your proud parents or grandparents had a difficult time interpreting it, yet it was the beginning of a process of learning. Creating 'art' is a learning process-it does not begin with full 'Classic' polychromatic representation of animals, i.e., Chauvet.

Additionally, it is important to consider historic accounts of cave art research from the mid 1800s. The discovery of the polychromatic images on the walls and ceiling of Altamira had scientific institutes believing such 'art' could not have been made by prehistoric man- "Hearsay", "a lie", "a vulgar joke" were common comments, surely it must be modern! (Papagianni and Morse, 2022; Sykes, 2021; Bahn, 1997; Shreeve 1997). Similar responses were received after respected archaeologists and their teams dated Iberian cave art to be older than 65 ka (Hoffmann et al., 2018a) providing an interesting parallel and debate among scholars.

Cognitive Archaeology meets Material Engagement Theory (MET)

Parietal and portable art, like an archaeological site, are artifacts that can have various interpretations affected by the archaeologists' own experiences and beliefs

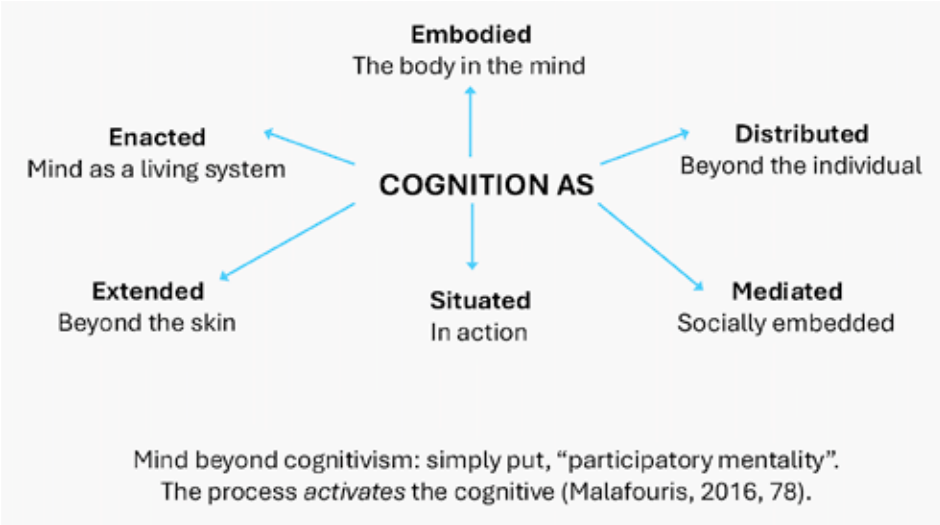
(Blundell et al., 2010). Steven Mithen (1998) concurs, "Archaeologists ...have more success at reconstructing the 'outside' meanings of art, rather than 'inside' meanings which require ...the world of the prehistoric mind" (17). Artistic practices (engravings, cave art, symbolic ornamentation) and stone tools are more than artifacts of the past; they help us understand the developing cognitive processes of a specific culture and require "trajectories of cultural change" (Renfrew, 2007, 98).

Colin Renfrew and Paul Bahn (2012) suggest early generations of archaeologists tended to "create a kind of counterfeit history, 'imagining' what ancient people must have thought or believed" (381). They believe this type of thinking led to a neglect of cognitive studies. Renfrew's research resides in the realm of cognitive archaeology, "the study of past ways of thought as inferred from material remains" (Renfrew, 1994, 3). Cognitive archaeology relates to an important question: *Where* in the archaeological record do we find cognition? (Malafouris, 2016). From the perspective of material engagement theory (MET), "to understand human cognition, material culture must be taken seriously, without doing so, we cannot understand what makes a *process* cognitive" (Malafouris, 2016, 43-44).

Early human cognition can be considered through language, stone tool technology, ability to plan, burial methods, and symbolic representations (Malafouris, 2016). Each of these areas allow for cognitive abilities to be examined through the process of learning (Renfrew, 2007). If we disintegrate the boundaries between "inner" and "outer" (Fig. 2) we get a new perspective on the human mind in relation to material culture and can further develop common "relational ways of thinking about the complex *interactions* among the brain, body, and the world" (Malafouris, 2016, 230).

With MET Malafouris extends cognitive archaeology suggesting, "that as long as we treat cognition and material culture as separate and distinct epistemic domains of human experience our chances of understanding the nature of either are very limited" (2007, 289). His research posits an assumption, that the image *and* perception are continuous—if one is changed the other is affected; thus, one cannot stand alone

Figure 2. After Malafouris (2004) Mind beyond cognitivism (p.57)



from the other. The image is a "historically situated component of human perceptual and cognitive architecture" (Malafouris, 2007, 289). This notion allows one to re-evaluate how we interpret the symbolic material culture and cognitive ability of the Neanderthals. MET requires the break down of boundaries on how we consider the mind in the creation of material culture; MET combined with rigorous dating methods provides a better understanding of the development of cognitive processes of prehistoric people.

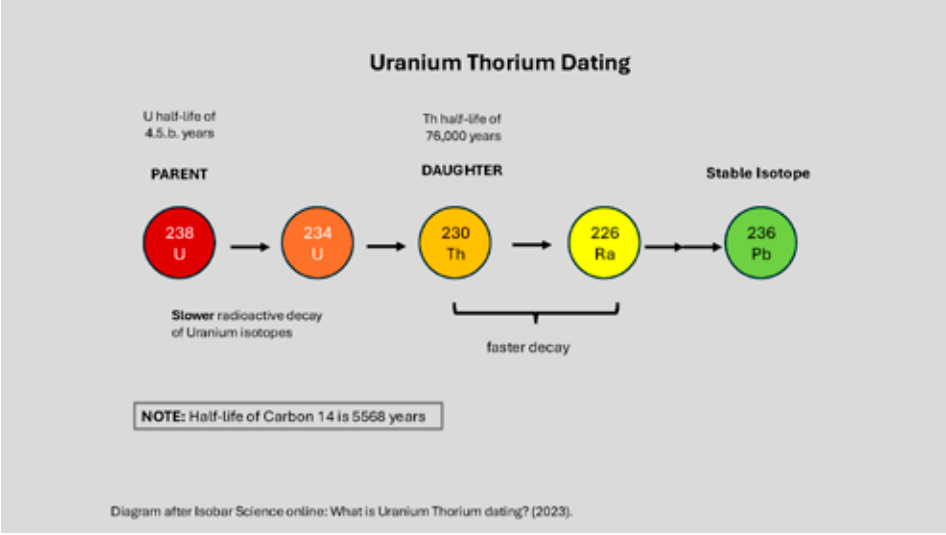
Dating Cave Art & how the Uranium Thorium method works[5]

Dating of cave art is difficult and often problematic. As of 2007 over 90% of decorated caves in Europe remained undated—only 61 images from 19 caves (out of over 350 known caves) have been reliably dated (Pettitt and Pike, 2007). In a discussion on the problems of dating Paul Pettit and Alistar Pike (2007) remind researchers of the need for "scientific rigour" and an emphasis of "the development of universal protocols regarding sampling, pre-treatment and measurement, and full objective publication of *all* results-including those that fail" (p. 43, italics added). Having precise knowledge on the chronological determination of cave art is important to "fully understand and study the social and symbolic structure of human groups" (Garćia-Diez et al., 2013). Paul Pettitt and Paul Bahn (2003) echo the call for a more critical approach to dating, specifically when radiocarbon dating and stylistic studies analysis disagree.

Another factor in the dating conundrum revolves around the cognitive context placed on symbolic material culture by archaeologists/anthropologists concerning Middle vs. Upper Palaeolithic artefacts: what no one would question as cognitively advanced in the Upper Palaeolithic continues to be questioned in the earlier period (Zilhão, 2020). Why the double standard?

Carbon-14 (^{14}C) dating has been the main method used to date cave art until recently. ^{14}C dating works on *organic materials* (charcoal, wood, seeds, plant remains, human or animal bone) and has a limited operational age range of approximately 40,000 years. Radiocarbon dates are accompanied by an estimate of probable measurement error:

Figure 3. Diagram showing the half-life and decay rates in the Uranium Thorium process of dating.



the plus or minus term (standard deviation), which should be attached to every date (Renfrew and Bahn, 2012). The half life or decay rate of ^{14}C is 5,568 years compared to Uranium-Thorium technique where ^{234}U has a half life of 245,000 years to decay to ^{230}Thorium.

U-Th dating has been used by geologists form many decades, and in 1987 U-Th dating began to be used in archaeology. Uranium (U) is present as a trace amount in some natural materials (although in very different concentrations). It is considered the most useful method for the period 500,000 to 50,000 years ago, which is far outside the range available for radiocarbon dating (Renfrew and Bahn, 2012). The use of the U-Th decay series to date cave art is considered "the least controversial" method (Pettitt and Pike, 2007, 41). The method is used to date the formation of thin calcite flowstone growths and precipitations (speleothems) that formed on the surfaces of paintings and engravings (Pike et al., 2012).

The technique compares the ratios of unstable uranium isotopes ^{238}U and ^{234}U with the daughter elements into which they decay (Thorium). Uranium decays into thorium (^{230}Th) at a known rate, called a half-life. The sample age can be calculated when the ratio of the two elements is compared: the higher the proportion of thorium, the older the sample (Fig.3). U-Th is considered a much less abrasive method for dating cave art (Pike and Standish, 2018). Samples are extracted directly from the speleothems, *not the image*, and samples can be as small as 10mg (Hoffmann et al., 2018a; Pike et al., 2012): unlike radiocarbon dating there is no destruction to the artwork. In some cases it is possible to obtain both a maximum and a minimum date when paintings have been applied on top of flowstone as well.

The recent U-Th findings provide a new chapter in the study of Palaeolithic rock art according to Gerd Christian Weniger of the Foundation Neanderthal Museum, Mettmann, Germany and part of the Ardales excavation team.

Skepticism

The recent U-Th dating of cave art in Spain (Hoffmann et al.,2018a) suggesting Neanderthals were the first cave artists has been met with skepticism and the shaking of heads. Among the critics, Rebecca Wragg Sykes (2020) writes, "for many the dates are literally incredible, in the sense of being highly unlikely", suggesting the dates are inconsistent with other calcite samples taken in the same locations and "samples should be removed down to the rock and then micro-sliced in laboratory conditions" (255).

Points of concern:

1. "U-Th results are sensitive to lixiviation of the Uranium, leading to an overestimation of age" (Slimak et al., 2018; White et al., 2020). Lixiviation is the process of separating a liquid from a solid.

2. "Awareness of this important error imposes protocol by which U-Th values obtained in order to be credible, must be cross-checked with other independent methods and whenever possible with the results obtained on the same sample by other laboratories" (White et al., 2020).

3. "Under no circumstances should minimum ages as old as 65-70 ka be accepted for works of parietal art based on the sole basis of U-Th dates on overlying calcite. Such dates are in contradiction with the abundant archaeological data now rigorously dated by ^{14}C" (White et al.,2020).

4. "Archaeological context and reasoning need to be a part of the process… in absence of a geological explanation for this anomaly" and "in each case geomorphic and paleoclimatic studies must accompany such U-Th based claims of great antiquity in order to account for the possible hiatus of calcite growth and the apparent discrepancy in the ages of loosely located concretions" (White et al., 2020).

5. Corrections for nonradiogenic ^{230}Th: There is a common problem that not all of this form of Th originates from 234 U decaying since the carbonate formed. If this is not corrected for, the sample would appear older than it is (Slimak et al., 2018).

6. Detrital contaminations corrections (Slimak et al., 2018).

Randell White et al., (2020) questions the quality of the analysis, while Slimak et al.'s (2018), concerns are more on the dates of the cave art from the results and questions the oldest age because he feels there is no proof they are correct.

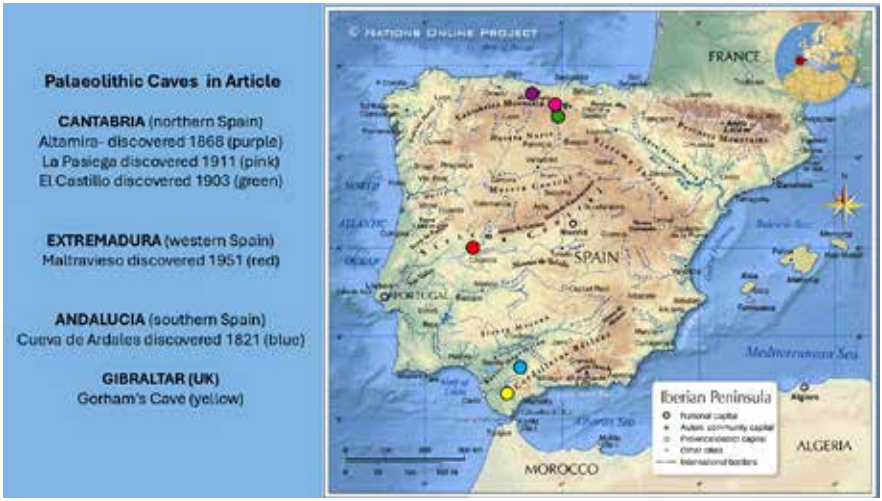
Rebuttals

Hoffmann et al., (2018b, 2020) provide detailed responses to both articles (Slimak et al. 2018; White et al., 2020) defending the team's research while pointing out that based on present evidence it is likely that parietal art in Europe emerged prior to 65 ka and continued during the rest of the Palaeolithic. They add that the earliest remains of modern humans' date to 40 ka ago (Oase, Rumania) and Neanderthal remains dated to 40-50 ka. from across Europe (Hoffmann et al., 2018b). In an interview Paul Bahn, not part of the research team, stated the U-Th results provided by Pettitt, Pike, Hoffmann and their various teams are "valid and reliable", yet he also knows the results will be rejected by some French colleagues who continue to suggest that any dating *previous* to Chauvet at 36ka is "hopelessly wrong" (Dvorsky, 2018). It seems the dating of Chauvet has become a point of contention as several of the 40 plus authors on White et al. (2020) criticism have been part of research teams at Chauvet.[6]

Palaeolithic Art of Iberia

Palaeolithic art can be found in several regions of Spain Cantabria / Basque Country (the Altamira World Heritage area, including *El Castillo* and *La Pasiega*), Andalucia (*Ardales*), Extremadura (*Maltraviso*), Cádiz (Moro), Valencia (Cova Dones), Gibraltar (*Gorham's cave*) and Málaga (La Pileta, Nera). The caves in italics are discussed in this article along with Altamira (Fig.4). According to UNESCO, Spain has nearly 272 rock art sites (rock shelters, caves, or ravine walls) with more than 116 in the Cantabrian area.

Figure 4. Locations of Iberian Palaeolithic caves discussed in this article. Map: Nations Online Project.



The northern autonomous communities of Cantabria and the Basque country have the largest concentration of Palaeolithic caves in Spain. Eighteen caves are part of the Altamira World Heritage (WH) Site designated in 1985.[7] According to UNESCOs WH website, the caves date from the Upper Palaeolithic from the Aurignacian to Magdalenian. However, recent research in 2018 will place the 'art' in three caves to an earlier, Middle Palaeolithic period, suggesting Neanderthals-not *Homo sapiens* were responsible for some of the markings made with a red pigment.

Evidence of Neanderthal symbolism through the use of pigment has become more acknowledged in the last decade. Pigments were used in Palaeolithic cave art and on shells and bones. Red and yellow pigments were primarily used along with black substances. Color is important to visual displays and social communication, and the pigment minerals can be used for sunscreen and insect repellent; ochres for hide work or as hafting glue additives (Sykes, 2020,252). The first known use of pigments (liquid red ochre) by Neanderthals was between 250,000 and 200,000 years ago based on findings at Maastricht-Belvédère, Netherlands—in this case the nearest source was 40-80 km (25-50 mi.) away. Sykes (2020) suggests, other locations, such as Combe Grenal (France) show long-term pigment use through 16 layers where the colors and materials change and appear to be connected to the various stone tool tecno-complexes (Quina, Discoid, Levallois).

Part 2 of this article will discuss the Neanderthal's use of pigment on shells (Cueva de los Aviones and the Fumane Cave), feathers, and bones believed to have been used for personal adornment, but even if it was not, Rebecca Wragg Sykes(2020) suggests the significance lies in their meticulousness to collect pigment from sources some distance away, and the use of pigment suggests the item was meant to be seen-it was put on the item for a reason.

Altamira was the first identified site of Palaeolithic cave art.[8] The history of its discovery and acceptance provides an important backdrop for the dating debate. Discovered in 1868 by a hunter freeing his dog from the rocks (Bahn, 1997; David, 2017). He then showed the site to Marcelino Sanz de Sautuola, a local nobleman. Sanz de Sautuola visited the cave in 1875 and noticed the black paintings on the walls but thought little of them until he saw an exhibit in Paris on Ice Age objects in 1878. He returned to the cave and found prehistoric tools and portable art on the floor near the entrance while his young daughter spotted polychromatic images on the ceiling. In 1880 Sanz de Sautuola published a book on his discoveries at Altamira without providing dates on any of his findings (Bahn, 1997). A colleague, palaeontologist, Vilanova y Piera, presented Sanz de Sautuola's findings to an International Congress of Anthropology and Archaeology in Lisbon, with most of Europe's foremost prehistorians in attendance. Reactions by some of Europe's most influential scholars; Montelius, Pigorini, Virchow, Lubbock, and Cartaihac suspected fraud and rejected the findings of Sanz de Sautuola and Professor Vilanova y Piera (David, 2017).

In 1881 Edouard Harlé, a French engineer examined Altamira and wrote that the paintings were too good to have been done by 'prehistoric savages' (Bahn, 1997): a reflection of European scholarship when evolutionary thought considered Palaeolithic people too primitive for such refined artwork (David 2017). In 1899 a French prehistorian, Emile Riviére, excavated Altamira and found a Palaeolithic lamp with an engraved Ibex that he used as a comparison to date the images: thus, his findings became more accepted.

Similar stories of early excavations were repeated time and again throughout Spain and France. Limited support was provided by the greater scientific society for the existence of the prehistoric paintings or engravings It wasn't until 1902 when the Montauban Congress of the French Association of

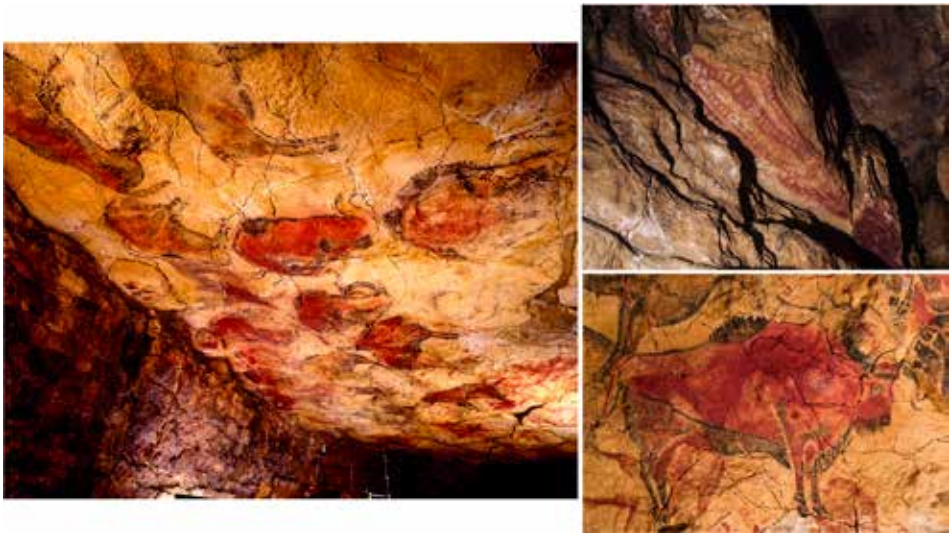


Figure 5. Altamira images: polychromatic bison images ceiling, claviform signo rojo, and detail of bison. Note the various layers of images beneath the bison. Images with the collaboration of the National Museum and Research Center of Altamira, Ministry of Culture, Spain. Photos by P. Saura

the Advancement of Sciences visited caves in the area of Les Eyzies (Lascaux) that the existence of prehistoric cave art was affirmed—this was some two decades after the first discovery (Renfrew, 2007; Bahn, 1997).

The images in Altamira have been radiocarbon dated from between 14,820 to 13,150 years ago (Bahn, 1997); however, research using U-Th dated a large red claviform to 36 ka (Aurignacian) and established painting in the cave took place over a period of more than 10,000 years (Pike et al., 2012). The cave is 296 meters long (971 ft.) and based on archaeological remains was occupied during the Solutrean (c. 21.0-17.0 ka) and Magdalenian periods (c.17.0 -11. ka). The chamber with most of the paintings has a height of 1.2 -2.7m. (3.8-8.7 ft.) suggesting there was a degree of difficulty painting the ceiling. Bisons are the dominate animal drawn with a lesser number of horses (Fig.5). There are also numerous anthromorphic figures, handprints, and hand stencils. It is believed the ceiling was not painted as a single continuous act. The main colors used were black (charcoal) and dark red (ochre pigment). In 2001 an exact facsimile of the cave opened within meters of the original; the original cave is open to researchers granted by a special permit (Lasheras, 2009).

In 2018 images at El Castillo and La Pasiega, both within the Altamira World Heritage area, were dated to a period before *Homo sapiens* were believed to have been in the area using the Uranium series dating (Hoffmann et al., 2018a), providing a stark contrast to the dating of Altamira. Both caves are located in the northern Iberian mountains. The U-Th method of dating precipitated carbonates has become a key procedure for obtaining ages of engravings and paintings made with inorganic materials—in the case of these caves- a dark red ochre pigment.

The *El Castillo* cave lies along the Pas River in Monte Castillo area in the same group of caves as La Pasiega. More than 100 images are located in several chambers (Pike et al., 2012). A polychromatic bison has been linked by style and technique to Altamira and dated to 13.0 ka (Bahn, 1997);

Figure 6. El Castillo: Partial overview of Panel de los Manos / The Panel of Hands. Photo by and used with permission of J. Zilhão.

however, a painted red disc on the Panel of Hands was found to have a minimum age of 34.1 ka (O-69) and a maximum of 36.0 ka (O-87) using U-Th which places the disc in the latter part of the Aurignacian (Pike et al., 2012), suggesting a period when both *Homo sapiens* and *Homo neanderthalensis* were known to be in the area and when either could have been the 'artist(s)'. The Pike research team also dated some hand stencils thought to have been made by blowing pigment onto the hand and then placing it directly on the wall of the cave (Fig. 6). The age of hand stencils is typically considered Mid-Upper Palaeolithic (Gravettian) based on direct radiocarbon dating in other caves in France and Spain. One hand stencil at El Castillo was dated to >24.2 ka (O-58) and another from the Panel de las Manos revealed a date of >37.3 ka (O-82) placing it in the Aurignacian period or earlier (Pike et al., 2012). The authors believe this implies that the "depictions of the human hand were among the oldest art known from Europe" (Pike et al., 2012, 1412). A large red disk nearby on the same panel made by the blowing technique provided a minimum age of 40.8 ka (O-83) backing up the date of the second hand stencil. The authors suggest the older date may provide a minimum for the entire panel that includes many abstract signs, numerous large disks and around 40 hand stencils. The findings suggest a concentrated artistic period during the pre-Gravettian times long before the 'classic' animal representations dated in other European locations (Pike et al., 2012; Zilhão, 2020).

La Pasiega cave had continuous human occupation throughout the last 100,000 years ago. (Hoffmann et al., 1918a). Discovered in 1911 and documented in 1913 by Henri Breuil. In 1924 the cave was designated as a monument of Spanish Cultural Heritage before being added to the Altamira WH site in 2008. The cave consists of an enormous gallery more than 120 meters long

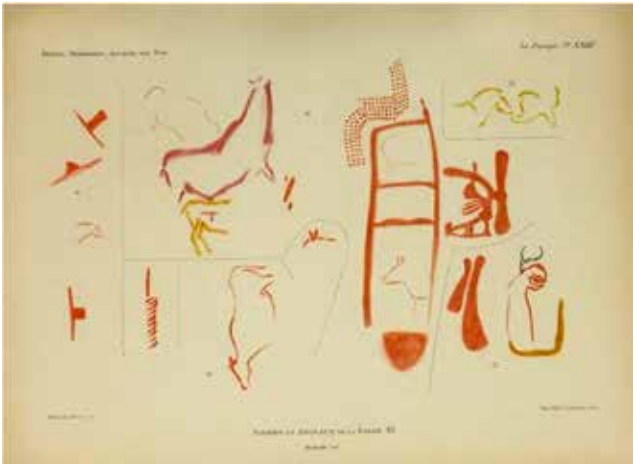


Figure 7. Breuil's documentation (1913) of La Trampa. Compare this to the actual image in Fig.8.

containing over 700 painted forms, which are comprised of groups of animals (ibexes, horses, bison, aurochs, reindeer deer, a Megaloceros), linear signs, claviforms, signs, dots, and possible anthromorphs painted in red and black. There are four zones or galleries (A-D), the focus in the present article is placed on gallery C, specifically a pictorial group (panel 78) called "La Trampa".

Breuil believed panel 78 (Fig. 7) showed two animals trapped by hunters; however, recent research posits the animals were added later. Hoffmann et al., (2018a) using the Uranium Thorium method dated three samples (outer, middle, inner) of a "cauliflower" type carbonate formation on top of a red scalariform sign (PAS 34a, PAS42b, & PAS34c) to a minimum corrected age between 50,470 to 64,760 years ago (respectively), the age increased moving towards the pigment layer (Fig. 8). Ludovic Slimak 2018 comments on the findings suggested the sample results of PAS34 would be

Figure 8. La Pasiega Panel 78 La Trampa with cauliflower deposit. Left: A.W.G. Pike and D.L. Hoffmann taking a sample from 'cauliflower' carbonate formation over pigment (inset before sampling) Image to right shows panel and approximately where sample in left image was taken. All images by and used with permission of J. Zilhão.

closer to 47-54 ka with a different method of dating, which still dates the image to a period before modern humans were in the area (Zilhão, 2020). The dot sequence to the upper left using U-Th was dated to 12,600 (+/- 100 yrs).

In 1968 André Leroi-Gourhan's broad chronology of four 'styles' based on the characteristics of securely dated portable and parietal figures was the most accepted dating until direct dating was developed (Bahn, 1997,69). He placed most of gallery C at the start of the 3rd period (~20 ka) and the early 4th period (~15 ka), which agrees with the dating of most cave art in Spain but is in direct contrast with the above results using U-Th dating, except for the dot sequence.[9]

Maltravieso located in western central Spain (Extremadura) was discovered in 1951 after an explosion in a nearby quarry. It wasn't until the 1990s that research in the cave began and found some of the paintings dated to the Middle Palaeolithic. There are +70 hand stencils, engravings of animals (bovines, ibex, a horse, deer) and symbolic lines of dots, finger marks and triangles painted in black and red ochre (Collado & Garcia, 2013). It was used at various times over the past 180ka (Hoffmann, et al., 2018a). The international research team lead by Hoffmann found one hand stencil (MAL13) with a deposit of carbonate overlying and almost obscuring the stencil's red pigment; therefore, they used DStretch software to enhance the image (Fig. 9). With the use of U-Th, it was dated to 66.7 ka, long before *Homo sapiens* established themselves in Spain (Hoffmann et al., 2018a; Zilhão, 2020).

Cueva de Ardales (Andalucia) is an important cave in southern Iberia, 50km from the Mediterranean coast. In context of the Andalucia and Gibraltar regions, Cueva de Ardales is part of a series of 32 sites with Palaeolithic rock art. It was first discovered 1821 after an earthquake exposed its entrance previously covered by sediments. In 1918 Henri Breuil was the first to recognize the Palaeolithic art within and later documented part of it. The complete inventory was documented in 1990 (Cantalejo et al., 2006) and the first excavations were carried out between 2011-18 by a Spanish and German team who focused on the cave entrance (Ramos-Muñoz et al., 2022). The site is divided into five areas containing over 1000 paintings and engravings including hand stencils and prints, dots, discs and other geometric shapes, and figurative representations of animals (horses, deer, and birds) (Ramos-Muñoz et al., 2022; Hoffmann et al, 2018a).

Fig. 9. Maltravieso hand stencil GS3b. Top: original image shows cauliflower location, also noted by black arrow at the top center of the lower D-stretch enhanced image. Inset shows the dated cauliflower sample (MAL13), after sampling. Photo of D-stretch, H. Collado; original photo, J. Zilhão; both images courtesy of J. Zilhão.

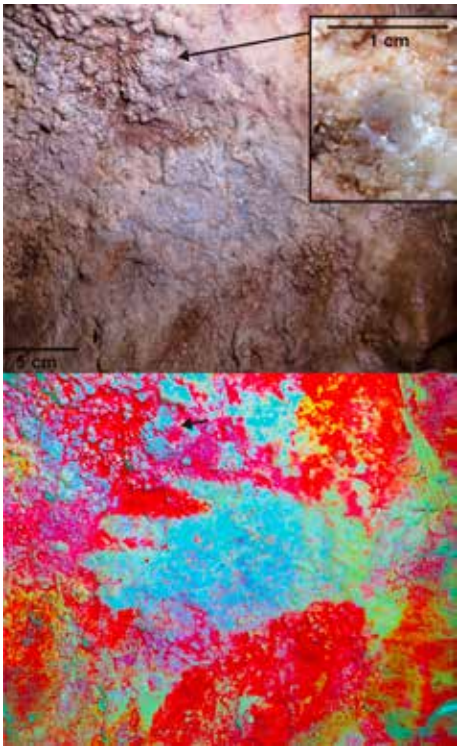


Figure 10. Cueva de Ardales: Layers of Carbonate curtains with red pigment. Photos by and used with permission of J. Zilhão.

Findings by Ramos-Muñoz et al. (2022) suggest the cave was occupied during the Middle and Upper Palaeolithic (Gravettian and Solutrean). Their dating agrees with U-Th research on some of the red non-figurative paintings near the entrance (Hoffmann et al., 2018a). Hoffman and his team dated five layers of carbonate curtains (Fig.10) from three areas (II-A, II-C, III-C) that had been painted with red pigment (Zilhão, 2020). In three cases they were able to sample directly *under* the pigment and on *top* of the carbonate providing maximum and minimum dates. The results showed different periods; one between 48.7 ka and 45.3 ka ago (ARAD14 and 15), 45.5 ka and 38.6 ka ago (ARD 26 and 28), and 63ka and 32.1 ka (ARD 6 and 8). Two other samples (ARD 13) provided minimum dating of 65.5 suggesting an earlier period while sample (ARD 16) provided a date consistent with the others at 45.9 ka (Hoffmann, et al., 2018, p.913) and agrees with the Middle Palaeolithic radiocarbon dates obtained in zone five (Ramos-Muñoz et al., 2022, 15-16). This is important as ochre is the source of the red pigment. Other abstract shapes of various sizes along were found in the entrance along with hand stencils—with the exception of two negative hand stencils, all paintings were executed in red pigment (Ramos-Muñoz et al., 2022). More red non-figurative marks were located in other sections of the cave close to the interior; however, over 90% of the images in the cave are representations of animals. The evidence supports the hypothesis that "non-figurative paintings represent the beginning of a long rock art tradition in Cueva de Ardales" (Ramos-Muñoz, et al., 2022, 26).

The research discussed above changes the idea of symbolic material culture being attributed only to *Homo sapiens*, yet the debate continues, Ludovic Slimak (2024) repeated his stance that the idea of "Neanderthal art is based on very little" (129). Hopefully, future research will lead to fully understanding cave art's role in hominin evolution and development during the Middle and Upper Palaeolithic. The question remains; Were they clever enough?

Summary of Part I

Those of us who have been involved with any form of rock art appreciate how difficult accurate dating and understanding

its meaning are. A fitting summary of Part 1 comes from *Seeing and Knowing: Understanding rock art with and without ethnography* (Blundell, Chippindale, and Smith, 2010) where the authors point out the largest error is, and what in my mind lies behind the U-Th dating debate, that as researchers we attempt to make sense of the past by placing it in "some relation to the present" because that is what we have direct knowledge of. In the first chapter they write:

So all issues of archaeological understanding have to do with what the Victorians called 'uniformitarianism', and its central paradox: we can understand and make sense of the past by its sameness, to the extent that is matches what we observe in the present, but a main reason we are interested in the past, especially the remote and other past, is that it shows or may show great or fundamental difference...Applying methods developed in one region or for one type of material or with a certain source of social knowledge to other regions or materials or social contexts raises important questions of this uniformitarian kind—some of them about how we understand meaning in the art, about social role of the images and about how we look at the images themselves (5)

In 2018 an international team of researchers (Hoffmann et al.) found the oldest minimum age for the three caves (El Castillo, Maltravieso, and Cueva de Ardales) was older than 64.8 thousand years ago using U-Th dating. This predates the arrival of modern humans in Europe between 45,000 and 40,000 years ago (Hoffmann et al., 2018a; Zilhão, 2020). The sample results from El Castillo reveal a period during the Aurignacian, suggesting the artist(s) could have been Neanderthal or *Homo sapiens.* Discussions/ debates on the beginning of symbolic behavior and its relation to the cognitive ability of Neanderthals will continue. Recent research implies other caves drawings in Western Europe *could* also be of Neanderthal origin; suggesting the "red painted draperies, hand stencils, and linear symbols are universal and when part of a complex superimposition, always form the base of the pictorial stratigraphies" (Hoffmann et al., 2018a, 915). Traces of faded red pigment can be seen several layers under the representative images of animals in Altamira, Lascaux, and Chauvet, yet most scientific research focuses on dating only the top layer, the 'representative' polychromatic images containing charcoal dated with ^{14}C. Is it possible future research will reveal the layers of abstract red ochre images under the black charcoal lines may point to the cognitive *process* of developing symbolic behavior *before* the 'classic' representation of animals were placed over them?

Hoffmann et al. (2018a), suggest the long debate over the "authorship" in Europe regarding cave art and objects of personal ornamentation closes the notion that Neanderthals lacked the ability for symbolic behavior at the time *Homo sapiens* were moving into Europe (915). Whether the cave art sampled in the research can be conceived of as symbolic, the hand stencils require a selection and preparation of pigment and a light source that suggest "evidence of premediated creations" (Hoffmann et al., 2018a, 914). Is the debate over, or does is it further illuminate the need of an academic discussion on authorship of cave paintings and the dating methods, and the specifics on how samples are taken and the analysed parameters for both ^{14}C and U-Th? The earlier dating of cave art indicates the continuation of a cognitive process of symbolic behavior of creating from the middle Palaeolithic to 'art' into the Upper Palaeolithic. Jean-Jacques Hublin, posits, for those who place cave art as the cognitive gap between *Homo sapiens* and Neanderthals, the new findings reduce that distance (in Appenzeller, 2018).

Part II continues the discussion with a brief historical background on Neanderthals before investigating recent research regarding their symbolic material culture (tool technology, burial practices, personal ornamentation). It will be in published in the 2025 *Adoranten* (c. May 2026), or for those you can't wait you will find it online later this year at RockArtScandinavia.com

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Notes

[1] A *rough* guide to **The Palaeolithic** (The Old Stone Age) timeframe in France and Spain. The period is divided into three periods: **Lower** (~2.6 mya-50 ka), **The Middle**: ~300-50ka is known as the period of the Neanderthal, also known as the Mousterian. **The Upper Palaeolithic**: ~50-12 ka, the period of *Homo sapiens* is divided into four periods: Augrignacian starts c. 30 ka; Gravettian c.25 ka; Solutrean c. 20 ka; Magdalenian c. 15-10 ka (Bahn, 1997, 13). The abbreviation **ka** denotes one thousand years, i.e., 50 ka reads 50,000 and **mya** denotes millions of years ago.

[2] In Chapter Four of *Aesthetics of Rock Art* (2005), Howard Morphy writes, "The fact that the notion of art is used as a criterion for identifying the emergence of fully modern humans, 'people like us', is interesting in itself. It may tell us as much about the way in which we see ourselves, the kind of animals we think we are, as it does about the prehistoric societies that we study. The question, 'When did people first begin producing art?, implies not simply, 'When did they acquire certain cognitive capacities?, but potentially, 'When did they develop certain reflexive dispositions toward the world?', 'When did they begin to recognize the aesthetic potential of forms'?" (59).

[3] Renfrew points to a more robust and significant period of 'human revolution' taking place during the Neolithic in western Asia and Europe: a transition from hunter gatherers to a period of early agriculturalists with innovations of food production, use of grindstones, exploitation of domestic animals, permanent dwellings in village life, production of pottery vessels, etc. (2007, 82-83).

[4] The exceptions being the Iberian caves mentioned in the article and the paintings of extinct pigs on cave walls in Sulawesi, Indonesia dated to 51.2 ka (see, Aubert et al., 2014). The Sulawesi pigs were also dated using U-Th, with little or no controversy regarding the dating or methodology, unlike the Iberian cave painting research in 2018.

[5] For readers wishing a deeper understanding of radiometric dating, reference is made to Richard Dawkin's *The Greatest Show on Earth: The evidence for evolution, Chap.4* (2009). Colin Renfrew (2007) provides an entire chapter on the background and complexities of radiometric dating, specifically carbon-14; additionally, Paul Pettitt and Alistair Pike's (2007) article on Dating European Cave Art discuss the pros and cons of both methods.

[6] See the following articles on Chauvet: Combier, J. & Jouve, G. (2012). Chauvet cave's art is not Augrignacian: a new examination of the archaeological evidence and dating procedure, *Quartär 59*, 131-152; Pettitt P, Bahn P. (2015). An alternative chronology for the art of Chauvet cave. *Antiquity 89*(345):542-553. doi:10.15184/aqy.2015.21; Quiles, A, Valladas, H., Bocherens, H. et al. (2016). A high -precision chronological model for the decorated Upper Paleolithic cave of Chauvet-Pont d 'Arc, Ardèche, France, *PNAS. 113*:17, 26 April, pp. 4670-4675.

[7] The eighteen caves are: Five in Asturias: El Pindal, La Peña de Candamo, Lionin, Tito Bustillo & La Covaciella; Ten in Cantabria: Chufin, Hornes de la Peña, Las Monedas, **La Pasiega**, Las Chimeneas, **El Castillo**, El Pendo, La Garma, Covlanas & **Altamira**; Three Basque sites: Santimamiñe, Ekain, and Altexerri. Names in bold have images dated to before *Homo sapiens* were in the area. The additional caves were added to the Altamira and Palaeolithic Cave Art of Northern UNESCO World Heritage list in July of 2008.

[8] For a comprehensive overview of Altamira see, José Antonio Laseras' article, The Cave of Altamira 22,000 years of history, *Adoranten*,2009, pp.1-33.

[9] In their 2007 article, 'Dating European Palaeolithic Cave Art: Progress, Prospects, Problems' Paul Pettitt & Alistair Pike provide a comprehensive background on the pros and cons of various methods of dating cave art, albeit it was written before the U-Th debate concerning the caves mentioned in this article.

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Abstract for Part II

Palaeolithic Art & Neanderthals: Were they clever enough? PART II- Lithics, Burials, & Symbolic Ornamentation

Who were the Neanderthals and what forms of symbolic material culture did they engage in? Part II provides a further historical background and overview of research over the past two decades on Neanderthals symbolic material culture to support the discussion in Part I on Iberian cave art on whether they had cognitive ability. No one disagrees that Neanderthals are not us- they are not the same as Homo sapiens. The question of cognitive ability centers on how Neanderthals are fundamentally different. Within that lies a cognitive process involved in knowing the needs, sources, or planning be it for tool making, mortuary practices, or fishing-hunting-gathering for food, personal adornment, or making images on cave walls. The act of doing is an extension of the mind embedded in a specific action. Humans think by constructing signs, the process involves the movement of the body, specifically the hands: Intelligence is enacted through the action of creating. It is important not to limit the define humanity as one homogenous group or to confine the definition of mind as something encased in the brain: Both limit our understanding of 'other' cultures. Research points to a Middle Palaeolithic transformation that transgressed current national boundaries and lead to an increase of symbolic material culture in the Upper Palaeolithic- not the beginning of it.

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