

Chapter 20

Evolution and the Origins of Visual Art: An Archaeological Perspective



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Introduction

The history of the first discoveries, identification, recognition, and scholarly reception of Palaeolithic art may be one of the most exciting and dramatic tales in the annals of archaeology. The story begins in the late nineteenth century, with the recurrent find of small figurines and carved images in French prehistoric sites, such as La Madeleine. These finds of so-called Ice Age portable art pieces were followed by the discovery of the spectacular painted cave of Altamira, Spain, in 1879 by Sanz de Sautuola. Initially thought to be a fake, Altamira was dismissed by the academic community. It would take 14 years and consequent discoveries of painted caves to convince scholars of Altamira's authenticity, and finally, in 1902 the cave was recognized as a true 'masterpiece' of prehistory, leading to a re-evaluation of cave paintings as humankind's 'first art' (Bahn and Vertut 1997; Cartailhac and Breuil 1903; Conkey 1987; Grand 1967; Lewis-Williams 2002; Pfeiffer 1982).

During the twentieth century, the corpus of European Palaeolithic art became increasingly more abundant, impressive, and ancient. Moreover, since the beginning of this century, finds from African and Middle Eastern sites have forced archaeologists to reconsider not only the initial age of visual art (from 25,000 to 100,000 years ago) but also the location of its emergence (from Europe to Africa) and even the kinds of artefacts that may be considered as art (from paintings to beads). Despite these recent and radical changes spurred by the material record, most archaeological explanations for art's origins have remained fundamentally the same since the first part of the twentieth century. The focus remains on the content of the artworks (e.g. symbolism, information, ritual, etc.), while pleasure, emotion, expression, and religion are still invoked as the prime motives for visual art-making, just as they were over a century ago. As an alternative to these archaeological narratives, evolutionary scholars have developed what have now become some of the most influential hypotheses about the origins of art. These approaches rely on behavioural and biological science and are at the centre of topical debates on the evolution of human cognition and behaviour; however they have seldom been assessed in view of the archaeological evidence of early visual art. The aim of this chapter is precisely to carry out such an evaluation in order to show that the collaboration between evolutionary thinking and archaeology can eventually lead to a better understanding of the emergence human culture, as a whole, and of art in particular.

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The study of visual art from an evolutionary point of view has a long history which can be traced back to Darwin's *The Descent of Man*, where he discussed the evolution of the mental powers and the aesthetic preferences of humans, as a whole and in regard to art (2004) [1879]. Since then, scholars have attempted to account for the place of art in human biology, and vice versa, to explain art-making as a biological phenomenon (Alland 1977; Huxley 1966; Morris 1962). Thanks to anthropological data from across the globe, we know that some sort of visual art is present in every known human culture and is therefore considered a 'universal' human behaviour that involves a propensity to make and/or mark objects with visual patterns or properties (Dissanayake 2010). Two main lines of thinking address the species-wide presence of visual art. The first suggests that visual art may have evolved not because it had a value in itself but because it was coupled to adaptive traits, that is, by 'piggybacking', for instance, on general intelligence, or as a side-effect of visual and perceptual biases (De Smedt and De Cruz 2012; Verpooten and Nelissen 2010), being retained only because it was pleasurable (Pinker 1997). The second view maintains that art most likely had a genuine 'adaptive value' throughout human evolution, meaning that it was shaped by natural selection because it somehow contributed towards the survival and reproduction (i.e. fitness) of the individuals that displayed it and may even be considered a human adaptation (Dissanayake 1980).

On this chapter, I will focus primarily on the second view, as it has generated the most interest in the academic community. Scholars working from this perspective have often started out by asking what art evolved for. There has been no shortage of proposals to answer that question,¹ but three main themes have prevailed: sexual selection, social bonding, and cognitive enhancement. These three hypotheses, in their different versions, are frequently cited in the literature on art's origins and have been the subject of many debates (Fig. 20.1). Most supporters and detractors of these models have based their arguments on the internal logic of the hypotheses or on mere affinity, but they have rarely evaluated them according to their compatibility with archaeological data. After a quick review of the archaeological record, we will see how the scenarios derived from these three hypotheses stand against the material evidence.

Identifying Pleistocene Visual Art

The Pleistocene is the name of the geological era spanning from 2.5 million years ago up to 12,000 years ago by the end of the last Ice Age, which marks the beginning of the following geological epoch, the Holocene. It is in the Pleistocene where we find the earliest evidence for the emergence of both the human lineage and visual art. Therefore we will here use the term 'Pleistocene art' to refer to the oldest examples of visual art on record (Nowell 2006). We will define visual art as objects or patterns made, modified, and displayed to engage attention through the manipulation of visual qualities like colour, shape, texture, brightness, etc., as well as the processes involved in their production (Mendoza Straffon 2014).

Archaeologists, however, often struggle to identify art objects among other traces of past human activity from the remote past. Most researchers have traditionally related art objects to qualities that amount to 'beauty', like symmetry, balance, and elegance (Currie 2011). However, an aesthetic element is not sufficient to define art (van Damme 2008), and by the same token, the 'aesthetic' is not limited to beauty. Rather, aesthetic features include all perceptible, attention-grabbing, visually arresting properties, whose effects need not be pleasing. Despite that, artefacts which have been

¹Dissanayake identified at least nine of these proposals (2007), each suggesting that art evolved for some specific purpose: pattern recognition, mental problem-solving, adaptive decision-making, increasing mating opportunities, supporting religious behaviour, providing fictional scenarios for action-planning, social manipulation, social cohesion, and cognitive enhancement.

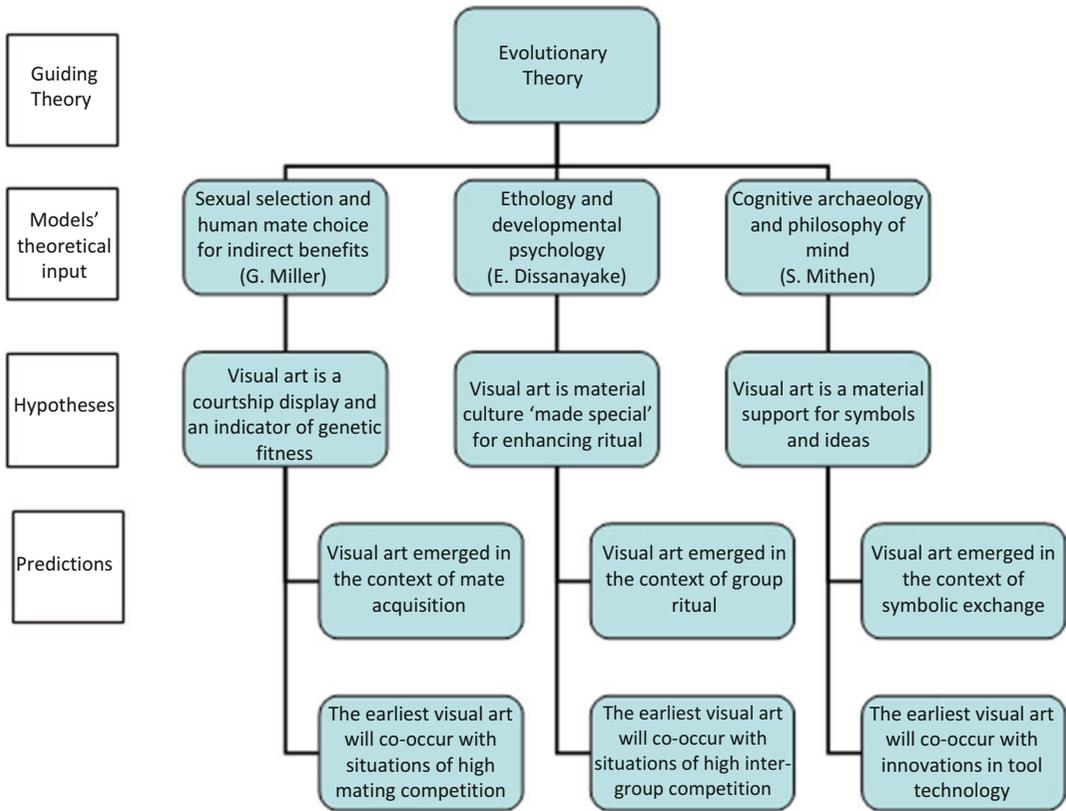


Fig. 20.1 Theoretical scheme of the three hypotheses for the origins of art examined here

produced to comply with gratifying aesthetic properties are more easily identified as artworks by cultural outsiders (Davies 2000). In the end, we classify visual art by analogy to what we historically know to be art (Moro Abadía and González Morales 2010).

Another criterion often used is ‘non-function’, that is, whenever an artefact does not seem to have any other function other than aesthetic or symbolic, it is often categorized as an artwork (Chase 1991; D’Errico and Villa 1997). However, it is difficult to say with any certainty whether an item has had a utilitarian function or not. Furthermore, neither the aesthetic nor the symbolic are exclusive properties of art, so they do not offer an answer to the question of how to distinguish art from non-art. Perhaps we had rather remind ourselves that visual artworks not only are aesthetic and symbolic but also are powerful communicative tools made to be displayed and perceived and that this may actually be their ultimate function (Mendoza Straffon 2014). Therefore, display will be an important criterion for identifying visual art. That is, when display can be inferred as a primary function of aesthetic or symbolic artefacts, then we may categorize them as visual art.

Finally, conceiving of visual art as part of a cultural system implies that it should appear as a recurrent practice in the archaeological record, and not only as an accumulation of isolated or ‘one-off’ cases. Cultural traits are typically socially shared, persistent, and variable in a population (van Schaik & Pradhan 2003). Therefore, continuity and/or recurrence in a constrained chrono-geographical span is used as an inclusion criterion. As a result, the present survey of Pleistocene visual art includes forms occurring at more than one site within the same time range and within a particular geographic region; forms that occur at more than one archaeological level in one site (suggesting transmission of cultural behaviour over time); and forms that are quantitatively significant at any given site or

period (suggesting that they were used and/or produced by several individuals, i.e. culturally shared behaviour). Overall, the corpus includes evidence related to activities such as the colouring and painting of surfaces, personal and artefact ornamentation by various techniques, and the inferred intentional transformation of materials towards decoration or representation.

Visual Art Before Homo sapiens

The existing literature on prehistoric art often discusses a handful of artefacts as potential ‘firsts’ of visual art forms. Three of the most prominent examples are the Makapansgat pebble, the Berekhat Ram figurine, and the Tan Tan statuette. These objects apparently show intervention by hominins and are said to represent ‘the earliest example of some kind of aesthetic sense, or at least evidence for recognition of a likeness’ (Bahn and Vertut 1997, p. 23). The Makapansgat pebble, which resembles a human face, was found in the context of a 3-million-year-old site belonging to *Australopithecus*. The Berekhat Ram statuette was recovered in Israel and estimated to be 250–280,000 years of age and is made of volcanic tuff that was artificially enhanced apparently to make it look like a female figure, which incidentally resembles an Upper Palaeolithic ‘Venus’ (D’Errico and Nowell 2000). The Tan Tan figurine is an anthropomorphic quartzite fragment found in a 400,000-year-old site in Morocco. Like the previous piece, this one also seems to have been partly shaped through human intervention and further has some minuscule traces of red pigment (Bednarik 2003). Although these alleged cases of early art-like objects cannot be readily dismissed (Bahn and Vertut 1997; D’Errico and Nowell 2000), the lack of academic consensus surrounding their significance rather renders them as archaeological oddities. A recent interesting addition to this list of finds is the incised shell of Trinil, Indonesia. Originally excavated in the nineteenth century and rediscovered a few years ago in a Dutch museum depot, this shell was in the archaeological collection of Eugène Dubois, who dug the *Homo erectus* specimen known as Java Man. The surface of the shell bears a fine geometrical pattern whose meaning or intentionality remains unknown but which shows that by half a million years ago, members of the *Homo* lineage were already inclined to modifying objects through pattern-making (Joordens et al. 2015). But even if these artefacts represented an early aesthetic or formal recognition sense, as far as we can tell, they did not seem to constitute a systematic cultural practice nor do they seem as yet to be directly related to the development visual art in the late Pleistocene (Davis 1993).

The case for Neanderthal art seems more promising. There are a number of incised pieces of bone from Neanderthal contexts which have long been claimed to be of a symbolic nature. One of the best known comes from the German site of Bilzingsleben and bears some parallel markings (Mania and Mania 1998). However, the origins of these pieces have remained debatable (Mithen 1996), as it proves difficult to determine whether the incisions were made intentionally or as a by-product of other actions, such as sharpening cutting tools or defleshing the bone (Davis 1993).

Much more recently, a series of new findings have thrown light on Neanderthal behaviours that may be interpreted as ‘artistic’. The earliest of these is an architectural feature deep inside the French Cave of Bruniquel. It is made of stalagmites arranged in circles and has been dated to 175,000 years BP. The structure could not have been used for habitation, so the assumption is that it had a symbolic function (Jaubert et al. 2016). At two Spanish sites, researchers reported the presence of shells in Neanderthal occupation layers, dated to ca. 50,000 BP. At Cueva de los Aviones, four *Glycymeris insubrica* shells were found, and at Cueva Antón, another shell of *Pecten maximus* with pigment remains has been recovered. The authors suggest that these shells may have been used as personal ornaments (Zilhão et al. 2010). Finally, the recent dating of three rock art sites in Spain yielded ages of over 60,000 years for various painted motifs. Because these dates pertain to a period when seemingly *Homo sapiens* had not yet entered Europe, they indicate that the paintings must have been made by Neanderthals (Hoffmann et al. 2018). Although it may be too early to fully appreciate the

implications of these recent discoveries, they will definitely force researchers to reconsider much of what is known about the evolution of hominin cultures and of the origins of visual art. We must note, however, that even if these finds show that different *Homo* species developed artistic practices, each would have done so in response to their own particular social and environmental circumstances. That is, the evolution of art, like that of any other type of material culture, cannot be traced as a single, continuous line from *Homo erectus* to modern humans. For the same reason, we should not simply assume that the motivation behind art-making behaviours should be the same for all hominin populations. Hopefully, future research will focus on reconstructing and understanding the particular contexts in which Neanderthals, or any other species, may have created art.²

‘Modern’ Art

I reiterate that the focus of this chapter will be on (purported) *Homo sapiens* contexts. Unlike the previous examples, our species has produced artworks of sufficient quantity and quality to leave a clearer, more recurrent, identifiable trace in the archaeological record, which can help us place art practice in its context and therefore test hypotheses about the emergence of art.

According to the chronological order in which they first appear in the archaeological record and the amount of labour investment that they entail (time and effort), I have grouped Pleistocene visual art forms into five groups: pigments, personal ornaments, incised objects, carved figures, and painting. Evidently, these five categories are an oversimplification, and there is some overlap among them. For example, there is ochre on ornaments, there are engravings on ochre, some carved figures seem to have been used as pendants, and cave art usually includes a combination of techniques such as engraving, finger tracing, and painting. Furthermore, we must assume that there were several other art forms which have been lost to archaeology, such as sand drawings, designs on wood, fibres or leather, and body art. Many researchers in fact agree that the human body surely must have been the first canvas (Donald 1991; Schildkrout 2004; Turner 2012). Ethnographic examples of body art include several techniques applied to the skin, teeth, and hair, like shaping, cutting, piercing, scarifying, tattooing, branding, and painting. We could also include here hairstyles and clothing (Gilligan 2010). Traces of these practices naturally disappear with the decomposition of the human body and organic matter; however, some indirect evidence can be used to infer them, like the presence of ochre pigments.³

In sum, the following survey offers a general overview of the earliest examples of such objects, which may be compressed in five categories: (1) pigments, (2) personal ornaments, (3) incised objects, (4) carved and sculpted figures, and (5) painting. The classification somewhat reflects the chronological sequence in which the various art forms appear in the record and, to some extent, correlate with an increase in technical and organizational complexity.

Ochre Pigments

Ochre is a generic term that encompasses several naturally occurring minerals with high contents of iron oxides that produce a range of hues of yellow, brown, orange, and red. Typical ochre minerals

²For a complete review of all purported art objects of Neanderthal origin, see: David (2017), Langley et al. (2008), Roebroeks (2008), and Zilhão (2007).

³Body art (e.g. tattoos, scarification, painting) and the use of garments can also be inferred from figurative art. For example, the ‘Venus’ figurines have proven a valuable source of information about Palaeolithic female hairstyles, headgear, and garments and of possible body art patterns (Soffer et al. 2000). Rock art from the European Palaeolithic has also provided some clues about the use of complex clothing and hats (Gilligan 2010).

like limonite or hematite can be rubbed directly on surfaces to apply colour or be crushed to produce powders of reddish hues that can then be used as pigment (Henshilwood et al. 2011). Other naturally occurring minerals which may be used for pigment production include, among others, gypsum and kaolin (white) and charcoal and manganese dioxide (black). The archaeological evidence of pigment use is ambiguous in that we often only find ochre as a raw material or traces of its processing, and most of the time, its final purpose has to be inferred by the researcher (D'Errico et al. 2012).

Evidence from various sites, most notably Kapthurin in Kenya (Barham 2002; McBrearty and Brooks 2000) and Twin Rivers in Zambia (Barham 1998, 2002), includes the accumulation of large quantities of ochre minerals (e.g. limonite, hematite, specularite), some of which show traces of intentional abrasion, indicating that they may have been scraped and rubbed onto surfaces to obtain yellow and reddish colouration (Barham 1998, 2002). Conservatively, the dates from these sites indicate that by 270,000 years BP, African hominins already 'had incorporated color into their lives' (Barham 2002). Since the origins of our species may go as far back as 300,000 BP (Hublin et al. 2017), this would mean that from very early on, our ancestors were interested in these minerals and their properties (Barham 1998).

The best example of early ochre exploitation by *Homo sapiens* comes from the South African site of Pinnacle Point (Marean et al. 2007; McBrearty and Stringer 2000), where archaeologists found an accumulation of over 50 pieces of red ochre, a dozen of which showed traces of use (grinding and scraping), dated to 164,000 BP (Marean et al. 2007). There is much more evidence of ochre extraction in South Africa during the Late Pleistocene. Ochre use is recorded at the sites of Klasies River and Howiesons Poort going back to 100,000 and 80,000 years BP, respectively. The archaeological material from Border Cave includes hematite 'pencils' older than 100,000 years, and Blombos Cave has a record of ochre exploitation spanning multiple stratigraphic layers dated from 100 to 75,000 years ago (McBrearty and Brooks 2000; Watts 2009).⁴

At Blombos Cave, two recent finds have revealed the sorts of activities and materials involved in ochre processing and its use. The first is an ochre-processing workshop that includes two toolkits used for producing and storing an ochre mixture. The toolkits consist of two abalone shell containers, a stone cobble, probably used as a hammerstone, mineral residues from grindstones, crushed bones whose marrow could be used as a pigment binder, charcoal, and red ochre. This find has been dated to ca. 100,000 years BP and is the best evidence that in the MSA, humans were purposively exploiting ochre for pigment extraction (Henshilwood et al. 2011). The second find, highly relevant to the discussion of visual art's origins, is a stone flake displaying a cross-hatched pattern drawn with a red ochre crayon some 73,000 years ago (Henshilwood et al. 2018). Even though this piece is only a fragment of what must have been a larger design, its significance is huge not only because it demonstrates that the Blombos humans were in fact using ochre pigments to depict visual signs for decoration or communication (and not only for 'practical' purposes), but also it pushes back the origins of drawing as a technique by 30-odd thousand years. That drawing had been practiced by early modern humans was somewhat implied by the previous finds of hematite 'pencils' mentioned above, but the Blombos drawing finally shows with certainty how and what for these ochre instruments were used.

There are other early examples of ochre extraction and use outside Africa. In the site of Qafzeh Cave, in Israel, several lumps of red ochre with traces of scraping have been recovered from stratigraphic layers dated to 92,000 BP. These pieces were transported to the site from outward locations where intense red-hued minerals (hematite) could be found, indicating the purposive

⁴The sites mentioned here only include the earliest samples of ochre exploitation but the actual record is much more extensive. For a general overview, see Watts (1999).

selection of and preference for particular raw materials. There also is a possible association of ochre occurrence with human burials and marine shells at this site (Bar-Yosef Mayer et al. 2009; Hovers et al. 2003).

In Europe, the use of ochre minerals is well documented in the Neanderthal archaeological record of the Middle Palaeolithic, particularly towards the end of that period, between 60 and 40,000 BP (D’Errico et al. 2008, 2010; Soressi and D’Errico 2007; Roebroeks et al. 2012; Zilhão et al. 2010). Iron oxides producing orange, yellow, and red were exploited, although in low quantities. The most common colour mineral used among these hominins was manganese dioxide, which produces a black pigment (D’Errico et al. 2008). However, the differences in ochre use between the Middle and Early Upper Palaeolithic are both quantitative and qualitative. In the latter, not only is the frequency of ochre exploitation much higher, but also the preference for the colour red is quite marked (Watts 1999, 2009). Furthermore, especially from the Gravettian onwards, red ochre is often found in burials (Riel-Salvatore and Gravel-Miguel 2013; Martínez González and Mendoza Straffon 2017).⁵ This suggests that red ochre might have played a much more important role in the lives and beliefs of modern humans.

Whether ochre use qualifies as evidence of human visual art behaviour has been hotly debated among archaeologists. Ochre can have many different utilitarian applications that would not necessarily involve any artistic intentions (Wadley 2005). For example, the minerals may have been used to treat and preserve animal hides (Dubreuil and Grosman 2009); mixed with resins and wax to produce an effective adhesive (Wadley 2005); consumed for their antiseptic, astringent, and deodorizing qualities (Velo 1984, 1986); or used as ‘sunblock’ (Ellis et al. 1997). There is no need, however, to divorce the utilitarian from the artistic. Ethnographic data show that pigments may be used in both practical and symbolic contexts and that these are not mutually exclusive (McBrearty and Stringer 2007). So, it is rather likely that throughout early prehistory, pigments were used for practical reasons as well as for personal and artefact ornamentation and in ritual.

It is however significant that in sites attributed to *Homo sapiens*, highly red-coloured minerals were recurrently targeted and preferred over blacks or whites, which points to an intentional selection that would not be expected if pigment use had been strictly utilitarian (McBrearty and Stringer 2007; Watts 1999). The aesthetic use of red ochre is also suggested by the fact that Pleistocene ornaments (beads and pendants) often show traces of ochre, meaning that they were either purposefully coloured or they acquired it by contact with coloured surfaces (e.g. skin, hair, garments). Finally, the recent find of a red pigment drawing at Blombos Cave shows that ochres were at times used to depict visual signs on hard surfaces and opens up the possibility that they may have been used in a properly artistic manner.

In sum, ochre use seems to be an ancient human practice. Moreover, in both Africa and Europe, the appearance of modern *H. sapiens* is accompanied by an increase in the frequency and quantity of red ochre exploitation. So, even if by itself it remains ambiguous as evidence for visual artistic behaviour, the habitual occurrence of red ochre minerals (for pigment production) may be considered an archaeological marker of our species (Watts 2009).

⁵The association of red ochre and human burial is also observed in one of the earliest known archaeological sites in Australia, Lake Mungo, dated around 60–40,000 BP, where a modern human skeleton covered in red ochre pigment was found (Bowler et al. 2003; Klein and Edgar 2002, p. 248; Stringer 1999). It is notable that the source of the ochre was about 200 km away from the burial site, which implies that the material was specifically sought after and transported a long distance (Klein and Edgar 2002, p. 249).

Personal Ornaments

Archaeologists usually include in this category those small objects that were seemingly used for suspension or attachment (Kuhn and Stiner 2007b), such as beads, pendants, and ‘charms’ which could have been used to decorate garments or utensils, or as jewellery (White 1992). We can divide personal ornaments in the two subcategories of modified and manufactured ornaments.

Modified Ornaments

These include natural items that have been selected and frequently, though not always, modified presumably for display. These often entail collected materials, such as shells, stones, or animal teeth, that have been slightly altered to fulfil a new function, for instance, by polishing, perforating, or stringing them. The amount of labour applied is not considerable, although the modification process might still have required special knowledge and skills (Tátá et al. 2014). Even though such materials are often called beads or pendants, implying their use as jewellery, they could have equally been sewn to pieces of clothing or attached to personal items like bags, baskets, or domestic utensils (White 1992).

Since the discovery of a collection of shells dating from 75,000 BP at the site of Blombos Cave in South Africa in the early 2000s (Henshilwood et al. 2004), the number of shell bead finds and their ages have only increased. The evidence now indicates that by 100,000 years ago, at the latest, humans were using modified marine shells for display purposes, likely as personal ornaments. So far, the oldest of these early beads come from the Levant. In the 1930s, excavations at the cave site of Skhul in Mount Carmel, Israel, exposed a rich archaeological context dated between 100 and 135,000 BP. It included the buried remains of ten (modern human) individuals, lithic artefacts, and a few seashells, two of which were perforated and probably used as beads (Vanhaeren et al. 2006). At the nearby site of Qafzeh Cave (92,000 BP), ten marine bivalve shells were found, most of which have perforations, traces of use wear, and signs of stringing, and some of them also bear red ochre stains (Bar-Yosef Mayer et al. 2009). Seashell beads were also retrieved at the sites of Ksar Akil in Lebanon and Üçağizli Cave in Turkey, dating back between 41 and 43,000 BP (Kuhn et al. 2001).

In Africa, small marine shells probably used as ornaments have been found in several Pleistocene sites, from North to South. In Morocco, they have been recovered at Smuggler’s Cave (108,000 BP), at Pigeons Cave (82,500 BP), at Rhafas Cave (80–70,000 BP), and at Ifri n’Ammar (83,000 years BP) (Balter 2011; D’Errico et al. 2009). The 13 seashells (*Nassarius gibbosulus*) from Pigeons Cave were transported some 40 km and show intentional perforations and signs of wear, and one bears red pigment residues (Bouzouggar et al. 2007). Finally, the collection from the Musée de l’Homme in Paris included a *Nassarius* shell from the site of Oued Djebbana, in Algeria, with an estimated age of 90,000 BP (Vanhaeren et al. 2006). In South Africa, a rich collection of Pleistocene shell beads has been recovered at Blombos Cave. A total of 68 *Nassarius* shells are dated to ca. 75,000 BP. Microscopic and experimental analysis has indicated that these shells were probably pierced with a bone point, and some show traces of stringing and wear. Most of the shells were found in groups, indicating that each group might have constituted single beadwork items (Vanhaeren et al. 2013). The shells from Blombos illustrate that these objects were being used for display, probably as ornaments. Elsewhere in South Africa, Border Cave yielded a perforated *Conus* shell associated with a human burial, dated to 76,000 BP (Vanhaeren et al. 2013). Although the production of shell beads in sub-Saharan Africa apparently came to a halt after 70,000 BP, the evidence suggests that by 100,000 years ago, the use of personal ornamentation was a common practice in Africa and the Levant (Bouzouggar et al. 2007).

In Europe, personal ornaments do not appear very frequently until the Early Upper Palaeolithic, at the time related to the spread of modern humans into this region. Throughout the Aurignacian

(45–28,000 BP), there are abundant modified ornaments made often from marine shells like small gastropods (including *Nassarius*) and from mammal teeth, as well as a wide range of other materials, such as freshwater, terrestrial and even fossil shells, fish vertebrae, animal bone, minerals, crystals, and amber (Álvarez Fernández and Jöris 2008; Kuhn and Stiner 2007b; White 2007). Clearly, eye-catching lustrous (and often exotic) raw materials were selected to be modified into ornaments (Álvarez Fernández and Jöris 2008; White 1993). The use of modified natural objects as ornaments continued during the whole of the Upper Palaeolithic, but along these, manufactured beads also became common.

Manufactured Ornaments

In contrast to the previous type, manufactured ornaments have gone through a more elaborated and exhaustive production process, where the raw material has been collected, worked (sometimes extensively), and shaped into the final artefact.⁶ This process entails a greater investment of labour and skill, as well as good knowledge of the qualities of the raw material and the tools and techniques to modify it. These kinds of personal ornaments made from scratch appear in the archaeological record later in time than the modified sort and similarly could have been used as body decoration, to adorn artefacts, or even as garment closures or buttons (Gilligan 2010; White 1992).

The oldest manufactured ornaments in Africa are ostrich eggshell beads created by cutting and shaping ‘blanks’ of ostrich eggshell, which were then perforated and reduced to round discs. At Border Cave, South Africa, 14 of these beads were found in layers pertaining to 44–41,000 BP (D’Errico et al. 2012). At Enkapune Ya Muto rock shelter in Kenya, 25 ostrich eggshell beads in different stages of the production process were excavated in a layer dated to around 41,000 BP, revealing the laborious manufacturing method (Ambrose 1998a). At times, the beads were further modified by heating, to turn them dark (D’Errico et al. 2012), or by applying ochre (Ambrose *pers. comm.*). Nowadays, ostrich eggshell beads play an important role in the exchange economy of the contemporary! Kung San peoples of the Kalahari (Wiessner 1983). This suggests a function for the Pleistocene examples and presents the possibility of some cultural continuity in the region (D’Errico et al. 2012; Deacon 1992).

In Europe, there is a high occurrence of manufactured beads from the Early Upper Palaeolithic onwards. The most common raw material used in this region was mammoth ivory, but other materials like bone, antler, minerals, limestone, and amber were also habitual (Álvarez Fernández and Jöris 2008). The fabrication process of ivory beads has been well-studied and reveals that these ornaments were often semi-mass produced using standard shapes, some of which show regional patterning (White 1993). Ivory pendants could be created individually by carving and scraping a piece of ivory into shape, but more commonly beads were produced in series. This process involved preparing an ivory rod, dividing it in segments by thinning to produce preforms or blanks, perforating each preform, and then smoothing and polishing each blank into the final form (White 1989) (Fig. 20.2).

Greater variation in form is to be expected in beads produced from scratch, as the makers are not as constrained by the natural form of the raw material as in the case of modified natural objects like shells or teeth. The fact that some forms, materials, and production techniques were localized even within regions (Kölbl 2009) indicates that the knowledge involved in bead-making was socially transmitted and, as reproduction experiments have revealed, required considerable time and skill (White 1989). The modern reproduction of Palaeolithic beads reveals on the one hand a labour-intensive sequence, but on the other, it shows that people were maximizing production by using techniques that allowed the creation of several beads from a single piece of raw material, reducing

⁶White has used the term ‘purposely fabricated beads’ (1989), for what I have called ‘manufactured ornaments’.

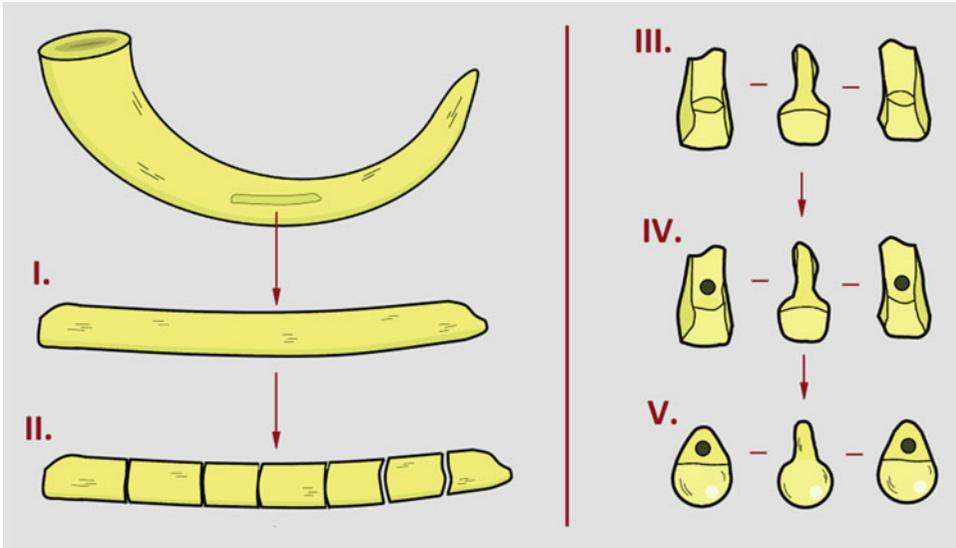


Fig. 20.2 Production process of Aurignacian mammoth ivory beads (after White 1989)

waste and time investment. This, along with the remarkable standardization of Aurignacian beads, hints at the ancient specialization of craft (White 1989, 1993).

The use of these artefacts as personal ornaments during the Early Upper Palaeolithic is supported by the fact that manufactured beads have often been found in burials (Riel-Salvatore and Gravel-Miguel 2013; Martínez González and Mendoza Straffon 2017). In the funerary sample from the Palaeolithic, manufactured beads are commonly found in the graves of adults and infants, and often near the head, neck, torso, and arms, suggesting these were most probably attached to headgear and items of clothing worn in daily life (Riel-Salvatore and Gravel-Miguel 2013). The possibility that both adults and children were frequently buried with their everyday ornaments supports the idea that these items had strong personal connotations of individual identity (Coe 2003; Kölbl 2009; Kuhn and Stiner 2007a, b; Vanhaeren 2005; White 1993; Zilhão 2007).

Incised Objects

This category includes all objects showing traces of intentionally made designs, generally by incision or engraving, on various materials. These patterns may not have required much effort to make, but probably great dexterity and precision were needed to create a discernible design on a surface (Henshilwood and D’Errico 2011; White 1996).

The earliest examples of this category come from various Middle Stone Age sites in Africa (Cain 2006; Henshilwood and D’Errico 2011). Most notably, in Blombos Cave, a collection of over a dozen engraved pieces of ochre dated between 100 and 75,000 years ago has been recovered (Henshilwood et al. 2009; Henshilwood and D’Errico 2011), as well as several bone fragments incised with linear patterns (D’Errico et al. 2001; Henshilwood et al. 2002). A few pieces portray clearly organized geometrical arrangements. The best-known example is the rectangular piece of reddish-brown siltstone which bears a double chevron design, recovered from a layer dated between 78 and 74,000 BP. Closer examination has shown that the piece was faceted and ground in preparation for the engraving (Henshilwood et al. 2009), indicating that the incising involved more than a spontaneous action. In Namibia, notched fragments of ostrich eggshell have been recovered from the basal strata

at Apollo 11, dating back to at least 83,000 years ago (Wilkins 2010). Another remarkable collection of incised ostrich eggshell pieces, of no less than 270 fragments, comes from the rock shelter of Diepkloof in South Africa, dated to around 60,000 years BP (Texier et al. 2010). These pieces show deeply engraved, well-arranged linear motifs. The incised eggshell fragments have been interpreted as the probable remains of ostrich egg water containers, like the ones used by contemporary San hunter-gatherers to collect and store water (Henshilwood and D’Errico 2011; Texier et al. 2010).

The archaeological assemblages of the European Early Upper Palaeolithic typically include incised objects such as engraved pieces of bone, ivory, and stone which have generally been classified as mobiliary or portable art (White 2003). Some of the earliest examples from the Aurignacian show linear patterns, dot arrangements, crosses, and some schematic motifs (Mellars 1996; Zilhão 2007); for instance, the bone and ivory shafts engraved with parallel and criss-crossed lines from Vogelherd, Germany, and Mladeč, Czech Republic, and the bone fragments engraved with linear motifs from Arcy-sur-Cure in France (Mellars 1996). Later engraved pieces, from the Gravettian, Solutrean, and Magdalenian periods, frequently feature figurative motifs as well, particularly animal figures and some humans. Engraved motifs are also a common component of European rock art. Cave and open-air rock art sites generally include numerous instances of linear, geometric, or representational patterns engraved on rock (Bahn and Vertut 1997).

Carved and Sculpted Objects

The production of carved or sculpted two- and three-dimensional objects involves a greater amount of work and expertise than the art forms that have been discussed so far. It requires a good knowledge of the base material, appropriate—perhaps specialized—tools, and, in the case of figurative motifs, artistic skill and an understanding of artistic conventions to properly depict the desired subject.

Carved figures are still absent from the archaeological record of Late Pleistocene Africa. The Eurasian Upper Palaeolithic, in contrast, includes several impressive examples of such items. The German region of Swabia has yielded what so far is the earliest tradition of figurative art, consisting of over 40 figurines carved in mammoth ivory, found across various Aurignacian sites dated between 40 and 30,000 BP (Conard 2003; Porr 2010).⁷ The caves of Hohle Fels, Geissenklösterle, Vogelherd, and Höhlenstein-Stadel, among others, contained dozens of figures depicting Pleistocene fauna (mammoth, horse, bison, lion, bear, water fowl) and a few anthropomorphic and therianthrope (human-animal) representations (Cook 2013).

The oldest of these carved figures so far is a female ‘Venus’ figurine from the basal Aurignacian layers at Hohle Fels, estimated to be some 40,000 years of age. The small figure is just 6 × 3.5 cm and shows a female body with exaggerated sexual features; it has a loop for a head which shows use wear, indicating that it was suspended and presumably carried or worn as an ornament or charm (Conard 2009). Its body is marked with grooves, and the right arm has some linear marks that could suggest a body art design (Cook 2013). But probably, the most notable of the Swabian carvings is the *Löwenmensch*, or Lion Man, from Höhlenstein-Stadel, which depicts a standing character with human and feline features (Fig. 20.3a). The body is very anthropomorphic, but the head, hands, and feet are clearly catlike. Like the Hohle Fels Venus, the Lion Man’s upper left arm bears a linear design that could be depicting body art. The figure, dated ca. 35,000 BP, measures 31.1 cm in height and was carved on a single mammoth tusk. Replication experiments have indicated that it would have taken up to 400 h of meticulous work to create it (Cook 2013). To some scholars, this figure denotes the

⁷Remains of what seems to be an ivory anthropomorphic figurine have been recovered at the Russian site of Kostenki. The possible human head has been dated to 42–45,000 BP (Anikovich et al. 2007; Cook 2013, p. 56), which would make it the oldest example of figurative representation yet found. However, identification is uncertain due to the worn condition of the piece.

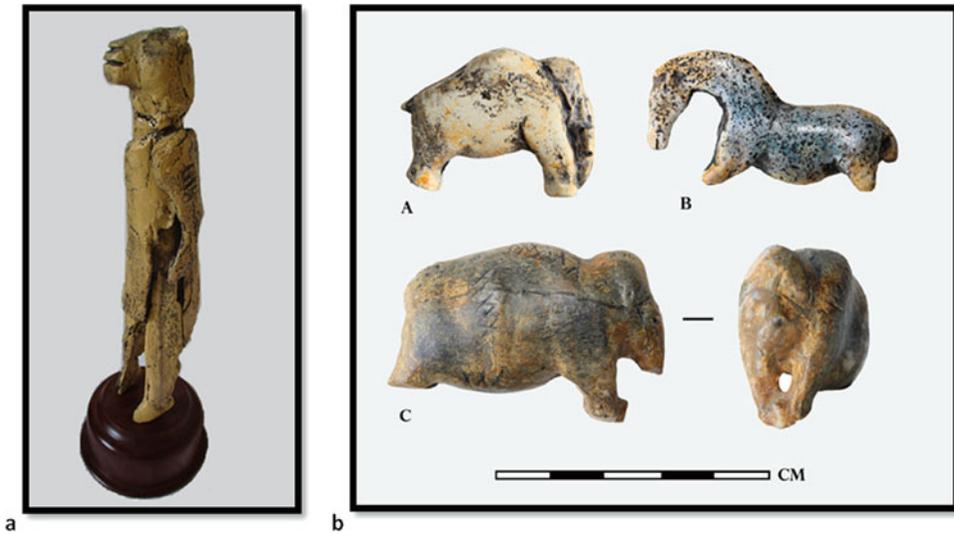


Fig. 20.3 Mammoth ivory figurines from Swabia, Germany (reproductions). (a) Lion Man from Höhlenstein-Stadel. (b) (A) Hohle Fels mammoth. (B) Hohle Fels horse. (C) Vogelherd mammoth

emergence of truly modern abstract thought, where the fusion of unrelated concepts (animal-human) gives way to a novel idea (Mithen 2007; Wynn et al. 2009). To others, the blending of animal and human properties supports interpretations of shamanic beliefs and practices among Pleistocene hunter-gatherers (Conard 2003; Dowson and Porr 2001; Lewis-Williams 2002). It is remarkable that at the nearby site of Hohle Fels, a second much smaller Lion Man figurine, of just a couple of centimetres in size, was found, indicating that the Aurignacian population of Swabia may be seen as a cultural unity who shared a common system of artistic conventions and most likely of customs and beliefs (Conard 2003; Conard 2003; Porr 2010).

Other remarkable ivory figurines from the Swabian cave sites include small but very detailed representations of a mammoth and a horse from Vogelherd, with an estimated date of 35,000 BP (Cook 2013). All of the carved figures from Swabia show tremendous craftsmanship and dedication, and although each is unique and seems to reflect individual choices and idiosyncrasies, as a whole, they constitute the earliest figurative art tradition in Europe (Porr 2010) (Fig. 20.3b).

After 30,000 BP, figurines and other carved objects become more common in the European Palaeolithic record. Generally grouped under the category of ‘portable’ art, examples include figurative sculptures and decorated tools (e.g. batons, awls, shafts, spear-throwers) carved in ivory, bone, antler, horn, stone, and various minerals (Cook 2013). Perhaps the best-known group of Palaeolithic sculptures are the female statuettes commonly known as ‘Venuses’, which have been found throughout a vast extension of the Eurasian continent. In their majority, these female statuettes pertain to the archaeological period known as Gravettian (28–23,000 BP), although female figures continue to be found up until the end of the Pleistocene (Cook 2013). The stereotypical ‘Venus’ figurine (e.g. Willendorf) is a small female representation, naked or scarcely clothed, with accentuated breasts, hips, thighs, and buttocks and contrastingly minimized upper limbs and facial features (Fig. 20.4). In actuality the term is (mis)used to denote any female figurine from the European Palaeolithic, underestimating their variability and thus giving the wrong impression that they comprise a cohesive group of artefacts similar in appearance and function (White 2003). Some of them, however, show clear regional and temporal variations, which perhaps would allow for more specific interpretations (Gamble 1982).

Fig. 20.4 Venus of Willendorf at the natural history museum in Vienna



Painting

Here I refer specifically to the practice of painting on large surfaces, such as rocks and walls, otherwise known as rock painting or rock art. Rock painting traditions like those from Palaeolithic Europe and Australia are probably the most complex and labour-intensive form of Pleistocene visual art. Wall painting requires not only time and skill but also a large amount of social and natural knowledge (Conkey 1993).

As with the previous category, early Pleistocene examples of wall painting are lacking from the African continent. The earliest known piece of a painted rock surface in Africa is the figurative image of an animal (eland?) on a slab found in the Apollo 11 Cave in Namibia, dated to 27–25,000 years BP (Wendt 1976), although some authors speculate it might be as old as 40,000 years (Masson 2006). It has been suggested that some rock art traditions from Australia (e.g. the Bradshaw paintings at Ubirr and the petroglyphs at Dampier) might also extend as far back as 40,000 years or more (Clarkson et al. 2017; Morell 1995; White 2003). Currently, the earliest dates of rock painting from outside Europe come from the Indonesian Island of Sulawesi, where a hand stencil and an animal figure have been dated to 39.9 and 35.4 thousand years ago, respectively (Aubert et al. 2014). This art is then at least as old as its European counterpart and makes it highly possible that earlier dates will be reported for Australia and the Pacific in the near future.

In Europe, the most renowned of early painted sites is Chauvet Cave, in France, due to its impressively realistic painted panels depicting numerous animals (cave lion, bear, horse, woolly rhino, bison, and mammoth, among others) and because its discovery in 1994 changed the standard view of the development of figurative art in the Palaeolithic. Until then, cave art from the Solutrean and Magdalenian periods, represented by sites like Lascaux and Altamira, had been considered the pinnacle of Palaeolithic painting (Fig. 20.5). But Chauvet yielded Aurignacian dates, going as far back as 32,000 BP, indicating that figurative rock art was not only much older but also quite magnificent from very early on (Clottes and Arnold 2003). By now, it seems that figurative painting may have been a usual practice during the Aurignacian. The site of Fumane Cave in Italy has yielded rock fragments that seem to have detached from the cave ceiling and bear ochre and some simple schematic paintings dated to 35–32,000 BP (Broglio et al. 2006). Another roof collapse with traces of paint depicting a zoomorphic figure and an engraving of a vulva at the site of Abri Castanet, in France, has recently given a date of ca. 36,000 BP (White et al. 2012). Also, a recent dating project covering several well-known painted caves in Spain, including Altamira, El Castillo, and Tito Bustillo, has yielded dates going back to the Aurignacian in all of the sites (40–34,000 BP), suggesting that the caves were



Fig. 20.5 Reproduction of Lascaux panel at the National museum of natural history in Paris

visited throughout the Upper Palaeolithic for artistic motives (Pike et al. 2012). Similarly, the Spanish site of Altxerri B, in the Basque country, includes painted motifs of various animals (feline, bear, horse) and has been dated to 34–30,000 BP (González-Sainz et al. 2013). These results support the suggestion that painting practices have a deep temporality in Europe (Jöris and Street 2008).

As in the case of carved and sculpted objects, instances of rock painting become more common in Europe after 30,000 years. Wall painting practices seem to have peaked towards the Magdalenian period (18,000–10,000 BP), during the coldest phases of the last Glacial era, when most painted caves clustered around the Périgord region in France and the Spanish area of Cantabria. Although at the moment few examples from other regions are known (e.g. Kapova Cave in Russia and Coliboaia Cave in Romania), it is probable that other Palaeolithic painted sites are still to be discovered. The improvement of dating methods and the increasing sample of dated caves also may start clarifying the development of rock painting traditions in the European Pleistocene.

Summary

This brief overview of the development of visual art forms over the Pleistocene allows us to make some very general inferences. First, the earliest traces of possible visual art activities are found in the form of ochre extraction, processing, and use in marking and probably decorating artefacts and the human body. This is followed by the simple modification of materials and later by the crafting of beads, and finally, there is the systematic production of visual art objects and traditions. Nonetheless, this development is not assumed to have happened in strict linear chronological succession. The various visual art forms and techniques frequently appear, disappear, and reappear in the archaeological record, and ‘simple’ forms usually co-occur with more ‘complex’ ones. From an archaeological perspective, the apparent trend in the development of visual art—from simple to more complex forms—has been recurrently attributed to the enhancement of human cognitive capacities over the Pleistocene (e.g. Mithen 1996; Coolidge and Wynn 2009). However, the increasing diversification of visual art forms, media, and techniques may also be interpreted in terms of increasing technological and social sophistication.

We will now see whether the three most cited evolutionary hypotheses on the origins of art can explain the evidence presented above. To reiterate, these are the sexual selection hypothesis, the social bonding hypothesis, and the cognitive enhancement hypothesis.

The Sexual Selection Hypothesis

In his *On the Origin of Species*, not only did Charles Darwin present his famous thesis on natural selection, but he also introduced the principle of sexual selection to explain those armaments and ornaments used in courtship displays (2006) [1859]. He further elaborated on the evolutionary effects of sexual behaviour in *The Descent of Man*, from 1871.⁸ In broad lines, he argued that whereas success in natural selection depended on the survival of individuals in relation to the conditions of life, in sexual selection success was measured by the reproductive advantage of certain individuals over others of the same sex and sort in relation to the propagation of the species (Darwin 2004 [1879]; Taylor 1996). That means that while the environment and competition for resources are major factors of natural selection, sexual selection is mainly driven by intraspecies competition over mates and mating opportunities (Andersson 1994). Since females have a higher investment on reproduction and offspring care, they will tend to be the choosier sex, whereas the males will compete among themselves for mating opportunities (Trivers 1972). Hence, the most common mating strategies in the animal world involve male-male competition and female choice (Geary et al. 2004), although these two do not exhaust the mechanisms of sexual selection (Andersson and Iwasa 1996). Mate preference is however of special interest because it seems to correlate with the evolution of 'ornaments' and extravagant traits which are often difficult to explain through natural selection (Kokko et al. 2003).

In the classical example of the peacock, the large, colourful, eye-spotted feathers of its long, heavy tail incur a huge energetic investment that, while attractive to the peahens, makes the male bird less agile and more noticeable to predators. However, if the tail is correlated to the general physical condition of the male, it will be more elaborate among strong, healthy individuals and therefore will be preferred by the peahens as high-quality mates. In this way, the peacock's tail serves as a 'costly signal' or indicator of general genetic quality (see Quinn, this volume; Zahavi 1975). The sexual selection hypothesis for the origins of art suggests that, like the peacock's tail, art behaviour in humans may have evolved through mate choice as a fitness indicator for courtship purposes (Dutton 2009; Miller 2000; Grammer et al. 2003; Taylor 1996; Zahavi and Zahavi 1997).

One of the major proponents of this hypothesis is the evolutionary psychologist Geoffrey Miller (2000), according to whom the mental and physical abilities required for art-making (e.g. creativity, concentration, coordination, dexterity, etc.) correlate with the general condition of the individual and thus serve as a cue of genetic fitness; therefore people, especially women, would have evolved a preference for art. In this view, works of art constitute material extensions of a person's genetic makeup; they are 'extended phenotypes' or out-of-body manifestations of the individual's self, much like a spider's web, a bird's nest, or a beaver's dam (Miller 2000). In consequence, this hypothesis sees early visual art essentially as an individual activity whose resulting products were kept by the maker for all to see and judge. Positive valuations of visual art displays would then bring reproductive as well as social success to the artist (Miller 2001). In short, this hypothesis states that art is a uniquely human behavioural trait that evolved through mate choice to serve a courtship function by signalling the artist's fitness, attracting mates, and outcompeting rivals (Miller 1999, 2000, 2001).

Also, this hypothesis assumes that women are more selective in their mating choices and males are more motivated to produce competitive fitness displays, like visual art; therefore it would predict that an intensification of visual art production in the archaeological record should correlate with periods of increased male-male competition and greater female choosiness, for example, in periods of abundance of resources, when there are more fit males who can afford complex courtship displays and females

⁸Darwin is often quoted as the first researcher to have drawn a link between sexual selection and the arts, but he actually dedicated few paragraphs to this issue and his opinions concerned mostly the occurrence of song and music, e.g.: 'I conclude that musical notes and rhythm were first acquired by the male or female progenitors of mankind for the sake of charming the opposite sex' (2006, p. 638 [1859], footnote 39).

can afford to exercise mating preferences (Geary et al. 2004, Miller 1999). So, the scenario to test is whether the increased production of visual art correlates archaeologically with periods of high resource availability.

Although the evidence on this issue is not vast, particularly for the earliest sites, we can draw some conclusions based on the available data. Several of the African sites with early presence of visual art (e.g. Blombos Cave, Sibudu, Klasies River) have yielded evidence of the types of resources being exploited. Unfortunately, the information is not detailed enough to get a clear picture of the complete range and frequency of the species extracted. However, some trends can be observed. At Blombos Cave, for example, the phases contemporaneous with the finds of ochre pigment production and shell bead use from 75,000 BP indicate that diet was broad and included both mammals and shellfish. At the time, this coastal site was surrounded by forest, which means that humans could make optimal use of both terrestrial and marine resources (Dusseldorp 2012; Langejans et al. 2012). The period when the earliest evidence of visual art becomes visible was a time of high climatic variation. But, by occupying locations near different sources of food (coast-forest), humans could have maximized their access to supplies. It then seems that the time and location of early visual art production is correlated with potentially high resource availability.⁹

In the European Upper Palaeolithic, personal ornaments would not be a good indicator to quantify variations in visual art production over time, since these are present in large quantities throughout the whole period. Instead, archaeologist Michael Barton et al. (1994) have used carved figures and rock art as a measure of artistic output during the Upper Palaeolithic. They observed that in the climatic downturn episode leading up to the Last Glacial Maximum (27–21,000 BP), when mean temperature deteriorated and glaciers advanced continuously, there was comparatively little figurative art production. In contrast, during the Last Glacial Maximum itself (21–13,000 BP), visual art became abundant, only to wane again at the beginning of the Holocene. Visual art seems to have flourished during the Aurignacian and Gravettian periods (40–28,000 BP), but it would seem that a decrease in art production during the downturn episode could be related to harsh climate change and a decline in available resources. The Last Glacial Maximum, on the other hand, may correlate with the stabilization of the new cold conditions, where despite the low temperatures, there was great availability of faunal resources to be exploited, especially of large grazing herbivores (Gamble 1998; Guthrie and van Kolschoten 2000).

So, although the data available in relation to resource availability and art production may be sketchy, it seems to support the scenario that an intensification of visual art would correlate with periods of greater resource availability. This would be in accordance with a sexual selection hypothesis which would predict that in prosperous circumstances, females would have more choice of high-fitness partners, becoming choosier and thus prompting male-male competition resulting in an increase of courtship displays, including visual art manifestations.

Despite the seeming correspondence between this scenario and the archaeological record, there are a few caveats. First and foremost, the match could only be corroborated if artworks were made predominantly by men, under the assumption of male fitness display and female mate choice. However, there is no way of saying with any certainty whether the archaeological examples of early art were made only by men. Actually, some evidence would point to the contrary. For example, some of the earliest personal ornaments found in Europe often come from the graves of women and children (Einwögerer et al. 2006; Formicola 2007; Martínez González and Mendoza Straffon 2017), which weakens the hypothesis that personal ornaments were being produced by males for courtship purposes. Furthermore, ethnographically, women play a prominent role in art production in small-scale societies.

⁹That the early production of visual art in Africa may have been correlated to propitious circumstances that allowed for abundant resource exploitation is further supported by the fact that art declined after 70,000 BP, when it is thought that conditions took a turn for the worse as consequence of the Toba volcanic eruption (Ambrose 1998b; Burroughs 2009).

Second, the correspondence between a rise in visual art production and high resource availability during the Pleistocene could have an alternative explanation. For instance, in periods of scarcity, the decrease of food resources could imply a similar decrease in raw material access for art-making. Third, this hypothesis suggests that visual artworks act as ‘extended phenotypes’ made to show off personal skill and creativity, in which case, we should expect the earliest examples of visual art to show a great deal of internal variation. But in fact, the increasing corpus of early body ornaments show a low degree of internal variation and a high level of standardization and formal redundancy instead (Kuhn and Stiner 2007a), suggesting that even when the production and use of early Pleistocene beads were personal, their makers were probably following established social conventions regarding the use of specific materials and natural forms, and not their own individual choices, resources, or skills.

The sexual selection hypothesis argues that visual art is a unique human adaptation that evolved to help solve the ancestral problem of finding and keeping a fit partner. In this courtship scenario, visual art is conceived as an indicator of individual quality to guide mate choice. The assessment of this model in view of the archaeological record shows that the Pleistocene data does seem to coincide with some of its predictions, but alternative explanations cannot be discarded. Furthermore, the fundamental premise that art production and display must have been predominantly male is difficult to test archaeologically but is not supported by either ethnography or the Palaeolithic burial record. Finally, the earliest instances of visual art contradict the idea that art was made on the basis of individualistic qualities and motives.

The Social Cohesion Hypothesis

The social cohesion hypothesis suggests that visual art was selected due to its capacity to bring individuals together by reinforcing social bonds (Boyd 2005; Coe 2003; Dissanayake 1992). One of the main proponents of this hypothesis and a pioneer in the field of art and evolution is Ellen Dissanayake. She has suggested that art-making is a universal innate human behaviour, meaning that any normally developed individual of our species will have a natural predisposition towards making art. But to have persisted as it did, she argues, art must have served an important function that throughout human evolution somehow contributed to the survival and reproductive success of the individuals that presented it. To find out what this function may have been, she has looked for the common element to all the arts, concluding that it is a sense of ‘specialness’ (Dissanayake 1980), which she called ‘making special’ (Dissanayake 1992, 2000) and more recently ‘artification’ (Dissanayake 2008, 2009, 2010). This refers to the act of transforming something ordinary (e.g. an activity or object) into something extraordinary by treating or making it in a special manner. To her, this universal tendency towards artification has been moulded by natural selection, constituting a true human adaptation (Dissanayake 1992).

According to Dissanayake the process of artification is achieved through the five operations of formalization, repetition, exaggeration, elaboration, and manipulation of expectation (Dissanayake 2007). For instance, bodily movements when repeated and exaggerated become dance; speech, patterned and embellished, becomes poetry; song emerges from elaborated, amplified vocalizations; and in visual art, regular objects and surfaces are made special by emphasizing their shape, pattern, texture, and colour (Dissanayake 2008). She further argues that the roots of these five basic operations are already present in the communications between carer and baby (Dissanayake 2000, 2010) and are

further developed during childhood in play (Dissanayake 2010).¹⁰ Furthermore, carer-baby interaction and play generate the release of the pleasurable prosocial hormone oxytocin, reinforcing social bonds (Dissanayake 2010) and generating an emotional response that is also found in the aesthetic response to the arts (Dissanayake 2000). Thus, in Dissanayake's view, the ontogeny of art is mostly innate and intensely developed in early infancy and childhood; hence it becomes later co-opted in normalized adult artistic behaviour (Dissanayake 2010).

Dissanayake understands the arts as a derived category of human ritualized behaviours that in several aspects overlap with play and ritual but which involve a particular aesthetic dimension. Ethologists like Huxley (1966) had noted that human ritualized activities have a strong self-rewarding component which is also highlighted in artistic behaviour (Morris 1962). For Dissanayake, as the cognitive capacities of hominins increased with encephalization, individuals would have become progressively concerned with vital life-changing and life-threatening situations (e.g. birth, death, puberty, marriages, seasons, hunts, migrations, etc.), causing uncertainty and stress. Ceremonies, she argues, were developed in hominin evolution as a communal strategy to cope with the anxiety and uncertainty generated by those situations, and because artistic behaviours were innately pleasurable, they were eventually co-opted in ritual ceremony (Dissanayake 1992). So, in her view, the arts coevolved with ritual ceremony, acquiring adaptive value and social function by providing psychological relief and promoting social cohesion, which can potentially enhance the survival of individuals and groups (Dissanayake 2000).

The hypothesis that visual art evolved in collective ritual contexts, selected for the adaptive function of reducing stress under uncertainty while promoting intra-group social cohesion, predicts that art will be most prominent in the context of communal rituals and ceremonies. Therefore, a noticeable increase of visual art should correlate with an increase in communal ceremonial activities and signs of emerging group identity. Because Dissanayake argues that groups whose individual members had the tendency to make things special would have had more unifying ritual ceremonies and would have survived better than individuals and groups that did not (Dissanayake 1992), the hypothesis would also expect artistic behaviour to be under strong selective pressure of environmental stress and intensive group-group competition. Let us now see how this prediction stands against the archaeological data.

Unambiguous evidence for ritual and ceremonial activity is difficult to identify in the material record and is often a point of debate in archaeological interpretation (Ross and Davidson 2006). It is clear that not all ceremonies leave a trace, but by analogy some remains are interpreted as evidence of ceremonial behaviour. From ethnographical and historical data, it is known that rituals and ceremonies may take place on a daily basis, and in a domestic environment, for example, the keeping of a home altar, morning prayers, or collective dining. But the types of ceremonies that Dissanayake actually refers to (e.g. public gatherings with lavish displays of visual and other arts) are special-purpose activities that generally require distinctive preparations and a determined time and place setting (Rappaport 1971).

Watts (2002, 2009) has argued that the notable intensification of red ochre exploitation in the record of the African Pleistocene indicates habitual collective ritual. But the presence of ochre as evidence of ritual is ambiguous. An increase in pigment use, even if used for body painting, need not imply that humans were carrying out the kind of communal ceremonies that Watts and Dissanayake seem to have in mind. For instance, body painting could have been an everyday, non-ceremonial (although highly symbolic) custom, as it is today among the Namibian Himba women whose hair and bodies are permanently covered in a mix of butter and red ochre. Also, many African Middle Stone Age ochre finds come from contexts with traces of multiple activities. They have often been found alongside

¹⁰For Dissanayake, play is very similar to art in various aspects. Both are 'removed' from reality, carried out in special contexts with special rules, both are pleasurable and encourage novelty and creativity, and both develop innately. In fact, in her earlier work, she suggested that art may have evolved from play (1980).

stone tools and food remains that indicate the sites were likely base camps where people carried out day-to-day subsistence activities rather than special ceremonial ones, for example, at Pinnacle Point (Marean et al. 2007) and Blombos Cave (Henshilwood and D’Errico 2011).¹¹ Naturally, the fact that the ochre has been found in these locations does not preclude its use in other places; it is still possible that the ochre was processed in these domestic locations and the pigments obtained were applied and/or displayed elsewhere. But in fact, it is not until the Upper Palaeolithic in Europe that we observe better-defined traces of the ceremonial use of space. For instance, the painted caves of France and Spain do not show signs of having been used as permanent habitation, indicating that they were reserved for the special purpose of painting and associated activities, which probably included some ceremonial displays (Conkey 1993).

Regarding identity, the Pleistocene shell bead finds from Middle Stone Age sites like Blombos Cave in South Africa and Pigeons Cave in Morocco have been interpreted as indicators of group cohesion and identity (Wadley 2007). However, these items seem to be too standardized over time and space to signal group differences (Kuhn and Stiner 2007a). Many of the beads from different sites are made of the same marine snail family (*Nassarius*) and show similar perforation and modification patterns. Objects that are meant to tell groups apart from one another should be easily identified as distinct.¹² Like linguistic dialects, which clearly signal specific group affiliations, material social markers should show relative regional and temporal stylistic variability (Wobst 1977). Instead, the formal redundancy and stylistic consistency of these earliest ornaments might relate to individual within-group social identity in the African Middle Stone Age before 75,000 BP (Kuhn and Stiner 2007b). Again, it is in the record of the European Upper Palaeolithic, especially from the late Aurignacian onwards, where we clearly see regional stylistic variations in material culture (like tool types and personal ornaments) that might speak of interaction between distinct groups (Gamble 1998; Vanhaeren and D’Errico 2006). The idea that the earliest signs of visual art might correspond to emerging group identity is thus not well supported by the art record of the African Middle Stone Age up to 75,000 BP but might apply to the evidence of the European Upper Palaeolithic particularly after 30,000 BP.

As previously discussed, the living conditions in Africa around 100–75,000 BP seem to have been relatively favourable for modern humans, with small populations benefiting from diverse productive environments. Under such circumstances, group-group competition is not generally expected to act as an important selective pressure. At the same time, because bands in a rich and stable environment are relatively self-sufficient and scattered, cooperation between groups and across large distances is weak (Ambrose 2010). In the absence of intensive intergroup competition or cooperation, group identity would remain underdeveloped, and markers of group affiliation would be unnecessary (Wobst 1977; Wiessner 1983). Hence, the conditions of precariousness and group-group competition expected by Dissanayake’s model are also not met by the African MSA before 75,000 BP. The archaeological predictions deduced from the social cohesion hypothesis are, in conclusion, not entirely consistent with the earliest record of visual art in the African Pleistocene. Nevertheless, some of the circumstances assumed by it seem to apply well to the conditions of the European Upper Palaeolithic. So, this model may potentially explain not the origins of visual art but the emergence of collective art forms, like cave art, and regional art styles of art and ornamentation during the Early Upper Palaeolithic.

¹¹With the exception of a recent find of 100,000-year-old ochre-processing toolkits at Blombos Cave, which have been interpreted as evidence of an ochre-processing workshop (Henshilwood et al. 2011)

¹²Nonetheless, we cannot discard the possibility that it was how these items were displayed by separate groups which made them different (as jewellery, sewn on clothing, as part of a headdress, etc.).

The Cognitive Adaptation Hypothesis

There is no one cognitive hypothesis for the origins of visual art. In fact, any model which proposes that visual art evolved as a direct result or side-effect of a mental capacity, either general intelligence (Mithen 1996), language (Mithen 2005), memory capacity and abstraction (Coolidge and Wynn 2005), or theory of mind (Henshilwood and Dubreuil 2011), may be considered a cognitive hypothesis. However, there is an underlying idea common to most of them, which is that visual art and other so-called complex behaviours (i.e. typical modern human practices such as ritual, trade, and material culture diversity) were the result of a mental change, or cognitive transition, detached from anatomical evolution. In addition, they often argue that visual art became adaptive by allowing people to express, discuss, exchange, and expand concepts and ideas through symbols (Donald 1991; Mithen 1996; Smith 2005; Tooby and Cosmides 2001). These two premises will constitute the focus of this section.

In the early decades of the 1900s, prehistorians had started to systematically record and describe hundreds of examples of 'portable' and cave art found all over Europe, known to have originated in a remote Ice Age. In the first instance, these artworks were thought to have been produced 'for their own sake' and by an 'artistic impulse' that drove Palaeolithic artists to embellish their environment and to depict elements from their surroundings that were important to them, hence the recurrence of primaevial naturalistic themes (Breuil 1974). Inspired by a growing ethnographic record, scholars later began to link prehistoric art to 'primitive' ceremonies, rituals, and religious practices like 'picture magic' (Bégouen 1929). Hunting and fertility magic then became the standard explanation for the beginning of visual art and remained popular well into the second half of the century (Grand 1967). By the 1950s, a large corpus of Palaeolithic portable art and cave paintings had accumulated, and archaeology had adopted an array of interpretive perspectives that encouraged researchers to start offering explanations in terms of the meanings of artefacts. As a result, Palaeolithic visual art was seen as a coded system whose interpretation could give us a glimpse into the social life and ideology of prehistoric peoples (Levine 1957).

Since the 1960s, under influence of the cognitive revolution in psychology and linguistics (Baars 1986), some influential archaeologists, like the French prehistorian André Leroi-Gourhan (1993) [1964], adopted a view of cognition in which the mind's function is to create and process symbols that are themselves generated in the brain to represent knowledge or reality (Sperber 1975). In this perspective, symbolic representation is seen as 'the principal cognitive signature of humans and the main phenomenon whose arrival on the scene has to be accounted for in any scenario of human evolution' (Donald 1993). This has had a profound effect on the archaeological study of early art. Whereas previous approaches had generally understood art as a noncognitive or affective activity, the cognitive perspective established the processes of art-making and art perception as mental activities originating in the brain and as part and parcel of symbolic thought (Gardner 1987).

Because in the cognitive approach symbolic representation takes pride of place, cognitive hypotheses on the origins of art tend to focus on figurative or representational art which, as reviewed above, only makes its appearance in the European Early Upper Palaeolithic. For this reason, explaining the origins of art has often been part of the greater scheme of explaining the so-called creative explosion, which includes the seemingly abrupt changes observed in the archaeological record of the European Middle to Upper Palaeolithic (Pfeiffer 1982). These include a sudden burst of objects and traits typical to modern humans, such as the production of specialized tools (e.g. harpoons, knives, awls, nets), the use of various raw materials (e.g. bone, wood, antler, ivory), the structured use of space, the exploitation of a wide array of resources for food (e.g. plants, seeds, small animals, aquatic resources), burials with grave goods, exchange, personal ornaments, and visual art.¹³ To proponents of cognitive hypotheses, the emergence of these practices is best explained by an enhancement in human

¹³For a full list of Upper Palaeolithic innovations, see Bar-Yosef (2002, 2007).

neural capacity that allowed the populations of the Upper Palaeolithic to create and exploit culture at a rate never before reached by any other hominin group (Coolidge and Wynn 2009; Klein and Edgar 2002; Mithen 1996).

In brief, the cognitive adaptation hypothesis discussed here suggests that there is a lag between the emergence of anatomical and cognitive modernity (Mithen 2007). That is, whereas the fossil record shows that by 100,000 years BP there already were populations that probably looked much like present-day people, the archaeological evidence for typical modern human behaviours like ritual, symbolic thinking, and art-making does not appear until much later (Klein and Edgar 2002). This is taken to mean that the transition towards ‘mental modernity’ must have occurred later (Coolidge and Wynn 2009; Donald 1993; Klein and Edgar 2002; Mithen 2007). From this perspective, the earliest examples of visual art, such as the Blombos Cave material, constitute mere ‘flashes’ of modernity that lack continuity, whereas the emergence of representational art seems sudden and rapidly cumulative (Mithen 2005, 2007).

The relatively abrupt transition towards mental modernity proposed by this hypothesis would be manifested in the archaeological record as greater technological diversity (e.g. more artefact types, use of various new raw materials, and an increase of composite and specialized tools) and cultural complexity (e.g. evidence for religious ritual and art) than in previous periods. Accordingly, the first visual art should appear in tandem with novel tool types and materials and greater artefact variation. Consequently, the scenario to test is whether the earliest evidence of visual art co-occurs with an increase of technological innovation and diversity.

The patchy character of the data available for the African MSA sites with art makes it difficult to assess this scenario. It seems that in most instances, these sites do present a wider variety of artefacts than sites with no art, but this is not always the case. For example, in one of the earliest occurrences of shell beads, Grotte de Pigeons (ca. 82,000 BP), the ornaments were found alongside typical Middle Palaeolithic artefacts (Bouzouggar et al. 2007). However, in sites like Klasies River Mouth and Blombos Cave, different forms of visual art (pigment use, personal ornaments, and engraved objects) coexist with innovative stone tool types (e.g. blades, bladelets, microliths, bone tools), carefully made in fine-grained raw materials (Henshilwood and Dubreuil 2011; Wadley 2001). The latter sites also have provided evidence that their inhabitants had a broader dietary niche and a formal division of space at camps, with separate habitation and work areas, suggesting ‘symbolically organized behaviour’ (Wadley 2001).

For its part, the archaeological composition of the Aurignacian (45–30,000 BP), which is the earliest phase of the Upper Palaeolithic in Europe and the period when the first figurative art appears, is actually not that different from the previous Mousterian, except for the art (Roebroeks 2008). Both records show the same low typological diversity (Davies 2001) and a similar scope of resource exploitation (Bar-Yosef 2004). The real ‘cultural explosion’ in fact seems to happen much later, around 30–28,000 BC, at the beginning of the Gravettian. In this phase indeed all of the ‘markers’ of modernity appear together, but that is some 10–5000 years after the first examples of representational art.

In fact, the archaeological record seems to contradict the very idea of a sudden cognitive transition. The sites from Pleistocene Africa indicate that many of the traits used to identify modern behaviour (e.g. artefact diversity, specialized tool types, the use of organic raw materials, personal ornaments, exchange networks, etc.) show a mosaiclike pattern of incidence and often did not co-occur. So, it is more probable that the transition was not swift but rather a piecemeal gradual development (Henshilwood and Marean 2003; McBrearty and Brooks 2000). So, whereas the co-occurrence of visual art with technological innovation and variability and other ‘modern’ behaviours may indeed indicate changes in the ways Pleistocene populations lived and interacted, these do not always require a cognitive explanation. At times, such changes can be equally or better explained in terms of social contacts (Gamble 1998; Marwick 2003; Wobst 1977), demography (Kuhn and Stiner 2007b; Powell et al. 2009), or cooperation strategies (Gärdenfors 2004; Mendoza Straffon 2016a), for example.

Finally, as we have seen, the presence or absence of visual art does not prescribe the presence or absence of novel materials or complex technologies during either the African MSA or the Early Upper Palaeolithic, disproving the key prediction of a cognitive hypothesis.

Conclusion

The way scholars deal with early prehistoric art has been profoundly transformed over the past few decades. Once a term reserved exclusively for the enticing images of Europe's Palaeolithic cave paintings, Pleistocene *art* now includes geometric designs before regarded as 'doodles' and items like beads and pendants, previously categorized as trinkets for 'mere' decoration (Moro Abadía and González Morales 2010). More importantly, recent finds have now demonstrated without a doubt that visual art did not emerge in a single sudden event and that its different forms did not appear simultaneously. Rather, it looks like visual art developed over a long time, generating great formal variation—some of which has unquestionably been lost to time.

The three hypotheses that I have discussed in this chapter mainly attend to the question of what art is for and hypothesize answers by looking at some of visual art's effects, each focusing on different aspects of art's current functions. The sexual selection hypothesis 'reverse-engineers' from art's influence in mate choice behaviour; the social cohesion hypothesis builds upon art's emotional power to bond individuals; and the cognitive adaptation hypotheses reflect on the informational symbolic operations involved in art-making. Given that visual art is known to often fulfil sexual, social, or symbolic functions, how are we to assess which hypothesis, if any, can best inform us about the circumstances in which visual art originated? I have aimed to show that one useful strategy is to weigh them against the archaeological record (Henshilwood and Marean 2003).

Once compared to the evidence from archaeology, it becomes clear that some key issues are left unanswered by all three hypotheses, namely, the timing of visual art's appearance and the expansion and diversity of visual art forms. The sexual selection and social cohesion hypotheses actually remain relatively mute on these important issues, perhaps because they are more concerned with assessing whether art, as a whole, has any adaptive value than with its specific path of development. In this sense, we could say that these models are hypotheses of the ancestral functions of art, and not of its origins as such, but function and cause of origin do not always coincide in evolution (Gould and Lewontin 1979). Perhaps, asking what art was selected for is not the right research question to find out about visual art's emergence. Instead, we might ask questions about the specific contexts and conditions that allowed for visual art to be selected and bloom as a social practice.

The cognitive hypothesis for its part predicts that the development of art should mirror the evolution of cognition, from simple to complex. Although at first glance, the archaeological record of visual art may indeed seem to go from the simple processing and use of ochre, to the production of ornaments, to the creation of complex figurative art, in closer detail it becomes evident that this development did not happen in strict linear succession. The various visual art forms and techniques frequently appear, disappear, and reappear across time and geography, and 'simple' forms usually coexist with more 'complex' ones. The trend is not one of complexification but of diversification of forms, media, and techniques which can be better interpreted in terms of increasing technological specialization. That is, the 'progression' of visual art forms may actually represent growing labour investment in visual art, indicating that visual art production became a progressively important practice to which more and more time, effort, knowledge, skill, and people were allocated over time (see Herzog and Goodale, this volume). In other words, over the course of the Pleistocene, visual art forms likely became more frequent, complex, and specialized, by way of cultural scaffolding processes through which existing types and practices occasionally allowed for novel forms (Mendoza Straffon 2016a).

In conclusion, future research on the origins of visual art, from either an evolutionary or archaeological perspective, needs fine-tuning. Researchers should become more specific about what it is that they want to address, be it the emergence of a specific art form or technique (e.g. carving, painting), a content style (e.g. figurative, schematic), or a behavioural pattern (e.g. mate choice, sociality). Also, studies should narrow down on traceable aspects of the development and production of art forms over time, such as conventions, techniques, materials, styles, distribution, etc., and try to relate those to other aspects of the archaeological record. For instance, network analyses (Knappett 2013; Marwick 2003), cultural transmission studies (Walsh et al., Chaps. 2 and 3, this volume), and phylogenetic approaches to material culture and archaeology (Mendoza Straffon 2016b) may offer interesting, fresh perspectives with potential application to the early record of visual art.

Finally, visual art constitutes a highly versatile form of material culture which may indeed be used to attract mates, to bind social groups, to explain and exchange ideas, to evoke emotions, and to obtain and display social prestige, among other things. Despite this, it is often said that art does not seem to serve any purpose in human survival and evolution (Pinker 1997). It is for this very reason that researchers are both puzzled and fascinated by its evolution. However, it may simply be that we got it wrong. It may be that visual art has in fact played an important role throughout human evolution, as a fundamental communication technology that has helped shape our societies and minds (Kuhn and Stiner 2007a; Quinn, this volume; Mendoza Straffon 2016a). Finding out more about that very role may be the way forward.

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