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Sex & drugs & rock art: revisiting three hypotheses on the origins of visual art in the Pleistocene

Larissa MENDOZA STRAFFON*

Abstract

From an evolutionary perspective, three theories account for the emergence of the visual arts. The first states that visual art, like the peacock's tail, arose as a sexual strategy to acquire mates. The second, sees visual art as a communal practice, originated in ritual ceremony. The third theory contemplates a neurocognitive change that allowed modern humans to conceive visual art at some point during the late Pleistocene. While all three explanations raise interesting points, a reassessment is clearly needed. As an alternative, I suggest exploring the role of visual art in evolution as a communicative signal and an instance of human material culture.

Keywords: *Pleistocene art; evolution; sexual selection; sociality; cognition.*

> *"Bad or good, known or unknown, every manifestation of artistic activity is equally illustrative for our purpose. We have to count with the immense number of dilettanti who produce in privacy and secret, as well as with recognised artists. And even those unfortunate persons who have never been able to find for themselves any satisfactory mode of aesthetic expression may still be adduced in proof of the universality of the artistic desire. If the notion of art is conceived in its most general sense, every normal man, at some time of his life at least, is an artist in aspiration, if not in capacity."* Yrjö J. Hirn, 1900

The 20th century saw a growing consensus towards accepting visual art as a human universal,[1] meaning that any fit member of the species *Homo sapiens* is capable of engaging in the processes of production and comprehension of visual art, irrespective of qualitative judgments. This notion is supported by two facts: the first is that all socialized healthy children rapidly learn and gladly participate in visual art-making activities (Dissanayake 1992). The second, as the world ethnographic record shows, is that all known human groups engage in visual art production. Among hunter-gatherers, even those with the simplest technology have been observed to

* Leiden University, The Netherlands

1 Although this pronouncement has been made for art in general, this paper will concentrate on visual art exclusively.

take on various visual art practices.[2] In this regard, Darwin already noted "that savages pay the greatest attention to their personal appearance. That they have a passion for ornament is notorious" (Darwin 2004[1879]: 640). Moreover, an increasing amount of archaeological evidence points to the great time depth of visual art,[3] although the debates on the date or cause of its emergence are far from settled.

The quest for the origins of the human faculty for visual has taken two directions. The first is mainly concerned with working out the age of this behaviour, or since when humans make visual art. An issue that is in turn related to the more general question of since when people behave and reason like they do today. To this aim, the archaeological record of early modern humans is scrutinized for evidence of absence/presence of visual art-related activities. The main goal of this rather empirical approach is to establish an approximate date of first appearance and, eventually, a sequence of development.

The second direction aims at explaining how and what for this behaviour came to be in the first place. Understanding visual art as part of our inherent behavioural makeup and as a complex, functional evolved trait allows space for applying an evolutionary approach, centred on making out which selective pressures might have given rise to and permitted the retention of visual artistic behaviour.

From an evolutionary perspective, three competing hypotheses currently dominate the field: sexual selection, ritual behaviour, and cognitive evolution. The aim of this paper is to provide an assessment of all three. After a brief recapitulation, it is shown that these proposals are difficult to test and offer only a partial explanation for the emergence of visual art in the Pleistocene. In the final section, I sketch an alternative proposal that might render more fruitful.

Sexual Selection

Charles Darwin was the first scholar to propose that there might be a correlation between the human 'passion for ornament' and the dealings of choosing a mate. In a comparative exercise with the animal kingdom, he suggested that just like the vivid colours and patterns of some male birds, like the peacock, serve them to lure females, humans turn to decoration to enhance their natural qualities and make themselves more attractive to the opposite sex (Darwin 2004[1879]: 640). He differentiated his principle of Natural Selection, which is driven by competition for limited resources, from that of Sexual Selection which "depends not on a struggle for existence, but on a struggle between the males for possession of the females" (*ibid.*: 56).

Modern researchers have recently taken up Darwin's idea to suggest that the origin and proliferation of visual art are likely the product of sexual selection through mate choice, or a 'courtship adaptation' (Dutton 2009; Miller 2000). Art, they claim, is

2 The inhabitants of Tierra del Fuego, described by Darwin (2004[1879]: 86) as ranking amongst "the lowest of barbarians" were fond of wearing necklaces, pendants, bracelets and other jewellery made of shell and bone, and were known to paint their faces and bodies of various colours (Garson 1886). The natives of Baja California, whose technological achievements have been described as poor at best, wore complex headdresses, hair and body decorations made of pearls and feathers hung from fibre strings, and practiced rock painting (Aschmann 1959). Similarly, the Tasmanians, whose tool-kit has been compared in simplicity to that of chimpanzees (McGrew 1987), had a complex system of bodily decoration through scarification and wore a variety of ornaments.

3 Pigment use may go as far back as 300,000 years; personal ornamentation 100,000 years, and 'graphic' art, 80,000 years (see McBrearty & Brooks 2000, and references within).

costly and wasteful and therefore not easily explained by natural selection, which is an economizing process and not one that would promote the perseverance of a superfluous behaviour. On the other hand, as in the elaborate plumage of birds, sexual selection often results in the development of exaggerated and apparently useless traits. For this reason, it might provide a good basis to explain the evolution of visual art. After all, Miller says, the closest example to anything like human art in the animal kingdom, the courtship bower of the bowerbird, evolved for the specific function of attracting a mate.[4]

According to evolutionary psychology, human mate choice is more often carried out by women who, having to put up with the costs of pregnancy, birth and rearing of the young, are more selective in their coupling practices, which supposedly favour males better able to provide care, protection and resources for them and their offspring (Buss & Barnes 1986). This preference is thought to have evolved during the Pleistocene, as human infants became more dependant on their mothers due to the development of a prolonged childhood brought about by an increasing brain size.

In the courtship behaviour scenario, visual art is supposed to work as a sort of advertisement for good genes whereby potential mates can guide their choices: artworks can act as 'fitness indicators', that is, they may be used by others to assess the prospectively attractive mental qualities of the author such as creativity, intelligence, sensibility, etc. As is the case among birds, male fitness displays would be more common in humans, as well. This aspect would clarify why throughout history male artistic output has been higher (Miller 2000: 275).

Seeing visual art as a 'courtship tool' would also elucidate why people are willing to spend precious time and resources on this activity. Producing and assessing visual art are seen as expensive activities that require learning, skill, material resources, and time that could be better spent in subsistence activities. The main reason for this seems to be that art is held in high esteem by conspecifics. An accomplished artist or art critic will therefore increase his status, which in turn will increase his chances of mating success.

In sum, for the proponents of this hypothesis, visual art has worked throughout human evolution as an effective fitness signal, shaped by the mating preferences and choices of Pleistocene humans.

But the sexual selection scenario only works if one assumes that visual art is 'useless' for survival and therefore not easily explained by natural selection. Thus, the model readily discards functional hypotheses (e.g. group cohesion, communication) so that courtship is left as the best explanation for artistic behaviour. Once placed in a courtship context, visual art is seen as an analogy of the 'artistic behaviour' of the bower bird and defined as a "sexually selected instinct for making ornamentation" (Miller 2000: 273). However, there is a qualitative difference between the bower bird's bower and human visual art: while captive bowerbirds who have not

4 Bowerbirds are found in Australia and New Guinea, and owe their name to a most peculiar behaviour. To attract mates, the male bowerbird creates an elaborate construction, called 'bower', which is built on the ground, generally made of twigs and branches, and decorated with various items, like berries, shells, bones, nuts, feathers, flowers, shiny insects, or other colourful or bright objects. Each bower is distinctive of a bird species, and shows variation from individual to individual. The male lures potential mates to his bower through displays of dance and song. Once the female bowerbird approaches a bower, she will inspect it and, if convinced by what she sees, she will mate with the bower's owner and then leave to build her nest, hatch, and raise the chicks by herself. Because of the use of specifically arranged and colourful items, reminiscent of decoration, bowers are often referred to as true artworks of the animal kingdom, but such an antropomorphic statement has long been reproached (see: Hirn 1900: 194).

been raised or been in contact with other bowerbirds will still produce bowers by instinct, visual art is not instinctive but, like language, it must be learned in and prompted by the human social milieu.[5]

The main mistake of this proposal consists in projecting data from the animal world onto human behaviour and, conversely, giving anthropomorphic interpretations to animal actions, a common issue among biological explanations of behaviour (Bolhuis & Wynne 2009). Evolutionary explanations in the humanities should strive to avoid this pitfall, which Hirn already warned us about over a century ago: "The attraction of the Darwinian theory is of course obvious. After having realised the important part which sexual selection plays in the 'artistic' activities of animals, one is naturally tempted to apply the same principle to all similar activities in men." (Hirn 1900: 238)

Thus, while the cases of the peacock and the bowerbird constitute interesting biological examples of sexual selection in their own right, drawing superficial parallels with the human situation is unsustainable. The development of art, or any other human behaviour for that matter, should be studied considering the specific circumstances of human evolution.[6]

A second objection to the sexual selection model is that in humans both sexes are equally capable and engaged in the perception and production of visual arts, and furthermore, individuals of pre-and post-reproductive ages also present this behaviour, so that the supposed greater artistic output by adult males is an illusion created by the history of modern Western art.

Thirdly, reducing human mating systems to male display and female choice is highly misleading. As cross-cultural studies have shown, mating preferences and practices are highly variable and flexible according to specific environmental and economic circumstances (Wood & Eagly 2002), not to mention guided not by mere biological reproductive impulses but by a very complex set of cultural rules and norms often guided not by female choice but by parental and kin group influence (Apostolou 2007; Buunk *et al.* 2010). Once again, the flaw consists in making unfounded generalizations of modern behaviour and projecting them onto the Pleistocene past.

Ritual Behaviour

The second hypothesis poses that visual art evolved in relation to ritual behaviour. The performance of rituals has been observed in every living and extinct human group. Erik H. Erikson defined human ritualisation as "an agreed-upon interplay between at least two persons who repeat it at meaningful intervals and in recurring contexts; and that interplay should have adaptive value for both participants" (Erikson 1966: 337). These "acts of display" transmit the physiological, psychological or sociological states of the participants (Rappaport 1971: 25), and in their institutionalized communal version, they are generally carried out to mark relevant events or influence/seek control of a situation. Furthermore, in small-scale societies, these types of activities typically help to regulate the socio-economical affairs of the group such as marriages, alliances, territorial moves, etc.

5 The sad cases of neglected and feral children clearly show that lack of exposure to art in childhood will result in difficulty to produce and perceive art in adult life (see Candland 1993).

6 It would be futile, for instance, trying to explain the evolution of human bipedalism by taking avian bipedalism as a direct analogy. not useful.

Ritual ceremony in forager societies is frequently led by an individual who in the literature is often (though erroneously) referred to as 'shaman'.[7] In his seminal work, Mircea Eliade identified 'trance' as the defining feature of shamanic activity. During this trance, the ritualist is thought to gain access to a supernatural realm, be it the spirit world, the dream world, the underworld, etc., and it is this ability that is taken as the source of his powers and justifies his status. Arriving at an altered state of consciousness, in which the trance or ecstasy is achieved, may be aided by the ingestion of psychoactive drugs, or by sensory deprivation, fasting, fatigue, meditation, rhythmic movement or sound, and illness, among other strategies.

The figure of a ritual specialist, or 'witch doctor', is omnipresent in the ethnographies of hunter-gatherers. Reportedly, the role of this individual, who could be male or female, was very important particularly in small-scale societies, and in egalitarian groups usually was the closest thing to a 'leader'. Some of his/her functions could include healer, decision-maker, group representative, mediator, oracle, and repository of ancestral knowledge.

Many scholars consider shamanism as a sort of primeval religion, common to all hunter-gatherers, therefore it is thought to have been the predominant belief system of Pleistocene humans, and some have suggested that shamanic rituals have been evolutionary adaptive, giving a survival advantage to practitioners through their beneficial stress-reduction and therapeutic effects (McClenon 1997).

David Lewis-Williams has applied the shamanic trance or neuropsychological model to the imagery of European Upper Palaeolithic rock art, explaining the origin of this artistic tradition as the result of shamanic practices during which mental images, visions and dreams experienced in altered states of consciousness were projected and 'fixed' onto wall surfaces (Lewis-Williams 2002, 2010). To him, the model explains both the form and content of Palaeolithic and many other rock art traditions (e.g. Southern African San, native North American). The universal presence of geometric motifs in these manifestations would represent trance-related entopic phenomena, and the systematic predominance of a selected group of animals and animal-human images, would represent a sacred bestiary and the shaman's transformation or trip into the supernatural. The socialization of such dreams and visions in a religious context through shamanic rituals would allow the emergence of image-making.

Lewis-Williams originally developed his model to account for European Upper Palaeolithic rock art, not visual art in general. Nonetheless, he has also attempted to establish shamanic practices and the related experience of altered states of consciousness as the driving factor of symbolism, spirituality, 'modern' mind and behaviour and, ultimately, art in the Pleistocene, and as an important force guiding human evolution.[8]

The neuropsychological model has been praised because it offers a plausible interpretation for Palaeolithic rock art. On the other hand, because it has been applied equally to art from South Africa, Australia, the Americas, and from the Pleistocene to present, disregarding particular contexts, it has been criticised as an

7 The word 'shaman' was taken from the Tungusic language, and originally referred to the ritual specialist of some Altaic groups from Mongolia and Siberia. The term has become an anthropological category that denotes a ritual leader, but it is now usually devoid of context or meaning (see Martínez, *in press*).

8 Even the Blombos Cave ochre engravings have been interpreted as possible visual patterns derived from altered states of consciousness (Lewis-Williams & Pearce 2004: 25).

oversimplified and unsubstantiated model (Bahn 2010). For one, the definition of consciousness as a spectrum of states, from awareness to stupor, is not at all generally accepted. And, what is experienced as an altered state of consciousness may not be a natural universal phenomenon but rather a social construction (Dennett 2001).

Secondly, following Eliade, this model reduces shamanism to a single neurophysiological state by stressing the importance of the trance, which is only one feature of a much more complex belief system (Martínez, in press). Furthermore, trance itself might not be intrinsic to shamanic religion, whereas the notions that shamanism is primeval and practised by all hunter-gatherers, and that forager rock art is invariably related to religious activity are plain misconceptions (Bahn 2001; Martínez *in press*; McCall 2007). Belief systems and religious practices, like all cultural traits, are diverse and context dependant, and although they may share some common features through time and space, making descontextualized assumptions and interpretations seems completely unjustified (Solomon 2006).

What the proposals of Lewis-Williams potentially explains is actually the origins of ritual and religion, but does not achieve to successfully account for the emergence of visual art as a separate trait in itself. It suggests that 'at the beginning' there was no distinction between image-making and ritual/religion, but barely treats the problem of when, why or how "at some point" the detachment between the two sets of practices might have taken place.

Cognitive Evolution

The third proposal suggests that visual art is an evolved cognitive ability, correlated with brain capacity and the 'modern' human mind. This so-called mental modernity refers, among other aspects, to the aptitude of understanding and manipulating symbols and meanings.

Currently, there are two views regarding the timing and process of the evolution of modernity which curiously resemble theories of the origins of the universe, represented by the 'big bang' (revolution) and inflation (gradual expansion) models. While the view purporting a long and gradual development of human mental capacities throughout the evolution of the *Homo* lineage is gaining momentum and support from archaeological data (McBrearty & Brooks 2000), the revolution scenario is most popular with archaeologists, who still struggle to identify that elusive decisive factor or combination of factors (language, technology, sociality, demography, competition, etc.) that first made Pleistocene humans start behaving 'like us'.

One of the best-known scenarios that have been put forward to account for the 'creative revolution' entails a genetic mutation that had an effect at the neurological level.[9] Steven Mithen has suggested that the capacity for art "may be a consequence of a major change in human mentality that occurred some 50,000 years ago" (Mithen 2001: 47) due to some random mutation that set off the reorganization of brain functions allowing "fluidity" or communication between different mental modules and, with it, symbolism, imagination, and creativity (Mithen 1996, 2001).

9 The 'creative revolution' is identified with the archaeological record of the Later Stone Age in Africa, and with the Upper Palaeolithic in Europe and the Levant, and includes cultural innovations (in regards to previous periods) such as recognizable stone tool types, geographic stylistic variation, standardized artefacts, burial, improved hunting techniques, and visual art, among others.

According to Mithen, being able to apply domain-specific knowledge from multiple 'intelligences' (technological, social, natural) simultaneously is what finally allowed the free use of symbols and ultimately made traits like art possible. Once freed from previous cognitive or imaginative constraints, humans were potentially able to diversify their technology and experiment with new types of tools and artefacts, and to populate new territories.

The appearance of symbolic thought, Mithen says, required new ways of expressing and communicating symbols, or external supports in which ideas could be 'offloaded' and exchanged between individuals and populations. Visual art emerged to make up for such need, and as the result of modern humans exploiting material culture for symbolic purposes. The visual arts became "not only the products of a new way of thinking, but also their source" (Mithen 2001: 49), constituting a true extension of the human mind (Mithen 2007).

The main problem of this model, as Richard Klein has acknowledged for his own support of a neurological mutation, is that it is unfalsifiable: "The idea admittedly fails one important measure of a proper scientific hypothesis: it cannot be tested or falsified by experiment or by examination of relevant human fossils" (Klein 2002: 24-25), rendering it simply speculative. And although hypothetical scenarios such as this may be useful heuristic instruments in archaeological research (Roebroeks 2008), it is also true that it is not able to offer either causal mechanisms or testable predictions about the phenomena it attempts to explain.

But more than that, in this proposal the presence or absence of art, and certain technologies (Upper Palaeolithic-like) and their complexity are taken as direct reflections of the state of development of human cognition (Mithen 2001: 39). But as indicated by the "Tasmanian paradox", many historical hunter-gatherers such as the Tasmanians, Fuegians, and Californians got by without problems on a Middle Palaeolithic-like toolkit that may be described as 'non modern'. Moreover, anthropologists have shown that the use and production of tools, weapons, and artefacts is more often a matter of cultural choice than of mental ability, creativity, material availability, or environmental constraints (see Rival 1996). Technological sophistication and variability are then no infallible archaeological indicators of species, intellectual development, or behaviour.

Much like tool-making, visual art is not merely the realisation of a preconceived idea (Ingold 1993): the active production process shapes material culture at least as much as the cognitive process does. We could say that visual art is not simply a mental occurrence (you cannot just 'think' art), it is a physical, practical activity that requires the use of tools, materials, cultural conventions, and individual choices, and in this sense it is closer to work and the hand, than it is to cognition and the mind (Vygotsky 1978). Thus a materialist approach may be more suitable than a cognitivist one for its study.

Analysis and proposal

Assessing which of the previous three competing hypotheses might provide the best explanation for the origins of visual art in the Pleistocene proves problematical, as all three are truthful, to a certain extent. We cannot deny that visual art can and does affect human mate choice, as recognised by Darwin, and summarized by Hirn: "there is no reason to doubt that the savage beaux and belles really have increased their chances by putting wooden slabs in their lips and ears or pins of bone through

their nose" (Hirn 1900: 208). Similarly, a quick look at the ethnographic material of forager groups would indeed make evident that the visual arts are closely associated to ritual and religion. Lastly, the use of signs and symbolic systems as auxiliaries to cognition (e.g. to recall, compare, inform, choose, etc.) has been long identified by psychology (see Vygotsky 1978), and so the conception of visual art as 'extended mind' is relatively a reasonable one.

At the same time, all three models may be criticised in two important points. The first is their assumption that, at least since the advent of 'modernity', the human mind has remained relatively unchanged. The notion, championed by evolutionary psychology, that contemporary humans still have 'Pleistocene brains', and that our behaviour is still guided by the preferences developed by our hunter-gatherer ancestors is accepted by all proposals, but has been harshly criticized by developmental psychology, anthropology and neurology. Furthermore, cognitive aspects that had been established as universal such as visual perception and spatial cognition patterns, when further considered actually differ across cultures (Henrich *et al.* 2010). Even the physiological functions of the human brain are not fixed, as it turns out, the brain is highly plastic, and what we call the human mind may in fact not be constant but shaped by epigenetic and developmental factors that are ecologically and culturally specific (Kolb & Gibb 2003).

Secondly, the discussed models do not distinguish properly between different levels of explanation, generating some conceptual confusion. According to Tinbergen (1963), a complete account of the evolutionary history of a behaviour should be made up of four different but correlated aspects: a) causation: the proximal factors and mechanisms that cause the behaviour; b) survival value: the role of a behaviour and how it contributes to the survival of the organism, i.e. its evolutionary function; c) ontogeny: how a behaviour emerges and develops in the life of the organism; d) evolution: how and why the behaviour evolved, i.e. its phylogeny. The proposals examined above set out to explain the phylogeny or evolutionary history of visual art, but somehow get fixated on function. What they do is provide a relatively accurate description of some effect that visual art can have in human life and ascribe them survival value, but they do not explain how and why the behaviour itself evolved.

Of course, to account for the phylogeny of a behaviour one has to make observations, descriptions, and analyse functions, causes, and effects, but these must be taken to the explanatory level in order to constitute a proper hypothesis, as Tinbergen himself put it: "Our study always starts from an observable aspect of a life process – in the present case, behaviour. The study of causation is the study of preceding events which can be shown to contribute to the occurrence of the behaviour. In this study of cause-effect relationships the observable is the effect and the causes are sought. But the life processes also have effects, and the student of survival value tries to find out whether any effect of the observed process contributes to survival if so how survival is promoted and whether it is promoted better by the observed process than by slightly different processes." (Tinbergen 1963: 418)

Clearly, it is not that simple to identify the different levels of explanation and the associations between them, and is easy to get caught on the effects of a behaviour as these are the observable aspect, whereas cause and function must be inferred. Consider 'eating': the cause of feeding behaviour is that the metabolism requires energy in order to keep the organism alive and functioning, which is experienced by the organism as hunger. Some of the visible effects of eating may be growth, weight

gain, etc., whereas the actual function or survival value of ingesting food is to absorb nutrients.

In the same manner, some of the visible effects of visual arts are attracting attention, enhancing beauty, luring mates, expressing ideas, depicting visions, aiding memory, etc. But, I suggest, the proximate cause of visual art is communication. Communication is here understood beyond its popular definition as mere transmission of information. Communication involves an interactive process (transmission of information *and* response) that influences and guides the behaviour of the individuals involved (Endler 1993; Maturana 1980). In this sense, we could say that the ultimate function of communicating through visual cues is orienting human interactions. In our highly social, highly visual species, enabling information exchange and coordinated action at a distance, and without speech, would certainly present its advantages.

To paraphrase Lorenz (in Sterenly & Griffiths 1999: 221), we might ask "What do humans have visual art for?" and answer simply "To coordinate behaviour", meaning that coordinating behaviour is the function whose survival value, by the process of natural selection, made a potential visual artist out of every member of the species *H. sapiens*.[10]

In this light, it is possible to conceive of visual art as a sign system. Vygotsky (1978) pointed out that, like tool technology or any other instance of material culture, sign systems are not 'natural' but created by societies over history, and change with society and the level of cultural development. And this is what we clearly see in the archaeological record of the Pleistocene: a gradual development of visual art from simple to complex, but not due to increasing brain capacity, but to increasing social sophistication (Fig. 1). From the earliest evidence of visual art onwards, we observe a diversification of media, and a specialization of art-making activities that likely correlate with developments in social organization.

Final remarks

If we are to come up with truly consistent, testable hypotheses that can properly account for the evolution (emergence and development) of visual art in our species, there are at least three fundamental points that we must take into account:

1. Visual art is diachronical: it is not 'an instinct', but an emergent social behaviour with a long evolutionary history which, like those of diet or technology, has to be acknowledged and accounted for.
2. The archaeological study of visual art must take a materialist approach: visual art must be regarded as an instance of material culture, rather than as cognitive ability or behavioural by-product.
3. The 'art impulse' is the universal human tendency to socialize or 'anthroposize' the environment: it is the process whereby humans incorporate objects or materials (which may range from the own body to the landscape) into their social communication system.

10 The evolutionary study of visual art would thus benefit from exploring sociological communication theory (e.g. Luhmann) and the evolution of animal communication systems. Regarding the latter, however, we should be careful not to commit the 'bowerbird fallacy'.

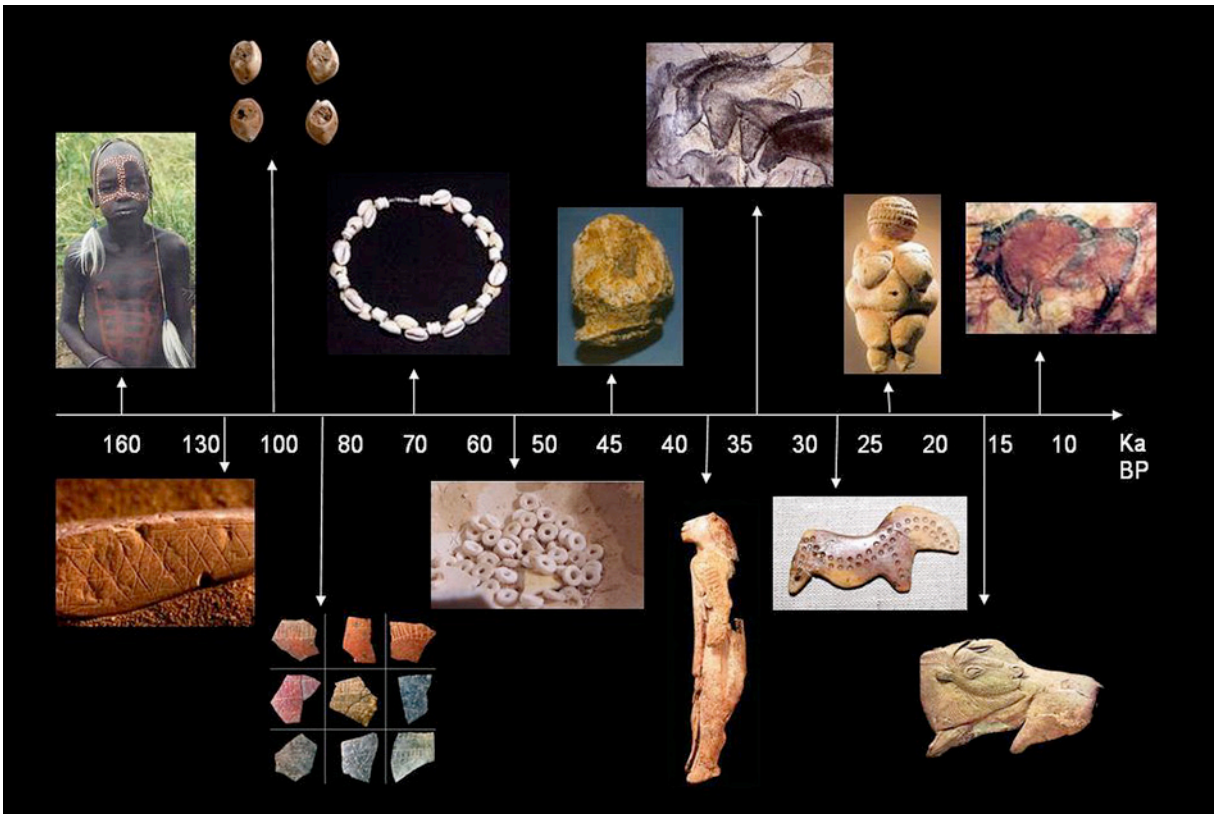

Fig. 1 : Development of visual art in the Pleistocene.

Evolutionary hypotheses on the origins of art have often been dismissed as simple 'just-so stories'. However, I believe an evolutionary approach has great potential to explain why and how modern humans developed visual art, and the part that visual art has played in human evolution. We must, however, try to explore new avenues of research and move away from those which might be exhausted. Studying the evolution and development of visual art as communication might constitute a way forward.

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