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The Descent of Art. The Evolution of Visual Art as Communication via Material Culture

Abstract

Dieser Artikel beginnt mit einer Analyse dreier aktueller und einflussreicher Evolutionsansätze zu den Ursprüngen der Bilder. Der erste Ansatz geht auf Darwin zurück und deutet an, dass Kunst, ähnlich wie der Pfauenschwanz, durch sexuelle Selektion entstand, um im Paarungsverhalten das andere Geschlecht anzulocken. Ein zweiter Ansatz geht davon aus, dass es die Hauptfunktion der Kunst ist, Aufmerksamkeit auf sich zu ziehen, um sozialen Zusammenhalt zu fördern und die allgemeine Fitness der Gruppe zu steigern. Das dritte Modell besagt, dass Kunst während der Evolution ein Hilfsmittel darstellte, um mentale Strukturen zu organisieren und kognitive Fähigkeiten zu fördern – bspw. Gedächtnis und Lernen. Vergleicht man diese Ansätze mit Belegen künstlerischer Handlungen aus archäologischen Funden des Oberen Pleistozän – 127000 bis 10 000 Jahre vor heute, und speziell zwischen 100000 und 30 000 Jahren vor heute – zeigt sich, dass keiner dieser Ansätze die Entstehung und Entwicklung der Kunst, wie die Archäologie sie nachweist, vollständig erklären kann.

Auf der Basis dieser Analyse argumentiert die vorliegende Arbeit:

1) Viele wichtige Aspekte bezüglich der Ursprünge der Bilder sind bisher nicht in existierende Modelle aufgenommen worden, so dass eine Beschreibung der Ursprünge, welche den archäologischen Befunden entspricht, bisher nicht existiert.

2) Es könnte sich lohnen, ein alternatives Szenario der bildenden Kunst zu entwerfen, welches diese als Kommunikationssignal, in Form einer stilistischen Variation der Sachkultur, begreift.

3) Ein auf Kommunikation, Sachkultur und Stil basierendes Evolutionsmodell kann die eingangs gemachten Vorhersagen – für die Entstehung und Entwicklung der bildenden Kunst im Pleistozän – erfüllen, von denen im Folgenden einige vorgestellt werden.

This paper starts out by offering an analysis of three highly topical and influential evolutionary approaches for the origins of art: The first goes back to Darwin and suggests that art, like the peacock's tail, was shaped by sexual selection to attract the opposite sex. The second proposal suggests that the main adaptive function of art is to attract and share attention, thereby promoting social cohesion and increasing the overall fitness of the group. The third model advances that throughout evolution, visual art has helped organize mental structure and enhanced cognitive abilities—e.g. memory and learning. By contrasting these models against evidence of artistic behaviour from the archaeological record of the Upper Pleistocene—127 000-10 000 years before present, and especially from 100000-30 000 BP, it becomes evident that none of them can fully account for the emergence and development of visual art as it is reflected in the archaeology.

Based on that analysis the present work argues that:

1) Many important issues regarding the evolution of visual art in particular have not been attended by existing models, for which an account that is compatible the archaeological record is still lacking.

2) It might be fruitful to pursue an alternative evolutionary scenario for visual art, in which this trait is conceived of as a communication signal in the form of stylistic variation in material culture.

3) An evolutionary model based on communication, material culture, and style can generate preliminary predictions for the emergence and development of visual art in the Pleistocene, some of which will be outlined.

Consider the faculty of making art not as a special God-given gift reserved for a few talented individuals, or as an acquired skill that takes years to learn and master, but as a universal human behaviour. Consider behaviour not as a fixed action pattern, but as any action of an organism that changes its relationship to its environment. Consider the environment not as the extraneous surroundings of the passive organism, but as a system with which the organism is in constant interaction and of which the organism itself is an active part of.

The view that emerges from these considerations is one of art as a generalized human ability that responds to and simultaneously influences the milieu in which human existence unfolds. It is this way of conceiving art that has been adopted by evolutionary approaches. Art is understood as an embedded behavioural faculty that must have its place in the phylogeny of our species. The task of the evolutionary art scholar is to find out and explain the possible role that visual art played in human evolution.

1. Three Evolutionary Rationales for the Origins of Art

The three influential and current evolutionary models for the origins of art presented below have been groundbreaking in redefining art as a biological as well as a cultural trait. Each model suggests a different scenario regarding the possible evolutionary forces that selected for art, and the adaptive benefits that art may have bestowed to humankind in the making. The following paragraphs will briefly recapitulate the main points made by these accounts.

1.1 Art Evolved by Sexual Selection through Mate Choice

The first rationale, which may be called ›the sexual selection model‹ holds as its central hypothesis that *art¹ functions as a fitness signal* (MILLER 1999; 2000): According to this, producing art is an energy-consuming, difficult activity because it requires training, skill, creativity, material resources, and time that could be better-off spent in subsistence undertakings. Thus, the fact that an individual can afford to ›waste‹ effort in such an enterprise shows that he/she is fit, intelligent, and vigorous enough and would make a suitable reproductive partner to produce healthy offspring. In this way, the properties of artworks act as an indicator of phenotypic and genotypic quality. Costly and skilfully made works of art, will therefore be perceived as special and beautiful, and elevate the status of the maker. This would explain why people are willing to spend precious time and resources on these practices. By this logic, the model suggests that art originally evolved under the selective pressure of mate choice related preferences. It predicts that art will be most salient in the context of mate acquisition and reproductive competition.

1.2 Art Evolved as Ritualized Behaviour for Group Bonding

The second proposal revolves around the notion of sociality. It poses the premise that art² is the human innate behaviour of shaping and elaborating

¹ Here, art denotes literature and the visual arts.

² In this model, art is used as a generic term that refers to all ›the arts‹ (dance, song, music, per-

objects and actions in order to emphasize them, making them extraordinary or special (DISSANAYAKE 1999; 2008): The early interactions of human mothers and their infants are characterized by the repetition and exaggeration of gestural, acoustic, and vocal stimuli to draw and sustain attention between participants (e.g. baby talk, lullabies). At some point in evolution, humans became aware of biologically important matters such as birth, death, health, fertility, growth, reproduction, etc. and started carrying out communal activities to mark and try to influence these situations. The ritualized behaviours of the mother-baby contact³, with their soothing and bonding psychological effects, became co-opted by group ceremonial contexts and were applied to different media to conform the arts. In this manner, the model explains, art co-evolved with ritual ceremony and acquired a social function and adaptive value by binding and organising groups and providing psychological comfort under stressful circumstances, ensuing group solidarity and ultimately survival. This model predicts that art will be most prominent in the context of communal rituals and ceremonies. Promoters of this model find support in the observation that the arts play an important part in ceremonies and rituals across times and cultures.

1.3 Art Evolved as a Cognitive Ability for Symbolism

The third model suggests that *art*⁴ is a manifestation of the cognitive capacity for symbolism which came about late in evolution by means of a neural re-structuration that likely took place sometime in the past 100 000 years (MITHEN 1996; 2001): Before the emergence of our species, hominins had developed four mental abilities that eventually supported the emergence of symbolic thought. First, the ability to make intentional marks probably became established with the use and fabrication of tools. Then, the capacity to recognize and classify natural signs, such as the sights and sounds of other individuals and properties of the environment, is probably an ancient trait as well. Third, the faculty of communicating intentionally with conspecifics is also present in apes and thus must have been available to our earliest ancestors. Finally, the ability to attribute meaning to marks and objects could have arisen gradually in our lineage. For instance, in a foraging context, ›reading‹ natural signs such as animal tracks must have had selective advantage, as the most successful hunters were those capable of interpreting or reading the meanings of the tracks. These separate abilities became cognitively integrated under symbolic thought only later, as attested by the archaeological record, where evidence for the use of symbols (for instance in the form of art) does not appear until the late Pleistocene.

formance, drama, literature, painting, sculpture, etc.).

³ Consisting of five operations: formalization, repetition, exaggeration, elaboration, and manipulation of expectation (DISSANAYAKE 2009).

⁴ In this model art refers mainly to ›visual symbolism‹, i.e. visual art.

This model states that this integration was spurred by a structural or organisational change in the human brain, possibly brought about by a mutation that allowed increased accessibility and fluidity between different neural functions. It was only then that humans were able to freely create and manipulate symbols in material form (MITHEN 1996). By attaching meanings to artefacts, these could be used as mnemonic and information-storage devices, extending the powers of the human mind. In this way, visual art provided external mental supports by which ideas could be ›offloaded‹, preserved, passed on, or exchanged, so accelerating cultural development. This proposal makes the prediction that the earliest evidence of art will co-occur with greater cultural variability (for instance new technologies, changes in diet, different settlement patterns, etc.).

2. Criticism of the Three Models

Each of the proposals presented above has a different understanding of what sorts of manifestations should be contained under the term art. This is problematic if they want to be seen as competing hypotheses for the origins of art as a ›whole‹. Perhaps for this reason there has been an affluence of works that deal with the origins of the specific arts instead of ›art‹, focusing mainly on three themes: music, storytelling or narrative, and the visual arts. Tackling the evolution of the individual arts separately may not only be convenient, as it attenuates the problems confronted by monolithic explanations, but it also may be the most factual way to proceed as the data presented below will suggest.

Recent research data from neuroscience and comparative biology suggest that each of the arts probably followed a different evolutionary path, and are unlikely to share a common origin or function. For one part, the faculties and behaviours that underlie each artistic form do not appear together in development, but have different onset times in ontogeny:

Whereas musical abilities appear to be innate, narrative faculties appear later in life as language is acquired. The skills involved in the visual arts also begin to occur by the age of 3-4 and have a strong social component as well. Thus the literary and visual arts do not appear to be innate, but emerge in development through social prompting.

Similarly, music and dance, storytelling, and visual art seem to have arisen at different times in evolution. Music and dance, some scholars think, are probably very ancient behaviours that appeared early in the evolution of *Homo*, probably preceding linguistic abilities (BROWN 2000, 2007; CROSS/MORLEY 2008; DUNBAR 2004; FITCH 2005; MCDERMOTT/HAUSER 2005; MITHEN 2009). Storytelling and other literary forms like poetry, oratory and drama must have evolved later, with or after spoken language (DUNBAR 2005; HEESCHEN 2001; SCHANK/ABELSON 1995) perhaps already in the common ances-

tor of Neanderthals and *sapiens*. Finally, the visual arts seem to have emerged only until the late Pleistocene (COE 2003; LEWIS-WILLIAMS 2002; ZILHÃO 2007), prospering particularly well among the members of our species. Therefore it should also not be surprising if each of the arts turned out to have different adaptive functions.

Regarding the archaeological record, as the following section will show, the mentioned proposals cannot fully account for a few crucial points about the art forms represented in the record:

1) their diversification and accumulation of media through time (e.g. from ochre, to beads, to decorations, etc.) 2) the time gaps between them (e.g. the late appearance of representational art); 3) their specific developments (e.g. from beads made from collected materials like shells to beads fabricated from different materials like eggshell or ivory); 4) the prevalence of certain types (e.g. apparent universality of ochre use and personal ornaments); and 5) their differential expression across and within hominin species (e.g. why art is from inexistent to scarce in Neanderthal contexts and abundant in modern human sites).

I have criticized the existing models for keeping too broad a spectrum on art and the species involved in its production. For this reason, they cannot account for the evidence from the Pleistocene art record. Alternatively, I will focus only on visual art because of its availability as archaeological material, and will attempt to trace back its development in *Homo sapiens* only. This should to an extent help in avoiding the pitfalls highlighted on the previous scenarios.

3. The Record of Pleistocene Visual Art

Visual art is here defined as any object made, modified, or displayed by humans with the intention of engaging a perceiver's attention through visual cues⁵. I consider this practice not as an individual enterprise but as embedded within a cultural tradition or systematic social practice. Since the notion of cultural traits defines them as socially shared, persistent, and variable (VAN SCHAIK/PRADHAN 2003), my definition is at odds with the idea of art as ›instinct‹ and excludes examples of ›animal art‹, and ›one-off‹ archaeological finds (such as the Tan Tan and Berekhat Ram figurines), whose intentionality and place in a cultural tradition are difficult to assess. Objects that are considered as characteristic components of the Pleistocene record of visual art include pigments, personal ornaments, engraved and decorated objects and two and three dimensional representational manifestations.

The archaeological record of visual art starts, just as the history of our species, in Africa. Several sites in this continent associated with early *Homo sapiens*, or its immediate ancestors, have yielded evidence of the systematic

⁵ This definition has been adapted from van Damme (2008).

exploitation of earth minerals (limonite and hematite) that were very probably used to obtain pigments. The minerals can also be rubbed directly on surfaces to apply colour. This practice goes as far back as 200 000 years and is very persistent throughout the Pleistocene (WATTS 2009).

Pigment use is also documented in European sites associated with Neanderthal occupation (ZILHÃO et al. 2010). However, their use of coloured minerals seems to have been much less exhaustive than among modern humans, as attested in the Upper Palaeolithic when the frequency and quantity with which pigments appear in the record clearly intensifies. For this reason, Watts has argued that the habitual use of ochre (for red pigment) can be considered as a defining trait of *Homo sapiens* (WATTS 2009: 80). It is very probable that pigments were involved in body art practices such as body painting and tattooing. Unfortunately these practices have left no trace in the Pleistocene record.

The most concrete evidence of personal ornamentation is the existence of perforated seashells which have been interpreted as beads, for use in jewellery or decoration of personal attires. These ›natural‹ ornaments have now been found in several Pleistocene sites in North and South Africa, and in the Levant in contexts older than 50 000 years, and after that date they appear in Australia, Europe, Asia and eventually the Americas⁶.

Decorated objects which show intentionally made patterns (engraved) are still scarce in the Pleistocene record. So far, the youngest item with clear intentional engravings is an ochre piece from Blombos Cave, in South Africa, which bears a repetitive geometrical romboïd pattern; this object has an estimated age of 77 000 years (HENSILWOOD et al. 2009). At the also South African site of Diepkloof, a group of 270 engraved ostrich egg fragments has been recovered. Again, the markings consist mainly of geometric forms. This find attests to the existence of a conventional symbolic tradition dating from 60 000 years ago (TEXIER et al. 2009).

Compared to pigment use and personal ornaments, the evidence until now indicates that representational or figurative art appeared quite late in our history. The first instances of representation are constituted by several mammoth ivory figurines originating from early Upper Palaeolithic cave sites in the valleys of Swabia, Germany, which have been dated to between 40 and 35 000 years BP (CONARD/BOLUS 2003). The figurines depict most often Pleistocene fauna: mammoth, horse, lion, bear, water fowl.

⁶ In chronological order, from most ancient to most recent, these shell beads have been recovered at the sites of Skhul, Israel (100-135 000 BP); Contrabandiers Cave (BALTER 2011), Morocco, (108 000 BP); Oued Djebbana, Algeria (100-90 000 BP); Pigeons Cave, Morocco (82 000 BP); Blombos Cave (HENSILWOOD et al. 2004), South Africa (75 000 BP), and Sibudu Cave (D'ERRICO et al. 2008), South Africa (70 000 B). Perforated shell beads first appear in the Australian record at the sites of Riwi (40-30 000 BP) and Mandu Mandu (32 000 BP) (BRUMM/MOORE 2005: 160).

As for figurative painting, the oldest dated example is constituted by the cave of Chauvet in France. The painted panels at this site represent, again, mostly animal motifs, the most common being lion, rhinoceros, and bison. The paintings of Chauvet have been dated to 33,000 BP (CLOTTES/ARNOLD 2003)⁷.

4. An Alternative Evolutionary Framework: Communication, Material Culture and Style

At this point we are confronted with the problem of presenting a viable alternative to the existing evolutionary proposals for the origins of visual art. The literature often mentions the communicative potential of this trait. I will argue that visual art is indeed a signal, and thus a basic element of the human communication system⁸. As such, visual art must have evolved under the same selective pressures as human communication in general.

Communication is commonly thought of simply as the transmission of information. This view, however, is incorrect or, rather, incomplete (CROFT 2000: 87). Communication is an operation that involves both information emission and response, in which at least one sender produces a signal conveying information that in turn somehow influences the response of a receiver. It is a process that guides the behaviour of the implicated organisms (CROFT 2000: 87).

A communication system may be characterized as

a concrete (material) system composed of animals of the same or different species, as well as non-living things, in some (natural or social) environment, and whose structure includes signals of one or more kinds—visual, acoustic, electromagnetic, chemical, and so on. (BUNGE 2003: 67)

Signals may inform, for instance, about the identity, presence, state, or intention of the sender, to which the perceiver may adjust its response (CROFT 2000: 98). The function of signalling behaviour is the coordination of behaviour among individuals.

The selective pressures that could have driven human communication have been a relevant topic among experts. Many researchers now concur in that these abilities unfolded in the context of human sociality (DUNBAR 1996; FITCH 2010); and organised cooperative activity (CROFT 2000; STEELS 2007; TOMASELLO 2008).

⁷ It has been suggested that some rock art traditions from Australia (the Bradshaw paintings at Ubirr and the petroglyphs at Dampier), might extend as far back as 40,000 years, making it potentially older than Palaeolithic cave art (WHITE 2003:183), but this chronology remains inconclusive. The earliest accepted dates for the so-called Bradshaw style at Ubirr lie between 25-17,000 BP (BRUMM/MOORE 2005: 160).

⁸ It is constituted by gestural, vocal, and artificial signals. Visual art may be described in Wobst's terms as »signalling in the artifact mode« (1977: 326).

On these lines, developmental psychologist Michael Tomasello (2008) argues that human human communication arises from social interactions (there is no communication outside a social context), which are primarily co-operative. Humans are more collaborative than any other primate species (MOLL/TOMASELLO 2007), engaging in cooperation⁹ for most of their group activities: For instance, by distributing communal tasks among the members of the community (i.e. social division of labour), humans achieve high subsistence productivity. Most foraging activities are taken on by specific units and returns are shared with the entire group. The manufacture of tools and implements is also a social enterprise, from sharing the knowledge about the manufacturing process to putting them into practice. Even the rearing of children is taken on communally, typically group members other than the mother or parents are actively involved in the care and provisioning of the human infant (BURKART et al. 2009; HAWKES et al. 2000). At the individual level, cooperation is also embedded in human psychology. Prosocial behaviour and cooperative action appear spontaneously in humans from an early age: young children are keen on offering help and requesting it, and enthusiastically take on cooperative activities (MOLL/TOMASELLO 2007).

If visual art may be seen as an extension of human communication, then the same selective pressures for cooperation and coordinated action should apply to it. To test this notion, one first has to outline how it is that visual art could function as a communicative signal. And to this aim, we must understand visual art as material culture.

By focusing on the cognitive and/or behavioural aspects of art, evolutionary researchers have described it as an instinct (MILLER 2000: 270), as something that people imagine (MITHEN 2001) or something that people do (DISSANAYAKE 2009: 166). Since neither past minds nor behaviour can be observed directly, these proposals have been difficult to ground on the available data from the Pleistocene. Thus, in order to incorporate the archaeological record in an evolutionary account of visual art, we had rather consider its practical and material aspects, seeing it not as the product of imagination or a way of acting, but as something that people make and use that is as material culture.

In archaeology, material culture is defined simply as the physical remains of humanly made traces of past societies. A more comprehensive anthropological perspective describes it as all physical objects made or used by humans, the totality of our cultural environment (TER KEURS 2006: 6). This cultural universe is constituted not only by utilizable finished products but also by humans and their activities which include the knowledge, materials and transformation processes that combine to bring material culture into being.

Material culture in a broad sense can also be characterized as the tangible transformation of matter through anthropic intervention (TER KEURS

⁹ Cooperation means that »the partners perform reciprocal roles and also understand them, in the sense that they coordinate their actions and intentions with the possibility of reversing roles and even helping the other with his role if needed« (MOLL/TOMASELLO 2007: 641f.).

2006: 6). This transformation process entails the »expenditure of physical and mental effort« and is thus an instance of human labour (INGOLD 2000: 299), which as defined by Marx is »by and large, *purposive* activity« (INGOLD 2000: 300). Therefore, to adopt a view of visual art as material culture means to reject a definition of visual art making as an activity without purpose (the notion of art for art's sake) and of visual artworks as non-functional.

By conceiving visual art as a communication signal expressed in material media, it is possible to identify potential selective pressures, which should correspond to those identified for human communication in general: cooperation and coordinated action. Moreover, understanding visual art as a form of material culture opens the possibility of approaching it from the perspective of archaeological theory. In this framework, style studies may be able to throw light on the development of art in the Pleistocene.

The information exchange theory of style, introduced by American anthropologist Martin Wobst (1977; 1999), and further developed by anthropologist and ethologist Polly Wiessner (1983) views visual art as an act of social communication defined by style.

In archaeology, style generally refers to specific patterns of variation in the form of artefacts that are socially constrained. Because style tends to be characteristic of human social groups, it can be used to infer information about the identity and situation of the group where these specific formal variations originated (SACKETT 1986). In this manner, archaeologists have used style to identify the makers of material culture. Wobst redefined style as an active strategy of information exchange in which messages are carried by artefacts (1977: 317)¹⁰. The contents of stylistic messages will typically be indexical (relating to identity), deictic (drawing attention), prescriptive, proscriptive, or relating to emotion, authorship, ownership, or affiliation. Style can take an individual or collective form.

Individual style conveys information about personal identity (emotional states, social position, affiliation, membership, authorship, possession, etc.), and is generally displayed in intra-group contexts¹¹. Collective style contains messages that typically refer to group norms, values, or attributes (can include messages of identification, territoriality, authorship, ownership, pre- and proscription, etc.) and its target group is usually well specified (for example, a particular population)¹².

Because of the simplicity of the contents, the utility of these messages is expected to be inversely proportional to the degree of familiarity between emitter and potential receiver, and should positively correlate with the size of

¹⁰ Information exchange »includes all those communication events in which a message is emitted or in which a message is received« (WOBST 1977: 321), and is just one aspect of the communication process.

¹¹ Those items of material culture that better portray assertive style are visible personal utensils and body ornaments. In the latter category, media may include the human body itself (through body art: tattooing, scarification, branding, paint, hairstyle, etc.), pieces of clothing, jewellery, etc. So, these forms would be expected to pervade in the record of Pleistocene humans.

¹² Rock art traditions may be examples of emblematic style in the Pleistocene (BARTON et al. 1993).

the social networks that individuals participate in. This means that in the household and close network few messages will be expressed through style or the stylistic content of artefacts will be low. If emitter and receiver are too close, the message will become redundant and costly, if they are too distant, reception and decoding chances become scarce. Contrastingly, more and more complex stylistic messaging will be targeted at socially distant but still acquainted receivers (WOBST 1977: 329).

In accordance, the model of style as information exchange predicts that among small-scale hunter-gatherer groups, like our Pleistocene ancestors, personally-guided manifestations will be more common, mostly alluding to an individual's position in the social structure (gender, age, status, etc.). Whereas, collective style will not be greatly developed (WIESSNER 1983: 258). But as societies increase in size and complexity, there will be more chance and necessity to interact with socially distant groups, and group style will become better determined, more visible and important (WOBST 1977: 326). This two-stage development of style seems to be reflected in the Pleistocene record, where individually based style dominated in the form of personal ornaments for the most part. But once collective style like representational art entered the scene, it seems to have rapidly increased in frequency and importance.

In her fieldwork among the Kalahari San hunter-gatherers, Wiessner found that motivation for assertive stylistic investment was often associated with a personal desire to present oneself positively. Gaining a good reputation might be important in the context of reciprocal altruism. As Tomasello explains, in humans cooperation is crucial for survival. Individuals care about building and enhancing a good reputation because people generally choose to help or cooperate with others who are known to be good helpers and co-operators, and are thus expected to reciprocate. So, a positive image and status largely contribute to social success (2008: 200-201).

It is possible that because of this close relationship with individual reputation and social reciprocity, visual art acquires its particular aesthetic and affective properties. Reputation and status are built upon style as a social signal, which is socially constructed and transmitted (it is a convention). But to function as an aid in building a reputation for cooperation, the stylized signals must allow the possibility to be traced back to the signaller (convey identity). In my view, it is due to this double-play between social and individual expression that visual art forms reflect and produce aesthetic and affective reactions: the maker will invest more in the signal to produce a positive effect in the receiver, and the receiver will pay more attention in order to accurately assess the social qualities of the maker. This operation can take place at both the individual and group level.

However, as it was explained before, the function of communication is not information exchange but coordinated action among participants. Style speaks before and in absence of speech and sets the mood for a first social contact between two parts. Thus the adaptive benefit of style in material cul-

ture resides not in the types of messages transmitted, but in the fact that it helps manage social interactions making them more predictable and stable, and less risky and stressful (WOBST 1977: 327). Desirable effects might have been the reduction of competition, aggression, and deception among individuals and groups, and therefore increasing cooperation and survival.

5. Three Testable Predictions

I have argued that that visual art is a communication signal in material culture form that evolved under the selective pressures of human cooperation and has the adaptive function of making social intercourse more predictable and less stressful (for instance, reducing the chances of aggression or deception). From this standpoint, I present three predictions about the emergence, affiliation and development of visual art.

5.1 Visual Art is More Prominent in Modern Humans than in Any Other Hominin Species Because of Their Highly Cooperative Lifestyle

I have reviewed the archaeological record of visual art in the Pleistocene, which seems to show a progression and accumulation of media and forms that has remained unexplained by other models. Based on the predictions of the information exchange theory of style, we can suggest that investment in visual art will correlate with demography and the degree of social interaction within and between groups. This point might also explain why visual art is scarce in Neanderthal associated contexts, for as far as it is known, these hominins had overall low population sizes and their exchange networks went from weak to non-existent (DUSSELDORP 2009).

5.2 Because (Material) Culture is Cumulative We Can Expect an Increase and Complexification Over Time, which is Reflected in the Record (More Media, Forms, etc.) but Trends Will Be Context-dependant and Local rather than in the Form of ›Universal Stages‹

With the appearance of our species and the establishment of well determined communities, pressure for an index of cooperation might have increased. The need to create and maintain indirect reciprocal relations could have driven humans to invest more heavily in their visual signals. Because of their function in reciprocity systems, style investment will be greater in highly visible (openly or frequently displayed) or mobile (prone to exchange) items. This

generally precludes objects from the domestic sphere to contain stylistic messages. Conversely, personal ornaments are very suitable for stylistic display. A second qualitative change is reflected in the emergence of collective style in visual art, which should correspond with major changes in factors that affect social structure (demography, networks, settlement patterns, etc.).

The increasing sophistication of social organisation over time, stemming from increasing population densities and the conformation of larger interaction networks, and its impact on material culture can potentially explain the development of the Pleistocene visual art record. From the earliest evidence of visual artistic behaviour onwards, we observe a cumulative and increasingly accelerated diversification of media, greater work investment in visual art forms, and a specialization of art-making activities: from the assumed use of pigments for body art, to the production of personal ornaments, to engravings, to two- and three-dimensional imagery. This progression (from individual to collective style forms) likely corresponds to social, not cognitive, changes among modern human groups.

5.3 Because Visual Art is Material Culture and an Instance of Labour, in Larger Groups it Will Become Institutionalized and Specialized. This Explains Why Major Representational Artistic Traditions Only Appear Later in History and Seem Progressive.

In the record we see a diversification of media and intensification of investment. The first visual art forms reflect individual style to manage intragroup relations. Then collective style forms appear and become increasingly important and intensive to coordinate intergroup relations. The latter forms, highly conventionalized and structured, require specialized work and the corresponding group size and social institutions to support it (to manage and transmit knowledge).

Work specialization arises and coexists with many social factors, mainly division of labour, population size and density, technology, exchange, the accumulation of knowledge, social stratification, political organization, and internal social institutions that manage the corresponding specialized knowledge and activities (STYMNE 2009). This explains why a complex, specialized activity, like image-making only emerges later in the Pleistocene record (when social structure can provide the necessary supports). Image-making requires arduous labour, skill and knowledge specialization, which is not the rule in smaller scale groups with reduced population size and densities.

6. Concluding Remarks

The proposal presented here views Pleistocene visual art as a human trait that arose and developed in response to social needs related to cooperation, communication, organised labour, and reciprocal relations. Furthermore, it suggests that once we understand the dynamics visual art as an instance of human material culture, it becomes possible to explain the archaeological record: the emergence and timing of certain art forms and the appearance and disappearance of traditions.

In sum, the account given can throw new light on various issues of Pleistocene visual art research. First, it may explain why no other hominin, particularly Neanderthals, evolved visual art to a great extent despite their high social and cognitive abilities. Second, it clarifies why body decoration is the earliest and most widespread visual art form. Third, it potentially accounts for the late occurrence of systematic production of representational art (image-making). Finally, to a certain extent it explains the discontinuity of the archaeological record of visual art.

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