

ideas, and demands a reassessment of the Eurocentric model that has permitted Franco-Cantabrian Upper Palaeolithic art to dominate all discussions of early art evolution, for the greater part of a century. We are witnessing the depreciation of the cultural neocolonialism expressed in this obsession with the early art of western Europe which, during the century of its predominance, has created in the specialist community a subconscious expectation that all answers on the subject of art origins had to come from that hallowed ground of France and northern Spain. Art evolution, consequently, has been seen in terms of diffusion, and art forms lacking Eurocentric concepts of iconicity were often seen as irrelevant to the mainstream of art prehistory (Bednarik 1991). It is therefore not surprising that a viable or persuasive general theory of art origins remains elusive after a century of Pleistocene art studies. In the remainder of this paper, I shall endeavour to present a rough outline of such a theory, based on the currently known evidence from the world.

4. Patterns in Early Art

The first thing one notices in reviewing the global evidence for Pleistocene art is that it remains extremely patchy, that geographic art regions are poorly connected or indeed unconnected, that samples of it have only managed to survive under extremely rare and unusual combinations of circumstances, and that the surviving record must be expected to be extremely fragmentary. Taphonomic processes have distorted all distributional and compositional characteristics of the surviving examples so profoundly that such indices, the basis of all "empirical" reasoning, are of no scientific reliability. Nor can they be relevant without sophisticated taphonomic considerations. Moreover, the available record by no means equals the surviving record, because of significant geographical biases in the research, which has concentrated almost entirely on a few regions of the world. For instance, what we know about the Palaeolithic art of the largest continent, Asia, fits easily into one single paper (Bednarik 1992e).

Upon closer inspection one might note that, with the exception of western Europe, most known Pleistocene graphic art is non-iconic, and some of the few extra-European exceptions are so conspicuous that one might be tempted to examine their authenticity or attribution. This underlines the exceptional status of western European rock art, but it does not resolve the question of art origins.

The paucity of relevant evidence from most parts of the world should not prevent the formulation of a preliminary model of art origins, but in doing so we need to shed our preconceived ideas and consider the data on its own merits, resisting the archaeologists' urge to anticipate what the evidence should confirm (Bednarik 1989c). Leaving aside the iconic component, which may well be of very restricted geographical distribution, it becomes apparent that the global evidence is surprisingly uniform: all prefigurative art in the world consists of a fairly restricted range of elements or form constants, which are found in numerous variants or which may be built into elaborate "mazes" or geometrical arrangements. Cupules and linear petroglyphs begin very early, and the use of ochre pigment is evident from the Acheulian onwards. In Europe, a tradition of producing extremely sophisticated three-dimensional iconic art (sculpture) exists earlier than the known beginning of two-dimensional iconic art (Delluc and Delluc 1978). The recently found Galgenberg figurine in Austria (Bednarik 1989b) confirms the existence of a sophisticated central European tradition of sculpted art that seems to precede the first, crude Aurignacian rock art in France. The technological and artistic sophistication of the animated Galgenberg stone figurine, firmly dated to about 32,000 years BP, cannot be explained as anything but the product of a lengthy tradition, in which people had experimented for thousands, and probably tens of thousands, of years (Bednarik 1989b: 120). Other representatives of this tradition are the ivory figurines from three caves in the Swabian Alb, southwestern Germany, which are of about the same age: Vogelherd (Riek 1934), Stadel im Hohlen Stein (Hahn 1971), and Geissenklösterle.

While intentional engravings on bone and stone seem to date back as far as the Lower Palaeolithic, and some level of appreciating three-dimensional iconicity seems to have existed long before the Upper Palaeolithic, abstraction of a three-dimensional object to a two-dimensional iconic image seems to be a comparatively recent development. In Europe, it may first appear less than 30,000 years ago, while in Australia it developed perhaps even later: there, a convention of non-iconic art persisted for tens of thousands of years. Its recent phases include tracks, i.e., two-dimensional phenomena that need not be converted from three-dimensional object. Fully iconic graphic systems appear to have been introduced in the late Pleistocene (Bednarik 1988a: Fig. 1). A similar development may apply in the Americas, where iconic art has been demonstrated by 10,000 BP. In Africa, iconic painting is

at least as old as it is in Europe, and in Asia the situation remains unclear, although the oldest known traditions are non-iconic. On this very preliminary basis it would appear that the cognitive processes leading to iconic graphic art were independently duplicated in various parts of the world (Fig. 2).

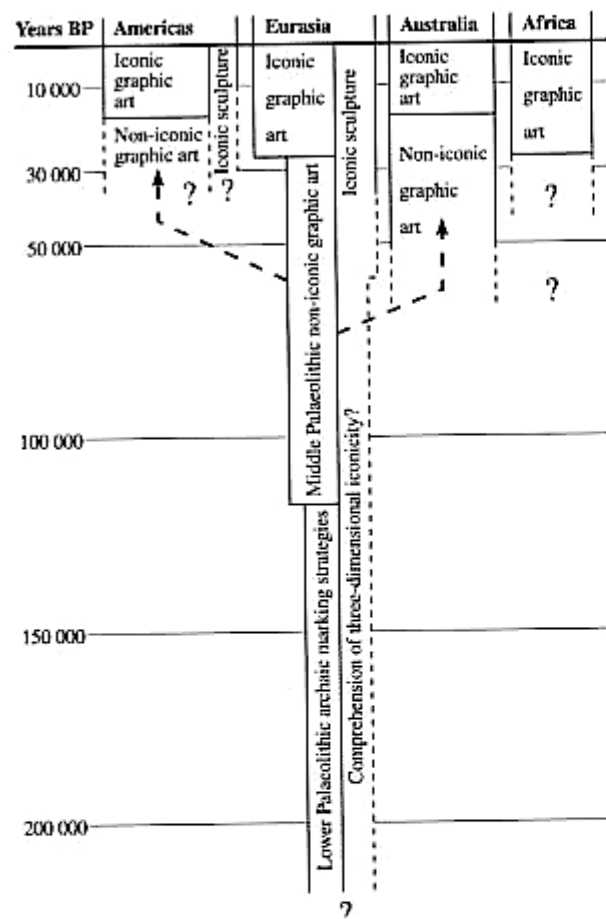


Fig. 2: Very preliminary model of early art evolution, based on the current evidence.

The intercontinental migration patterns during the Middle Palaeolithic as they are currently apparent are of interest here. With first landfall in Australia before 50,000 BP (Roberts et al. 1990), and perhaps much earlier, and a similar order of magnitude for the human settlement duration in the Americas (Guidon and Delibrias 1986; Bednarik 1989a), it is to be assumed that these first seafarers possessed traditions of nonfigurative mark making. That they possessed advanced language is accepted even by Davidson and Noble. This Middle Palaeolithic dispersal model might help to explain the similarity of the early petroglyphs in Africa, Asia, Australia, and the Americas. However, there is a second possibility to account for the uniformity, perhaps in conjunction with the first.

The prefigurative art of the world, I have claimed for more than ten years, is derived from phosphene motifs, and it therefore consists of arrangements and combinations of a known series of form constants (Bednarik 1984, 1986, 1987). These may occur singly, or as parts of elaborate "mazes" or geometrical arrangements. Chase and Dibble (1992: 50) have observed that the phosphene theory has the distinction of being testable, of being accessible to refutation. It has remained the only hypothesis of art origins that is scientifically testable, yet since it has been proposed it has not been refuted, nor am I aware of any refuting evidence.

The basic elements of all archaic rock art are dominated by circles and curvilinear motifs, such as multiple arcs, concentric circles, meandering lines; by convergent lines motifs, radial designs, dot arrangements, sets of parallel lines or grids, and zigzags or wave lines. Variations and intermediate forms are common: for instance, the convergent lines motif (Rosenfeld's [1981] trident; Conkey's [1978] arrow tip, elsewhere described as vulva, bird track, etc.) can be transformed into a radial one by three different mutation processes, which are evident from motifs of Australian archaic linear petroglyphs. Different motif types may be combined, e.g., sets of parallel lines or grids enclosed by circles (in Australia), radial design enclosed by a circle (North America; Bednarik 1988c), or the cross, a radial design, enveloped in a surround (e.g., South America; Bednarik 1988d).

The phosphene hypothesis is in no way related to the recent pseudoscientific attempts to interpret all rock art as shamanic or as trance-induced (Bednarik 1990c), but it notes instead that precisely the same range of about fifteen phosphene motifs (Kellogg et al. 1965) determines all art produced by children before they draw figuratively, i.e., before the age of four years or so. The findings of Knoll, Kugler, and colleagues have been independently confirmed by others who had been unaware of their work, such as van Sommers (1984) and Fein (1976). If we now return to my postulate that art externalizes human concepts of reality and communicates awareness of perceived reality between humans, we see that, so more "developed" an art is, so less it can tell us about the past human quest for comprehending reality. If it were our aim to explore objective reality, we would first have to determine how anthropocentricity (the human concept of reality) was conceived. The arts of "pre-iconic humans," at both the ontogenic and the phylogenetic levels, are apparently similar, and they may be capable of providing some

answers. This potential has remained essentially unexplored, which indicates more than anything else that this discipline has yet to come to grips with the profound issues it faces.

One might argue that it is patronizing or trivializing to compare ontogenic and phylogenetic art development. To this I say that it is patronizing to emphasize the Eurocentrically perceived aesthetic value of French Upper Palaeolithic art, and it is trivializing to seek shamanistic, religious, ritual, and cultural significance in palaeoart: so more enculturated an art is, so lower its scientific value. The scientifically most valuable palaeoart is the most spontaneous, the most simple, the psychologically most accessible art, and the least enculturated. Development in art as well as in human cognition is synonymous with what I have called aggravation of anthropocentricity. The cognition of three year-old children is closer to reality than that of university professors (cognitive sophisticates). Contemporary doodling behaviour, the scientific value of which has also remained almost entirely ignored, can tell us much more about art origins than so-called San or so-called shamans (cf. Hromník 1991). In repetitive, "subconscious" doodling, the artist becomes a mere spectator to his own spontaneous graphic production.

It may be no coincidence that doodles often resemble the graphic production of Lower Palaeolithic hominids. Neural arousal theory (Berlyne 1960; Ellis 1973) holds that optimal level of arousal is of survival value in any species. Level of arousal depends upon the balance between the arousing influence being exerted by the reticulate arousal system of the lower brain, and the inhibiting influence of the cortex on that system. Stimulus-seeking behaviour is a biological imperative, and is intimately related to such phenomena as exploratory behaviour, and strategies that create cybernetic feedback or modify the immediate environment to render it more interesting. Tactile proficiency resulting from tool manufacture and use can be argued to have equipped hominids with new manipulative skills, enabling them to proceed from rhythmic tool manipulation to marks which, given the optimal arousal imperative, would have inevitably led to the "decoration" of interesting aspects of the immediate physical environment: facets or edges of bone fragments, as at Bilzingsleben or Stránská skála (Bednarik 1988b), surface features on cave walls, or whatever else invited cognitive response.

5. Outline of a Hypothesis

It is postulated that neuropsychological insights into the articulation between archaic art and cognitive evolution are possible. Key elements in such work are the assumption that the human neural system has not been subjected to fundamental changes over the last few hundred millennia, and that the operation of the human visual system has remained largely unchanged during this time (Bednarik 1984). An examination of the currently perceived early marking traditions leads to the following, preliminary model of how art production began. This model, admittedly, considers various data that some scholars would view with scepticism, and it may have to be modified in the future if significant new data are presented. However, in the model presented here, the taphonomy of palaeoart (Bednarik 1994b) has been taken into account, and the sample considered is as representative as the current record permits. Moreover, a large portion of it has been examined by myself, so I am not relying entirely on the reports of many different workers with different biases and experiences. Finally, parts of this model are refutable and thus scientific.

I perceive three very vaguely defined main stages, which are obviously not all represented in all regions. In the formative phase of art production, initial marking strategies may have developed from a striving for optimal arousal, by the reaction of "stimulus-seeking" hominids to existing marks, edges, shapes, and surface aspects, who emphasized and "decorated" such features. This reshaping of salient aspects of the physical world resulted not only in an increasing consciousness of the physical reality and a feedback on the impact of mark making behaviour, but inevitably also in an increasingly complex cognitive environment and in the emergence of new, taxonomizing mental processes. Responses to one's own markings also became inevitable. One is tempted to tentatively place this initial phase in the Lower Palaeolithic.

The second phase of this model is characterized by an increasing repertoire of phosphene motifs, experimentation with them, and standardization and conventionalization of their forms. Since all markings at this stage resemble phosphene motifs, it would be futile to consider art origins without involving certain aspects of the phosphene theory. One possible explanation would be that the visual correspondence between phase 1 marks and certain phosphene experiences was recognized. The phase 2 proposition can be readily refuted, by presenting evidence of pre-iconic graphic produc-

tion that lacks a significant content of phosphene motifs.

The beginning of the third phase is marked by the introduction of iconicity as it is recognized by us, an innovation for which I cannot offer a more plausible explanation than that already provided by Davis (1986). It coincides roughly, but by no means always, with the advent of the Upper Palaeolithic. Ambiguity of visual perception, in a population possessing evolved mark-producing and sculpting traditions, is the most plausible explanation for the introduction of iconicity in graphic art. No criteria for refutation of this third stage can be offered, because iconicity cannot be defined scientifically. However, one can call for a more convincing hypothesis to account for the advent of what we experience as iconicity. Presently the competing hypotheses are inferior to that of Davis.

This three-stage model thus suggests that mark production was essentially the predictable outcome of neurophysiological and cognitive evolution, with which it is closely interwoven. The processes leading to it, if repeated under the same conditions, would result in a cosmovision similar to ours. While this provides no support whatsoever for the validity of the human worldview, it does imply that the processes that led to it are theoretically repeatable. That would render them accessible to definition, scientific argument, and quantification. Such access is of course beyond our present capabilities and knowledge – which are themselves merely products of the very processes under investigation.

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