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On the Neuroscience of Rock Art Interpretation

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Introduction

The most pervasive human reaction to rock art, irrespective of the age, ethnicity, or conditioning of the beholder, is to try to figure out what it depicts and what it means. If adequate clues are spotted in a motif to invite an "identification," it is considered to be figurative or iconographic, and it is then interpreted on that basis. Clearly, then, this process reflects the values, mental constructs, and visual responses of the beholder rather than the producer of the rock art motif.

Vision of the type used by primates derives from a complex neural system involving the eye, the optic nerve and chiasm conveying the information to the thalamus (lateral geniculate nucleus), and the primary visual cortex in the occipital lobe, from where it is disseminated through the cortical hierarchy of the visual cortex and visual association cortex. According to the two-streams hypothesis (Mishkin and Ungerleider 1982), the ventral stream, connecting to the medial temporal lobe, limbic system, and dorsal stream, is involved in recognizing, identifying, and categorizing visual information.

However, the effectiveness of this process of detecting meaningful patterns in the visual data and interpreting

them is determined by the state of interconnectedness of the various brain regions involved as well as other factors, such as the degree of integration between the left prefrontal cortical areas and memory. The level and volume of prefrontal cortex activity is widely variable among human brains and, depending on the amount of integration it facilitates, degrees of constellated psychic contents are more or less available for conscious analysis. Having evolved in a patterned world, the brain inevitably has the stamp of patterns built into its structure, and it is patterns it seeks. This can result in apophenia, the experience of seeing meaningful patterns or connections in random or meaningless data, a Type I error. Of particular relevance here is a special form of it, pareidolia, in which iconographic patterns are detected in random phenomena. It is most strongly developed in individuals whose brains are suboptimally integrated and provide limited sophistication of their cause and effect reasoning.

Neurology and Rock Art

In the scanning of rock art imagery by human vision, much the same neural structures as those causing pareidolia are involved. The neurophysiological limitations of rock art interpretation are somewhat different, but there are also parallels. The low connectivity between the hemispheres responsible for what neuroscientists call "magical thinking" contributes to susceptibility to pareidolia. In rock art interpretation, it is the susceptibility to autosuggestion that contributes to the conviction that the modern beholder's visual perception is capable of extracting emic meaning from pigment traces or petroglyph marks made in prehistory. This misconception seems to be attributable to the view that modern mentality and behavior can be attributed to all humans since thirty or forty millennia ago. That error is so ingrained in orthodox archaeology it seems almost impossible to correct, and yet it is self-evident that practically all rock art was created by non-literate people. They most certainly had no "modern minds." Helvenston (2013) has patiently explained that the brains of literates and of people with oral-aural traditions are very differently organized and connected. Those of non-literates operate largely through "magical thinking," whereas the operation by cause and effect reasoning is acquired ontologically. Therefore the most reliable modern interpreters of rock art should be infants, followed by illiterates. The least qualified are modern academic sophisticates, especially archaeologists. And yet it is the latter who keep telling us what rock art means (Chippindale 2001).

Blind Test

In the history of rock art research there has only been one blind test of an academic's determinations of what had been depicted in rock art. But he was much better qualified than archaeologists to present these; he was a distinguished professor of anatomy. Macintosh (1977) had become aware that the makers of a large Australian painting site of biomorphs he had recorded twenty years previously were still alive, so he asked them to identify each motif at the site he had earlier "identified." He found that about 90 percent of his expert interpretations had been false. Thus Macintosh demonstrated that his intimate understanding of anatomy

was no help in establishing the correct identities of a large series of human and other animal images. Since then, the Australian rock art researchers have universally adopted the convention of placing all rock art motif determinations in quotation marks to indicate that they are merely fictional names. This has not yet been understood by many of those working elsewhere, which is unfortunate when one considers that it is only in Australia that substantial and comprehensive ethnographic and emic meanings of rock art remain available. This wealth of reliable information about rock art interpretation has shown in countless examples that the perception of cultural aliens is not capable of interpreting any rock art reliably.

Elsewhere archaeologists continue the practice of telling everyone else what the rock art means and depicts, in the safe knowledge that their pronouncements cannot be tested, cannot be falsified, being fundamentally unscientific propositions. This has led to thousands of claims that range from the likely to the nonsensical and the absurd. Not only do these self-appointed interpreters of rock art tell us what is depicted, they even claim to know that the subject is running, falling, swimming, pregnant, praying, dead or whatever else they happen to perceive in the biomorph motifs. Some motifs in China were interpreted as depicting giraffes (Figure 1), and since this species became extinct there before the Pleistocene, the petroglyphs in question were dated to the Tertiary period.

And why not? There are countless precedents where archaeologists have dated rock art through their "identifications" of objects depicted. An Australian example of

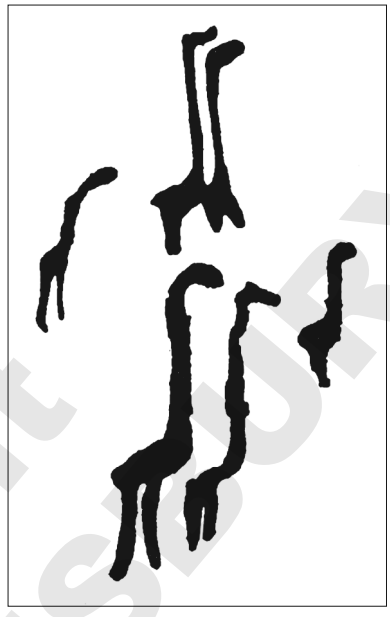

Fig 1 "Giraffe" petroglyphs in China "of the Tertiary." (Image: Li Fushun)

Fig 2 Australian "giraffes"; for correct identification see Welch (2012). (Photo: David M. Welch)

apparent giraffes in rock art (Figure 2) has been contributed only recently, but without yielding claims of giraffes in the Antipodes.

The astute researcher in question, David Welch, looked into the ethnography and

determined the correct interpretation of these enigmatic figures (Welch 2012). Thousands of other examples of unsubstantiated and absurd claims of this kind, ranging from zoomorphs to "shamans" to the purported attitudes of biomorphs are cited in the archaeological literature. And all too often they are somehow interwoven with chronological contentions or connotations.

Myths about the Past

Provided that all these interpretations are offered for the purpose of creating an entertaining folklore about the art, a new mythology, one could not possibly object to them. Indeed, such interpretations may even be useful to the scientist, because from them s/he can learn about the perception of the person seeking to interpret the paleoart. If the rock art interpreter speaks her/his language and is capable of analyzing her/his own responses to the paleoart (to tell, for instance, very precisely why s/he thinks an animal figure is of a dying individual), an analyzable example of an ethnographic reaction to an alien art becomes available. Indeed, an ethnography or neuroscientific examination of archaeological claims seems to hold a great deal of promise in learning why archaeologists engage in rock art interpretation. Provided we indulge in interpretation without physical interference with the rock art it is a perfectly harmless pastime, and there can be no objection to it. Rock art interpretation is highly stimulating, it has been attempted for millennia, it enriches our experience, and it can embellish our own art, culture, and existence. It can help us create more myths about the past; we can invent our own favored story of what happened in that past. Provided that in the process we do not belittle any other culture or inflict any damage on the rock art, there can be no objection to such quests—as long as we make no attempt of presenting them as science.

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