

SCIENCE & TECHNOLOGY

Survival Art

THE SOURCE: "On the Origin of Art and Symbolism" by Michael Balter, in *Science*, Feb. 6, 2009.

ENGRAVED OCHER CHIPS FOUND in South Africa's Blombos Cave in recent years feature what could be triangles, waves, fans, or maybe just



This ocher fragment was etched by a human-like hand some 77,000 years ago.

fancy crosshatchings that are dated to between 77,000 and 100,000 years ago. Archaeologists disagree on whether they are art.

But a continual stream of discoveries is dramatically pushing back the dates of objects that were surely shaped by the hand of early man. There was room for doubt about whether the Venuses of Tan-Tan and Berekhat Ram, discovered in Morocco and in the Golan Heights and dated to 250,000 to 500,000 years ago, were fertility symbols or simply unusually weathered or chipped stone. But the newly discovered chunks of red ocher from Blombos were clearly left by a human-like hand. They may not be art, but archaeologists are quite sure they are symbols, the creation of which requires the cognitive ability to communicate meaning, writes Michael Balter, author of

The Goddess and the Bull (2004).

For many years, conventional archaeological wisdom held that a creative explosion occurred about 40,000 years ago when modern humans colonized Europe. British archaeologist Clive Gamble once described the evolution of symbolism as occurring so rapidly that it was like "flicking on a light switch." Now, the increasing number of finds at Blombos and elsewhere point to a far more ancient genesis for symbolic markings. Gamble has modified his metaphor, saying that the growth of symbolism may be more like a "stuttering candle." And it is now clear that the earliest clearly symbolic expression by humans occurred in Africa, not Europe.

Why would a few scratchings on ocher represent an evolutionary advantage over other hominid competitors in the race for survival?



The Venus of Berekhat Ram

Many scientists say that the answer is a no-brainer, especially when it is focused on the most sophisticated form of symbolic communication—language. The ability to communicate detailed, concrete information as well as abstract concepts allowed early humans to cooperate and plan in ways unique to our species, says Balter, thus enhancing their prospects for survival during times of hardship and boosting their reproductive success in good periods.

Art and other non-linguistic forms of symbolic behavior may have been key to cementing these bonds by expressing meanings that are difficult to put into words, Balter says. Indeed, artistic expression may have helped ensure the survival of the fittest.

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The Bulging Brain

THE SOURCE: "Sculpting the Brain" by Claus C. Hilgetag and Helen Barbas, in *Scientific American*, Feb. 2009.

EVERY TIME YOU READ AN *In Essence* article, responding to it by saying "hmmm," getting mad at the author, or even flipping the page, you are exercising your cerebral cortex, which is about as thick as a piece of cardboard and as big as an extra-large pizza. The cortex fits in your skull because it folds up into consistent patterns of bulges and valleys. The geography of the brain has been studied for hundreds of years. A pseudoscience called phrenology once did considerable harm to people whose brain and, particularly, skull measurements were judged to be savage. But Claus

C. Hilgetag, a neuroscientist at Jacobs University Bremen, and Helen Barbas, a professor at Boston University, say that the phrenologists may have been on to something. The shape of the brain may be critical to the causes of such mental disorders as schizophrenia and autism.

The cortex of a human fetus starts out smooth, and stays that way for about the first six months of development, according to Hilgetag and Barbas. Fetal neurons send out spindly fibers called axons that become tethered to target neurons in other areas of the cortex. As the cortex expands, the axons tighten up like bungee cords. That's how bulges are formed, as the two parts of the cortex are pulled together. By the time a baby is born, the brain has become characteristically wrinkled.

Animals lower on the evolutionary chain, such as zebra finches and platypuses, have nearly smooth cortices. Large-brained mammals such

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as whales, dogs, and apes have corrugated brains somewhat like those of humans. In *Homo sapiens* the major convolutions are remarkably regular, but the small folds are so diverse that they differ even in identical twins.

The cerebral cortex is crucial to a human's ability to perceive, think, experience emotion, and act. It's what people are talking about when they say "gray matter." There are "clear differences" between the cortical folds of healthy people and those of sufferers from mental disorders such as schizophrenia and

autism, the authors write. But the findings are controversial because there's no uniform pattern to the aberrations. Many scientists now believe that some diseases affect "neural networks" rather than specific areas of the brain.

As with so many other questions involving the brain, scientists are working zealously to understand how neurological diseases with different symptoms might be the result of something that went awry during crucial developmental periods. "The landscape of the brain does correlate with mental function and dysfunction," Hilgetag and Barbas write. Like the earliest archaeologists, today's neuroscientists know they have found something important, but are only beginning to investigate exactly what it is. For the moment, even with advanced imaging methods for measuring brains, experts still cannot distinguish between the cortex of a saint and that of a criminal.

ARTS & LETTERS

Postmodern Pews

THE SOURCE: "Building for Humans" by Matthew J. Milliner, in *Christian Century*, March 10, 2009.

PARTISANS OF MODERNIST ARCHITECTURE in the mid-20th century didn't mince words, writes Matthew J. Milliner, a doctoral candidate in art history at Princeton, even when the subject was sacred buildings. Gothic churches were dismissed as a futile "fight against the forces of gravity."

Chartres Cathedral was a "sentimental" vestige of the past and St. Peter's Basilica a "wretched failure."

Religious architecture now should communicate a "scientific spirit," wrote one Modernist enthusiast. Churches should forsake architectural façades, showcase new materials produced by industrialization, and be honest about a building's structural needs. Modernism should

rebel against historicism and overblown form, and should no longer pander to the rich.

But Modernist religious architecture was often a failure in the eyes of the average parishioner it was supposed to serve. Its mistake, Milliner says, was to "underestimate the needs of humans who inhabit buildings." In spite of the human love of color and variety, Modernism offered monotonous white planes; in the face of people's appreciation of ornamentation, Modernism preached plainness.

Modernism went from a world-saving mission to one among several furniture options on an Ikea