ELLEN DISSANAYAKE

Born to Artify: The Universal Origin of Picturing

My approach to the arts differs from usual anthropological or philosophical discussions in being ethological. Rather than focusing on the mark (or picture), I treat mark-making as a »behavior«, something that people *do*. With regard to this conference, then, I approach our subject as »The Origin of Pictur*ing*«, Even at that, however, there is a further departure. Although the *Concise Oxford Dictionary* defines »picture« as »painting or depiction of person(s) or object(s), esp. as work of art«, it is well known that the earliest marks or drawings that have been discovered, everywhere in the world, are not of persons or objects. They are »non-representational« or »non-iconic«. At the same time, they are quite numerous, suggesting that they were intentional and had significance to the people who made and saw them. Before we look at the origin of actual pictures, then, the origin of their predecessor – non-iconic imagery or a behavior of mark-making – requires examination and explanation.

The question of the origin of pre-picturing (or *artifying*, as I prefer to call it) requires that one offer a hypothesis about the adaptive (evolutionary) advantage that such a behavior would have given those who practiced it over those who did not. Such a hypothesis demands answers to several major questions, among them what motivates mark-making in individuals and what it accomplishes for them (proximate or immediate mechanisms and functions), how it develops in the individual and over evolutionary time (ontogeny and phylogeny), and how it ultimately contributes to an individual's survival and reproductive success (ultimate function). Before addressing these questions (albeit briefly, in a short chapter), some background is necessary.

Fig. 1: World-wide, the oldest surviving paleoart is non-representational.Engravings from the Dampier Archipelago, northwest Australia. Photo: Ekkehart Malotki.

1. Background: Why »artifying« is a more useful term than »picturing«

The title of the conference, »The Origins of Pictures«, carefully avoids use of the troublesome word »art«. However, in the various contributions, the question of the origins of »pictures« was frequently conflated with the origins of »art«. It is worth being reminded that assumptions about what art is are by no means generally agreed upon, and thus it is difficult to agree about what the origin(s) of pictures might be.

The usual Western notion of art is that the term refers to an *object or image* (»*picture*«) – that is, something that is visually perceived. More than that, some theorists restrict the term art only to things that are »good« – usually implying »beautiful« or »skilled«. Others, especially modern Western theorists who are aware of the vast array of works that are considered to be art, have suggested that art is a *label* assigned by an »art world« of museums, critics, scholars and so forth – that it is a cultural designation (DANTO 1964; DICKIE 1969). Scientists, such as researchers in evolutionary aesthetics, have considered art to be a *cue* to something else that is selectively valuable, like good genes for traits such as virtuosity or creativity (e. g., MILLER 2000, 2001; THORNHILL 1998). Most prehistorians require that a mark or carving be *symbolic* (or putatively symbolic) before they accept it as an instance of art (BALTER 2010). Often these different assumptions are implicit, not stated. Sometimes one or more may blend together.

My ethological view is different because it considers art as a *behavior* – what people do when they make or »do« art, when they »artify«. This new approach is justified by the fact that most languages in the world (with perhaps the notable exception of Indo-European) completely lack a noun for art. They have no problem, however, naming a multitude of art-like activities such as drawing, marking, carving, molding, decorating, singing, dancing, dramatizing, storytelling and other such endeavors, suggesting that »making« or »doing« is an appropriate subject of inquiry (DISSANAYAKE 1992, 1995, 2000a). Artifying is the behavior of intentionally making parts of the natural and manmade environment (shelters, tools, utensils, weapons, clothing, bodies, surroundings, and other paraphernalia) extraordinary or special by marking, shaping, and embellishing them beyond their ordinary functional appearance.[1] In other publications I have described artification as it occurs in aural or vocal, gestural, and verbal modalities – i. e., in what we call song, dance, poetic language, and performances of various types. By their nature, these arts take place in time and are easily conceptualized as behaviors, in contrast to visual arts, which are themselves static – the *result of* behavior. In this volume about the origin of pictures, my emphasis will be on a behavior of mark-making rather than on the pictures that result, and mark-making will be treated as a kind of artifying.

The archaeological record reveals that from the Middle Pleistocene (ca.780 – 127kya [thousand years ago]), ancestors of our species *recognized* some objects, such as unusually shaped, marked, or colored stones, as »special« (BEDNARIK 2011; DISSANAYAKE 1988: 96f.). From at least 250kya and earlier, they displayed a mental capacity (and motivation) deliberately to *make* ordinary things extra-ordinary. Examples of three stone tools that were fashioned with a centrally-embedded fossil appear in Dissanayake (1988: 54; 2000a: 133). Other found objects were artified by means of coloring, engraving, and marking as well as being set in unusual places. We cannot know the motivations for doing these things, but such actions indicate that the object (or perhaps the occasion or place), was thereby situ-

1 At first I called this activity »making special« (DISSANAYAKE 1974: 1988); then » making the ordinary extra-ordinary« (DISSANAYAKE 1992: 49); then »elaborating«(DISSANAYAKE 2000a: 130), and in subsequent publications (e. g., DISSANAYAKE 2001), »artifying« (which embraces all these terms).

ated in a »non-ordinary world« – thus giving access to, or even hoping to attract spirits from that world.

Pieces of shaped ochre from 300 kya suggest that body decoration may have been the earliest artification. In recent and contemporary pre-modern societies, ornaments that come from the bodies of rare, beautiful, powerful creatures – feathers, shells, teeth, carapaces – or the use of colorful minerals and other inorganic substances indicate that the wearer is or has become extraordinary or »special«.

Fig. 2: Nothing is simpler than a dot or a line. It is the »proto«-artistic operation of repetition that creates the aesthetic »wow« effect. Photo: Ekkehart Malotki.

The extra-ordinariness of artification is achieved by means of at least five *operations* used by artifiers: formalization (a term that includes shaping, composing, patterning, organizing, schematizing, and simplifying), repetition, exaggeration, elaboration, and – in some instances – manipulation of the perceiver's expectation (DISSANAYAKE 2009). Readers who are familiar with ethological concepts will recognize these first four features as characteristics of »ritualized behaviors« as described in writings by ethologists such as Eibl-Eibesfeldt (1970), Huxley (1914), Tinbergen (1952), Smith (1977), and many others.

In ritualized displays by birds, these operations on ordinary behaviors (such as pecking the ground for food, plucking grass to make a nest, preening wing-feathers, or lifting the wings to prepare for flight) serve to attract attention, sustain interest, and evoke and shape emotion of conspecifics. I suggest that these same operations comprise the behavior of artification, with these same effects.

Fig. 3: The concept of artification is characterized by »making special«, not »making beautiful«. Petroglyphs at a site in western Nevada. Photo: Ekkehart Malotki.

Although artification remains undescribed as a human universal, I propose that it is a legitimate evolved (that is, adaptive) behavioral trait in our (and earlier hominin) species. The term may seem initially unwieldy or unappealing, but its use avoids connotations of value, beauty, skill, depiction, creativity, and self-expression that are inherent in the modern Western concept of art. When applied to Pleistocene paleoart, the artification hypothesis provides new avenues for thinking about motivation, function, and meaning of making images, even non-iconic ones. For example, it considers visual art as a kind of behavior that takes place in time (like other arts, such as music, dance, and poetic language), rather than (as at present) as *residue* of that behavior. Such reconceptualization also calls into question the reigning assumption among present-day cognitive archaeologists and prehistorians that in order for something to be considered art, it must be symbolic (see section 5).

2. Evolutionary origins of the »operations« of artification

The artification hypothesis begins with the consequences of two early adaptations in hominin evolution. The first is bipedality – walking upright on two legs (e. g., POTTS 1996). Numerous anatomical adaptations occurred over evolutionary time to convert a four-legged creature into an upright bipedal strider. For example, structures as different as the rib cage and the bones of the inner ear had to be reconstructed, the spine reshaped, the opening of the spinal cord relocated, the lower limbs and feet altered, joint surfaces reconfigured, and body musculature reshaped.

A second significant trait, brain enlargement, took place concurrently so that by the time of *Homo habilis*, between 2.0 and 1.5 mya [million years ago], the brain had doubled in size from that of earlier four-legged forms. Another spurt of brain growth and doubling in size occurred around a half million to two hundred thousand years ago (MITHEN 1996: 11).[2]

Among the anatomical changes required by bipedality was a reshaped pelvis. This presented a serious obstetric problem for females – giving birth to a large-brained baby through an increasingly constricted birth canal. In other words, these conflicting trends became a life-threatening problem for our ancestors that itself required further anatomical adaptations. Neonate skulls became compressible and females developed a pubic symphysis that could separate slightly at the time of birth. In addition, considerable infant brain growth takes place outside the womb: by age four it is three times larger than at birth. Finally, the gestation period gradually decreased so that, compared to other primates, babies were born in a quite immature state. It has been estimated that if a human baby today were as mature at birth as a newborn chimpanzee, it would need to have been in the womb for 21 months and would weigh 25 pounds (FALK 2009; GOULD 1977; LEAKEY 1994; PORTMAN 1941).

Such helpless creatures require constant attention and care for months and years. To ensure that care, I propose that another important *behavioral* adaptation contributed to the survival of immature infants. This is the affectionate way we interact with babies, what is sometimes called baby talk,

2 Bailey and Geary (2009) provide strong empirical evidence that human cranial capacity increased systematically with population density that led to competition between groups. Neural/behavioral mechanisms to increase cooperation within groups would have been advantageous.

»motherese« (FERNALD/KUHL 1987), or infant-directed-speech. Compared to conversation with adults, talk to babies has a higher overall tone, wider tone range, slower tempo, exaggerated vowels, more repetition, and a simplified specialized vocabulary (MONNOT 1999).

But baby talk is more than »talk«. Concurrent with their vocalizations to babies, adults also alter their facial expressions and head and body movements. Babies are born ready to respond to these; indeed, they actively let adults know by their own positive and negative reactions – their beguiling wriggles, coos, kicks, and smiles – which sounds, facial expressions, and movements they prefer. That is to say, babies evolved to elicit exactly these signals from their caretakers.

Why should that be? Although these infant-directed sounds, expressions, and movements have been well described, no one has pointed out that they are all derived from adult signals of friendliness and accord described by ethologists and psychologists such as Eibl-Eibesfeldt (1989) and Grant (1968, 1972). These affinitive signals include Looking At and Open Eyes (expressing interest), Raised Eyebrows and Backward and Upward Head Raising (indicating familiarity and receptivity), Head Nods (showing agreeableness), Open Mouth or Wide Smiles (showing receptivity, pleasure, liking, appeasement), Mutual Gaze (intimacy), Soft Voice (non-threat, submission), and physical gestures of sympathy and devotion such as Touching, Stroking, Patting, Hugging, and Kissing. The ordinary adult behavior is, as it were, ritualized – that is, it is formalized, exaggerated (e. g., made larger, held longer) and repeated, often with dynamic variation and elaboration (louder, softer, faster, slower, larger, smaller, higher, lower).[3]

Although mother and baby are simply enjoying each other's company, awash in loving feelings, the mother's emphatic signals of friendly interest are, unknown to her, releasing in her brain the prosocial hormones that foster maternal behavior in all mammals (PANKSEPP 1998). Making such signals, then, reinforces her brain's neural circuits for affiliation and devotion, insuring that she will want to care for a demanding, helpless creature (see SCHERER/ZENTNER [2001] for a description of biofeedback).

3 To an ethologist, the mother's behavior has all the hallmarks of a »ritualized« – therefore evolved and adaptive – behavior. See also DISSANAYAKE 2000b: 400; EIBL-EIBESFELDT 1970.

Because the trend toward difficult births and greater infant altriciality was well underway about 1.8 to 1.6mya in *H. ergaster* (FALK 2004: 499; MITHEN 2005) and *H. erectus* (FLINN/WARD 2005: 31), I consider that mother-infant interaction as described here is an adaptive behavior in hominins that evolved that long ago to address the problem of ensuring continued care of highly altricial infants. With minor variations, mother-infant interaction is universally observed in every type of society (DISSANAYAKE 2000b; FALK 2009).[4]

3. The artification hypothesis

The artification hypothesis proposes that ancestral mother-infant interaction, with its universal and characteristic operations or features that we see today, holds the germs of the beginnings of the arts. Although I have described how these »proto«-artistic operations of formalization, repetition, exaggeration, elaboration, and manipulation of expectation arose – in ancestral mother-infant interaction – these are not yet »art« or »artification«. It is now necessary to retrace the evolutionary steps that led from biological adaptation to cultural predisposition – that is, from proto-artistic capacity to intentional artification.

I suggest that four universal human behaviors – play, mark-making, self-adornment, and ritual/ceremony – were »steps« on the evolutionary path to artification, both phylogenetically and ontogenetically. There is space here to discuss these only briefly. Recall that in artification one differentiates between an ordinary or mundane order, realm, mood, or state of being and one that is unusual, extra-ordinary, or »super-natural«. Play, mark-making, self-adornment, and ritual/ceremony are human behaviors that also recognize or create other worlds. Additionally, they use the operations of ritualization that are first experienced in mother-infant interaction and that will recur in adult artification.

4 Results of an unintended experiment that came to public awareness after the decline of the Soviet empire – the psychological problems often shown by children who had been raised from birth in some Eastern European orphanages – further support findings by psychologists that if early face-to-face interaction is absent or unreliable, the social, emotional, cognitive, and even physical development of infants is compromised.

3.1 *On the Path to Artification, in Children: Play*

Because play occurs in many juvenile animals, we can reasonably assume that young hominins, like other primates, played.[5] Although we cannot know when fantasy play (pretense) began in our remote ancestors,[6] it is universal in human children, where it often occurs in a social context. Interestingly, it often requires the player to take a stance that is different from reality (LILLARD 1993): something (say, a stick) is substituted for something else (a doll or a horse to ride). Also in human children, as in other social animals, »frame markers« such as exaggerated voice or movement signal to others that »this is play – not ordinary – behavior« (LESLIE 1987; PELLEGRINI/BJORKLUND 2004: 31).

3.2 *On the Path to Artification, in Children: Mark-making*

From their first months, babies are preoccupied with using their hands – first, they reach out, then grab and manipulate anything within reach, and finally use a precision grip. As tool-makers and users, it is not surprising that members of our species evolved to find satisfaction and even pleasure in using their flexible and dextrous hands. Making marks is part of the hand-mind repertoire. Children eagerly learn to draw with »orderly growing complexity« (FEIN 1993: xiii). Their first scribbles gradually resolve into more controlled movements, then into deliberate meanders and spirals, which eventually become more and more »geometric«. The elements of representational form emerge from only four modalities – the circle, and perpendicular, parallel, and oblique lines – which children discover spontaneously between ages three and four, and which they use as the fundamental elements of their first drawings of humans and animals (FEIN 1993). In their early drawing, children do not intend to represent or symbolize. Even their eventual drawings of people or houses are based on conventions that they learn and traits that they know about; they do not copy from something they see or remember.

5 I do not wish to imply that prehistoric art makers were »childlike«, but to suggest that the ontogeny of visual thinking and manual dexterity may provide insights into their phylogenetic origin and trajectory in our genus and species.

6 Evidence for its occurrence in great apes is controversial (PELLEGRINI/BJORKLUND 2004).

Children's early drawings emerge from an »inner imperative« (FEIN 1993: xiii; see also ALLAND 1983; KELLOGG 1970) to mark and then follow their marks where they lead – often to the operations of artification. For the child, the making itself (and its frequently unforeseen results) is the »meaning« (see section 5).

3.3 *Intentional Artification in Pre-Modern (and Presumably Ancestral) Adults: Self-Adornment*

As described earlier, perhaps the earliest artifications were to the human body: skin and hair made extra-ordinary with feathers, leaves, dyed and woven fibers, or bone and shell objects inserted through the nasal septum, lips, or earlobes. Permanent and extreme procedures such as tattooing or cicatrization are unmistakable indications of a non-natural state. Evidence of tooth-filing and skull elongation exists from at least 75kya (COE 2003). Although usually called »body modification«, these are all examples of making the ordinary body extra-ordinary. Perforated beads made of materials such as marine shell, ostrich eggshell, and ivory occur from as early as 200kya (BEDNARIK 2011). They are generally interpreted as denoting social rank, and thereby indicating the presence of symbolic thought. Beads artify those who wear them, marking them as important in some way. It can be argued whether or not all indications of importance should be assumed to be »symbolic« (see Section 5).

3.4 *Intentional Artification in Pre-Modern (and Presumably Ancestral) Societies: Ceremonial Practices*

Although »ritual« is considered to be an important human universal, it is not always appreciated that rituals themselves are »collections of arts«. That is, if the artifications of face and body (masks and costumes), decorated paraphernalia, voice (song), movement (dance), and story (performance) were removed, there would be no ritual, just everyday people using their voices and bodies in ordinary ways. It is by means of artifications that early members of our species created the »other world« of a ceremony. In recent and contemporary pre-modern societies, artifications are intrinsic components of ritual ceremonies, and one can posit that they arose along with religion; indeed, they *were* religious practice.

Fig. 4: Extraordinary body decoration, song, drumming, and movement all together unify a group of individuals as they celebrate a successful harvest of Kairuku nuts in Gogime village, Chimbu Province, Papua New Guinea. Photo: Maureen MacKenzie.

Ritual ceremonies occur at transitional times of uncertainty or anxiety about success in important biological matters such as obtaining or ensuring food, safety, prosperity, and health, conceiving and bearing a healthy child, and traversing important life changes such as puberty, marriage, and death (VAN GENNEP 1960: 1908; TURNER 1969). Ceremonies are performed in order to influence important outcomes – to have an effect (MALINOWSKI 1925).

Although a discussion of the subject of religion can take us far afield, for my purposes here I consider religion to refer to a group's beliefs and practices that explain their world and help its members to get what they want and need. As Jean Clottes and others have noted, religions entail belief in supernatural entities and related practices that afford contact with those entities (CLOTTES 2006: 9). Super-natural entities are embodied and accessed through the artifications of ceremonial practices.

I propose that arts behavior (artification) in ceremonies developed as a way of demonstrating individual and group care and concern about biologically-important outcomes and that its proximate (immediate or motivating) functions were twofold. First, artification provided »something to do« in uncertain circumstances that by its extravagance was believed to persuade spirits and other supernatural powers to affect individual and/or group interests. At the same time, artifications, with the inherent

appeal and reinforcing effect of their operations, enticed people to engage in and become convinced of the truth of the ceremony.

Religious practice appeals not only to the intellect in the form of beliefs or precepts but to senses and emotions. Deep emotions (awe, wonder, fear, desire) and emotional bonding are produced by the operations of artification. Rituals work because their artifications provide the excitement and drama that make their messages memorable and meaningful (DISSANAYAKE 1992; SCHIEFENHÖVEL 2009). The earliest culturally-created artifications can be considered as behavioral/emotional mechanisms of religious belief.

4. Artification as adaptive

Finally, the adaptive value of artification (here, mark-making) can be addressed. I have proposed in earlier sections of this article that deliberate artification developed over evolutionary (phylogenetic) time from the proto-artistic operations of mother-infant interaction.[7] These operations on voice, face, and body movements were (in evolutionary parlance) »co-opted« or »exapted« to address two adaptive problems in human societies – relieving stressful existential anxiety (MALINOWSKI 1925) and fostering coordination and cooperation among group members, each with his or her own self-interest. As »design features« that were already used to coordinate emotional states and unify mother and infant, proto-artistic operations were inherent means to attract the attention of participants, sustain their interest, arouse and shape their emotions, and physically coordinate, as well as psychologically and emotionally unify, a group.[8] Hunter-gatherers,

7 Ancestral mother-infant interaction itself relied on earlier propensities or capacities – i. e., to recognize or posit an »other« world, and to be sensitive to the operations that altered communicative signals, attracting attention, sustaining interest, and molding emotion (all evident in other animals who use and respond to ritualized behaviors).

8 Early Pleistocene mother-infant interaction as described here could have contributed to other features that became adaptive during human evolution (e. g., an increase in multimodal association cortex [PANKSEPP 1998: 310 n35]; the development of vocal anatomy for language [FALK 2009]; and provision of psychological and emotional predispositions for bonding between males and females [EIBL-EIBESFELDT 1989], helping to ensure that fathers remain close to mothers and their infants, willing to protect and provide for them).

whose social systems had no chiefs or central authority, need ways to encourage communal action (WADE 2006: 164).[9]

I propose two *ultimate adaptive functions* of artification (as it appears in arts-suffused rituals). First, by providing something to do with others, in uncertain circumstances, artifying can alleviate the deleterious effects of the stress response. The release of stress hormones like cortisol negatively affect growth, tissue repair, energy release, immune system activity, mental activity, digestive function, metabolism, and even reproductive physiology and behavior (SAPOLSKY 1992). In this sense, ceremonial/arts behavior – compared to doing nothing – is adaptive (KAPTCHUK/KERR/ZANGER 2009). Repetitive or regularized movement, in particular, is notably effective in regulating disturbing emotions like fear or anxiety and thereby contributing to the well-being of participants.[10]

A second ultimate adaptive function of participation in the artifications of ceremonies is to instill collective emotions such as trust and belongingness and to coordinate (physically, neurologically, and emotionally) members of the group, so that they cooperate in confidence and unity. Not only are brain chemicals like cortisol suppressed by participating with others in formalized and rhythmically repeated activities, oxytocin and other endorphinic substances are secreted, creating pleasurable feelings of unity with others, strengthening their commitment to each other.[11]

9 Wade further suggests that religion, language, and reciprocity are three comparatively recent elements of the »glue that holds human societies together«, and that all seem to have emerged some 50kya (WADE 2006: 165). Others (e. g., BEDNARIK 2011) argue that religion, language and reciprocity occurred much earlier.

10 Humans seek out others for comfort when they are fearful (TAYLOR 1992). Mead (1976 [1930]) and Malinowski (1922) each describe members of small-scale societies huddling together during terrifying storms, chanting charms to abate the wind. Additionally, the lament is a widespread musical/poetic form performed by or for bereaved persons that apparently helps individuals cope with their loss (DISSANAYAKE unpub.).

11 Affinitive behaviors and emotions, such as those created and reinforced in arts-suffused ceremonial participation, activate the orbitofrontal cortex and other reward centers of the brain (CARTER et al. 1999 and others cited in BROWN/DISSANAYAKE 2009: 53). Although neuroscientists have known for many years that oxytocin and opioids are released at parturition and during maternal behavior in all mammals, they have only recently discovered that moving to and even listening to music releases these same chemicals as do dancing and other movement activities in which people participate with one or more others (FREEMAN 2000). I suggest that the regularized movements and sounds of marking on rock surfaces may do the same for maker and observer/listener/participant. In addition to instilling trust, oxytocin relieves individual anxiety (ÜVNAS-MOBERG 1999).

5. Some concluding thoughts concerning symbols and artification

The two adaptive functions of artification proposed in section 4 are derived from the experience of arts as they appear in ritual ceremonies – that is, as concurrent behaviors of music and dance, enhanced by special visual and material accoutrements (including painted bodies, striking and colorful masks, costumes, and decorated paraphernalia). That is, one's experience is simultaneously visual, vocal, auditory, and motor. The neurochemistry that is posited to reduce stress and produce feelings of trust and belonging is premised on active participation.

When one addresses a behavior of mark-making or of looking at marks made by another person (who may not even be present), this adaptive scheme seems less relevant. Unless marks on rock surfaces are made as part of a ceremony in which others participate, or perhaps as a prelude to or a record of a ceremony, they do not seem likely to produce the adaptive results described. One might suggest that repetitive hammering or pecking could set up a regular auditory pattern to which a maker (and one or more listeners) becomes entrained, but that is only conjecture. It is equally or more likely that such marks would become part of a ceremony after their completion – perhaps as a focus for dance, song, and other performance.

It is not surprising that human marks that remain long after their making have been regarded as loci of symbolic meaning. Regarding static artifacts is so unlike experience of the temporal and moving arts, which may be felt viscerally even if one is not actually participating, as to be a quite different thing. They can be contemplated as unchanging.

Yet I propose that archaeologists re-examine their now axiomatic assumption that human intentional markings on rock surfaces are necessarily symbolic and accept the possibility that pre-symbolic or non-symbolic artifications probably preceded symbolic visual markings. In the first place, archaeological use of the term »symbol« is rarely, if ever, defined. Studies in semiotics use a range of labels – including sign, signal, icon, index, likeness, representation, analogy, and metaphor – as well as »symbol«. Any specific marking could fit into one or several of these terms – or not. When used naively, the terms are fuzzy, even interchangeable. In any case, they are really only ways of classifying the world so that we can talk about it for our purposes.

The earliest human marks illustrate what I am talking about. Cupules (hemispherical cup-shaped depressions) are the oldest and most common form of petroglyph in the world (BEDNARIK 2010), occurring profusely on every continent except Antarctica. They are labor intensive, requiring in some cases many thousands of blows for one cupule, depending on the hardness of the rock. The costly expenditure of time, physical effort, and even the potential risk of attracting the attention of animal or human predators with so many resounding strikes indicates that cupules had significance to their makers.

It has sometimes been said that cupules on horizontal surfaces could be a non-functional by-product of the activity of grinding or percussion for a functional purpose. Many, however, are on vertical surfaces where such activities seem unlikely. In many sites, cupules appear in rows, even separated by carved lines so that they form an intentional pattern.

Fig. 5: Cupules represent the most ancient rock art in the world and exhibit an astonishing uniformity as seen here on a vertical cliff at a site southwest of Phoenix, Arizona. Photo: Ekkehart Malotki.

Cupules have been largely ignored by rock art theorists, perhaps because it is not easy to assign a symbolic meaning to them. Indeed, and probably because of that reason, few prehistorians call them »art«. But if they are not art, what are they? What should we call them? I find them superb examples of artification – that is, they make ordinary stone extraordinary. They also show the ability to plan and carry out an abstract intention.

Cupules may be neither utilitarian or symbolic. However, when carved in careful rows or divided into ranks with engraved lines, they reflect the

importance of whatever they signify. Perhaps a place with many cupules is analogic of the concept »more« or of the effort expended on them, communicating that »I [we] care enough to go to this much time and trouble«. This kind of thinking is less symbolic than »indexical«.

As described in section 3.2, children find motor, cognitive, and emotional satisfactions in drawing before they have symbolic intent. For them, the making itself is the meaning, and this may also be the case for at least some ancestral markings. However, the concentration and physical effort required to make a cupule or other rock engraving would seem to exceed the pleasure and general satisfaction of making or marking for its own sake. Yet can we accept that there are emotional rewards that encompass casual scribbling (say, in the dust, or with a piece of chalk or crayon) and sustained engraving of or hammering a symbol on a rock surface? It is likely that people are sometimes, even frequently, motivated to artify for reasons other than symbolism.

Simply making or marking, in themselves, give or add meaning (not necessarily symbolic meaning). They often show that something is significant, important, as when streamers are placed on a tray that holds a temple offering of fruit or flowers (themselves arranged with care) to further express the *importance* of the offering. As described, acts of artifying or marking indicate that an object, place, or occasion is »special« – different from the everyday. If beads or tattoos are signs of »status« (and hence are »symbolic«), must we say the same for placing a flower in one's hair? Is oiling and coloring the body *always* a symbolic act? Are beads placed on bodies at burial (»symbols« that indicate rank) different from beads that make one's clothes or skin attractive?

Symbols themselves may be used *as artifications* – as when an angel or crêche is displayed on a mantelpiece at Christmastime or when colored eggs are fastened to leafless shrubs in the garden at Easter, making one's home extra-ordinary. Or people may *artify a symbol* – as on an announcement or poster where the lettering and background of the (symbolic) words are exaggerated and elaborated with shape and color or when a (symbolic) plain cross carved on a gravestone is encircled with an engraved wreath borne by cherubs.

In addition, many things other than art (such as money or printed texts) are symbolic just as many things we call »art« (music, dance, body decoration) are not symbolic (or they are *not necessarily* symbolic).

Artification, as described here, is biologically distinctive and noteworthy, irreducible to other behaviors. This is not the case with the axiom

that art is a kind of symbol. Evidence of artification precedes evidence of symbolization phylogenetically in human evolution and ontogenetically in the development of children. Indeed, the behavior of artification precedes or lies outside the ability to make and use symbols. Furthermore, it does not exclude the possibility of *pre*-symbolic markings, suggesting that a capacity and motivation to artify is deeper or more fundamental than symbolization. Rather than art being a subset of a larger class, symbolization, I suggest that we consider symbolic art (like depiction) to be a subset of the broader concept of »artification«.

References

ALLAND, A.: *Playing with Form*. New York [Columbia University Press] 1983

BAILEY, D. H.; D. C. GEARY: Hominid Brain Evolution: Testing Climatic, Ecological and Social Competition Models. In: *Human Nature*, 20, 2009, pp. 67–79

BALTER, M.: On the Origin of Art and Symbolism. In: *Science*, 323, 2009, pp. 709–711

BEDNARIK, R.: *The Human Condition*. Berlin, New York [Springer] 2011

BROWN, S.; E. DISSANAYAKE: The Arts are More than Aesthetics: Neuroaesthetics as Narrow Aesthetics. In: SKOV, M.; O. VARTANIAN (eds.): *Neuroaesthetics*. Amityville, NY [Baywood] 2009, pp. 43–57

CARTER, S.; I. LEDERHENDLER; B. KIRKPATRICK (eds.): *The Integrative Neurobiology of Affiliation*. Cambridge, MA [MIT Press] 1999

CLOTTES, J.: Spirituality and Religion in Paleolithic Times. In: SHULTS, F. (ed.): *The Evolution of Rationality: Interdisciplinary Essays in Honor of J. Wentzel van Huyssteen*. Grand Rapids, MI [William B. Eerdmans] 2006, pp. 133–146

COE, K.: *The Ancestress Hypothesis: Visual Art as Adaptation*. New Brunswick, NJ [Rutgers University Press] 2003

DANTO, A.: The Artworld. In: *Journal of Philosophy*, 61, 1964, pp. 571–84

DICKIE, G.: Defining Art. In: *American Philosophical Quarterly*, 6, 1969, pp. 253–56

DISSANAYAKE, E.: An Hypothesis of the Evolution of Art from Play. In: *Leonardo*, 7 (3), 1974, pp. 213–217

DISSANAYAKE, E.: *What is Art for?* Seattle [University of Washington Press] 1988

DISSANAYAKE, E.: *Homo Aestheticus: Where Art comes From and Why*. Seattle [University of Washington Press] 1992

DISSANAYAKE, E.: The Pleasure and Meaning of Making. In: *American Craft*, 55 (2), 1995, pp. 40-45

DISSANAYAKE, E.: *Art and Intimacy: How the Arts Began*. Seattle [University of Washington Press] 2000a

DISSANAYAKE, E.: Antecedents of the Temporal Arts in Early Mother-infant Interaction. In: WALLIN, N.; B. MERKER; S. BROWN (eds.): *Origins of Music*. Cambridge, MA [MIT Press] 2000b, pp. 389-410

DISSANAYAKE, E.: An Ethological View of Music and its Relevance to Music Therapy. In: *Nordic Journal of Music Therapy*, 10 (2), 2001, pp. 159-175

DISSANAYAKE, E.: The Artification Hypothesis and its Relevance to Cognitive Science, Evolutionary Aesthetics, and Neuroaesthetics (Special Issue on Aesthetic Cognition). In: *Cognitiv Semiotics*, 5, 2009, pp. 148-173

EIBL-EIBESFELDT, I.: *Ethology: The Biology of Behavior*. New York [Holt, Rinehart and Winston] 1970

EIBL-EIBESFELDT, I.: *Human Ethology*. Hawthorne, NY [Aldine de Gruyter] 1989

FALK, D.: Prelinguistic Evolution in Early Hominins: Whence Motherese? In: *Behavioral and Brain Sciences*, 27 (4), 2004, pp. 491-541

FALK, D.: *Finding our Tongues: Mothers, Infants and the Origin of Language*. New York [Basic Books] 2009

FEIN, S.: *First Drawings: Genesis of Visual Thinking*. Pleasant Hill, CA [Exelrod] 1993

FERNALD, A.; P. K. KUHL: Acoustic Determinants of Infant Preference for Motherese Speech. In: *Infant Behavior and Development*, 10, 1987, pp. 279-293

FLINN, M.; C. WARD: Evolution and the social child. In: ELLIS, B; D. BJORKLUND (eds.): *Origins of the Social Mind: Evolutionary Psychology and Child Development*. London [Guilford] 2005, pp. 19-44

FREEMAN, W.: A Neurobiological Role of Music in Social Bonding. In: WALLIN, N.; B. MERKER; S. BROWN (eds.): *The Origins of Music*. Cambridge, MA [MIT Press] 2000, pp. 411-424

GOULD, S. J.: *Ontogeny and Phylogeny*. Cambridge, MA [Harvard University Press] 1977

GRANT, E. C.: An Ethological Description of Nonverbal Behavior During Interviews. In: *British Journal of Medical Psychology*, 41, 1968, pp. 177-183

GRANT, E. C.: Nonverbal Communication in the Mentally Ill. In: HINDE, R. (ed.): *Non-verbal Communication*. Cambridge, UK [Cambridge University Press] 1972, pp. 349 - 358

HUXLEY, J.: The Courtship Habits of the Great Crested Grebe (Podiceps Cristatus) Together with a Discussion of the Evolution of Courtship in Birds. In: *Journal of the Linnean Society of London: Zoology*, 53, 1914, pp. 253 - 292

KAPTCHUK T. J.; C. E. KERR; A. ZANGER: Placebo Controls, Exorcisms, and the Devil. In: *Lancet*, 374 (9697), 2009, pp. 1234 - 1235

KELLOGG, R.: *Analyzing Children's art*. Palo Alto [Mayfield] 1970

LEAKEY, R.: *The Origin of Humankind*. New York [Basic Books] 1994

LESLIE, A. M.: Pretense and Representation: Origins of »Theory of Mind«. In: *Psychological Review*, 94, 1987, pp. 412 - 426

LILLARD, A. S.: Pretend Play Skills and the Child's Theory of Mind. In: *Child Development*, 64 (2), 1993, pp. 348 - 371

MALINOWSKI, B.: *Argonauts of the Western Pacific*. London [Routledge and Kegan Paul] 1922

MALINOWSKI, B.: *Magic, Science, and Religion*. Garden City, N. Y. [Doubleday Anchor Books] 1954 [1925]

MEAD, M.: *Growing up in New Guinea*. New York [Morrow] 1976 [1930]

MILLER, G.: *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature*. New York [Doubleday] 2000

MILLER, G.: Aesthetic Fitness: How Sexual Selection Shaped Artistic Virtuosity as a Fitness Indicator and Aesthetic Preferences as Mate Choice Criteria. In: *Bulletin of Psychology and the Arts*, 2 (1), 2001, pp. 20 - 25

MITHEN, S.: *The Prehistory of the Mind: The Cognitive Origins of Art*. London [Thames & Hudson] 1996

MITHEN, S.: *The Singing Neanderthals: The Origins of Music, Language, Mind and Body*. London [Weidenfeld and Nicolson] 2005

MONNOT, M.: Function of Infant-directed Speech. In: *Human Nature*, 10, 1999, pp. 415 - 43

PANKSEPP, J.: *Affective Neuroscience: The Foundations of Human and Animal Emotions*. Oxford [Oxford University Press] 1998

PELLEGRINI, A. D.; D. F. BJORKLUND: The Ontogeny and Phylogeny of Children's Object and Fantasy Play. In: *Human Nature*, 15 (1), 2004, pp. 23 - 43

PORTMANN, A.: Die Tragzeit der Primaten und die Dauer der Schwangerschaft beim Menschen: Ein Problem der vergleichenden Biologie. In: *Revue Suisse de Zoologie*, 48, 1941, pp. 511 - 518

POTTS, R.: *Humanity's Descent: The Consequences of Ecological Instability*. New York [William Morrow] 1996

SAPOLSKY, R. M.: Neuroendocrinology of the Stress Response. In: BECKER, J. R.; S. M. BREEDLOVE; D. CREWS (eds.): *Behavioral Endocrinology*. Cambridge, MA [MIT Press] 1992, pp. 287 - 324

SCHERER, K. R.; M. R. ZENTNER: Emotional Effects of Music: Production Rules. In: JUSLIN, P. N.; J. A. SLOBODA (eds.): *Music and Emotion: Theory and Research*. Oxford [Oxford University Press] 2001, pp. 361 - 392

SCHIEFENHÖVEL, W.: »Explaining the Inexplicable: Traditional and Syncretistic Religiosity in Melanesia«. In: VOLAND, E.; W. SCHIEFENHÖVEL (eds.): *The Biological Evolution of Religious Mind and Behavior*. Berlin [Springer] 2009, 143 - 164

SMITH, W.: *The Behavior of Communicating: An Evolutionary Approach*. Cambridge, MA [Harvard University Press] 1977

TAYLOR, S.: *The Tending Instinct: How Nurturing is Essential to Who We Are and How We Live*. New York [Henry Holt] 1992

THORNHILL, R.: Darwinian aesthetics. In: CRAWFORD, C.; D. L. KREBS (eds.): *Handbook of Evolutionary Psychology: Ideas, Issues, and Applications*. Mahwah, NJ [Erlbaum] 1998, pp. 543 - 572

TINBERGEN, N.: »Derived« Activities: Their Causation, Biological Significance, Origin and Emancipation During Evolution. In: *Quarterly Review of Biology*, 17, 1952, pp. 1 - 32

TURNER, V.: *The Ritual Process: Structure and Anti-structure*. London [Routledge and Kegan Paul] 1969

ÜVNAS-MOBERG, K.: Physiological and Endocrine Effects of Social Contact. In: CARTER, C. S.; I. I. LEDERHANDLER; B. KIRKPATRICK (eds.): *The Integrative Biology of Affiliation*. Cambridge, MA [MIT Press] 1999, pp. 245 - 261

VAN GENNEP, A.: *The Rites of Passage*. Original work published 1908, London [Routledge and Kegan Paul] 1960

WADE, N.: *Before the Dawn: Recovering the Lost History of Our Ancestors.* New York [Penguin Press] 2006