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# FROM PLAY AND RITUALISATION TO RITUAL AND ITS ARTS: SOURCES OF UPPER PLEISTOCENE RITUAL PRACTICES IN LOWER MIDDLE PLEISTOCENE RITUALISED AND PLAY BEHAVIOURS IN ANCESTRAL HOMININS

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A contemporary discussion of play or ritual in animals and early humans will do well to begin with an appreciation of these classic concepts as formulated by the founders and pioneers of ethology (see also Renfrew, Chapter 2, this volume). As an academic field, ethology – the naturalistic study of behaviour from an evolutionary perspective (Burghardt 2005, 10) – had only a half-century lifespan (roughly from the 1930s to the 1980s) before being incorporated into the newer fields of evolutionary psychology, behavioural ecology and cognitive psychology. Yet the close observations and descriptions of play and ritualised behaviours in animals by early ethologists have informed interesting and stimulating recent theory in a variety of subjects in humans (e.g. Rappaport 1999; Watanabe & Smuts 1999; Bjorklund and Pellegrini 2002; Schechner 2002; Burghardt 2005; Feierman 2009) and are, I believe, relevant to archaeological understanding of ritual and the formation of religious belief. Studies in affective neuropsychology and neuropsychiatry (e.g. Panksepp 1988; Panksepp & Biven 2012) make clear that there is a continuity of animal and human minds and behaviour.

In this chapter, I propose that what anthropologists call 'ritual' originated in several constituent elements of play and ritualised behaviours – to be described later. These can be observed in many non-human animals and are assumed to have developed further during the evolution of brain and behaviour of Lower Middle Pleistocene hominins. I further suggest that these elements, gradually elaborated in ritual contexts, are antecedents and components of what are called 'arts'. I maintain that it is primarily through participation in 'arts'-filled rituals that (religious) belief and doctrine are instilled and reinforced (see Burghardt, Chapter 3, this volume, who also considers belief and doctrine 'secondary' concerns; see also Garfinkel, Chapter 11; Renfrew, Chapter 2; Watkins, Chapter 10, this volume).

## Ritualisation

One of the most interesting and original observations ethologists describe is *ritualisation* of behaviour. It is important to emphasise that the term, although derived semantically from a seeming correspondence with human rites or rituals, nevertheless has a precise ethological meaning that is to be distinguished from other uses that are not specifically ethological.

In 1914, while studying the courtship behaviour of the great crested grebe (a bird), Julian Huxley proposed that highly stereotyped communicative signals in animals had evolved by natural selection in the same way as more instrumental behaviours (see also Watanabe & Smuts 1999). He coined the

term *ritualisation* to refer to this process. In the 1950s, ethologists (e.g. Tinbergen 1952, 1959; Eibl-Eibesfeldt 1971, 1989; Hinde 1982; Lorenz 1982) expanded Huxley's insight and described how the process occurs.

In ritualisation, components of a behaviour that occurs as part of normal, everyday, instrumental activity – such as preening, nest-building, preparing to fly or caring for young – are, as it were, 'selected' or taken out of context, 'ritualised', and used to signal an entirely different motivation – usually an attitude or intention that might then influence (affect or manipulate) the behaviour of another animal. For example, the head movements gulls use to pluck grass for building a nest may be co-opted and ritualised to signal aggression (thus driving another gull away), or behaviours derived from feeding young may become ritualised and used for courtship (i.e., touching bills, offering a token with the bill or coughing as if regurgitating, in order to attract and seduce a mate).

The process of ritualisation refers to particular changes or 'operations' that make the new activity prominent, distinctive and unambiguous (Smith 1977, 328; Eibl-Eibesfeldt 1989, 439–40). Unlike the original instrumental or 'ordinary' precursor behaviour, ritualised movements or sounds become 'extraordinary' and thus attract attention. They typically become (a) *simplified* or stereotyped (formalised), and (b) *repeated* rhythmically, often with a 'typical' intensity (Morris 1957) – that is, with a characteristic regularity of pace. The signals are frequently (c) *exaggerated* in time and space, and (d) further emphasised or *elaborated* by the development of special colours or anatomical features. The peacock's display is a canonical example of a ritualised behaviour that originated in such simple precursors as pecking the ground for food and lifting, spreading and fanning the tail feathers for thermoregulation (see Eibl-Eibesfeldt 1971, 44–7).

Another alteration of ordinary behaviour can be seen in the 'displacement activities' of animals when they are in uncertain or conflicted circumstances. As in ritualised behaviours, body movements used in everyday contexts such as grooming (scratching, preening) or locomotion are transformed, becoming *stereotyped* – that is, *exaggerated*, patterned in space and time and regularised (*repeated*). Such movements reduce tension in the displaying animal at the same time as they signal its mood and intentions to conspecifics (Lorenz 1982, 249–53).

Although ethologists suggested that there were parallels or analogies between ritualised behaviours in non-human animals and particular kinds of behaviour in humans (e.g. greetings and partings, smiling in submission), to my knowledge none identified an actual human ritualised behaviour. However, in several articles (e.g. Dissanayake 2000, 2001) I have argued that apparently universal, cross-culturally observed interactions between mothers and small infants possess many noteworthy characteristics of a biologically ritualised behaviour. That is, visual, vocal and gestural expressions drawn from common adult contexts of affinity and intimacy (Look at, Smile, Open Eyes, Open Mouth, Mutual Gaze, Eyebrow Flash, Head Bob Backwards, Head Nod, Head and Body Lean Forward, Soft but High-Pitched and Undulant Sounds, Reassuring and Sympathetic Touching, Pats, Hugs and Kisses) are simplified or stereotyped, repeated or sustained, exaggerated and elaborated – all serving to temporally coordinate and emotionally unite the mother-infant pair. Some of these behaviours can be seen in affiliative contexts in higher primates (King 2004), suggesting that they probably occurred in early hominins.

Psychologists have described a number of important adaptive psychological and cognitive benefits of these interactions to babies. These include assisting emotional equilibrium, self- and interactive regulation, socialisation, language-learning, cognitive development and acquisition of the parental culture (see list in Dissanayake 2008, 254). Importantly, neurochemicals secreted in the mother's brain when she intensifies these affinitive behaviours inadvertently create tender and loving feelings towards her infant, assuring more attentive care (Carter 1998; Nelson & Panksepp 1998; Carter, Lederhandler & Kirkpatrick 1999; Panksepp, Nelson & Bekkedal 1999).

Infants are born ready to respond to and coordinate their own behaviour with these extraordinary affinitive signals. In fact, by their responses, infants 'teach' their caretakers to speak and act this way: they 'reward' extraordinary signals with smiles, wriggles and coos, but are unresponsive to adult-style discourse directed to them. The mother–infant

interaction can be viewed as a co-created evolved adaptive behaviour with benefits to both infant (survival) and mother (reproductive success).

## Play

Mother–infant interaction is often described, thought of and experienced as playful or a kind of play (e.g. Stern 1977). It is spontaneous, improvised and self-rewarding; both partners show that they are enjoying themselves. Between three and four months of age, infants become bored with the soothing predictable interaction described previously. Instead, they desire suspense and surprise, which mothers provide in action games and songs such as Peek-A-Boo, This Little Piggy or Round and Round the Garden. Manipulation of expectation rests, I suggest, on Desmond Morris's ethological notion of 'typical intensity', described when he noted that the iteration of a ritualised movement or sound has a typical rhythmic regularity and intensity in time (1957). If humans (including four-month-old infants) were not aware of typical intensity of a repeated, regular stimulus, they would not be susceptible to its manipulation. Recent studies of the nature and evolution of a capacity for temporal and affective entrainment (a shared sense of rhythmic timing and affective state) suggest that some of the abilities for cross-modal integration of timing and 'beat' information in music begin to emerge early in infancy in interactions with parents (Phillips-Silver, Aktipis & Bryant 2010; Phillips-Silver and Keller 2012).

As described by early ethologists (e.g. Meyer-Holzapfel 1956), play – though difficult to define – is common to all social animals and is often based in recognising and creating an 'as if' or 'other' world, or a 'meta-reality'. Because play occurs in all higher mammals, we can reasonably assume that young hominins, like other primates, played. Although it is not known when fantasy play (pretence) began in our remote ancestors – evidence for its occurrence in great apes is controversial (Pellegrini & Bjorklund 2004; Smith, Chapter 5, this volume) – it is universal in human children, where it frequently occurs in a social context (see also Smith, Chapter 5, this volume, and Morley, Chapter 6, this volume). Interestingly, pretend play 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 to hold or a horse to ride). When playing, human children, like other social animals, alter their ordinary behaviour using devices like the operations of ritualisation described in the previous section. For example, 'frame markers' such as exaggerated voice or movement signal to others that 'this is play' (Leslie 1987; Pellegrini & Bjorklund 2004, 31). Actions of play also may be stereotyped, use rhythmic and other kinds of repetition and be elaborated (Meyer-Holzapfel 1956). The predisposition to adorn the self or to present a 'different' self with costume, easily observed in the play of children as well as more seriously in adults, also creates a state of being that is recognisably extraordinary.

Using the hands for play should also be mentioned. As toolmakers and users, it is not surprising that members of our species evolved to find satisfaction and even pleasure in using their flexible and dexterous hands. This is evident even in babies who from their first months are preoccupied with their hands. First they reach out, then grasp and manipulate anything within reach, and finally develop a precision grip. Usually in about the third year, when given a drawing or marking implement, children will spontaneously use it on a suitable surface. The marks at first look like locomotor and exploratory play, with energetic large, often circular arm movements. As motor skill improves, children learn to draw with "orderly growing complexity" from "an inner imperative" (Fein 1993, xiii) – that is, the process is self-taught (Burrill 2010). They spontaneously 'play with form' (Alland 1983), as they make scribbles with meandering lines or dots and flecks, then geometric shapes – circles, arcs, more deliberately drawn and intersecting lines, spirals – which are frequently repeated, exaggerated and elaborated (Kellogg 1970; Fein 1993).

## Meta-representation

During the evolution of humans, as during child development, brain growth and reorganisation eventually enabled what has been called 'meta-representation'

or 'decoupling' – the ability to pretend and to understand pretence in others (Leslie 1987; Cosmides & Tooby, 2000) and to appreciate fiction as distinct from reality (Tooby & Cosmides 2001). A related capacity is 'mental time travel,' the ability to recall the past in order to imagine the future (Suddendorf & Corballis 1997). Other investigators speak of the development of explicit or working memory that permits one to juggle the past and present, aiming for future goals (Kavanagh, Andrade & May 2005). Although implicit memory presumably exists to varying degrees in all species with a nervous system, allowing for simple conditioning, explicit memory seems to be unique to humans and probably developed in stages, which Bjorklund and Pellegrini (2002, 122–4) have assigned to Merlin Donald's four stages of hominin cognitive evolution (Donald 1991). I use their scheme heuristically, appreciating of course that the particular characteristics are matters of degree and that they occur on a continuum (see also Renfrew, Chapter 2, this volume, and Morley, Chapter 6, this volume). The stages can be very minimally described as follows.

The first cognitive stage, 'Episodic Culture', characterises Australopithecines (as well as primates and even other animals). Individuals live in what can be called a 'continuous present', reacting to occurrences as they appear in their environment by general instinctive programmes such as approach, avoid, fight, flee or freeze. Memory is of specific events in the past that have rich perceptual content, different from (and additional to) procedural memory (of how to do things).

The second cognitive stage, 'Mimetic Culture', characterised *H. erectus*, whose tool manufacture required inventing and remembering a variety of complex procedures as well as maintaining and transmitting them to others. Mimesis involves the ability to produce conscious, self-initiated, representational acts that are intentional yet not symbolic. Donald cites trades and crafts, games, athletics, 'a significant percentage of art forms', various aspects of theatre, including pantomime, and most social ritual as being within the capabilities of mimetic cultures. He reminds us that mimesis can incorporate a wide variety of actions and modalities, such as tones of voice, facial expressions, eye movements, manual signs and gestures, postural attitudes, patterned whole-body movements of various sorts and long sequences of these elements (1991, 167, 169).

Although Donald dissociates mimetic skill from the symbolic and semiotic devices on which modern human cultures depend, he proposes that it has many of the properties of language, which developed during a long transitional period to the third cognitive stage, 'Mythic Culture', in which humans had speech and highly developed semiotic skill – the ability to invent and use signs to communicate thought. Donald considers Mimetic Culture to have continued after the reign of *H. erectus* (from upwards of 1.5 million to about 300,000 years ago) in a transitional phase to Mythic Culture, which is characteristic of modern humans (from about 50,000 years ago, though more recent finds may revise this age upwards considerably: see Henshilood et al. 2002;Vanhaeren et al. 2006; Bouzouggar et al. 2007; d'Errico et al. 2009). He emphasises the monumental effects of speech on human cognition – on what could be thought once there were words to think with. The fourth cognitive stage, 'Theoretic Culture', emerges from the ability to store symbols externally in books, film, recordings and now electronic forms.

Among the properties of language that Donald describes in Mimetic Culture (intentional communication, recursion and differentiation of reference), he does not include the prosodic (emotional, expressive) half of language, which I suggest would have been used and developed by ancestral mothers interacting with infants. Researchers have posited 'intense maternal care' or 'intensive parenting' as early as 1.8 million years ago (Rosenberg 1992; Leakey 1994; Falk 2004, 2009; Flinn & Ward 2005, 31), permitting the interactive mother–infant ritualised behaviour described earlier to evolve and contributing to the invention of pre-symbolic ritual in Mimetic Culture (see next section).

Whether or not one accepts Donald's scheme in all details (an analytic and critical task that is not necessary for my purposes here), I suggest that it would have been possible for meta-representational ability to develop in early hominins during the long pre-symbolic and pre-linguistic stage of Mimetic Culture. Evidence of foresight and sophisticated tools in pre-sapiens humans can be found as early as 400,000 years ago with the discovery of wooden

spears, six to seven feet long, with more than 10,000 animal bones near Schöningen in Germany (Thieme 1997) and between 110,000 and 80,000 years ago in beautifully carved bone harpoons from Katanda in Zaire (Yellen et al. 1995).

Rather than simply reacting in the moment to hunger or danger and following the promptings of instinct, ancestral humans with a developing explicit memory were able to remember past events that were desirable or undesirable and then attempt to forestall unpleasant experiences and ensure satisfying ones. (With this statement, I do not mean to discount that squirrels cache nuts for the winter, some chimpanzees have been observed putting aside a stick for future use, and similar examples. Birds such as the Western scrub-jay and other corvids show remarkable abilities to remember the past and plan ahead [Clayton, Bussey & Dickinson, 2003; Raby et al. 2007].)

I suggest that the human cultural invention of ritual behaviour and religion was grounded in the ancestral capacity for meta-representation, which not only is related to explicit memory and foresight, but, I submit, includes expansion of the recognition of the extraordinary that is implicit in ritualised behaviours and play. I further claim that although it has not been sufficiently recognised and described by other scholars, a predisposition to *deliberately create the extraordinary*, especially in response to matters of biological importance with high affective valence, is inherent in human nature as it evolved during the transition from Mimetic to Mythic Culture as just described and as further elucidated in the next section.

## The Invention of Religion

### Awareness of Ordinary and Extraordinary

The behaviours of play and ritual have many similarities, but one seems particularly relevant to the subjects of this volume: the capacity to discriminate between an ordinary or mundane order, realm, mood or state of being and another that is unusual, extraordinary or supernatural. These are imprecise terms and may be considered scientifically or philosophically inadequate, although other contributors to this volume have used similar terminology (e.g. Renfrew, 'as if' as a meta-category, 'special' artefacts, 'special' places; Kyriakidis, the coming together in games and rituals is "not every day", "[b]oth ritual and games are special actions, in that they are separated from the mundane world"; Garfinkel, "dance is … not associated with any everyday functional activity"; Halley, Puebloan dances are "removed from everyday life"; Osborne, "both ritual and play define themselves by opposition to the 'normal'").

The distinction seems apt to account for evidence that as early as 250,000 years ago ancestral hominins noticed stones with unusual patterns or markings and carried them to their dwelling sites (Oakley 1971; Dissanayake 1988) or hammered cupules on stone surfaces (Bednarik 2008), thereby making 'ordinary' rock 'extraordinary'. I am aware that anthropologists sometimes describe the worldviews of traditional peoples as making no distinction between natural and supernatural realms, considering themselves and non-human entities and forces all equally real inhabitants of their cosmic order (e.g. Tonkinson 1978, on the Mardudjara in Australia). However, actions in rituals demonstrate that holders of these worldviews nevertheless make their bodies, surroundings, movements and utterances different from their ordinary state, showing that they make deliberate distinction between imbibing a ritual drink and quenching one's thirst or giving thanks to the forest with a dance and casually moving around in the forest. It is this distinction that I am concerned with here.

As described earlier, ethological observations show that infants with caretakers, young children and many other animals also recognise and even create non-ordinary 'realities' in ritualised behaviours and play (Burghardt, Chapter 3, this volume). If birds and babies can do it, one should not be surprised that this capacity could exist in ancestral humans.

### Ritual as Participation

Psychologists confirm that humans are fundamentally motivated to achieve some level of control over events, resources and relationships that are significant in their lives and become distressed when this control

is lacking (Geary 2005). Individually, we appraise the circumstances of our lives in terms of elements such as pleasantness, certainty, anticipated effort, control, legitimacy or perceived obstacle (Ellsworth 1991). Perceived uncertainty may produce fear and anxiety (Keltner, Ellsworth & Edwards 1993), with the release of stress hormones such as cortisol, which can have a number of deleterious physiological consequences (e.g. Flinn et al. 1996, 127). The pernicious effects of stress are reduced when individuals have a sense of control over uncertain circumstances (Whybrow 1984;Sapolsky 1992; Huether et al. 1996), and people generally have a strong desire to *do something* to affect circumstances for which a good outcome is desired but not assured (Malinowski 1948, 60; Lopreato 1984; Rappaport 1999). For humans, acting together as a group is more reassuring than doing nothing or acting alone (Taylor 1992).

Humans use memory and foresight for practical ends: they make tools for procuring food and weapons for predation or defence; they concoct remedies for wounds and illness. However, in most if not all small-scale societies that anthropologists have described (e.g. Guss 1998), practical preparation is usually considered insufficient. In the case of biologically important concerns, people do something *more* to try to influence or ensure the outcome they desire. They make things associated with these matters special – extraordinary – even to the point of creating complex physical and mental constructions or ways of doing things that are not obviously relevant to the vital matter at hand. These complex 'constructions' or 'ways' are called rituals or ceremonies. They are a primary feature of social life in small-scale groups, surrounding people from birth and throughout their lives (Tambiah 1979; Rappaport 1999). The often excessive amounts of time, energy and material resources devoted to preparing for and participating in ritual practices indicates how important they are to individuals and societies (see Watkins, Chapter 10, this volume).

I suggest that existential uncertainty – leading to emotional investment or 'caring about' – was the original motivating impetus for the invention of ritual in humans. One can observe in every society that rituals are meant to affect biologically important states of affairs whose attainment is uncertain – assuring food (see Malone, Chapter 13, and Taube, Chapter 17, this volume), safety, health, fertility, prosperity and successful transitions through important life stages. It is an anthropological axiom that rituals occur at times of transition and uncertainty (van Gennep 1960/1909; Turner 1969), and it is worth mentioning that ritualised behaviours in animals also occur when the situation is 'ambivalent' (Hinde 1982, 126).

Although they occur in every society, human ritual practices are not instinctive; indeed, they are culturally highly varied and complex. Yet if examined closely, their individual components can be regarded as extensions or elaborations of the innate operations of ritualised and play behaviours: faces, bodies, body movements, vocalisations, surroundings and materials (such as pigment, shells, stones or feathers) are transformed from their ordinary state to an extraordinary one by means of one or more of the operations that comprise ritualised behaviours and play (Simplification, Repetition, Exaggeration, Elaboration and Manipulation of Expectation, as described earlier).

Such behaviour could occur spontaneously. Margaret Mead (1976) described the Manus engaging in monotonous chanting when chilled and miserable or frightened at night – much like the Trobrianders who chanted charms in a singsong voice during a terrifying storm (Malinowski 1922). In such a manner, I suggest that as they engaged in the operations of ritualisation (already part of a 'behavioural reservoir' that existed in mother–infant interactions and children's play), ancestral hominins in Donald's Mimetic Culture were psychologically comforted and felt relieved of tension – particularly if the operations were performed in a coordinated fashion with others. Already in infancy, the operations assist bio-behavioural self-regulation and infant homeostasis (Hofer 1987; Gianino & Tronick 1988). Simplification and repetition of movements relieve tension in stressed animals (Charmove & Anderson 1989). Adult humans show similar behaviour, sometimes called 'comfort' movements, when they repeatedly tap a foot, wiggle a knee or wind a strand of hair around a finger. It has been reported that doing a repetitive task such as tapping a key, compared to verbally describing what one experiences while

watching a traumatic film, reduces subsequent painful, uncontrollable flashbacks like those that affect sufferers of post-traumatic stress disorder (Holmes, Brewin & Hennessy 2004).

Humans, like all primates, come together when under threat or other stress (Caporael 1997; Taylor et al. 2007), and the behavioural phenomenon of individuals engaging in highly coordinated actions is widespread in pairs and groups of humans and other animals. Even without deliberate orchestration, individuals tend to 'behaviourally' match the actions or postures of others (Bernieri & Rosenthal 1991; Dugatkin 1997; Chartrand & Bargh 1999).

It is perhaps not surprising that humans should behave in ritualised ways when stressed. Examples of 'superstition' ('a wrong idea about external reality') are reported in laboratory pigeons who, when given food at random and thus unpredictable time intervals, began to perform stereotyped and elaborated movements, as if their behaviour might have an effect on the food-releasing mechanism in their cage (Beck & Forstmeier 2007). Examples cited include turning around counter-clockwise in the cage, thrusting the head into one of the upper corners of the cage and 'tossing' the head as if placing it beneath an invisible bar and lifting it repeatedly.

Although to my knowledge neuroscientific studies have not been conducted specifically on participants in rituals, conclusions from other research can be cited to support a hypothesis that engaging in the operations of ritualised behaviours has adaptive effects. Several studies of participants in musical activities such as singing, dancing and drumming (which by their nature require coordinating regularised behaviour with other individuals) revealed that subjects had a higher pain threshold, lower levels of depression, anxiety and fatigue and an increase in vigour after the session, compared to a control group (Koelsch, Offermanns and Franzke 2010; Dunbar et al. 2012). These effects are attributed to the release of 'endorphins' or 'endogenous opioids' and oxytocin, often referred to as 'bonding hormones'. Panksepp and Biven (2012, 307) describe further beneficial effects of these neurohormones, such as behavioural indications of individual confidence and social comfort.

Affinitive behaviours and emotions, such as those created and reinforced by the operations of mother–infant interaction (in humans and other mammals) and participation in temporally coordinated and integrated multimodal (facial, vocal, gestural) behaviours (see Garfinkel, Chapter 11, and Halley, Chapter 9, this volume), activate the orbitofrontal cortex (OFC) and other reward centres of the brain, such as periaqueductal gray (PAG) (Carter et al. 1999; Miller & Rodgers 2001; Bartels & Zeki 2004). Brown and Dissanayake (2009) speculate that the functional properties of OFC provide important insight into the multimodal processing so central to the components of ritualised behaviours, whether in mother–infant interactions or participation in group-wide rituals. In both contexts one finds entrainment, joint action, emergent coordination, planned coordination, chorusing, turn-taking, imitation, complementary joint action, motor resonance, action simulation and mimesis (Phillips-Silver & Keller 2012, 3) as described for the Hopi circle dance by Halley, Chapter 9, this volume.

Even though oxytocin's primary function in all mammals seems to be its contribution to maternal nurturing, its contribution (along with other endorphins) to the reduction of the stress hormone cortisol (Uvnäs-Moberg 1999; Heinrichs et al. 2003; Taylor et al. 2008) supports an argument that participation with others in coordinated music-making, as in the songs and dances of ritual practice, relieves individual anxiety and emotional tensions (Koelsch et al. 2010; Dunbar et al. 2012). Among individuals who coordinate their behaviour in time, oxytocin additionally promotes cooperation, trust and bonding – all obvious adaptive benefits of the ritualised and ritual behaviours that foster and sustain these outcomes (Shaver, Hazan & Bradshaw 1988; Hazan & Zeifman 1999).

## Play, Ritual, Arts and Belief

The previous sections support my hypothesis that the evolutionary beginnings of religious rituals can be traced to the specialised components of play and ritualised behaviours that I have repeatedly described here – visual, vocal and gestural signals that attract attention and indicate to other participants, animal or human, that 'this is not ordinary or everyday'.

Again, these components (which I will now refer to as *aesthetic* devices or operations) are Simplification (Stereotypy), Repetition, Exaggeration, Elaboration and Manipulation of Expectation, all of which are amodal or polymodal in that they can occur visually, vocally or gesturally in both space and time.

Discussions by archaeologists of Pleistocene hominins do not usually mention evolved behavioural predispositions as described by ethologists such as play between mothers and infants or play in children. Yet it is universally observable that children precociously and pleasurably not only respond to but use aesthetic operations in art-like behaviour. For example, before their first year babies spontaneously vocalise with and move to music. When a little older, they sing with others or alone, dance, mime, make believe, play with sounds and words, decorate themselves and their possessions and make marks – recognising that these are non-ordinary.

These predispositions are raw material for adult rituals, a society's major occasions for making ordinary reality extraordinary. Visually arresting costumes, masks and other body ornamentation, altered and embellished artefacts and surroundings, chanting, dancing, singing, drumming, versifying and performing – all transform ordinary bodies, objects, environments, movements and utterances (see Renfrew, Chapter 2, this volume). We can call these extraordinary behaviours 'arts', and most rituals, whatever else they may be, can be considered as 'collections of arts', since without these transformations, it is hard to imagine what a ceremony would consist of.

Moreover, I think it is now clear that not only creators of rituals, but practitioners of the arts in all times and places, including the present day, also use the same aesthetic devices (on their behaviours in visual, vocal and gestural modalities and on various materials) in order to attract the attention of others, sustain their interest and evoke and shape their emotions.

One might consider the aesthetic devices to be *aesthetic 'primitives'*, immediately attracting attention in any sensory modality (as lines, contours, edges, colours and other 'visual primitives' stimulate the visual cortex before being analysed in higher cortical centres) because they are recognised instantly – perceptually, cognitively and emotionally – as being unlike ordinary or familiar stimuli (Dissanayake, 2016). Depending on what follows, their effect can be momentary or sustained, of mild interest or overpowering affect. Perceptions that startle or dazzle manipulate expectation and provide emotions of surprise, wonder, fear and awe. They seem to occupy another order of experience or state of being that is often interpreted as 'spiritual'.

Although art-filled ritual practices themselves may or may not resolve the immediate vital problems that are their proximate motivation, they inadvertently address and satisfy evolved needs of human psychology. Through their characteristic aesthetic operations, ritual practices create and reinforce emotionally satisfying, reassuring and psychologically necessary feelings of *mutuality* or intimate relationship with another person (Hinde 1975) and *belonging to a group* (Hinde 1975; Baumeister & Leary 1995; Dissanayake 2000). They *coordinate and unify* group members in a feeling of 'oneheartedness' (see Garfinkel, Chapter 11, and Halley, Chapter 9, this volume) as they *relieve individual and group anxiety* by instilling confidence and fostering a sense of control of disturbing circumstances. Further, they provide to individuals a sense of *meaningfulness* or cognitive order (belief) and individual *competence* insofar as they give emotional force to explanations of how the world came to be as it is and what is required to maintain it. These basic needs resemble the seven social functions of musical participation ('Seven Cs') described by Koelsch and colleagues (2010, 308–10): contact, social cognition, co-pathy, communication, coordination, cooperation and cohesion.

When anthropologists conceptualise a society's 'rituals' as part of its symbolic cognitive belief system, they may overlook the fact that regardless of the doctrine or meanings conveyed, rituals are constituted of art-like behaviours *and would not exist without them*. Because of the inseparability of religious practice and art-like behaviour, it is plausible to suggest that the arts arose in human evolution as components of ceremonial behaviour rather than as independently evolved activities. In any case, an ethological approach entails that one distinguish between religious belief and religious behaviour (Feierman 2009). Such a distinction revives the emphasis on the behavioural and emotional means of instilling and reinforcing a society's beliefs that

was described by early twentieth-century anthropologists such as Bronislaw Malinowski (1948) and A. R. Radcliffe-Brown (1952, 155), who proposed that religion in small-scale societies was less a matter of beliefs than of rites, indeed that belief was an *effect* of rites (see also Garfinkel, Chapter 11; Renfrew, Chapter 2; Watkins, Chapter 10, this volume).

Belief in religious dogma may or may not have been biologically adaptive, but the behavioural vehicles (arts participation) that installed and reinforced religious beliefs could inadvertently become adaptive. For example, formal organisation and articulation behaviourally instil a psychological sense of control over disorderly or disturbing content, thereby allaying anxiety. Or if further anxiety is created, as in some rituals, by being shaped and shared, it becomes a means to a further end of coping. Through a ceremony's arts, its messages or meanings are reinforced and the practitioners convinced that they are addressing and affecting the matter at hand. When used in culturally created ritual performances that transmit beliefs, aesthetic primitives bring emotional force to the messages, reinforcing their effect on participants.

Contemporary neuroscience reveals that belief, like other higher cognitive functions, rests on emotion (Damasio 1994; see also Kyriakidis, Chapter 18, this volume). Although literate people can read doctrinal texts and be persuaded to hold certain beliefs, for most of human history, belief was instilled nonverbally in individuals as they participated in song, dance and other vehicles of entrainment by means of neurohormonal effects of the aesthetic devices that were used in these activities.

As a final addendum to the views presented here, I propose that although the residue of specific beliefs may be difficult to find in the archaeological record, wherever one finds any or all of the aesthetic devices manifested in material form (as structure or decor), one can infer that their makers were likely to have been motivated by emotionally valenced beliefs.

## References


Alland, A., Jr. 1983. *Playing With Form*. New York: Columbia University Press.

Bartels, A. & S. Zeki, 2004. The neural correlates of maternal and romantic love. *Neuroimage* 21(3), 1155–66.

Baumeister, R. F. & M. R. Leary, 1995. The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin* 117(3), 497–529.

Beck, J. & W. Forstmeier, 2007. Superstition and belief as inevitable by-products of an adaptive learning strategy. *Human Nature* 18(1), 35–46.

Bednarik, R., 2008. Cupules. *Rock Art Research* 25, 61–100.

Bernieri, F. J. & R. Rosenthal, 1991. Interpersonal coordination: behaviour matching and interactional synchrony, in *Fundamentals of Nonverbal Behaviour*, eds. R. S. Feldman & B. ~~Rime~~. Cambridge: Cambridge University Press, 401–32.

Bjorklund, D. F. & A. D. Pellegrini, 2002. *The Origins of Human Nature: Evolutionary Developmental Psychology*. Washington, DC: American Psychological Association.

Bouzouggar, A., N. Barton, M. Vanhaeren, F. d'Errico, S. Collcutt, T. Higham et al. 2007. 82,000-year-old shell beads from North Africa and implications for the origins of modern human behavior. *Proceedings of the National Academy of Sciences*, 104(24), 9964–9.

Brown, S. & E. Dissanayake, 2009. The arts are more than aesthetics: neuroaesthetics as narrow aesthetics, in *Neuroaesthetics*, eds. M. Skov & O. Vartanian. Amityville, NY: Baywood, 43–57.

Burghardt, G. M., 2005. *The Genesis of Animal Play: Testing the Limits*. Cambridge, MA: MIT Press.

Burrill, R., 2010. The primacy of movement in art making. *Teaching Artist Journal* 8, 216–228.

Caporael, L. R., 1997. The evolution of truly social cognition: the core configuration model. *Personality and Social Psychology Review* 1, 276–98.

Carter, C. S., 1998. Neuroendocrine perspectives on social attachment and love. *Psychoneuroendocrinology* 23: 779–818.

Carter, C. & M. Altemus, 1999. Integrative functions of lactational hormones in social behaviour and stress management, in *The Integrative Neurobiology of Affiliation*, eds. C. Carter, I. Lederhendler & B. Kirkpatrick. Cambridge, MA: MIT Press, 361–71.

Carter, C., I. Lederhendler & B. Kirkpatrick, (eds.), 1999. *The Integrative Neurobiology of Affiliation*. Cambridge, MA: MIT Press.

Charmove, A. S. & J. R. Anderson, 1989. Examining environmental enrichment, in *Housing, Care and Psychological Well Being of Captive and Laboratory Animals*, ed. E. F. Segal. Park Ridge, NJ: Noyes Publications, 183–202.

Chartrand, T. L. & J. A. Bargh, 1999. The chameleon effect: the perception-behaviour link and social interaction. *Journal of Personality and Social Psychology* 76, 893–910.

Clayton, N. S., T. J. Bussey & A. Dickinson, 2003. Can animals recall the past and plan for the future? *Nature Reviews Neuroscience* 4, 685–91.

Cosmides, L. & J. Tooby, 2000. Consider the source: the evolution of adaptations for decoupling and metarepresentation, in *Metarepresentations*, ed. D. Sperber. Oxford and New York: Oxford University Press, 53–115.

Damasio, A., 1994. *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Grosset Putnam.

d'Errico, F., M. Verhaeren, N. Barton, A. Bouzouggar, H. Mienis, D. Richter et al. 2009. Additional evidence on the use of personal ornaments in the Middle Paleolithic of North Africa. *Proceedings of the National Academy of Sciences* 106(38), 16051–6.

Dissanayake, E., 1979. An ethological view of ritual and art in human evolutionary history. *Leonardo* 12(1), 27–31.

Dissanayake, E., 1988. *What Is Art For?* Seattle: University of Washington Press.

Dissanayake, E., 1999. Antecedents of the temporal arts in early mother–infant interaction, in *The Origins of Music*, eds. N. L. Wallin, B. Merker, & S. Brown. Cambridge, MA: MIT Press, 389–410.

Dissanayake, E., 2000. *Art and Intimacy: How the Arts Began*. Seattle: University of Washington Press.

Dissanayake, E., 2001. Becoming *Homo aestheticus*: sources of aesthetic imagination in mother–infant interactions. *SubStance* 30(1,2), 85–103.

Dissanayake, E., 2006. Ritual and ritualization: musical means of conveying and shaping emotion in humans and other animals, in *Music and Manipulation: On the Social Uses and Social Control of Music*, eds. S. Brown & U. Volgsten. Oxford: Berghahn, 31–57.

Dissanayake, E., 2008. The arts after Darwin: does art have an origin and adaptive function?, in *World Art Studies: Exploring Concepts and Approaches*, eds. K. Zijlmans & W. van Damme. Amsterdam: Valiz, 241–63.

Dissanayake, E. (2016). Mark-making as a human behavior, in *Darwin's Bridge: Uniting the Humanities and Social Sciences*, eds. J. Carroll, D. P. McAdams, & E. O. Wilson. New York: Oxford University Press, 101–30.

Donald, M., 1991. *Origins of the Modern Mind: Three Stages in the Evolution of Cognition and Culture*. Cambridge, MA: Harvard University Press.

Dugatkin, L. A., 1997. *Cooperation Among Animals: An Evolutionary Perspective*. Oxford: Oxford University Press.

Dunbar, R. I. M., K. Kaskatis, I. MacDonald & V. Barra, 2012. Performance of music elevates pain threshold and positive affect: implications for the evolutionary function of music. *Evolutionary Psychology* 10(4): 688–702.

Eibl-Eibesfeldt, I. 1971. *Love and Hate: The Natural History of Behaviour Patterns*, translated by Geoffrey Strachan. New York: Holt, Rinehart and Winston.

Eibl-Eibesfeldt, I. 1989. *Human Ethology*, translated by Pauline Wiessner-Larsen and Anette Heunemann. New York: Aldine de Gruyter.

Ellsworth, P., 1991. Some implications of cognitive appraisal theories of emotion, in *International Review of Studies of Emotion*, vol. 1, ed. K. Strongman. New York: Wiley, 143–61.

Falk, D., 2004. Prelinguistic evolution in early hominins: whence motherese? *Behavioural and Brain Sciences* 27(4), 491–503.

Falk, D., 2009. *Finding Our Tongues: Mothers, Infants & The Origin of Language*. New York: Basic Books.

Feierman, J. R. (ed.), 2009. *The Biology of Religious Behaviour: The Evolutionary Origins of Faith and Religion*. Santa Barbara, CA: Praeger.

Fein, S., 1993. *First Drawings: Genesis of Visual Thinking*. Pleasant Hill, CA: Exelrod Press.

Flinn, M. V., R. J. Quinlan, S. A. Decker, M. T. Turner & B. G. England, 1996. Male-female differences in effects of parental absence on glucocorticoid stress response. *Human Nature* 7(2), 125–62.

Flinn, M. V. & C. V. Ward, 2005. Evolution of the social child, in *Origins of the Social Mind: Evolutionary Psychology and Child Development*, eds. B. Ellis & D. Bjorklund. London: Guilford Press, 19–44.

Geary, D. C., 2005. Folk knowledge and academic learning, in *Origins of the Social Mind: Evolutionary Psychology and Child Development*, eds. B. J. Ellis & D. F. Bjorklund. New York: Guilford, 493–519.

Gianino, A. & E. Z. Tronick, 1988. The mutual regulation model: the infant's self and interactive regulation and coping and defensive capacities, in *Stress and Coping*, eds. T. Field, P. M. McCabe & N. Schneiderman. Hillsdale, NJ: Erlbaum, 47–68.

Guss, D. M., 1998. *To Weave and Sing: Art, Symbol, and Narrative in the South American Rain Forest*. Berkeley & Los Angeles: University of California Press.

Harris, J. R., 1995. Where is the child's environment? A group socialization theory of development. *Psychological Review* 102, 458–89.

Hazan, C. & D. Zeifman, 1999. Pair bonds as attachments: evaluating the evidence, in *Handbook of Attachment: Theory, Research, and Clinical Applications*, eds. J. Cassidy & P. R. Shaver. New York: Guilford, 336–54.

Heinrichs, M., T. Baumgartner, C. Kirschbaum & U. Ehlert, 2003. Social support and oxytocin interact to suppress cortisol and subjective responses to psychosocial stress. *Biological Psychiatry* 54, 1389–98.

Henshilwood, C. S., F. d'Errico, R. Yates, Z. Jacobs, C. Tribolo, G. A. Duller, et al., 2002. Emergence of modern human behavior: Middle Stone Age engravings from South Africa. *Science* 295(5558), 1278–80.

Hinde, R., 1975. *Biological Bases of Human Social Relationships*. New York: McGraw Hill.

Hinde, R., 1982. *Ethology: Its Nature and Relations With Other Sciences*. New York and Oxford: Oxford University Press.

Hofer, M. A., 1987. Early social relationships: a psychobiologist's view. *Child Development* 58, 633–47.

Holmes, E. A., C. R. Brewin & R. G. Hennessy, 2004. Trauma films, information processing, and intrusive memory development. *Journal of Experimental Psychology: General* 133(1), 3–22.

Huether, G., S. Doering, U. Rueger & E. Ruether, 1996. Psychic stress and neuronal plasticity: an expanded model of the stress reaction processes as basis for the understanding of adaptive processes in the central nervous system. *Zeitschrift für Psychosomatische Medizin und Psychoanalyse* 42, 107–27.

Huxley, J., 1914. The courtship habits of the great crested grebe (*Podiceps cristatus*) together with a discussion of the evolution of courtship in birds. *Journal of the Linnean Society of London: Zoology* 53, 253–92.

Huxley, J., 1966. Introduction, in *A Discussion on Ritualisation of Behaviour in Animals and Man*, organized by Sir Julian Huxley. Philosophical Transactions of the Royal Society of London, Series B. Biological Sciences 772, 249–71.

Kaptchuk T. J., C. E. Kerr & A. Zanger, 2009. Placebo controls, exorcisms, and the devil. *Lancet* 374 (9697), 1234–5. (10 Oct.).

Kavanagh, D. J., J. Andrade & J. May, 2005. Imaginary relish and exquisite torture: the elaborated intrusion theory of desire. *Psychological Review* 112(2), 446–67.

Kellogg, R., 1970. *Analyzing Children's Art*. Palo Alto, CA: Mayfield.

Keltner, D., P. Ellsworth & K. Edwards, 1993. Beyond simple pessimism. *Journal of Personality and Social Psychology* 64, 740–52.

King, B. J., 2004. *The Dynamic Dance: Nonvocal Communication in African Great Apes*. Cambridge, MA: Harvard University Press.

Koelsch, S., K. Offermanns & P. Franzke, 2010. Music in the treatment of affective disorders: an exploratory investigation of a new method for music-therapeutic research. *Music Perception* 27(4), 307–16.

Leakey, R., 1994. *The Origin of Humankind*. New York: Basic Books

Leslie, A. M., 1987. Pretense and representation: origins of 'theory of mind'. *Psychological Review* 94, 412–26.

Lillard, A. S., 1993. Pretend play skills and the child's theory of mind. *Child Development* 64(2), 348–71.

Lopreato, J., 1984. *Human Nature and Biocultural Evolution*. Boston, MA: Allen and Unwin.

Lorenz, K. Z., 1982. *The Foundations of Ethology: The Principal Ideas and Discoveries in Animal Behaviour.*, translated by K. Z. Lorenz and R. W. Kickert. (Original German publication 1981). New York: Simon and Schuster.

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

Malinowski, B., 1927. The life of culture, in *Culture: The Diffusion Controversy*, eds. G. E. Smith, B. Malinowski, H. J. Spinden & A. Goldenweiser New York: Norton, 26–46.

Malinowski, B., 1948. *Magic, Science, and Religion*. Boston, MA: Beacon Press. Original publication 1925.

Mead, M. 1976. *Growing Up in New Guinea*. New York: Morrow. Original publication 1930.

Meyer-Holzapfel, M., 1956. Das Spiel bei Säugetieren. *Handbuch der Zoologie* 8, 1–26.

Miller, W. B. & J. L. Rodgers, 2001. *The Ontogeny of Human Bonding Systems: Evolutionary Origins, Neural Bases, and Psychological Manifestations*. Boston, MA and Dordrecht: Kluwer Academic Publishers.

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

Morris, D., 1957. 'Typical intensity' and its relation to the problem of ritualisation, *Behaviour* 11, 1–2.

Nelson, E. E. & J. Panksepp, 1998. Brain substrates of infant–mother attachment: contributions of opioids, oxytocin, and norepinephrine. *Neuroscience and Biobehavioural Reviews* 22, 437–52.

Oakley, K. P., 1971. Fossil shell observed by Acheulian Man. *Antiquity* 47, 59–60.

Panksepp, J., 1998. *Affective Neuroscience: The Foundation of Animal and Human Emotions*. Oxford: Oxford University Press.

Panksepp, J. & L. Biven, 2012. *The Archaeology of Mind: Neuroevolutionary Origins of Human Emotions*. New York: Norton.

Panksepp, J., E. Nelson & M. Bekkedal, 1999. Brain systems for the mediation of social separation-distress and social-reward: evolutionary antecedents and neuropeptide intermediaries, in *The Neurobiology of Affiliation*, eds. C. S. Carter, I. Lederhendler & B. Kirkpatrick. Cambridge, MA: MIT Press, 222–41.

Pellegrini, A. D. & D. F. Bjorklund, 2004. The ontogeny and phylogeny of children's object and fantasy play. *Human Nature* 15(1), 23–43.

Phillips-Silver, J., C. A. Aktipis & G. A. Bryant, 2010. The ecology of entrainment: foundations of coordinated rhythmic movement. *Music Perception* 28(1), 3–14.

Phillips-Silver, J. & P. E. Keller. 2012. Searching for roots of entrainment and joint action in early musical interactions. *Frontiers in Human Neuroscience* 6(26), 1–11.

Raby, C. R., D. M. Alexis, A. Dickinson & N. S. Clayton, 2007. Planning for the future by Western scrub-jays. *Nature* 445, 919–21.

Radcliffe-Brown, A. R., 1952. Religion and society, in *Structure and Function in Primitive Society*. Glencoe, IL: Free Press, 153–77. Original publication in *Journal of the Royal Anthropological Institute* (1945) 75(1–2), 33–43.

Rappaport, R. A., 1999. *Ritual and Religion in the Making of Humanity*. Cambridge and New York: Cambridge University Press.

Rosenberg, K. R., 1992. The evolution of modern human childbirth. *Yearbook of Physical Anthropology* 35, 89–134.

Sapolsky, R. M., 1992. Neuroendocrinology of the stress response, in *Behavioural Endocrinology*, eds. J. R. Becker,

S. M. Breedlove & D. Crews. Cambridge, MA: MIT Press, 287–324.

Schechner, R., 2002. *Performance Studies: An Introduction*. New York: Routledge.

Schiefenhövel, W., 2009. Explaining the inexplicable: traditional and syncretistic religiosity in Melanesia, in *The Biological Evolution of Religious Mind and Behaviour*, eds. E. Voland & W. Schiefenhövel. Berlin: Springer, 143–64.

Shaver, P. R., C. Hazan & D. Bradshaw, 1988. Love as attachment: the integration of three behavioral systems, in *The Anatomy of Love*, eds. R. J. Sternberg & M. Barnes. New Haven, CT: Yale University Press.

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

Stern, D. 1977. *The First Relationship*. Cambridge, MA: Harvard University Press.

Suddendorf, T. & M.C. Corballis, 1997. Mental time travel and the evolution of the human mind. *Genetic, Social, and General Psychology Monographs* 123, 133–67.

Tambiah, S. J., 1979. A performative approach to ritual. *Proceedings of the British Academy, London* LXV, 113–69. Oxford: Oxford University Press.

Taylor, S., 1992. *The Tending Instinct: How Nurturing Is Essential to Who We Are and How We Live*. New York: Henry Holt.

Taylor, S. E., 2007. Social support, in *Foundations of Health Psychology*, eds. H. S. Friedman & R. C. Silver. New York: Oxford University Press, 145–171.

Taylor, S. E., L. J. Burklund, N. I. Eisenberger, B. J. Lehman, C. J. Hilmeet & M. D. Lieberman, 2008. Neural bases of moderation of cortisol stress responses by psychosocial resources. *Journal of Personality and Social Psychology* 95(1), 197–211.

Thieme, H., 1997. Lower Paleolithic hunting spears from Germany. *Nature* 385, 807–10.

Tinbergen, N., 1952. 'Derived' activities: their causation, biological significance, origin and emancipation during evolution. *Quarterly Review of Biology* 17, 1–32.

Tinbergen, N., 1959. Comparative studies of the behaviour of gulls (*Laridae*): a progress report. *Behaviour* 15, 1–70.

Tonkinson, R., 1978. *The Mardudjara Aborigines: Living the Dream in Australia's Desert*. New York: Holt, Rinehart and Winston.

Tooby, J. & L. Cosmides, 2001. Does beauty build adapted minds? Toward an evolutionary theory of aesthetics, fiction, and the arts. *SubStance* 30(1,2), 6–27.

Turner, V., 1969. *The Ritual Process: Structure and Anti-Structure*. London: Routledge and Kegan Paul.

Uvnäs-Moberg, K., 1999. Physiological and endocrine effects of social contact, in *The Integrative Neurobiology of Affiliation*, eds. C. Carter, I. Lederhendler & B. Kirkpatrick. Cambridge, MA: MIT Press, 245–61.

Van Gennep, A., 1960. *The Rites of Passage*. London: Routledge and Kegan Paul. Original work published 1908.

Vanhaeren, M., F. d'Errico, C. Stringer, S. L. James, J. A. Todd, & H. K. Mienis. 2006. Middle paleolithic shell beads in Israel and Algeria. *Science* 312 (5781), 1785–88.

Watanabe, J. M. & B. B. Smuts, 1999. Explaining religion without explaining it away: trust, truth, and the evolution of cooperation in Roy A. Rappaport's 'The obvious aspects of ritual'. *American Anthropologist* 101, 98–112.

Whybrow, P., 1984. Contributions from neuroendocrinology, in *Approaches to Emotion*, eds. K. Scherer & P. Ekman. Hillsdale, NJ: Erlbaum, 59–72.

Yellen, J. E., A. S. Brooks, E. Cornelissen, M. J. Mehlman & K. Stewart, 1995. A Middle Stone Age worked bone industry from Katanda, Upper Semliki Valley, Zaire. *Science* 268 (28 April), 553–6.