Chapter 14
The Origins of Symbolic Culture

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Abstract Symbolic culture is a realm of patently false signals. From a Darwinian standpoint, it is not easy to explain how strategies of reliance on such signals could have become evolutionarily stable. The archaeological record shows evolving modern humans investing heavily in cosmetics, with a particular emphasis on ochre pigments matching the colour of blood. This chapter discusses the Female Cosmetic Coalitions model of the origins of symbolic culture in the context of hypotheses sometimes considered to be alternative explanations. It is shown that these various hypotheses are not genuine alternatives. Many are not Darwinian, while others either fail to address the question of symbolism or address it but make no reference to details of the archaeological record. It is concluded that the Female Cosmetic Coalitions model offers the most testable and parsimonious way of integrating these different perspectives.

'Symbolic culture....requires the invention of a whole new kind of things, things that have no existence in the 'real' world but exist entirely in the symbolic realm. Examples are concepts such as good and evil, mythical inventions such as gods and underworlds, and social constructs such as promises and football games'. (Philip Chase 1994, p. 628)

From a Darwinian standpoint, 'symbolic culture' is an unsettling notion. Modern science became established in opposition to the idea that culturally accepted fictions can be equated with facts. Yet the concept of symbolic culture requires us to grasp just that paradoxical possibility. Long before the late twentieth century invention of the Internet, evolution allowed humans to flit between two realms, reality on the one hand, virtual reality on the other. Symbolic culture is an environment of objective facts – whose existence depends entirely on subjective belief. In this chapter, I attempt to bridge the gap between Darwinism and the human sciences by providing a materialist account of our species' puzzling reliance on moral, religious, and other cultural illusions.

14.1 Two Kinds of Fact

'Brute facts', in the terminology of John Searle (1996, p. 27), are facts which are true anyway, regardless of human belief. Suppose you don't believe in gravity: jump over a cliff and you'll still fall. Natural science is the study of facts of this kind. 'Institutional facts' are fictions accorded factual status within human social institutions. Monetary and commercial facts are fictions of this kind. The complexities of today's global currency system are facts only while we believe in them: suspend the belief and the facts correspondingly dissolve. Yet although institutional facts rest on human belief, that doesn't make them mere distortions or hallucinations. Take my confidence that these two five-pound banknotes in my pocket are worth ten pounds. That's not merely my subjective belief: it's an objective, indisputable fact. But now imagine a collapse of public confidence in the currency system. Suddenly, the realities in my pocket dissolve.

For scholars familiar with Rousseau, Marx or Durkheim, none of this is especially surprising or difficult to grasp. Some facts are true anyway, irrespective of human belief. Others subsist in a virtual realm of hallucination or faith. For Saussure (1983 [1915], p. 8), it was the parallel between linguistic meanings and currency values – all in some sense hallucinatory – which made a scientific linguistics so problematical:

> "Other sciences are provided with objects of study given in advance, which are then examined from different points of view. Nothing like this is the case in linguistics... The object is not given in advance of the viewpoint: far from it. Rather, one might say that it is the viewpoint adopted which creates the object".

It was in rebellion against such troubling notions that Noam Chomsky (2000, pp. 106-133) redefined 'language and similar phenomena' as 'elements of the natural world, to be studied by ordinary methods of empirical enquiry'. Linguistics, within Chomsky's new paradigm, ceased to be social and became instead a natural science. Ideologically hostile to Marx, Durkheim and what they termed 'Standard Social Science', a generation of Darwinians (Tooby and Cosmides 1992, 1995, Pinker 1994) embraced Chomsky's naturalistic approach. Somehow, language had now to be explained as an innate cognitive module without any animal precursor. Its emergence had also to be explained if possible without reference to social selection pressures (e.g., Hauser et al., 2002; Fitch et al., 2005). The consequence of all this was to render language's very existence an insoluble mystery (Knight 2004, 2009). Far from yielding to Darwinian explanation, the evolutionary emergence of language is nowadays considered 'the hardest problem in science' (Christiansen and Kirby 2003).

14.2 Four Positions on the Origins of Symbolic Culture

Within the past fifteen years, archaeological revelations from the African Middle Stone Age have transformed our picture of the timing of symbolic culture's emergence. Until the early nineties, the prevailing view of the 'human revolution' (Mellars and Stringer

1989) was notably Eurocentric, focused on the Upper Palaeolithic Revolution as humanity's 'Great Leap Forward'. Recent discoveries from Africa have at least doubled the time-depth of acknowledged and accepted evidence of symbolic activity. This has left us with four main positions concerning the timeline for symbolic culture's emergence:

1. *Francesco D'Errico.* Multispecies transition across Africa and Eurasia. Symbolic capacities already in place with Homo heidelbergensis 300,000 - 400,000 years ago. Sporadic behavioural expressions of symbolism among ancestors of both Neanderthals and ourselves (D'Errico 2003).

2. *Sally McBrearty* and *Alison Brooks.* Down with the revolution! African ancestors of modern humans undergo gradual, sporadic build-up of modern cognition and behavior spanning 300,000 years. Symbolism presents no special theoretical difficulties, emerging as part of the package of modern, flexible, creative behaviours within Africa (McBrearty and Brooks 2000; McBrearty 2007)

3. *Christopher Henshilwood* and *Ian Watts.* The human revolution occurred as part of modern human speciation in Africa. Evidence for symbolism in the form of cosmetics and personal ornamentation is the archaeological signature of this transition. Symbolism was not an optional extra – life following the transition became fundamentally organized through symbols (Henshilwood and Dubreuil 2009; Watts 2009)

4. *Richard Klein.* Recent interpretations of the African Middle Stone Age record are wrong; the original 'human revolution' theory remains correct. Middle Stone Age humans evolving in Africa may appear anatomically modern, but did not become cognitively modern until the Late Stone Age/Upper Palaeolithic. Symbolic culture emerged some 50,000 years ago, caused by a genetic mutation that re-wired the brain (Klein 1999; Klein and Edgar 2002).

14.3 The Archaeological Evidence

In the African archaeological record, the earliest persuasive evidence for symbolic culture includes certain engraved pieces of ochre (Henshilwood et al., 2002) associated with marine pierced shells (Henshilwood et al., 2004; d'Errico et al., 2005). Dated to around 70,000 years ago, these were recovered from Middle Stone Age levels at Blombos Cave, South Africa. Mounting evidence for symbolic behaviour at still earlier dates includes a South African coastal site (Pinnacle Point) yielding mollusc remains, bladelets, and red ochre pigments dating to at least 164,000 years ago (Marean et al., 2007). Use of ochre pigments extends back between 250-300 ky at some sites in the tropics; regular and habitual use dates back to the time of modern speciation (Watts 1999, 2009).

Most archaeologists now accept that the shells and pigments were used for personal ornamentation. Often, the shells were strung together to form a necklace. Traces of red pigment have been found on a set of 82,000 year-old perforated shells from the Grotte des Pigeons in North Africa, suggesting that the wearer's body was

perhaps already ochred (d'Errico and Vanhaeren 2009, plate 2). Traces of red ochre pigment have similarly been found on some shells from Blombos in South Africa (d'Errico et al., 2004). At Blombos, several modified pieces of ochre have a sharp bevelled edge, as if designed to produce a clear outline of colour on a surface (Watts 2009, Plate 4). Ochres yielding the most saturated dark reds – especially 'blood' reds – were subjected to the greatest intensity of grinding and use (Watts 2009). Pinnacle Point nearby yields similar 'crayons' dated to 164,000 ky (Marean et al., 2007). Geometric engravings found on Blombos pieces (Henshilwood et al., 2002) add to the suggestion that many of these delicately shaped 'crayons' were used to produce abstract designs, probably on the human body (Watts 2009). This cultural tradition can be traced back to at least a hundred thousand years ago (Henshilwood et al., in press). Such evidence suggests that cultural traditions involving body painting were already being established with the speciation of *Homo sapiens.*

14.4 Explanatory Scenarios

To Christopher Henshilwood and Benoit Dubreuil, the cosmetic evidence indicates that Middle Stone Age people were capable of symbolic communication (Henshilwood and Dubreuil 2009). For individuals to wear cosmetics or a necklace, they must care about how they look. To adorn oneself appropriately, it is necessary to imagine one's appearance from the standpoint of others. The requisite capacities for multiple perspective taking are distinctively 'modern' and underlie all symbolic communication including language. Henshilwood and his colleagues on that basis conclude that the producers of the Blombos pigments and ornaments already had language-ready minds.

Ian Watts (2009) arrives at similar conclusions concerning language, but on different theoretical grounds. Since my own theoretical position converges closely with that of Watts, and since we both support Camilla Power's Female Cosmetic Coalitions model (see discussion below), I will avoid repetition at this point and turn directly to Klein, who is the main archaeological opponent of the idea that African Middle Stone Age findings from sites such as Blombos have anything to do with symbolism.

The argument for a mutation generating language and then triggering symbolic culture (e.g. Klein 1999; Chomsky 2005) has little to recommend it. We should be suspicious when a puzzle regarding our own species is addressed using 'special' methods – methods without parallel elsewhere in evolutionary science. No specialist in, say, elephant or social insect communication would invoke a single mutation to explain its evolution. We would be equally astonished at an appeal to elephant or honeybee psychology fixed by an 'environment of evolutionary adaptedness' (Tooby and Cosmides 1992, 1995) in the remote past. Evolution is not driven by mental phenomena. In the case of any natural species, we explain cognition and communication by reference to reproductive strategies, foraging strategies and other behavioral adaptations to environmental and social conditions as these

fluctuate and change over evolutionary time. We need a theory of the evolution of *Homo sapiens* faithful to the methods of behavioral ecology which have proved so successful elsewhere in the living world.

It might be thought that by now we would have a number of theoretical attempts in this direction. Sadly, this is not so. If we are looking for hypotheses which are (a) based in behavioral ecology (b) focused on the emergence of symbolism and (c) testable in the light of relevant archaeological data, the range of suggestions is limited. Camilla Power's Female Cosmetic Coalitions model (see discussion below) meets all three conditions. But before presenting it, I will survey an array of models which meet at least some of these basic preconditions.

14.5 Costly Versus Cheap Signals: Cooperation Between Strangers

1. *Philip Chase: Symbolism enforces co-operation between strangers.* During the later phases of human evolution, humans began to invent entities lacking any existence in the real world – intangibles such as underworlds, promises and totems. Symbolic culture arose because its coercive rituals and associated belief systems provided the only mechanisms of punishment and reward capable of enforcing cooperation between strangers, in turn a prerequisite for the establishment of institutional facts. The term 'cooperation between strangers' means cooperation on a scale transcending the limits of Darwinian kin-selection or reciprocal altruism (Chase 1994, 1999).

2. *Richard Sosis: Costly ritual enforces cooperation between strangers.* Religious communities are networks of 'strangers' held together by costly ritual. The supernatural entities that help to inspire allegiance don't spontaneously replicate in human brains: they must be coercively installed. Painful ordeals such as initiation rites perform this function. The only way to reliably demonstrate religious commitment is to undergo rituals so demanding of personal sacrifice that the benefits of subsequent defection are likely to be outweighed by the costs (Sosis 2003).

3. *Merlin Donald: Mimesis.* Symbolic culture became established as *Homo erectus* came under communicative pressure to exercise cognitive control over previously hard-to-fake, emotionally expressive body language. Mimetic culture took the form of learned, culturally transmitted, simulated versions of such body language. Through dance, song, pantomime and ritual, evolving humans bonded with one another and became increasingly equipped to express in public their emotional and cognitive states (Donald 1991, 2001).

4. *Dan Sperber: To qualify as symbolic, a signal must be false.* To determine whether a signal or statement is 'symbolic', a simple rule can be applied. Is it patently false? If so, it may qualify as a symbol. Falsehood is intrinsic to symbolism. Linguistic utterances are symbolic to the extent that they are patent falsehoods serving as guides to communicative intentions. Metaphor, irony,

sarcasm and humour illustrate the principle. Language began to evolve when humans started reciprocally faking in communicatively helpful ways (Sperber 1975, 2005; Sperber and Wilson 1986).

5. *Roy Rappaport: In the beginning was the Word.* Words are cheap and unreliable. Costly, repetitive and invariant religious ritual is the antidote. At the apex is an 'ultimate sacred postulate' – an article of faith beyond possible denial. Words may lie, so it is claimed, but 'the Word' emanates from a higher source. Without such public confidence upheld by ritual action, faith in the entire system of interconnected symbols would collapse. During the evolution of humanity, the crucial step was therefore the establishment of rituals capable of upholding the levels of trust necessary for linguistic communication to work (Rappaport 1999).

6. *Jerome Lewis: Hunting, mimicry and play.* Antelopes, monkeys and other animals hunted by Central African forest people treat vocal signals as intrinsically reliable. Forest hunter-gatherers routinely exploit such gullibility, faking animal cries to lure their targets within range. When these same hunters subsequently recall a particular hunting episode, they act out the story drawing on the same sophisticated capacities for faking, mimicry and pantomime. Story-telling, ritual, play and religion in such societies is the in-group, co-operative and correspondingly honest redeployment of capacities for deception initially deployed in the forest. This converges with the people's indigenous view of their signs, songs and rituals as echoes of the forest's own voices and spirits (Lewis 2009).

14.6 Symbolism: Puzzles and Paradoxes

Turning now to a review of these ideas, archaeologist *Philip Chase* asserts that Darwinism alone cannot explain co-operation between strangers. He also reminds us that symbolic culture enforces just this kind of cooperation. But how did symbolic culture itself emerge? Having posed the question with admirable clarity, he leaves the evolutionary emergence of symbolic culture unexplained.

Behavioural ecologist *Richard Sosis* does offer a Darwinian model in which individual strategies of alliance-building enforce cooperation between strangers. To explain the mechanisms at work, Sosis relies on costly signalling theory (Zahavi 1975; Zahavi and Zahavi 1997). Religious communities hold themelves together by insisting that each individual member pays admission and continued membership costs so heavy as to deter freeriding. The threshold of costs will be set by the probability of social defection. This explains why rituals of initiation are so often painful, and potentially why there should be variability in costliness. A ritual involving no hardship or sacrifice cannot signal commitment: it would allow freeriders to flourish.

Sosis has done his main studies on contemporary or recent historic religious communities, who are already immersed in symbolic culture. In principle, however, the model can apply to the evolutionary emergence of ritual and religion. Indeed Alcorta

and Sosis (2005) discuss the African Middle Stone Age archaeological record, mainly the ochre evidence, in relation to this model. The value of this work is that it suggests a bridge between animal signalling and symbolic cultural display: the same body of theory can be applied in both domains. But why exactly must hard-to-fake ritual generate what Chase (1994) terms 'things that have no existence in the "real" world'? Hunter gatherer ritual and religious landscapes are populated by animal spirits, tricksters and other such fictional entities. What is the connection between these two apparently incompatible properties of ritual – its intrinsic reliability on the one hand and its trickery on the other?

In stark opposition to the hard-to-fake costly signal model stand *Merlin Donald* and *Dan Sperber*. For symbolism to evolve, if we accept their positions, evolving humans had to stop probing signals for their reliability and instead collude with patent fakes. At first sight, this seems wholly incompatible with Sosis' argument that symbolically constituted communities hold themselves together by resorting to signals whose reliability is underwritten by their costs. If Donald and Sperber are correct, symbolism seems to presuppose signals which are not just unreliable but patently false. But perhaps the cheap signals and the costly ones perform distinct functions, operating on quite different levels?

This is essentially the argument of *Roy Rappaport,* a social anthropologist who rejected modern selfish-gene Darwinism but independently converged on the costly signalling idea. Social acceptance of symbols presupposes high levels of trust already in place. Sosis in fact follows Rappaport's argument that costly ritual is designed to generate trust where none existed before. Integrating these lines of reasoning, we might conclude that ritual is needed to cement bonds sufficiently trusting to permit communication on the basis of cheap fakes.

Let me put this another way. A distinction can be drawn between signalling costs of two kinds (cf. Grafen 1990; Guilford and Dawkins 1991). Either the signaller must generate trust signal by signal, using intrinsically convincing features to do so. Where this is the case, the costs involved in eliminating perceptual ambiguity won't suffice: added costs will have to be incurred to ensure reliability as well. A strong case can be made that all animal signals fall into this category, such that both kinds of costs ('efficacy costs' plus 'strategic costs') are always involved. The reason for this is that animal signals must always carry at least some of the burden of generating the trust necessary for communication to work.

But what if the signaller doesn't have to generate trust at all? Trust could be assumed, leaving the signaller free to concentrate only on perceptual discriminability. If it were possible to reduce the strategic cost of proving reliability to zero, all signalling effort could be poured into efficacy. Carried to its conclusion, this should permit digital signalling – the cheapest and most efficient kind of communication. We know that human language is in fact digital on a number of levels, both phonological and semantic, and that this is one of its most remarkable and biologically unprecedented features (Burling 2005: 25-7, 53-5). Animal signalling is never like this for the same reason that it doesn't have the luxury of being patently false or fictional. Costly signals of any kind can only be evaluated on an analog scale. Putting all this together, it seems that language is digital for the same reason that it consists of social fictions. Signals of this kind

are acceptable only under highly unusual conditions – such as those internal to a ritually bonded community whose members are not tempted to lie.

Combining the insights of Chase, Sosis, Donald, Sperber and Rappaport, we might summarize by defining symbolic culture as a domain of transparent falsehoods whose social acceptance depends on levels of trust generated through the performance of costly ritual. We might add that once such fictions are accepted, they qualify as 'institutional facts' (Searle 1996). Human social institutions perpetuating facts of this kind evolved in associated with the uniquely human phenomenon of 'cooperation between strangers'. But it remains to be explained just how and why.

Following Maynard Smith and Harper (2003, p. 3), we may define a 'signal' as any act or structure which alters the behaviour of other organisms, which evolved because of that effect, and which is effective because the receiver's response has also evolved. If one animal pushes another away, that is not a signal. If one animal bares its teeth and the other retreats, it's a signal because the response depends on evolved properties of the brain and sense organs of the receiver. The signal must carry information of interest to the receiver. This need not always be correct, but it must be correct often enough for the receiver to be selected to respond to it. Krebs and Dawkins (1984) view signal evolution as an 'arms race' between signallers as 'manipulators' and receivers as 'mind-readers'. Zahavi (1975) proposed 'the handicap principle' to explain why signal selection favours extravagance and apparent wastefulness as opposed to utilitarian efficiency. Receivers on guard against deception force signallers to compete in producing signals so costly that they cannot be fakes.

The problem is that by these standards, conventional signals such as those of language appear to be *theoretically* impossible – a point explicitly made by Zahavi (1993). Machiavellian primates can produce tactical deceptions, but these are frequency-dependent: they only work if most signals are honest. To explain the emergence of human cultural symbolism, we need a theory which addresses this difficulty: How can we imagine fakes becoming so prevalent as to dominate social life? How can we imagine Machiavellian evolving humans, by definition resistant to deception, allowing themselves to become immersed in whole realms of patent fiction and illusion?

Here is a possible solution. Whether a given signal is deceptive or reliable, costly or cheap, analog or digital depends on one's perspective. We need to know who is doing the evaluating and from what standpoint. Imagine a coalition of individuals cooperatively aiming deceptive signals at an external target. Viewed from inside the coalition, those patent deceptions will have positive value. Instead of being resisted, *from this standpoint* they should be celebrated and embraced. To quote Saussure (1983 [1915]: 8) once again: 'The object is not given in advance of the viewpoint: far from it. Rather, one might say that it is the viewpoint adopted which creates the object.'

Drawing on his work with the Mbendjele forest people of Central Africa, social anthropologist Jerome Lewis offers a proposal along similar lines, rooting human vocal deception capacities in hunting. Human volitional control over vocal

signalling, he suggests, did not evolve initially in contexts of human social interaction. Instead, it was used initially to deceive prey animals who would prove vulnerable again and again to such fakes. Humans co-operating with one another to deceive external targets would be predicted not to resist one another's deceptions but on the contrary to echo and amplify them. In Lewis' account, vocal simulations re-deployed internally within the community laid the basis for vocal humour, children's games, choral singing, narrative fiction, metaphor, religion and so forth. Humans successfully 'deceived' the forest and then constructed the symbolic domain as that forest's own echo, now directed back into the human social world.

We now need to consider how hunter-gatherer strategies of this kind might have beome established in the evolutionary past.

14.7. Counterdominance, Egalitarianism and Collective Intentionality

1. *Michael Tomasello: The cultural origins of human cognition.* Cultural evolution can proceed rapidly, helping to explain the accelerated pace of evolution associated with the emergence of *Homo sapiens.* It presupposes the 'ratchet effect', in which innovations are preserved and accumulated intergenerationally. This would have been fostered by cooperative strategies in which individuals subordinated their private purposes to collective future goals. Apes are not capable of this kind of cooperation, which explains why they don't even point. Declarative pointing presupposes 'we'-intentionality: a shared subjectivity rendering things interesting or relevant 'for us'. It involves a triadic structure of representation in which signaller and receiver share the same focus of attention. If ape cognition is poorly adapted to such tasks, the explanation is ultimately that they are just too competitive (Tomasello 1999, 2006).

2. *Andrew Whiten: The evolution of deep social mind.* Primate selfishly Machiavellian cognition reflects the fact that reproductive success is likely to be secured by harassment and deception as much as by cooperation. In humans, strikingly different cognitive developments reflect novel strategies of cooperation whose roots lie in 'counterdominance' – resistance to being physically dominated by others. Within increasingly stable coalitions, status began to be earned in novel ways, social rewards accruing to those perceived by their peers as especially cooperative and self-aware. Selection pressures favoured such psychological innovations as imaginative empathy, joint attention, moral judgment, project-oriented collaboration and the ability to evaluate one's own behaviour from the standpoint of others. Underpinning enhanced probabilities of cultural transmission and cumulative cultural evolution, these developments led to the establishment of hunter-gatherer-style egalitarianism in association with 'deeply social' minds (Whiten 1999).

3. *Christopher Boehm: From counterdominance to reverse dominance.* During the later stages of human evolution, counterdominance tipped over into 'reverse dominance'. Humans became so resistant to being intimidated or dominated

that they remained constantly on guard, ready at any moment to band together in countering perceived threats. As coalitions organized in this way regularly defeated all opposition, they established themselves collectively as the dominant force. Society became 'moral' when everyone was embraced within the same coalition, evaluating the behaviour of its individual members from this new collective standpoint (Boehm 2001).

4. *Robin Dunbar: Social brain, gossip and grooming.* Seeking safety in numbers, evolving humans formed larger groups. Among primates, larger group sizes lead to greater internal competition, raising levels of harrassment and associated stress. Negotiating larger groups also selects for a larger neocortex, placing females in particular under more reproductive stress. Increase of Machiavellian intelligence is a specifically female problem, in terms of meeting reproductive costs. Dunbar proposes a strategy for cutting costs of time budgets – the vocal grooming and gossip model which offers a precursor to language. Subordinates buffer themselves by forming defensive alliances, maintaining friendships through manual grooming. But as such alliances became progressively larger, pressure mounted to find a cheaper, more efficient way of maintaining social bonds. The solution was to switch to vocal grooming. By using sounds instead of fingers, evolving humans could service multiple allies at once while leaving their hands free for practical tasks. Vocal 'gossip' had its origins here (Dunbar 1996).

8. Dominance and Reverse Dominance

Psychologist *Michael Tomasello* studies the cognitive interface between humans and other primates. The special thing about humans, in his account, is *cooperation in pursuit of a goal held jointly in mind.* An element of contractual understanding is involved, since commitment would collapse without confidence that future gains would be shared. Resource sharing is in this way bound up with an orientation toward the future. There has to be a dream or vision, those sharing it committing themselves to whatever forms of collaboration are needed to secure its practical implementation.

So how and why did *Homo sapiens* begin collaborating in this special way? The fact that wild-living apes don't even point things out to one another shifts attention from cognitive mechanisms to competitive and cooperative strategies. Declarative pointing presupposes individuals so trusting and cooperative that they are willing to decide collaboratively on the perspective to be adopted toward the world. Humans during the course of evolution established such 'we'-intentionality. Linguistic rules and symbols – complex elaborations on the simple theme of pointing – are in Tomasello's view culturally inherited patterns which evolved and became transmitted from the moment when this development occurred. As to why it occurred, Tomasello offers no evolutionary explanation, remarking with refreshing candour 'I really have no idea' (Tomasello 2003, pp. 108-09).

Andrew Whiten offers at least the beginnings of an idea. The struggle to resist being dominated has an inherent tendency to bring together unrelated individuals

who might not previously have been allies. In Whiten's model, humans retain their primate heritage of 'Machiavellian' strategic intelligence, initially without undergoing any psychological rupture or break. But as they developed increasingly effective strategies of resistance, the benefits of imposing dominance on others became matched by the associated costs. Eventually a stalemate was reached: instead of everyone competing to find someone else to dominate, the winning strategy was 'don't mess with me' – a generalized refusal to be dominated. As this strategy became evolutionarily stable, it altered the trajectory of cognitive and cultural evolution, leading to the emergence of distinctively modern human psychology.

Whiten avoids the conundrums and paradoxes associated with the topic of symbolism. Boehm does little better, barely mentioning ritual, religion or language. Yet Boehm takes one notable step in the necessary direction. Tomasello, as we have seen, links the evolution of symbolism with collaboration in pursuit of a shared vision or goal. Boehm in this context offers a concrete proposal. The vision which really mattered was a political one. The aim was to take hold of primate-style dominance and turn it upside down. No longer should physical violence or threat be allowed to determine access to resources or status within the group. Humanity's first moral community was committed to the ideal of an egalitarian order turning dominance on its head.

According to Boehm, the strategy of resisting dominance leads eventually to full-scale revolution. But how exactly did this happen? Boehm asks us to envisage a coalition expanding until eventually it includes everyone. This is a demanding concept, since a coalition by definition presupposes a boundary between insiders and outsiders. Given that primate dominance is always in some sense sexual, it would follow that a model of counterdominance culminating in reverse dominance should take account of this. Could male-versus-female conflict and cooperation lead to a coalition embracing everyone? Boehm (2001: 167-9) does consider distinctively female strategies, but curiously only when dealing with chimpanzees. His arguments about the evolution of human hunter-gatherer egalitarianism are surprisingly unisex.

If we are to consider counter- and reverse dominance in human evolution, the most critical issue becomes reproductive counterdominance. How do these models deal with the question of reproductive skew among males? Bowles (2006) points to reproductive levelling among predominantly monogamous hunter-gatherers as critical to egalitarianism. To explore the evolutionary establishment of egalitarianism on this reproductive level, we must bring into consideration the energetic requirements of females.

According to the Social Brain hypothesis (Dunbar 1996, 2003), the factor driving increase in neocortex size in hominin ancestors was increasing group size. In the case of early Homo, as climate dried towards the end of the Pliocene, groups needed to be bigger for protection in more open environments. In the case of later Homo, during the Pleistocene, the main danger of predation was likely to have been from other human groups. Under these pressures for increasing group size, Homo was selected for increased Machiavellian intelligence to negotiate increasing social complexity. Pawlowski et al., (1998) show that as neocortex size increases in

primates, the correlation of male rank with mating success is progressively undermined. Selection for increased social intelligence therefore goes hand in hand with greater reproductive levelling.

But whatever the specific selection pressures were, these larger brain sizes in later *Homo,* along with their larger bodies, led to increased costs of reproduction for females. It is now time to consider how the extra energetic requirements of mothers of large-brained offspring were being met. We turn to models for sexual strategies and investment.

14.9. Female Coalitionary Strategies

1. *Sarah Hrdy: The origins of mutual understanding.* Ape mothers are insufficiently trusting to allow others to hold their babies. *Homo erectus* mothers, facing increasingly heavy childcare burdens, enhanced their fitness by relinquishing young offspring to trustworthy allocarers. However, this was only possible if female kin were living close together (see Hawkes below). Distinctively human cognition evolved in this context, as mothers probed potential allocarers for their cooperative intentions. Infants monitoring the intentions and feelings of mothers and others became adept at perspective-taking and integrating multiple perspectives. Offspring more skilled in reading the intentions of others and eliciting their help were better nourished and more likely to survive. Female strategies of cooperative childcare can explain how and why humans became cognitively and emotionally 'modern' (Hrdy 2009).

2. *Kristen Hawkes: Grandmothering and show-off hunting in human evolution.* Together with her colleagues James O'Connell and Nick Blurton Jones, Hawkes offers two key arguments for investment in offspring at different stages of human evolution. The 'grandmother' hypothesis (Hawkes et al 1998; O'Connell 1999) argues for the beginnings of humanlike life history in early *H. erectus.* Burdened with increasingly heavy childcare costs, evolving *Homo* mothers sought help from the most reliable source – female kin and especially their own mothers. Post-reproductive lifespans extended as older females came under selection pressure to invest in the offspring of their daughters. With drying of climate in the Early Pleistocene, and scarcity of accessible foods for weanlings, older females stepped in, providing gathered foods such as tubers to these young offspring. In terms of life history this selected for relatively early weaning (hence short interbirth intervals) along with longer childhood dependency on adult provisioning, and delay in sexual maturity, along with longer lifespans. Males were intermittently or unreliably involved in supporting offspring at this stage, but during the Middle to Late Pleistocene(associating to *H. heidelbergensis*), hunting strategies become more effective and reliable. Males were motivated to hunt big game as 'show offs'. Rather than hunt small to medium game for their own offspring alone, they demonstrated quality by generously providing big game to the whole camp (Hawkes and Bliege Bird 2002). So females gained male investment via mating effort rather than specifically paternal strategies.

3. *Camilla Power: Female cosmetic coalitions.* The evolution of concealed ovulation, extended receptivity and increased reproductive synchrony in the human female forced males to spend more time in female company. Potential philanderers were deprived of the information they needed to successfully rove from one female to the next, picking and choosing between females on the basis of current fertility cues. However, one signal – menstruation – was left salient, giving away this kind of information to philanderers. As an indicator of imminent fertility, menstruation will trigger conflict both between males, who may compete for the cycling female, and between females, who may compete for male investment. In the absence of countermeasures, mothers who are pregnant or lactating may be at risk of losing male investment to the cycling female. The rapid increase in neocortex size characteristic of human evolution over the last half million years meant mothers could no longer tolerate such risks; it was in their individual fitness interest to prioritise future economic security over short-term sexual favour-seeking. Counterdominant female coalitions on this basis responded by 'painting up' with false signals representing all members of the coalition as uniformly 'fertile'. Investor males – whose offspring might have better chances of survival – had a fitness interest in colluding with the corresponding fictions. The evolutionary stability of female strategies of cosmetic bonding and adornment, culminated in the transition to symbolic ritual, religion and language (Power and Aiello 1997; Power 1999, 2009).

10. On Cooperative Breeding

Sarah Hrdy effectively combines the 'grandmother' model with Tomasello's arguments for intersubjectivity as the basis for human culture and cognition. Pregnancy and postnatal childcare in *Homo* were such heavy burdens that they offer the most convincing context for the development of novel cooperative strategies. Alone of the great apes, we became cooperative breeders. Hrdy's arguments about the effects of alloparenting on human cognitive evolution are persuasive. Her focus on changing female strategies and on consequences for infant psychology are necessary and welcome. Demographically flexible cooperative breeding networks could act as a safety net compensating for extreme variability of male commitment to investment.

Neither Hrdy nor Kristen Hawkes, whose model she acknowledges as the initial steps into cooperative breeding, aim to deal with symbolic culture. Both models also keep males as investors in the margins, with female kin getting on with the job, not expecting regular investment from males. Males enter the picture only late, becoming more reliable hunters as female sexual choice drives them to intensified mating effort. There is no clear argument from Hawkes as to what causes the shift in male behavior and productivity between *H. erectus* and subsequent encephalized humans. In fact, in her life history models she does not take much account of increasing brain size even though this is critical in adding to female costs. Among Hadza bow-and-arrow hunters to this day males are only intermittently successful, an observation which led Hawkes to doubt the validity of the model of 'man the hunter' provisioning his own offspring.

Camilla Power concurs with Hrdy's and Hawkes' initial position of female kin-related social structures among *H. erectus.* Because female fertility is altered by the grandmother strategy, since mothers with allocare support would tend to have shorter interbirth intervals and be fertile more often, this must affect male behaviour. More dominant males might attempt to target fertile females opportunistically, moving from one to another, while less dominant males could pursue a strategy of hanging around more reliably, offering provisioning and protective support to a particular female and her kin. As interbirth intervals shortened, investor males who waited around, rather than competed for other mates, should get more reproductive benefits. Such a picture of variability in male commitment fits Hrdy's observations of stark differences among modern human fathers.

Power argues that while such variability may have been tolerable for less encephalized early *H. erectus,* as brains rapidly expanded during the Late Middle Pleistocene (from c.500,000 to 150,000 ky), female fitness was increasingly affected by male investment. In these conditions among *H. heidelbergensis,* sporadically in Eurasia, and increasingly regularly in Africa, females resorted to the cosmetic strategy from ca. 300,000 ky. This had the effect of rejecting male philanderers who were not prepared to work and invest, while promoting the rewards to male investors – in the form of Hawkes' big game hunting show offs.

An advantage of Power and colleagues' model (Knight et al., 1995) is that the emergence of symbolism is intrinsic to the strategy. Symbols are socially accepted fakes, and in Power's model that means cosmetics. But were pigments necessarily used by women alone? Evolving human males had little Darwinian reason to alter or transform their biologically perceptible identity. With females, matters had always been more complex. The evolving human female had good reason to conceal external signs of ovulation, given that philanderer males might use such information to their advantage. The use of blood-red cosmetics to scramble menstrual signals was in that sense nothing new. Power's model does not exclude males from using cosmetics; but there is no good Darwinian reason why males should 'fake' with cosmetics first. At present, the Female Cosmetic Coalitions (FCC) model is the only Darwinian explanation as to why the ochre is so prominent at Blombos and other Middle Stone Age sites.

The FCC model posits counterdominance leading to reverse dominance. In this case, however, both the initial dominance and its subsequent reversal are gendered. The model applies a standard behavioural ecological approach (one distinguishing sexual strategies and male and female trade-offs) to the suggestions of Whiten and Boehm. Females concealing ovulation and extending sexual receptivity are already promoting 'counterdominance' on a sexual level, since the strategy discriminates against dominant males in favour of subordinates more likely to invest time and energy. When the scrambling of reproductive signals is extended to menstruation, the effect is to tip 'counterdominance' into 'reverse dominance'. When a female begins to menstruate, her senior female kin have every interest in surrounding her, identifying with her attractions and 'painting up' to spread those attractions around. But they also have every interest in barring male access to her except on their terms (cf. Knight 1991).

Hawkes' model of male hunting as a 'show-off' strategy needs to be placed in this wider sexual and political context. After all, there are many different ways in which males might show off, not all of them conducive to symbolic culture. Males could resort to violence and threat, 'showing off' in terms of aggression and fighting skills. The Female Cosmetic Coalitions model can explain how they were successfully corralled into showing off productively rather than destructively.

11. Sex and Symbolism

Whereas Chase argues that symbolic culture emerges in order to enforce co-operation between strangers, Power sets out from selfish-gene theory and stays with it throughout. "There is no reason to believe that symbolic culture was ever essential to survival", writes Chase (1994: 626-8). But in that case, why invest so much energy in the necessary rituals? Chase has contributed to the conceptual definition of symbolic culture, but in the absence of any evolutionary theory he lacks specific predictions about exactly what taboos, what laws, what rules would be collectively enforced. By contrast, Power and colleagues offer an array of specific predictions testable against the archaeological, fossil and ethnographic records (Power 2009, table 14.2, p. 273; for detailed ethnographic tests see especially Watts 2005).

But how exactly does the model generate such detailed predictions? In pursuing their direct reproductive interests, women 'gang up' on anyone in their own ranks threatening to prove a weak link in the chain. A female who has begun cycling comes potentially into that category: in view of her special attractions she might be tempted to break ranks. Abandoning his current partner, any would-be philanderer will be on the look-out for a new partner signalling that she is of the same species as himself, of the opposite sex and currently available to be impregnated. This immediately gives us the predicted signature of 'reverse dominance'. The defiant, cosmetically adorned coalition must bond tightly with the target of philanderer attention. Reversing her perceived biological identity, they signal collectively: 'Wrong species, wrong sex, wrong time!'

Note that we now have a coalition which might in principle extend to embrace everybody, as Boehm's argument demands. On the one hand, the entire female community has an interest in joining, irrespective of kinship or previous friendship or familiarity – all should benefit over the long term by making philandering an unplayable game. But the coalition of females should also expect much male support. Brothers and sons might be expected to defend the interests of their female kin. Meanwhile, investor males should have an interest in ganging up against potential philanderers seeking to impregnate their long-term mates. On all these grounds, we might expect the 'reverse dominance/reverse reality' coalition to succeed in imposing its message.

There is cognitive hardship in believing in counter-reality. It is not easy to accept that biological reality can be so completely reversed – that the categories of human versus animal, female versus male, menstrual blood versus hunting blood can be

switched around in this way. But such tricks – the stuff of mythology the world over – are not arbitrary cultural inventions. Reverse dominance will generate them by conceptual necessity. The message which results is patently false. The biological female undergoing her 'initiatory' ordeal is not a male, not an animal and not mortally wounded. But if everyone accepts the reversal, it is an institutional fact. And not just any institutional fact. If the argument is accepted, reverse sexual dominance conjures up Rappaport's Ultimate Sacred Postulate – the symbolic truth underpinning all others.

12. Conclusion

In this chapter, I have tried to show how the problem of the emergence of symbolic culture might be solved. In revisiting a set of currently prominent models – all of which which offer insights – I have asked how they might be parsimoniously fitted together.

My aim has not been to set up Female Cosmetic Coalitions in opposition to the other models considered here. Chase is correct to view symbolic culture as a means of enforcing co-operation between strangers. But we require more than a statement: we need a Darwinian explanation. Rappaport and Sosis are surely correct about the importance of ritual, but to construct a testable theory we need to specify which rituals, when, where and by whom. Donald is persuasive in his arguments about mimesis. But mimesis is 'faking it': if everyone is just acting, why should anyone believe? Similar theoretical difficulties afflict Sperber: how, when, where and why did patent falsehoods become trusted by evolving humans as valid intellectual currency? Whiten's model is persuasive but unfortunately avoids the topic of sex, as does Boehm's. What political purposes might have been sufficiently constant and unifying to produce 'deep social mind'? Tomasello posits commitment to shared goals as a condition of language's evolutionary emergence. Can we specify whose goals? Hrdy reminds us that half the human population is female, and that novel strategies of social cognition and cooperation are most likely to have been driven by females and infants. But why stop there, given increasing reproductive costs associated to encephalization after *H. erectus*? Why not posit the emergence of symbolism as a continuation of the previous logic of female allocare strategies? Hawkes brings male mating effort back into the picture, but without explaining why symbolism had anything to do with it.

Lewis comes into a rather different category. Instead of proposing yet another cultural origins theory, his purpose is to persuade scholars researching modern human origins of the relevance of hunter-gatherer ethnography. The Mbendjele forest people who inspire Lewis' vision challenge the conceptual distinctions central to so much western evolutionary psychology and social science. Language, play and ritual are cut from the same cloth. Religion is not a different thing from childhood pretend-play: it is pretend-play taken seriously and enjoyed also by adults. Hunting is not necessarily a different thing from speaking or listening: from a Mbendjele perspective, it is a matter of talking to and listening to the forest. Lewis argues persuasively that such interconnections need to be borne in mind by those of us struggling to explain the evolutionary emergence of human symbolic culture. It may be that everything is simpler than we thought.

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