The Human Nature Review
ISSN 1476-1084
URL of this document
http://human-nature.com/nibbs/02/lock.html

Human Nature Review **2** (2002) 195-203

Essay Review

The Possible Origin of Culture

by

Andy Lock

Review of: *The Evolution of Culture: An Interdisciplinary View*
Edited by Robin Dunbar, Chris Knight and Camilla Power
Edinburgh University Press, 1999 Pp. xii + 257

There are four great systems whereby that phenomenon called 'life' variously sustains itself by moving information around in time. Three of these, the genetic system, the immune system, and the various nervous systems that support learning, are miracles of individual biology. Our understanding of each of these is conceptually united and underpinned by the Darwinian explication of 'selection'. Natural selection explains how a profusion of genotypes is winnowed down to a set of 'adapted' individuals. Clonal selection theory explains how a profusion of lymphocytes are selected by their fit to antigens. And as Skinner (1953: 430) has pointed out 'In certain respects [learning] resembles the natural selection of evolutionary theory. Just as genetic characteristics which arise as mutations are selected or discarded by their consequences, so novel forms of behavior are selected or discarded through reinforcement.'

The fourth great system – culture – has never been satisfactorily fitted into this framework. The social systems of sub-human animals have proved to be explainable within an evolutionary framework, but human culture is more elusive. Cultural behaviour has a moral component rooted in self-awareness that the other systems do not display. It is fundamental to the maintenance of cultures that the individuals who make them up *must* have some awareness of their social standing with respect to age, sex, hierarchies of social standing, etc, for 'if [they] were not aware of [their] roles they would not be in a position to appraise their own conduct in terms of traditional values and social sanctions' (Hallowell, 1971: 83); they would not be able to provide an acceptable account of their actions when called to do so upon transgressing 'custom' – accounts which draw on the local 'social constructs' of the group; and without such an awareness, human groups would be, if they could even exist under such conditions, little more than a collection of mindless sociopaths. Culture has thus, within the social sciences, come to be felt of as some-

thing 'beyond biology', with socio-biological Darwinism being reacted to as an ideological construct rather than an applicable scientific framework.

The aim of the present volume is to counter this rejection by asking evolutionary questions about culture: 'What is a 'social construct'? Under what selection pressures did such morally compulsive intangibles become invented, believed in and held up for respect?' (p. 5). It is divided into three sections: the evolution of society; the evolution of art and religion; the evolution of language. The chapters are brief at around 20 pages each (bar one). They are packed with information, but generally very well written and thus their arguments are all accessible. And at the same time, fascinating.

To begin with, the chapters appear to evince an advance over the telling of 'just-so' stories even while they are speculative. Apparently gone is the style of an Ardreyesque analogising. In practically every case the arguments made are hypothetical in the best sense of being amenable to testing and thus refutation, though in many instances the necessary data are and will continue to be hard to come by. Because most of the direct data are historically 'gone', the typical line of each chapter is to propose a scenario, make inferences from it as to what might be the case, and then delve into the data to see what holds up. Speculations are thus put to the test. Good science, and generally good reading too. However, as the plot cumulatively unfolds, alternative hypotheses become harder to find, and the whiff of advocacy gets stronger.

The volume is billed by its editors as aiming 'to draw on resources from evolutionary theory in making an attempt to breach social anthropology's chosen citadel' (p. 5), that being the 'domain of constructs in general – religion, ritual, art, ideology and language' (p. 5). The chapters hang together by-and-large as notes on a common theme, that theme being Knight's earlier (1991) proposals in his book *Blood Relations: Menstruation and the Origins of Culture*. Before commenting on the collection I summarize the chapters below, trying to draw out their main points by using each author's own words.

Part 1: The evolution of society

Catherine Key and Leslie Aiello investigate the evolution of cooperation in human society. They review the data on co-operation among a number of species, particularly with respect to the care of offspring. Female-female cooperation is more common than male-female cooperation, since the 'risks' involved in terms of costs and benefits are higher between the sexes where various of forms of cheating are possible because of the differences in the certainty the sexes have as to who the parent of the offspring is. Female-female cooperation tends to occur when their energy costs of reproducing are high and when meat is the staple diet. Provisioning of young is thus rare in primates, but common among the social carnivores. Male-female strategies of cooperation and competition are also linked to sex differences in the energetic costs of reproduction. Paternal care tends to be found only when female energy costs are high relative to male ones, and is the pattern shown in those 15% of primate species, where there is little sexual dimorphism (since when males are at least 50% larger than females, their energy costs balance those of the females). To find both female-female and male-female cooperation in the same social group is rare. It is this arrangement, however, that characterises human social systems. Key and Aiello look for an explanation of this in the fossil record, that allows insights as to likely changes in ancestral energy expenditure (due to increasing energy costs brought about by increasing brain size) in reproduction; relative changes in sexual dimorphism that increase the relative expenditure for the female; and the increase of meat in the diet. These factors push human cooperation in the direction it has taken, and place further cognitive demands of human ancestors to refine their social skills. Female-female cooperation

and paternal investment is indicated for *Homo erectus*.

Philip Chase is also concerned with co-operation, but in the more recent period when symbols come to play a role in human life. His motivation starts from his interest in the so-called Middle to Upper Palaeolithic revolution, when the first solid evidence for human symbol use has been used to argue for a 'revolution' in human lifeways (but see Mcbrearty and Brooks (2000) on the 'revolution that wasn't'). However, Chase doesn't deal with the archaeological record here, but rather reflects on some of the basic issues. In doing this he makes a proposal that is very, very important. It is a point that has been implicit in my own work for a while, but when I look at it as he puts it explicitly in this chapter I get that feeling of 'yes, it's so obvious, how on earth could such an economy of expression have eluded me, damn it!'. He draws a distinction between 'symbolic reference' and 'symbolic culture' – the extension of symbolism beyond reference to the creation of an intellectual environment' (p 34). What he points out is that 'these two phenomena are inextricably linked today, but that does not mean we can assume that they appeared simultaneously in the course of human evolution' (p. 34). Symbolic culture enables cooperation in very large social systems, and its appearance could be motivated as an adaptation to local conditions, as an outgrowth of symbolic referential skills, perhaps, skills that predate the evidence in the archaeological record.

Alan Barnard considers questions as to the relevance of contemporary hunter-gatherer societies in providing insights into the reconstruction of early cultures. He focuses on Australian and African societies. His argument is that the differences that can be documented between the two groups make African hunter-gatherers the better bet. Australian world-views are uniquely Australian, particularly in their complexity. He concludes with some allusions to universal kinship structures and his argument being 'at least as good a model of the origin of human culture as any other' (p. 66), but I confess to having lost the thread of this chapter.

The implicit model put forward in this section is that original human social structures were elaborated very much under biological constraints (Key and Aiello), to yield a species that used symbols for referential purposes (Chase, point 1). Out of this emerged symbolic culture (Chase, point 2), motivated by a need to keep track of kinship relations as group sizes expanded their numbers, territorial ranges, and contacts with others (Barnard).

Part II: The evolution of art and religion

Once we have the basis for symbolic culture, the next question is what pushed the elaboration of cultural objects and practices. This is the focus of the four chapters in Part Two of this collection.

Geoffrey Miller puts the view that 'culture may have evolved mostly through reproductive benefits for individual displays of 'cultural' behaviours' (p. 71). The argument that it is sexual selection rather than natural selection at the root of cultural elaboration is partly made on the basis that most of what humans do is so expensive in terms of time and effort that it does little to work as a survival adaptation. The other part comes from the data indicating that the amount of cultural production in many domains is strongly correlated with the age and sex of the producer. The hypothesis is that 'cultural production should increase rapidly after puberty, peak at young adulthood when sexual competition is greatest, and gradually decline over adult life as parenting eclipses courtship' (p81). It should also be biased towards male innovators. The hypotheses hold up for 1,892 jazz albums, randomly selected; 3,374 paintings in the Tate Gallery; 2,837 20th Century books of all genres; over 2,500 rock albums; 3,800 works of classical music; 850 paintings in the National Gallery; etc.

Camilla Power takes up this line of sexual selection in the context of beauty adornment and a 'sham menstruation' model of female

coalitionary strategies, the argument being that 'symbolic culture emerged as a strategy of female resistance to male control through 'brokering' of high energy resources' (p97). Thus, assume concealed ovulation evolved before symbolic culture. Menstrual blood is a visible indicator of imminent ovulation and should be attractive to males. But, to a pregnant or lactating female, menstrual blood indicates a potential threat to divert male resources away from her needs. However, if females were to form reciprocal alliance coalitions, then rather than hiding one member's menstrual period, they could increase each other's overall benefits by all advertising the fact. This is because female coalitions are in competition with each other, and the one which puts on the best advertising show - a ritualistic amplification - will attract the most beneficial male attention. The prediction then is that 'the earliest evidence of ritual traditions in the archaeological record will take the form of a cosmetics industry focused on red pigment (a topic taken up in the next chapter). Power looks at the modern African ethnographic record with respect to the use of ochre (perhaps because Africa is a better model for early cultures, according to Barnard (above)). Anyway, she is able to interpret present-day uses of ochre in line with her hypothesis, and thereby claim that 'dance and body-painting constituted the earliest art media, long before the production of representational imagery on inanimate forces' (p. 108).

Ian Watts picks up two themes already introduced in the longest and most detailed chapter in the book, looking at the archaeology of ochre. The first theme, obviously, concerns ochre, and other possible evidence for symbolic and modern human behaviours that pre-date the African Middle/Late Stone Age and Eurasian Middle/Upper Palaeolithic transitions. The second theme concerns the interpretation of the analysis of these so-called transitions, which are not as apparent when looked at through Watt's lens. African ochre use is argued to be symbolic rather than utilitarian from the beginning of the Upper Palaeolithic, and the classical equation of the previously mentioned two 'transitions' is argued to be unwarranted. In fact, the real 'transition' occurred much earlier: 'the MSA2b [c 100,000-75,000 BP in Africa] witnessed the most significant suite of behavioural changes seen in the course of the Upper Pleistocene' (p. 120); and 'the ubiquity and regularity of ochre use from the MSA2b onwards … allows us to infer a continuous symbolic tradition linking most of the Upper Pleistocene MSA with the LSA down to the ethnographic present' (pp 131-3). Watts follows his presentation of the archaeological record with a review of the contemporary ethnographic data on ochre use amongst the Khoisan. He concludes by suggesting that 'the first means by which people were ritualized … was body painting' (p138), and that once skin-changing performances were habitual – originating to serve 'sham menstruation' – these were 'sufficient to establish symbolic culture' (p. 138) which went beyond concrete reference to a 'collectively held construct of 'supernatural potency'' (p. 138).

Steven Mithen picks up on this theme in his chapter by noting that perhaps the only remaining human ability that is distinctively human is a belief in supernatural beings, and this very belief poses some challenging problems for an evolutionary explanation. This is because 'what is particularly perplexing from an evolutionary perspective is not just that apparently maladaptive ideas and ways of behaviour have existed [and belief in the supernatural often leads to 'maladaptive' activities], but that they appear to have been so pervasive throughout human populations' (p. 149). The earliest evidence of 'religious ritual' goes back maybe 100,000 BP (e.g., burials at Skhül and Qafzeh; the earliest 'religious artifact' maybe 30,000 BP (e.g., Chauvet and Hohlenstein-Stadel). Mithen argues that the significance of religion is that it indexes the evolution of 'cognitive fluidity', in that religion requires the integration of separate domains of thought that were, he hypothesises,

only brought together by *Homo sapiens sapiens*. Religious ideas only really become possible once they can be translated into material artifacts which function to 'anchor' abstract ideas into the emerging mind by enabling their acquisition, recall, understanding and transmission. Such objects 'mediate' and scaffold thought. Consequently, 'at present, we have no evidence that prior to 30,000 years ago material symbols did exist. And without them, nor could shared ideas about supernatural beings' (p. 165). Religion is thus viewed as a spandrel formed at the intersection of ritual, symbolic culture and emerging modern cognitive fluidity.

Part III: The evolution of language

Jim Hurford considers the evolution of the human language faculty rather than any particular language. His basic assumption is that 'at some point an individual must have arisen who was capable of internalising a grammar of a type that none of his or her ancestors (no matter what data they were exposed to) could possibly have internalised' (p. 177). He goes on to legitimise the notion of preadaptation, and how these might accumulate until the last piece in the mosaic could be put in place and circumstances become such that an evolutionary shift is made possible. He then lists a number of likely cognitive, social and physiological preadaptations that would need to be in place that would enable, but not squeeze out, language. He then gives a partial view of how a language might have been squeezed out, appealing to the notion that once the set of necessary prerequisites were in place, language structures adapted themselves to fit the constraints of their users, and hints at some of the computational work being done along these lines.

His argument implies a symbolic form of communication would need to have been in place before the suite of preadaptations completed itself to unleash the 'communication adapts itself to the vagaries of the 'learner' model', harking back to Chase's two stage argument separating symbolic reference from symbolic communication. He gets stuck when considering the timing of this change, but I will suggest below he gets stuck because he is stuck in the framework of being a linguist. In that framework, his concluding question is, that - if modern human language might have arisen with modern humans, but that the processes by which it was elaborated were analogous to modern day creolization, yet in fact modern language really dates back only 40,000 years - 'what on earth were modern humans doing for the preceding 60,000 years?'. His possible answer to this is that 'the socio-cultural transition from protolanguages to modern languages took 60,000 years; but this seems unlikely in the light of modern evidence from creolization' (p. 189). Which sounds quite reasonable. This is, though – as I suggest below – possibly reasonable, but erroneous without a further inquiry into the likely nature of the socio-cultural transitions involved in allowing protolanguages to become more elaborate.

Robin Dunbar considers that human group size evolved from an early baseline of 60-80 individuals to around 150 individuals in modern humans. Preventing cheating in groups of the modern size is an important issue. Being cheated by kin is less biologically-costly than being cheated by non-kin. Language dialects offer one good means of deciding who one's kin are. Language can also be used to engage in social coercion, and thus also work against cheating.

Daniel Nettle takes up these issues: 'of explaining how such generalized and extensive coordination, cooperation and trust could have evolved and persisted in a Darwinian world of individuals' (p. 218). He follows Durkheim's view that shared identity is a moral glue that makes individuals 'obliged' to others. But where Durkheim looked for the generation of shared identity through common ritual activities, Nettle argues that shared language and dialect can play the same role. The Babel of languages and dialects 'serves to maintain the unity of groups in which generalized reciprocity is the norm' (p. 222). He suggests that the Up-

per Palaeolithic 'revolution' represents not 'the origin of language itself but the beginning of its use to create social boundaries' (p. 224).

Chris Knight argues, contra Chase (above) that 'symbolic reference and symbolic culture are logically inseparable and so must have evolved together' (p. 233). His chapter is perhaps intended as a synthetic overview of the volume, in that so many of the previous themes are drawn on. He contrasts ritual with speech. The former is a high-cost signalling system that is forged out of 'conflict, manipulation and exploitation' (p. 231), and the latter a low-cost one that would have emerged from a cooperative context. The link between the two is that 'every linguistic term for a discriminable 'thing' in symbolic culture is tokenistic of some *game-defined* entity … Words do not map to external, perceptible realities – only to things established as 'real' through the playing out of the local game. … participants in game-like domains must negotiate their way through a virtual world – a world of contractual intangibles which 'exist' only because it is agreed to act collectively 'as if' they did. Ritual is this collective acting out' (p. 233).

He then conjectures the first ritual as arising from female coalitionary strategies adopted to secure the required additional social investment to ensure the survival of their big-brained, slow developing offspring. Drawing on his previous work, Knight argues that the optimal strategy is for females to enlist support from their local male and female kin as well as potential outgroup male sexual partners: 'females enhanced their fitness, if this model is accepted, by combining sexual allure with coalitionary organizing skills aimed at maximizing 'brideservice' exploitation of spouses' (p. 239).

The 'problem' in all this is, he points out, menstrual bleeding, because only fertile women bleed, and thus advertise their impending fertility, and their value to males over any commitments those males might have to already pregnant or lactating rivals. The proposed solution to this is for all females in a kin group to paint themselves red when one of their members menstruates to increase their own 'bonding' in support of each other and their own kin, and subvert the signalling characteristic of menstrual blood.

> The outcome will be a situation in which, whenever a woman menstruates, the signal sparks a contest. On the one hand, this is a contest for dominance between sexually motivated males. But on the other hand, contesting this whole dynamic are the menstruant's kin, who have no interest in allowing the outcome to be decided by naked sexual conflict between outgroup males. Their interest lies in retaining control over the menstruant, preventing any outgroup male from successfully privatising her. That way, they can ensure that additional mating effort expended by outgroup males accrues to themselves as a coalition. If all equally 'paint up', constructing the menstruant as inseparable from themselves, then every outgroup male can be fed the illusion that his current partner is imminently fertilizable. In this way, success in turning the menstrual signal from threat into a communal asset can in principle be achieved (p. 241).

But there is more. What this 'painting up' achieves is the establishment of a socially-constructed 'counter-reality', because the natural signal of blood is having its natural value reversed from 'Yes, I am not only sexually receptive but am imminently fertile' to signal 'No, we are not available, and will resist you should you act otherwise until you have proved yourself useful to us'. Knight concludes that 'the value of this model is that it accounts for the whole pretend-play game – the game of symbolic and cultural production and reproduction – which must be established if speech as a subsystem is to work' (p. 242), since it establishes ritual: 'signalling 'no' to outgroup males

involves staging a kind of 'theatre of the absurd … On the one hand, there is currently perceptible reality. On the other, ritual performers are insisting on the secondary status of this reality. 'Counter-reality' … is being vigorously asserted, and for moral reasons accorded higher status' (p. 242-3). And hence, from Darwinian origins, culture grows beyond evolution.

The book makes a contribution to a number of issues in the establishment of a distinctively human way of life, and I think that it would be better titled 'The Possible **Origins** (rather than 'Evolution') of Culture'. It presents a clear analysis of the problem of cooperation in the human lineage. It is all well and good paying lip-service to the claim 'cooperation is adaptive' as so many commentators have done in the past, since it has intuitive benefits. But cooperation is a major stumbling block in evolution, since the cost-benefit window that any organism's behaviours has to be squeezed through to establish cooperative activity is exceedingly small. There is a sense in which we can see that the tantalizingly 'proto' human abilities chimpanzees exhibit have remained 'proto' because there is such a pressure on each individual chimp **not** to communicate with its fellows, and to keep information to itself, despite adopting some reciprocally altruistic practices. Key and Aiello provide an analysis of the economics of human reproduction that shows a great deal of promise in identifying how the conditions that would open that small window could arise, and thus provide the social organizational structures that establish the crucible within which a highly encephalised hominid such as *Homo erectus* could possibly move beyond the social into a symbolic, cultural life. They certainly make a persuasive case that these pressures increased in the incipient *sapiens* period from around, say, 400,000 BP. Again, there is evidence from separate traditions that some other basic modern human traits were consolidated around this time. For example, the configuration of the basicranium, and presumably the upper respiratory tract soft anatomy it supports, starts to fall within the modern human range at this point (Laitman, 1982). Similarly, Wynn's analyses of tool forms indicate basically modern human intelligence as being in place within the same time frame. Once the energy costs associated with reproduction similarly hit those characteristic of modern humans, then we have a culturally pregnant situation.

If we follow Chase's suggestion that symbolic reference does not necessarily entail symbolic culture, we are freed to speculate that some form of referential proto-language a la Bickerton was also an established part of the mix here. This, then, shifts our problem to theorizing how the mix was elaborated to ratchet itself to culture proper. Watt's analysis of ochre use is an important contribution here. Gamble speculated 10 years ago that 'elements of the full Upper Palaeolithic package such as modern skulls, blade technologies, hearths, even, I would suggest, undecorated bone tools, will be found over wide areas and throughout periods from 200,000 BP to 40,000 BP' (1993: 170). This speculation has proved to be close to the mark (though continuing work at Blombos Cave may require the pushing back of that recent terminal date), as Mcbrearty and Brooks (2000) have shown in their recent review of the early (i.e., post 120,000 BP) African data: the separate elements, bar clear evidence for symbolic practices, all appear demonstrable, but not in the full ensemble. Watt's analysis makes it pretty clear that ochre is an index of symbol use.

With the mosaic of elements in place around 100,000 BP, the next problem we face is the one Hurford identifies: what on earth were people up to in this transitional period? What could have prevented the mix from maturing? Why, in Chase's terms, didn't symbolic reference sediment out symbolic culture right away, when everything was apparently in place to provide for it? This could, in one sense, be regarded as a pseudo-problem, an artifact of the decreasing likelihood of finding the evidence

the further back one goes. But in another sense, even if it is a pseudo-problem, then it is still necessary to account for the transition to modernity whenever it occurred. I think here we need an understanding of two further processes. One I have tilted at in my own recent work (e.g. Lock, 1997, 1999): how social conditions can generate the bootstrapping conditions required to season the mix. The other is pointed to by Knight and Power in this volume: the potential power of ritual in bringing another reality, that is somehow beyond the everyday, mundane reality of 'real life', into our 'experienced reality'. Ritual, as theorized by Knight, provides a concrete manifestation of the imagination, and hence a possible entry lever into the elaboration of symbolic culture, and the implications of his analysis merit a deal of further consideration for our further understanding of this 'biggest of questions'. Whether his, Power's or Watt's current specific take on the origins of ritual in 'sham menstruation' has anything to commend it or not appears to me to be irrelevant to this more fundamental point elaborated in his writing.

There is much more in this book that provides insight into the crucible in which evolution provided the conditions that enabled it to seemingly transcend itself, and I in no way wish to denigrate the other authors in this collection by singling out just a few in this commentary. I would locate the book as a whole as an excellent resource for provoking more work on the problem of the transition from biology to culture. We do have a grasp, I think, of the ingredients that got biological humans to that transitional point. We do have a grasp of the dynamics of culture. As the editors allude in their introduction, each of these 'grasps' has been constituted as a separate citadel. Have they succeeded in making the breach from one to the other? On the one hand, 'no': it is unlikely that biology has much to say about the ways in which cultures have been elaborated since they became possible. Should the chosen title for the volume be taken to suggest the contributors have much to offer here, then that would be an erroneous conclusion. On the other hand, emphatically 'yes': because those in the other citadel have almost nothing sensible to say about the originating point of the phenomenon that constitutes their academic livelihood.

Humans are suspended at that point that Herman Hesse's Steppenwolf described as: 'an experiment and a transition. [Man] is nothing else than the narrow and perilous bridge between nature and spirit '. This volume is a watershed contribution from the left-hand support of that bridge to how the principles of suspension were put in place. What is now required is for the right-hand end to come to the party, untangle what pulled the pieces into place, and to grapple with and reformulate the contribution to their biological underbelly which they so often appear to dismiss. That book should be called 'The **Elaboration** of Culture'. This one should be called 'The Possible **Origin** of Culture'. No book should really be called 'The **Evolution** of Culture'.

Andy Lock, Professor of Psychology, School of Psychology, Massey University, Palmerston North, NEW ZEALAND. Email: A.J.Lock@massey.ac.nz

References

Gamble, C. (1993) *Timewalkers: The prehistory of global colonization*. Penguin, London.

Hallowell, A. I. (1955) *Culture and experience*. Philadelphia : University of Pennsylvania Press.

Lock, A. J. (1999) On the recent origin of symbolically-mediated language and its implications for psychological science. In M. Corballis and S. Lea (Eds.) *Evolution of the hominid mind*. Oxford: Oxford University Press. Pp: 324-56

Lock, A.J. (2000) Phylogenetic time and symbol creation: where do ZOPEDS come from? *Culture and Psychology* **6**: 105-129

Mcbrearty, S. and. Brooks, A. S. (2000) The revolution that wasn't: a new interpretation of the origin of modern human behavior. *Journal of Human Evolution* **59**: 453-563

Skinner, B. F. (1953) *Science and human behavior*. New York: Macmillan