

RITUAL AND THE ORIGINS OF LANGUAGE¹

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THE NEANDERTHALS WERE PROBABLY DISPLACED, according to Cavalli-Sforza *et al.* (1988: 6006), because they were “biologically provided with speech of more modest quality than modern humans.” Bickerton (1990; *cf.* Mellars 1991) extensively elaborates this theme, postulating “a single genetic event” which gave modern *Homo sapiens* the competitive edge, launching the human revolution by turning “protolanguage” into “syntacticized language”.

Neanderthals and modern humans

Such scenarios treat speech as unconditionally superior to alternative systems of communication. Darwinian theory, however, does not recognise superiority/inferiority in the abstract – only selection pressures. Speech involves not only benefits but potential costs; among these must be counted the dangers of excessively relying on uncorroborated information *from* others and – conversely – the risks of entrusting valuable information *to* others. “Tactical deception” theory (Byrne and Whiten 1988) would not predict such trust; within the terms of this paradigm, it is disturbingly anomalous. Humans undoubtedly possess specialised neurophysiological hard-wiring for sharing information via syntactical speech. This is a species-specific biological adaptation which – no less than stereopsis in monkeys or echolocation in bats – must have evolved through standard processes of Darwinian natural selection (Pinker and Bloom 1990). Postulating sudden macromutations is not Darwinism.

Nonhuman primates have homologues to Broca’s and Wernicke’s areas in which the internal connections broadly mirror the modern human configuration (Deacon 1987: 4; Steklis 1985). The endocast of a two million year-old *Homo habilis* specimen (KNM ER 1470) indicates a humanlike sulcal pattern in the region of Broca’s area (Falk 1992). Although the neocortex of *Homo sapiens* is 3 times the size predicted for nonhuman primates of the same body weight (Passingham 1975;

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see also Jerison 1973; Martin 1990: 361-396; Pilbeam and Gould 1974; Dunbar and Aiello 1993), this applies to archaic *Homo sapiens* as much as to anatomically modern humans. Differences in vascular structure and blood-flow may conceivably distinguish Neanderthal brains from their modern counterparts (Coppens 1981); yet studies of Neanderthal endocranial casts yield no evidence of radical inferiority (Holloway 1991).

It has been claimed that their supralaryngeal tract incapacitated Neanderthals from producing the range of vowel sounds central to modern speech (Lieberman and Crelin 1971; Lieberman 1985, 1989, 1991). But Falk long ago showed that Lieberman in his reconstruction of a classic Neanderthal had positioned the hyoid bone so high as to make swallowing impossible! The definitive position of this bone remained unknown until the discovery of a well-preserved Neanderthal at Kebara Cave, Israel (Arensburg *et al.* 1989). Its hyoid was low as predicted by Falk, indicating a fully descended larynx like that of modern humans (Falk 1992).

Palaeontology, then, has been unable to corroborate the speech impediment theory of Neanderthal extinction. Neither does the artefactual record help. Excavations at Qafzeh, Israel (Vandermeersch 1981) have shown that for tens of millennia, early anatomically modern populations had a culture no more developed than that of their local Neanderthal contemporaries (Shea 1989). This and much other data suggests – as Soffer (1991: 13) has put it – “that our arguments about differential capacities of the two types of hominids are wanting”. By focusing on questions of *capacity* and totally ignoring the actualization of capacity into *performance*, she continues, “we have ignored the social contexts crucial to understanding habitual behavior, and thereby effectively sabotaged our understanding of what happened at the [Middle-to-Upper Palaeolithic] transition”.

A processual approach

Few archaeologists have been willing to speculate on what Soffer terms the “social contexts” of the Upper Palaeolithic revolution. Among the exceptions, both Binford (interview in Fischman 1992) and Soffer herself (1991; 1992) offer convergent scenarios. Evaluation of Binford’s results must await full publication. According to Soffer (1992: 254), “a dramatic change in economic and social relationships” was decisive.

The touchstone was biparental provisioning. Like Binford, Soffer can find no evidence that Neanderthal males reliably brought meat “home” to their mates. Forced onto their own resources as glacial conditions intensified, Neanderthal mothers faced scarcities and came under stress. To minimise the energetic costs of travel, they increasingly restricted themselves to biotically rich, diversified southerly areas such as the foothills of the Crimea and Caucasus, where they could secure subsistence by moving camp-sites frequently but within relatively small ranges (Soffer 1991; *cf.* Gamble 1986: 367-83).

From data on tooth size and patterns of juvenile mortality, Soffer (1991; 1992) infers that anatomically modern females and their offspring migrating into Europe suffered much less stress. Instead of falling back on their own resources as conditions deteriorated, they became involved in a profound restructuring of sexual relationships and hence of their expectations of males. Males now combed wide areas for big game, bringing it “home” over long distances, thereby enabling females to reduce travel costs and to select from a much wider range of potential dwelling sites (*cf.* Binford 1989; Knight 1991). Whereas Neanderthal females were forced to retain their robust features to cope with their environment, their modern counterparts became gracile considerably *before* corresponding processes of gracilisation set in among anatomically modern males. Soffer (1992: 251) concludes that “whatever behavioral changes occurred at the time, their impact was far more dramatic on the females who were no longer subject to the same amounts of physical exertion as were Neanderthal females.” Females are particularly vulnerable to the reproductive penalties of stress, so such changes could have been decisive in enhancing these humans’ reproductive potential.

Symbolic language: what makes it different

Before turning to symbolic origins, we must adequately differentiate speech from animal call-systems. Many primates vocalise referentially, conveying information not only about the sender’s sex, group membership and social relationships but also about external objects and events (Steklis 1985; Cheney and Seyfarth 1990). Pressures to convey still more information of this kind can be linked with archaic humans’ hypothesised “protolanguage” – in effect, a sophisticated repertoire of vocal calls far richer than the system of any primate (Bickerton 1990). There are grounds for linking speech evolution in this sense with evolving *Homo*’s need to service increasingly complex networks of potential allies; as social groups expanded, keeping in touch meant replacing time-consuming primate-style grooming methods with “cheaper” vocal methods which freed the hands and allowed multiple partners to be simultaneously addressed (Dunbar and Aiello 1993).

But speech is emphatically more than this. It is *not* a matter of drawing attention to features of the perceptible world; nor is it essential for communicating about ongoing *social* phenomena. We would get nearer to the relationships central to true language by stating that the relevant vocalisations are labels for collective abstractions – non-existent, socially constructed entities, such as a Unicorn (Bickerton 1990; Kendon 1991). Only humans can converse about these.

Abstract and arbitrary constructs like “Unicorn” are what human language labels, even if we are talking about, say, a table. In saying “table”, we are vocally labelling a communal construct. In this particular case, we can attach it, secondarily, to what each of us individually perceives to be a flat-topped wooden thing with legs. But such a secondary attachment to a set of *perceptual*

representations is inessential. Even if no table were present, we could still refer to it vocally because the construct, “Table” – like “God”, “Justice” or “Unicorn” – is communally maintained and serviced as a construct quite independently of any ordinary physical object. It is this which makes “displacement” possible (Hockett 1960; Bickerton 1990).

Brains, displacement and deception

With their developed primate brains, humans don’t wait for trees to walk into them. They respond not directly to sensory stimuli as these impinge upon the body surface but to an internal “virtual world” of the brain’s own making, constructed from primary – i.e. perceptual – information. We act upon this *as if it were the real world*. This is what makes foresight – “planning” – possible. There is nothing unusual about this: it is what brains are for. But in the human case, extraordinarily, we each possess our own personal *copy* of a shared map constructed on the basis of secondary information. This facilitates *communal* foresight or “planning depth” (Binford 1988). Human language is a system of references to this additional map. Although it has to be superimposed upon the one we share with other primates, there is a massive disjunction – in fact an incommensurability of principle – distinguishing these two *levels* of representation (Bickerton 1990: 27-30). Whereas a primate’s cognitive map is organism-centred, its coordinates measured from the “here” and “now” of individual experience, our communal map is sociocentric. Its basic topography is dependent neither upon who you are individually, nor where you are in space/time.

We know approximately how an individual builds up her/his internal perceptual map (e.g. Edelman 1989; Humphrey 1993). But how can a *shared* map be implanted and sustained throughout a community?

Students of language have traditionally worked with either one of these two models:

- 1) listeners *infer* meanings from contextual and other cues, the role of signallers being simply to supply behavioural evidence of their communicative intentions;
- 2) messages are tightly specified through a *code*.

In fact, human language is best understood by combining inferential *and* code models, for human speakers routinely emit coded utterances in providing evidence from which – in conjunction with more subtle behavioural/contextual cues – communicative intentions can be richly inferred (Sperber and Wilson 1986).

Primates share with humans the principle of inferential communication: one animal infers another’s communicative intention from evidence provided specifically for this purpose. Certainly, chimpanzees can (1) indicate through pantomime *possible* courses of action; (2) grasp the nature of the information their

own behaviour provides to others; and (3) modify it accordingly if it suits their purposes (Kendon 1991 and references).

Primate communication can also be accommodated to the *code* model. Vervet monkeys in Kenya (Seyfarth *et al.* 1980; Cheney and Seyfarth 1990) have an alarm call for “Snake!”. They can also cry “Eagle!” or “Leopard! Play back a recording of the snake chutter: the vervets search the grass. Play “Eagle!” and they seek cover. Play “Leopard!” and they climb the nearest tree. Clearly, they have assigned coded vocal labels to their perceptual identifications of things.

But they cannot refer to *non-existent* things. No currently perceived snake: no call. By the same token, a vervet hears “Snake!” much as if perceiving one: with a series of automatic escape reactions. The internalised “snake” of a vervet is not *socially* constructed/replicated; it is not a *symbolic concept*. It is a lower-level representation (Bickerton 1990), whose features are determined only by the properties of actual snakes as internalised by the monkey’s own perceptual equipment. If there is any commonality between one monkey’s snake-representation and another – and there must be for the “snake” alarm call to work – this stems not from social input but from the fact that snakes, being part of the external world, are equally visible to all.

It is different when representations are of internal fantasies. These would normally be so fluid and idiosyncratic as to defy all attempts at communal labeling. Yet humans in the course of evolution have evidently managed to label at least certain stable *kinds* of fantasies, which we call “concepts”. Chimpanzees have no knowledge of these; they know of no “*Unicorns*”. Neither do they need them. There is therefore nothing for them to label – except real things, which are best labeled directly, by giving the appropriate alarm-calls or in some comparable way. In the absence of a *constructed* world whose features are common knowledge, symbolic language is simply not required.

Admittedly, primates can communicate internal states behaviourally; likewise, humans can laugh or cry. But immeasurably more is occurring within the brain than is recoverable from such cues. A chimpanzee – for all we know– might be quietly daydreaming, perhaps remembering some painful event from yesterday. Whatever the details, on waking, she lacks any way of drawing others’ attention to such visions. Her companions just don’t see them. Moreover, what motive has she to try? Why should anyone be interested in her dreams?

We humans, by contrast – as any initiated Australian (Stanner 1956) or !Kung San trance dancer (Katz 1982) will confirm – are prepared to suffer immense energetic expenses to share our dreams. It is essential to understand why this became important - why the benefits of tapping into such otherworldly knowledge began to outweigh the extremely high costs. Why did the inner world become so vital, even to the point of partially eclipsing “reality”?

At this point, primatologists may counter that too sharp a contrast between primate and human consciousness and communication has been presented. It is untrue that primates can refer only to real things. They can, after all, deceive. Consider the case of a subadult male baboon who has harassed a youngster and is being chased by the victim's mother together with a gang of adults. Fearing attack, the subadult surprisingly does not run. Instead, he stares into the distance as if watching a predator. There is no leopard to be seen, but the adults in pursuit all stop, turn and look. After this, the situation has been defused and the chase is abandoned. The subadult has escaped thanks to his deceit (Byrne and Whiten 1988: 208).

It might be claimed that a "false" leopard is in effect a "symbolic" leopard (*cf.* Sperber 1975). But it is not. It fails to qualify because there is no shared understanding here. The victims of the deceit have no interest in maintaining the deceit as such. They will therefore never knowingly *join in* with the deceiver, replicating his deceit. As soon as the baboon punishment party realise there is no leopard to be seen, they lose all interest in the unreal phenomenon. Instead of being collectively amplified or indefinitely perpetuated, the fiction expires without further ado. Primates never perpetuate claims to have seen "symbolic" leopards, any more than they believe in Unicorns. It is this which precludes the development among them of a symbolic domain.

The human symbolic domain is a realm of *indefinitely* maintained *collective* deceptions, *collective* fantasies, such as – to take an example from the Dorze of southern Ethiopia – "Christian leopards" (Sperber 1975: 93-5). It is as if the gang of baboons in our example all looked at the horizon, saw no leopard – but then joined in with their deceiver in pretending to see one. Clearly, they could only be predicted to do this if they shared some collective interest in perpetuating the fantasy, for example in the course of deceiving a third party. There are no primate examples of this (Dunbar, personal communication). And it is because primate deceptions are never collectively perpetuated that *they cannot be labelled by the community*. Private lies, private fantasized experiences, are simply not the kinds of things to which agreed, collective labels can be attached.

In this light, it seems misguided to imagine that even highly intelligent archaic humans who stumbled upon the supposedly self-evident "advantages" of symbolic language would necessarily have had any motive to exploit those advantages. Whatever their symbolic *capacities* (Marshack 1989), unless they already had powerful reasons for sharing pure fantasies, the *point* of making the switch to true language would have escaped them. Symbolic speech would have been redundant for the same reason that teaching chimps how to say "God" is a waste of time. For evolving Late Pleistocene humans, choosing a verbal label for a construct such as "Spirit" or "Supernatural Potency" would have been a small challenge compared with the difficulties inherent in establishing a construct of this kind in the first place. More than a linguistic revolution would have been required, after all, to generate the *need* for constructs of that kind.

To summarise: primates CAN:

- Vocally label reality
- Individually deceive
- Fantasize.

They CANNOT:

- Collectively deceive
- Label their fantasies.

Our task, then, is to elucidate the conditions necessary for “collective deception” to evolve, and – since no better theoretical paradigm exists – to do so within a neo-Darwinian, behavioural ecological framework.

The evolution of animal signals

Dawkins and Krebs (1978; 1984) have applied “selfish gene” thinking to signal evolution in the animal world, proposing that communicative episodes are typically exploitative; the signal-emitter is a “manipulator” aiming its signals at an intended “victim” *in order to exploit its muscle-power*. Where there is a conflict of interest between manipulator and victim, an intelligence/counterintelligence “arms race” may build up. Instead of attempting to convey accurate information about its capacities or intentions – for example, its willingness to fight – a signal-emitter may wish to conceal, exaggerate or distort this information. Then the victim will benefit through being able to resist being duped, penetrating the smokescreen to ascertain the truth.

An aggressive male bares its teeth: its rival backs off. But then a rival calls its bluff. It has developed “sales resistance”; the teeth baring no longer works. The manipulator must now amplify, back down – or fight. Real fighting is costly, so there will usually be an incentive simply to intensify the signal, leading to yet heightened sales resistance. “By analogy with human advertising”, comments Krebs (1987: 169), “the counter-ploy to sales resistance is to increase the sales pitch, to make the signal louder, more repetitive, more conspicuous, in fact to modify it in any way that will overcome the raised threshold of the reactors”. Along this route, animal signals – like the display of a peacock – can become elaborated, stereotyped, repetitive and “ritualised”, the degree of elaboration reflecting not so much the reliability of the message as its vulnerability to being exposed as a sham.

But while conflicts of interest lead to the increasing loudness and elaboration of relatively information-poor signals, the opposite occurs when communicating individuals *share the same interests*. Suppose – writes Krebs (1987) – the same outcome increases the evolutionary fitness of all parties involved. Members of an ant colony, for example, share an interest in rapid and efficient communication

about the approach of an ant eater, since the future genetic representation of any individual depends crucially on the survival of the colony.

Such a signal will evolve *in the opposite direction* to an exploitative one. No one now has an interest in falsifying signals; there is correspondingly no basis for the build-up of “sales resistance”. Instead of selection for exaggeration or concealment, there will be pressures to make the “genuine” or “give-away” cues more readily detectable. At the same time, selection on listeners will favour the opposite of sales resistance: heightened sensitivity for detecting information-rich cues. “In other words”, as Krebs (1987: 170) puts it, “the co-evolutionary interaction here is between decreased response thresholds on the one hand and increased signal clarity on the other”. Ant chemical signals are quiet and efficient.

Emitting any signal incurs a *cost*. A prolonged, energetically expensive display may be required to transmit a manipulative message, but if the benefits of exploitation are high, the emitter may still proceed. In cooperative signalling, there is no need to incur such a cost because the threshold of response in listeners will be selected to decrease and not to increase. As the threshold decreases, communicators will be able to send their messages at ever-lower amplitudes, using less and less energy. Dawkins and Krebs (1984: 391-2) call this “conspiratorial whispering”.

Speech transmits much information with minimum time and effort (Dunbar and Aiello 1993; Lieberman 1988: 5). Over the generations, listeners in the human case have evidently *needed to know*: otherwise they would not have evolved such highly specialised neurophysiological adaptations for decoding messages accurately at low amplitudes, requiring minimal redundancy and at astonishingly high speeds (Lieberman 1991; Pinker and Bloom 1990 and references). An inference is that neither “Machiavellian Intelligence” nor “arms race” scenarios were central to speech’s evolution. *Speech-capacities evolved through selection upon co-operating individuals*.

By contrast, *ritual* in human cultures demands seemingly disproportionate energetic investments (Sperber 1975). Like their animal counterparts, human rituals are loud, repetitive, conspicuous, stereotyped and costly in terms of energy-expenditure. They are also characteristically illusion inducing or “deceptive” (Sperber 1975; Lattas 1989).

The difference is that animal manipulative displays are individualistic and competitive, whereas their most potent human counterparts in traditional cultures are quintessentially *collective* performances. They demarcate social relations of power, identifying groups with common interests and setting them in opposition to other groups (Leach 1954; Cohen 1985). But despite this collectivity, they are also highly manipulative performances; the whole aim is to produce an illusion (Leach 1954; Lattas 1989). Potlatches competitively exaggerate communal wealth (Mauss 1954). Males in secret initiation cults – in addition to priesthoods, dominant castes

and royal lineages throughout recorded history – have exploited others by using elaborate ritual to overcome their victims’ “sales resistance”. We might infer – in view of the energy expended in relation to the paucity of reliable information conveyed (Sperber 1975: 8) – that such rituals arose as groups of speech-using humans *collectively* strove to “exploit the muscle power” of others who tended to resist the message.

We are now in a position to begin putting all this together. Humans produce both speech and ritual – both co-operative and exploitative signals. If we attempt to relate these two patterns, they appear at first sight to be mutually incompatible. If the relationships at the root of symbolic origins were exploitative, how could they have been cooperative at the same time?

The preceding analysis suggests a solution; and it ties in satisfyingly with Soffer’s (1991; 1992) hypotheses on Upper Palaeolithic social changes considered earlier. What was exploited – as the “Human Revolution” (Mellars and Stringer 1989) got under way – was the muscle-power of males. Those who benefited were females and their offspring.

A testable theory of human symbolic origins

Late Pleistocene foraging strategies incorporated an increasing component of long distance hunting (Binford 1989). In the absence of complex logistic arrangements, this confronts not only adult males but all individuals with demands for high levels of mobility. For evolving human females and particularly mothers, the energetic costs of travel (*cf.* Dunbar 1988: 90-105) must have constrained choice of strategy in trading sexual access for meat. Consorting continuously with meat-possessing males has been visualised as a possible female strategy (Hill 1982; Parker 1987), but “chasing after” mobile hunters could only have been optimal where child carrying burdens were minimal and/or distances short. *The alternative was to make the meat move.* Assuming initial male reluctance to comply, this would have entailed refusing sex to all males except those who returned “home” with provisions.

From soon after the onset of the last glacial, and in Africa probably sooner, this strategy was apparently adopted with increasing success. Archaeological evidence for structured hearths, logistic hunting and seasonal/semi-permanent base camps can in this light be parsimoniously explained: “making the meat move” enabled whole groups of child-burdened mothers to share both parental tasks and incoming provisions without having to move (Binford 1989; Knight 1991).

It was the collectivist dynamic of this female-driven coalitionary strategy which generated “shared dreaming” and hence the possibility of symbolism. Whenever one female was signalling “no”, she had to ensure (a) that all other females in the vicinity were signalling with her and (b) that male kin could be drawn on for support. “Cheats” would have constituted a potential threat. To succeed, the new

strategy would have required “morality” as defined by Boyd and Richerson (1992) – you punish anyone who does not co-operate, and you punish anyone who does not punish. By such collectivist means, *anything* can become an evolutionarily stable strategy (Boyd and Richerson 1992). To the extent that the new strategy *did* become non-invadable, the logic of “all-or-nothing” – intrinsic to strike action everywhere – would have generated close solidarity between females, building on any previously-evolved capacities for menstrual synchrony (Turke 1984; 1988). The only available natural clock for scheduling such synchronised action would have been the moon, whose light would also have constituted a useful resource for males on overnight hunting trips (Knight 1991 and references). Achieving the necessary fine attunements between productive, reproductive and celestial rhythms would have been the remit of ritual action. This in turn provided the infrastructural basis for fully symbolic speech.

The generation of a stable repertoire of communal fantasy-elements cannot be explained by standard primatological “tactical deception” theory (Byrne and Whiten 1988). It can be explained only if tactical deception is driven beyond primatology and confronted with a hypothetical limiting case, in which the production of “deceptions” is the signalling activity not of individuals but of groups. The present theory meets this requirement. It will now be shown how periodic sexual refusal – the collective establishment of “sexual inviolability” as the primary ritual construct – accounts for the emergence of ritual together with speech.

To understand how a sex-striking female ought logically to signal “no”, recall, first, how animals normally signal “yes”. Courtship ritual in the animal world is a key component of a species’ mate recognition system (Paterson 1978, 1982). Fundamentally, it involves signalling to prospective partners:

- “*Same species*”
- “*Different sex*”
- “*Fertile moment*”

This suggests immediately what any “no”-signalling female must do. Far from perpetuating such a mate recognition system, she must rupture it, systematically reversing the normal parity-settings. This predicts:

- “*DIFFERENT species*”
- “*SAME sex*”
- “*INFERTILE moment*”

To appreciate the logic of this inversion, it must be remembered that biologically, the human female is “continuously receptive”, her body-signals (in male eyes) permanently indicating “potential yes”. This means that unlike her closest primate relatives, who regularly signal “no” through anoestrus, the human female must *override* her sex-inviting body-signals with some non-hormonal, cortically

controlled yet *at least equally powerful* display. Remember, too, that to counter male cheating or coercion, the sex-striker needs support from male kin and female companions, her whole strategy depending on co-operation and hence trust. But how to remove all suspicion that she might “cheat”? Clearly, any body language even vaguely interpretable as ambiguous must be suppressed. If there is “sexual competition” here, it must be of the inverted kind. The logic will be for each female to seek to allay her coalition-partners’ suspicions by going one step beyond them in terms of utter negativity. Carried to its logical extreme, this dynamic will reach a point of absurdity. The sex-striking female will scramble her normally sex-inviting signals to the point of denying her status as a biologically appropriate sexual partner for the human male.

This, then, is the prediction. To be maximally defiant, females ought logically to link the visible appearance of menstruation (“infertile moment”) with a communal construction of their metamorphosis into “animal” (“different species”) and “gender-inverted” (“same sex”) forms. The result will be a composite fantasy: part animal, part human, its sexual characteristics blurred or inverted - and shedding blood. Since sexually active males will now be predicted to develop “sales resistance” to so improbable a message (intelligent males will of course suspect *quite ordinary human females* beneath the deceptive display), an “arms race” signalling scenario can be predicted, females responding by repeating, amplifying and elaborating their “absurd” pantomime (*cf.* Dawkins and Krebs 1978; 1984). Down to many of the fine symbolic details, the emergence of elaborate menstrual ritual on the model of the San “Eland Bull Dance” (Lewis-Williams 1981) can be accounted for in this way.

Between coalition-partners, by the same token, the opposite will apply. Interests being shared, “conspiratorial whispers” – i.e. low-amplitude, energy-saving, information-rich signals – will suffice. Human speech stands out as the most energy-efficient, highly encoded system of communication known (Liebermann 1991). An implication is that its roots lie in the solidarity of the world’s first picket line.

A striking female who cried, “*Snake!*” even when none could be seen might now encounter not incomprehension but sympathetic interest. Snakes are animals (“wrong species”), penis-like (“wrong sex”) and easily representable as “liquid” like the menstrual flow (“wrong time”). Moreover, they can be venomous. Pantomiming “*We are not human females but a snake!*” might, then, be a good way of repelling males. Insofar as the initial cry, “*Snake!*”, set in motion a full ritual performance, it would be a new kind of utterance, not “true” in a referential sense but – like invocations of an Aboriginal Australian’s “Rainbow Snake” constructing its own truth. This “performative” function – which includes such activities as cursing and spell-casting – is the basic, overarching function of all human speech (Austin 1980). In Australia, the model’s predictions are met with precision. The “Rainbow Snake” is a recurrent focus of symbolic discourse; it has

been for countless millennia (Flood 1983; Lewis 1988). True to form, it is gender ambivalent, part-zoological, part-human, conjured up by prolonged ritual dancing – and widely regarded as responsible for women’s menstrual flows (Knight 1983; 1991).

Merely to shout “*Snake!*” however, sets up difficulties in inferring details about the speaker’s intended meaning. Unless those attempting to organise the full performance have perfect solidarity, they will not know precisely what to do. “*Snake!*” yes – but what else? *When? What for? How can we justify it? How do we organise it?* Since the “real” world is no longer relevant, such questions are now unanswerable by reference to the context which physical reality provides. If listeners are prepared to share in the fantasy and want to know more about it, there will be only one place for them to go – back into the recesses of the imagination. Primate-style holistic utterances – verbal equivalents of knowing nods and winks, each rich with contextual significance – are in this context useless. Required, now, is a wholly new category of utterances – calls triggering acts of identification within a shared imaginative domain, each labelling one specific bit of that domain, linked sequentially, their basic meaning-conferring context being that provided not by external or perceptible reality *but by other elements of this domain*.

At this point, we need invoke no sudden genetic changes or “macromutations”. Gradualist Darwinian processes suffice (Pinker and Bloom 1990). Whilst speech as a sound-stream may be serial, syntax is not serially but hierarchically arranged, with structures nesting inside other structures – just like ordinary perception, cognition and motor coordination. This alone is sufficient to suggest its evolutionary roots. In the human case, as Sperber and Wilson (1986: 172-76) nicely put it, the “internal language” of the primate brain has become curiously exapted for the new purposes of external, *social* communication. “Mind” – to cite Johnson (1987) – emerged when *bodily* and hence intimately *personal* perceptual and cognitive skills were transposed wholesale into the new domain of *communicable imagination*.

The detailed imaginative life of conspecifics constitutes the one domain of knowledge for which external sensory evidence is not merely inadequate, but for all practical purposes non-existent. Where others’ fantasies are concerned, our ordinary senses leave us – like bats reliant on echolocation (Pinker and Bloom 1990) – in the dark. No holistic primate-like call, all-of-a-piece and interpretable thanks to its real-world context, can now help us out. We have no choice but to listen to one call, then another, then another, each successive bit necessary if we are to narrow down the range of possible interpretations. No primate listener would have the patience for this: it always has the quicker and surer alternative of checking for itself, from the real-world context in which all calls should be embedded. Deprived of that option, we humans have been obliged to wait and listen; indeed, we *demand* of our conspecifics that they communicate with us at length. And this in turn has had its own internal consequences. No other primate

has ever had to *think* in this bizarre way, relying not on eyes and ears but on channels formerly used exclusively for communication (Vygotsky 1986; Sperber and Wilson 1986). Syntactical complexity was born here. Syntax is the structure you need when cognition of the perceptible world is no longer structuring your mind for you. Under the right – albeit highly improbable – conditions, it naturally evolves.

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The human symbolic domain, to conclude, consists of collective deceptions; a more familiar anthropological term is “collective representations” (Durkheim 1965 [1912]). Acted out in pantomime or in the imagination, these need not be referred to using coded calls. To the extent that they are danced energetically or otherwise acted out in full, without reliance on speech, the result is “ritual”. Just as perceptually alert life for an individual is cognition – the process of constructing meaning – so ritual is communal cognition. It is the process of constructing symbolic meaning. Where there is no ritual, there is – can be – no such meaning. There may be individual meanings, but there can be none for the community as such. Without ritual, indeed – as all the world’s religions confirm – no *community* can even exist (Durkheim 1965 [1912]).

Ritual can also be defined as a particular, communal *kind* of inferential communication, in no way dependent upon a code (*cf.* Sperber 1975; Sperber and Wilson 1986). Being inferential, it is fully effective with incomprehensible or even non-existent speech. Logically, then, ritual might have evolved before speech. The reverse relationship, however – the possibility of early speech without ritual does not hold. Ice age minds *not as yet structured by communal ritual* could not have evolved fully symbolic speech; even if brought into contact with it, they could have found no use for it. Since ritual is the only known way of imparting, maintaining and standardising collective representations throughout a community (Durkheim 1965 [1912]), it follows that communicators without shared ritual would simply have had no displaced domain to refer to. Regardless of physical speech capacities, then, they could have possessed no sense of the symbolic. Ritual was therefore a condition of symbolic speech. It alone was capable of generating the sets of stable, communal fantasies to which coded vocal calls – hitherto used only to label the real world – could now become attached. Once the calls and the fantasies *had* been attached, by contrast, everything was possible. Humans could now communicate precise sequences of abstract semantic representations from which, drawing on contextual cues, listeners could infer more complex, subtle and individual thoughts (*cf.* Sperber and Wilson 1986). Language as we know it had been born.

This scenario accords clear logical primacy to inference over code, ritual over speech. It is not suggested, however, that ritual in fact evolved independently, prior to speech. Rather, one and the same collective “no”-signal appeared as

“speech” in the course of being agreed upon by coalition-members, “ritual” each time it was synchronised, amplified and eventually transmitted across the gender divide. Ritual was the energy-expensive “pantomime” of signalling “no” to initiate male hunting. But what was a “no” in the hearing of sexually motivated males would have been experienced positively – as a “yes” to synchronised action – within the camp of females and their supportive kin. *Speech was this go-ahead*. In short, whilst ritual was a system of pantomimed representations – collectively acted-out fantasies – speech was the means through which participants communicated to one another about these. Within this perspective, the two most easily distinguished ethnographically documented ways of communicating – one vocal, the other gestural, one “speech”, the other “ritual” – appear not as successive stages but as interdependent aspects of one and the same symbolic domain.

Fully symbolic speech organised *ritual*, in turn initiating hunting, whilst ritual served as the newly constructed domain of “displaced” events and processes which language could now for the first time point to. Speech conveyed *information*. Through the vocal-auditory channel, collaborating individuals could guide one another through the complexities of their constructed domain. Ritual, by contrast, conveyed very little information. It was not “about” something else – not a system of references to things external to its participants. It was itself what *constituted* the symbolic domain. Ritual action was what constructed the hallucinatory world of communal constructs to which speaking humans could henceforth refer.

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This hypothesis, although speculative, generates precise predictions potentially falsifiable across a range of disciplines. Most crucially, periodic female inviolability should be discernible as a focus of early ritual traditions.

Menstrual taboos satisfy this condition, being sufficiently widespread and invariant to indicate extreme antiquity. Predictably, where hunting is practised, the taboos are closely linked with beliefs concerning hunting luck; such symbolic linkages tend to be most intense and elaborate in populations most heavily dependent on hunting (Kitahara 1982). Further confirmation comes from the fact that where menstrual rites are performed, the associated myths persistently stress themes of gender inversion and lunar periodicity, often combined with “skin-changing” into snake-like or other animal form (Knight 1991).

Much archaeological data suggests the antiquity of such traditions. From the Aurignacian onwards, representations of vulvas are ochred, linked with game animals and associated with notched patterns suggestive of periodic record-keeping (Marshack 1991a). “Dancing” all-female groups are represented, as are meanders suggestive of both “periodicity” and “flow”. A close-up of an engraving from Lalinde, France, shows the pubic regions of two “dancing” females

deliberately linked (Marshack 1991b). In other engravings, synchrony is suggested by the linking and formal repetition of female “buttocks” images (Bosinski 1990). In Upper Palaeolithic art, women are frequently shown associating with other women or with game animals; instances of male-female association or intercourse within nuclear families are rare or non-existent. Interpreted in the light of recent ethnographically informed analyses of San rock art (Lewis-Williams 1981; Power 1993), such data provisionally confirms the hypothesis.

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BIBLIOGRAPHY

Arensburg, B., A. M. B. Vandermeersch, H. Duday, L. A. Schepartz and Y. Rak 1989. A Middle Palaeolithic human hyoid bone. *Nature* 338: 758-760.

Austin, J. L. 1978 [1955]. *How to Do Things with Words*. Oxford: Oxford University Press.

Bickerton, D. 1990. *Language and Species*. Chicago & London: University of Chicago Press.

Binford, L. R. 1989. Isolating the transition to cultural adaptations: an organizational approach. In E. Trinkaus (ed.) *The Emergence of Modern Humans. Bio-cultural adaptations in the later Pleistocene*. Cambridge: Cambridge University Press, pp. 18-41.

Bosinski, G. 1991. The representation of female figures in the Rhineland Magdalenian. *Proceedings of the Prehistoric Society* 57: 51-64.

Boyd, R. and P. Richerson 1992. Punishment allows the evolution of co-operation (or anything else) in sizeable groups. *Ethology and Sociobiology* 13, 3: 191-96.

Byrne, R. and A. Whiten 1988. *Machiavellian Intelligence. Social expertise and the evolution of intellect in monkeys, apes, and humans*. Oxford: Clarendon Press.

Cavalli-Sforza, L. L., A. Piazza, P. Menozzi and J. Mountain 1988.

Reconstruction of human evolution: Bringing together genetic, archaeological, and linguistic data. *Proceedings of the National Academy of Sciences (USA)* 85: 6002-6006.

Cheney, D. L. and R. M. Seyfarth 1990. *How Monkeys See the World*. Chicago: University of Chicago Press.

Cohen, A. P. 1985. *The Symbolic Construction of Community*. London: Tavistock.

- Coppens, Y. 1981. Exposé sur le cerveau: Le cerveau des hommes fossiles. *C. r. Acad. des Sci. Inst. France, Paris* 29(2): 3-24.
- Dawkins, R. and J. R. Krebs 1978. Animal signals: information or manipulation? In J. R. Krebs and N. B. Davies (eds) *Behavioural Ecology. An evolutionary approach*. Oxford: Blackwell Scientific Publications, pp. 282-309.
- Dawkins and J. R. Krebs 1984. Animal signals: mind-reading and manipulation. In J. R. Krebs and N. B. Davies (eds) *Behavioural Ecology. An evolutionary approach*. Oxford: Blackwell Scientific Publications, pp. 380-402.
- Deacon, T. 1987. Human brain evolution: the inside story. *Symbols. Journal of the Peabody Museum*. June, pr. 1-5.
- Dunbar, R. I. M. 1988. *Primate Social Systems*. London & Sydney: Croom Helm.
- Dunbar, R. and L. Aiello 1993. Neocortex size, group size, and the evolution of language. *Current Anthropology* 34: 184-93.
- Durkheim, E. 1965 [1912]. *The Elementary Forms of the Religious Life*. New York: Free Press.
- Edelman, G. M. 1989. *The Remembered Present: A biological theory of consciousness*. New York: Basic Books.
- Falk, D. 1983. Cerebral cortices of East African early hominids. *Science* 221: 1072-74.
- Falk, D. 1992. Review of P. Lieberman, "Uniquely Human. The evolution of speech, thought and selfless behavior." *International Journal of Primatology* 13: 217-220.
- Fischman, J. 1992. Hard evidence. By re-creating Stone Age behavior, researchers are learning that the Neanderthals were nothing like the people we imagined. *Discover* February 1992.
- Flood, J. 1983. *Archaeology of the Dreamtime*. Sydney & London: Collins.
- Gamble, C. 1986. *The Palaeolithic Settlement of Europe*. Cambridge: Cambridge University Press.
- Gould, S. J. 1977. *Ontogeny and Phylogeny*. New York: Norton.
- Hill, K. 1982. Hunting and human evolution. *Journal of Human Evolution* 11: 521-44.
- Hockett, C. F. 1960. The origin of speech. *Scientific American* 203(3): 89-96.
- Holloway, R. 1991. The Neanderthal brain: What is primitive. *American Journal of Physical Anthropology* Supplement 12. P. 94 (Abstract).
- Humphrey, N. 1993. *A History of the Mind*. London: Vintage Books.
- Jerison, H. J. 1973. *Evolution of the Brain and Intelligence*. New York: Academic Press.

- Johnson, M. 1987. *The Body in the Mind. The bodily basis of meaning, imagination, and reason*. Chicago & London: The University of Chicago Press.
- Katz, R. 1982. *Boiling Energy. Community healing among the Kalahari Kung*. Cambridge, MA: Harvard University Press.
- Kendon, A. 1991. Some considerations for a theory of language origins. *Man* (N.S.) 26, 199-221.
- Kitahara, M. 1982. Menstrual taboos and the importance of hunting. *American Anthropologist* 84: 901-3.
- Knight, C. D. 1991. *Blood Relations. Menstruation and the origins of culture*. New Haven and London: Yale University Press.
- Krebs, J. 1987. The evolution of animal signals. In C. Blakemore and S. Greenfield (eds) *Mindwaves. Thoughts on intelligence, identity and consciousness*. Oxford & New York: Blackwell, pp. 163-174.
- Lattas, A. 1989. Trickery and sacrifice: tambarans and the appropriation of female reproductive powers in male initiation ceremonies in west New Britain. *Mall* (N.S.) 24: 451-469.
- Leach, E. 1954. *Political Systems of Highland Burma*. London: Bell.
- Lewis, D. 1988. *The Rock Paintings of Arnhem Land, Australia. Social, ecological and material culture change in the post-glacial period*. Oxford: BAR International Series 415.
- Lewis-Williams, J. D. 1981. *Believing and Seeing. Symbolic meanings in Southern San rock art*. London: Academic Press.
- Lieberman, P. 1985. On the evolution of human syntactic ability: its preadaptive bases – motor control and speech. *Journal of Human Evolution* 14: 67-75
- Lieberman, P. 1988. On human speech, syntax, and language. *Human Evolution* 3: 3-18.
- Lieberman, P. 1989. The origins of some aspects of human language and cognition. In P. Mellars and C. B. Stringer (eds) *The Human Revolution. Behavioural and biological perspectives in the origins of modern humans*. Edinburgh: Edinburgh University Press, pp. 390-414.
- Lieberman, P. 1991. *Uniquely Human. The evolution of speech, thought and selfless behavior*. Cambridge, Mass.: Harvard University Press.
- Lieberman, P. and E. S. Crelin, 1971. On the speech of Neandertal Man. *Linguistic Inquiry* 2: 203-22.
- Marshack, A. 1989. Evolution of the human symbolic capacity: the symbolic evidence. *Yearbook of Physical Anthropology* 32: 1-34.

- Marshack, A. 1991a. The female image: a 'time-factored' symbol. A study in style and aspects of image use in the Upper Palaeolithic. *Proceedings of the Prehistoric Society* 57: 17-31.
- Marshack, A. 1991b. An innovative analytical technology: a discussion of its present and potential use. *Rock Art Research* (in press).
- Martin, R. D. 1990. *Primate Origins and Evolution*. London: Chapman and Hall.
- Mauss, M. 1954. *The Gift. Forms and functions of exchange in archaic societies*, trans. I. Cunnison. London: Cohen & West.
- Mellars, P. 1991. Cognitive changes and the emergence of modern humans in Europe. *Cambridge Archaeological Journal* 1: 63-76.
- Mellars, P. and C. Stringer 1989. Introduction. In P. Mellars and C. Stringer (eds) *The Human Revolution. Behavioural and biological perspectives in the origins of modern humans*. Edinburgh: Edinburgh University Press.
- Parker, S. T. 1987. A sexual selection model for hominid evolution. *Human Evolution* 2: 235-53.
- Passingham, R. E. 1975. Changes in the size and organization of the brain in man and his ancestors. *Brain Behav. Evol.* 11: 73-90.
- Paterson, H. E. H. 1978. More evidence against speciation by reinforcement. *South African Journal of Science* 74: 369-71.
- Paterson, H. E. H. 1982. Perspective on speciation by reinforcement. *South African Journal of Science* 78: 53-7.
- Pilbeam, D. R. and S. J. Gould 1974. Size and scaling in human evolution. *Science* 186: 892-901.
- Pinker, S. and P. Bloom 1990. Natural language and natural selection. *Behavioral and Brain Sciences* 13; 707-84.
- Power, C. 1993. The Woman with the Zebra's Penis. Evidence for the mutability of gender among African hunter-gatherers. Unpublished MSc dissertation, Department of Anthropology, University College London.
- Seyfarth, R. M., D. L. Cheney and P. Marler 1980. Monkey responses to three different alarm calls: evidence of predator classification and semantic communication. *Science* 210: 801-803.
- Shea, J. J. 1989. A functional study of the lithic industries associated with hominid fossils in the Kebara and Qafzeh caves, Israel. In P. Mellars and C. Stringer (eds) *The Human Revolution. Behavioural and biological perspectives in the origins of modern humans*. Edinburgh: Edinburgh University Press, pp. 611-25.
- Soffer, O. 1991. Ancestral lifeways in Eurasia – the Middle and Upper Paleolithic records. Paper prepared for the Spring Systematics Symposium *Origins of*

Anatomically Modern Humans May 11, 1991, Field Museum of Natural History, Chicago.

Soffer, O. 1992. Social transformations at the Middle and Upper Palaeolithic transition: The implications of the European record. In G. Brauer and F. Smith (eds), *Continuity and Replacement. Controversies in Homo sapiens evolution*. Rotterdam and Brookfield: Balkema, pp. 247-59.

Sperber, D. 1975. *Rethinking Symbolism*, Cambridge: Cambridge University Press.

Sperber, D. and D. Wilson 1986. *Relevance. Communication and cognition*. Oxford: Blackwell.

Stanner, W. E. H. 1956. The Dreaming. In T. A. G. Hungerford (ed.) *Australian Signpost*. Melbourne: Cheshire.

Steklis, H. D. 1985. Primate communication, comparative neurology, and the origin of language re-examined. *Journal of Human Evolution* 14: 157-173.

Turke, P. W. 1984. Effects of ovulatory concealment and synchrony on protohominid mating systems and parental roles. *Ethology and Sociobiology* 5: 33-44.

Turke, P. W. 1988. Concealed ovulation, menstrual synchrony and paternal investment. in E. Filsinger (ed.), *Biosocial Perspectives on the Family*. Newbury Park, CA: Sage, pp. 119-136.

Vandermeersch, B. 1981. *Les hommes fossiles de Qafzeh (Israël)*. Paris: Centre National de la Recherche Scientifique.

Vygotsky, L. S. 1986 [1934]. *Thought and Language*. Cambridge, MA: MIT Press.