

# AN EVOLUTIONARY APPROACH TO HUMAN CULTURE

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The past two decades have seen a resurgence in Darwinian evolutionary theory that has revolutionized our understanding of social behaviour.

Previously, it was difficult to apply a rigorous Darwinian analysis to so nebulous a phenomenon as behaviour. In consequence, students of animal behaviour were too often reduced to vague *post hoc* explanations that were largely untestable. In the 1960s, however, a number of developments including most notably William Hamilton's (1964) solution to the problem of altruism sparked an intellectual revolution which was to transform the landscape.

Hamilton clarified mathematically how to assess the costs and benefits of an individual's social behaviour in terms of that behaviour's 'fitness consequences' – its effects in getting the individual's genes into future generations. The impact on the behavioural sciences was little short of electric, precipitating a full-scale paradigm shift or 'scientific revolution' (cf. Kuhn 1970). Whole new fields of investigation opened up, with a veritable surge of empirical studies based on detailed quantification and, in some cases, experimentation. Precision in hypothesis-testing became at last a real possibility. The result was a dramatic increase in the development of explanatory theory and understanding, made possible precisely because weak or incorrect hypotheses could now be rapidly excluded by the results of carefully thought-out analyses.

The reverberations of this revolution in biology were bound to spill over into the human sciences. Though slow to get going, and often dogged by empirical underdetermination and an excess of theoretical speculation, the study of human behaviour within the new Darwinian framework has taken off during the last decade. This development has been represented by a plethora of carefully executed empirical studies in two broad areas.

One of these, often termed 'evolutionary anthropology', has involved the application of theories and methods from Darwinian behavioural



ecology to living and historical human social groups. The focus here has been on foraging strategies, mate choices, marriage practices, parental investment patterns and other areas of social behaviour where the fitness consequences are relatively easy to measure. Questions are asked about how individuals choose between alternative strategies in maximizing their immediate returns (energy acquired per unit time spent foraging) or their long-term 'fitness' (genetic representation in future generations). Evolutionary anthropologists are especially interested in how and why behavioural strategies vary between individuals, as well as between whole societies.

The other approach is usually referred to as 'evolutionary psychology'. This has focused less on the functional consequences of behaviour than on the cognitive mechanisms believed to underpin it. The view here is that, during the course of human evolution, natural selection has given rise to certain core elements defining the human psyche. Evolutionary psychologists see their remit as the study less of variation than of human cognitive and behavioural universals, the ultimate aim being to specify the basic design-features of the human mind. Much of this work has involved studies of the criteria used by humans in choosing mates, forming alliances, detecting and exposing cheats and so on. Evolutionary psychologists do not necessarily expect a good adaptive fit between human evolved psychology and the contemporary environment. Instead, they posit an Environment of Evolutionary Adaptedness spanning two or three million years of hominid evolution. The distinctively human mind is said to have evolved in adapting not to present conditions but to a life in which prehistoric hunter-gatherers related to one another face-to-face within small-scale cooperative bands. An obvious corollary is that the human psyche may be ill-adapted to the complex and often stressfully competitive conditions of life in modern Western societies.

Common to both perspectives, however, has been an interest in decisions about mate choice, parental investment and other forms of behaviour which can be argued to have counterparts in the animal world. By contrast, rather little attention has been devoted to those topics which form the special subject matter of social anthropology. Neither Darwinian anthropology nor evolutionary psychology has focused on how or why, over evolutionary time, humans have established, elaborated and diversified their symbolic systems, languages, rituals, gender ideologies and magico-religious myths. Topics such as 'totemism' or 'taboo' – staples of classical social anthropology – do not feature as problems within Darwinism. There have, of course, been several attempts to model cultural evolutionary processes (most successfully by Cavalli-Sforza and Feldman 1981; Boyd and Richerson 1985; Laland et al. 1995), but these have focused mainly on the rates at which cultural patterns can be expected to

change over time. A further debate has concerned the relationship between cultural and genetic evolution. More recently, some evolutionary psychologists (e.g. Boyer 1994) have claimed that a knowledge of human cognitive architecture may allow us to grasp the 'naturalness' of religious ideas as 'memes' (Dawkins 1976) whose seemingly odd features in fact enhance their chances of being replicated in human minds. But a more fundamental challenge, rarely addressed by Darwinians, is to specify the concrete selection pressures which, uniquely in the case of human evolution, led to such bizarre fictions being entertained by human minds in the first place.

This book arose from a meeting organized by Chris Knight under the auspices of the Human Evolution Interdisciplinary Research Group and held at the School of Oriental and African Studies, University of London, in March 1994. The meeting's theme was 'Ritual and the Origins of Culture'. The participants included social anthropologists, archaeologists, palaeontologists, primatologists and evolutionary psychologists. Almost thirty years earlier, in June 1965, a similar focus had brought together a remarkable interdisciplinary array of ethologists, symbolic anthropologists, psychologists, classicists and art historians in a meeting organized by Julian Huxley (1966) at the Royal Society. The title of that meeting had been 'Ritualisation of Behaviour in Animals and Man'. The luminaries present included Konrad Lorenz, Robert Hinde, Victor Turner, Edmund Leach, Meyer Fortes and R. D. Laing. Perhaps the meeting proved most historic as the last occasion on which the two branches of anthropology – the biological and the social – talked to each other.

The more modest 1994 event represented an attempt to resurrect that dialogue. The chapters in this volume comprise a selection of papers from participants at that meeting, as well as some additional chapters commissioned for this volume. Although the meeting from which this book arose focused on ritual, we have broadened the scope to include also wider aspects of culture, not least because it makes little sense to discuss the evolution of ritual in isolation from the rest of symbolic culture including language.

Broadly, the present volume exemplifies two different levels of approach to cultural phenomena. One is behavioural ecological, modelling processes of social negotiation using cultural mechanisms such as gossip, dialect and other group markers. Another, more unusually, uses Darwinian models to address specific problems in symbolic culture, in line with Edmund Leach's aphorism that 'god is in the detail'. If symbolism arises as an adaptive strategy, we should be able to 'reverse-engineer' (Pinker 1997) symbolic systems in order to elucidate their adaptive function. In explaining the novelty of his approach to Central African myths, the structuralist anthropologist Luc de Heusch (1982) proclaimed:



'Instead of brutally eliminating it, for the first time we are going to take the marvellous seriously.' Darwinism has not so far devoted much time to addressing our species' more 'marvellous' creations, but this book is aimed as a step in that direction. The first part addresses the origins of society; the next asks questions about art and religion; the final part turns to the evolution of language.

The atmosphere of mistrust that had long clouded relations between the two wings of anthropology – the biological and the social – became even more deeply entrenched during the three decades from 1965 to 1994 as a result of the gene-centred developments that took place in evolutionary biology. Prior to the 'selfish gene' intellectual revolution, it had been widely assumed that cooperative behaviour in animals (including altruistic behaviour) evolved thanks to selection at the level of whole groups or species. It was argued that those groups which functioned best as harmonious wholes survived, while less cooperative groups or species became extinct, along with the genes responsible for such lack of co-operation. Such ideas attributed a kind of morality to animals, in the sense that the larger social unit was supposed to foster group-functional behaviour among its individual members. Such ideas may be seen as a misapplication to biology of something resembling Durkheimian sociology, although as Nettle (this volume) points out, Durkheim himself would never have argued that animal social systems were in any sense morally regulated. Be that as it may, the naked methodological individualism of the new 'selfish gene' Darwinism involved a rupture with Durkheimian sociology and indeed with all human-derived assumptions about morality in the social life of animals.

Initially, social anthropologists and indeed most social scientists saw the new Darwinism not as science but as right-wing ideology. They queried what they took to be the new intellectual movement's founding assumption – the dogma that human social motivations are universally reducible to the competitive maximizing of personal gain. Anthropologists who had spent their professional lives studying hunter-gatherer norms of economic or other gift-giving, sharing and generosity understandably viewed such assumptions as offensive, overgeneralized and ethnographically ill-informed. Anxious to preserve humanistic values, social anthropologists have been fighting a rearguard action to insulate their discipline from such moral contamination ever since.

Two major strategies for this insulation offered themselves. First, the new, gene-centred view of natural selection was denounced as a derivative of Western capitalist economics, inevitably tainted with political evils inherited lock, stock and barrel from 'free market' economic theory. Compounding this was the widespread view that the new Darwinism was intent on building a human origins myth which would legitimize the

prevailing world order as unchangeably rooted in 'human nature' (Sahlins 1977). With the rise of postmodern influence within social anthropology during the 1970s and 1980s, not only Darwinism but Western science itself became viewed as little more than an ideological construct designed to serve the dominant political powers. This view licensed politically sensitive social anthropologists to treat social constructs as the only phenomena accessible to study. Correspondingly, the citadel into which these anthropologists retreated was the domain of constructs in general – religion, ritual, art, ideology and language. Darwinians, it was noted, generally do not 'see' collective representations or constructs, searching instead for underlying behavioural realities alleged to be masked by such myths. The final step in this chain of reasoning was to conclude that since Darwinism has nothing to say about ideological constructs – in other words, about the symbolically constituted domain – then its claims can safely be ignored by those interested in what it means to be human.

In this book, our aim is to draw on resources from evolutionary theory in making an attempt to breach social anthropology's chosen citadel. With our colleagues in the social sciences, we acknowledge that human symbolic culture is biologically unprecedented (cf. Chase, Nettle this volume). Humans inhabit a world in which promises are explicitly made, contracts symbolically formulated, taboos laid down for ritual observance, often on pain of 'supernatural' punishment. Promises, contracts, taboos, supernatural sanctions – these are all social constructs. But precisely what is a 'social construct'? Under what selection pressures did such morally compulsive intangibles become invented, believed in and held up for respect?

At this point, numerous fundamental questions arise. Is religious ideology a 'spandrel' – a mere epiphenomenon? Or did it emerge as part of an evolutionarily stable strategy linked directly with problems of subsistence and reproduction? Do humans manifest belief in supernatural beings as part of their evolved psychology? Or is it just that the human mind, as Dawkins (1993) suggests, is anomalously gullible, enabling self-replicating religious delusions to infect us like computer viruses? If gullibility is the problem, then what were the selection pressures driving humans to become so readily deceived? On face value, gullibility would hardly seem to be an ideal candidate for an evolutionarily successful strategy.

A variant of the view that religious belief is a 'spandrel', arising in the first instance as a consequence of the development of cognitive fluidity, is represented in this volume by Mithen. An alternative Darwinian approach uses models of sexual selection to explain the evolutionary emergence of a capacity for manipulating shared fictions (Miller, Power this volume). Yet another theme, recurrently explored in the chapters which follow, is



the idea that for any human cooperative group, its own contractual foundations are likely to form the primary focus of linguistic, religious and other symbolic representational activity (Barnard, Chase, Knight, Nettle, Watts this volume).

In large-scale social groups, the need to cooperate in order to maintain group cohesion is continuously undermined by the tempting benefits of freeriding – accepting the benefits of cooperation while avoiding the costs (cf. Dunbar, Key and Aiello, Nettle this volume). Issues of trust and deception provide the stuff of the so-called ‘Machiavellian Intelligence’ or ‘Social Brain’ hypothesis, according to which humans evolved their unusually large brains as a result of powerful selection for social skills (Humphrey 1976; Byrne and Whiten 1988). We humans have minds which appear well-designed to read other minds from cues provided by eye movements, facial expressions, tones of voice and other bodily signals. Correspondingly, we can anticipate the effects which our movements may have in shaping others’ thoughts about what we are thinking. From this, it is but a small step to the deliberate and deceptive manipulation of information.

An implication of ‘Machiavellian Intelligence’ theory is that it was humans’ increasingly sophisticated capacity for deceiving one another which eventually gave rise to that entirely novel level of representational activity which we call ‘symbolic culture’. Social deception exercises a capacity which is fundamental to symbolism – the ability to hold in mind simultaneously both a ‘true’ representation and also its ‘false’ counterpart. No Darwinian treatment of the evolution of human symbolic culture can avoid addressing the problems which must have been posed to evolving group-living humans by such devious cognitive abilities. To signal deceptively is, in principle, to concoct an imaginative scenario. Yet the paradox is that humans within symbolically constructed communities apparently delight in fictional scenarios, which are not necessarily experienced as deceitful or exploitative. Humans who participate collectively in magico-religious ritual performances do so precisely in order to instil belief in fictional ‘other worlds’. Representations of such fictions are more than epiphenomenal; they are central in securing cognitive acknowledgement of and allegiance to the contractual intangibles underpinning cooperation in human social groups. Given the characteristically collaborative, cooperative nature of the rituals designed to generate such illusions, the ‘deceptions’ which emerge may be dubbed ‘collective deceptions’, corresponding to Durkheim’s classic notion of ‘collective representations’.

Ritual appears central among mechanisms designed to control free-riders and the rampant individualism which might otherwise cause society to disintegrate. Hunter-gatherers and others organized in pre-

state social systems consistently invest enormous energies in their illusion-inducing ritual performances; it would be puzzling if the consequent religious representations – the aim of the whole exercise – were maladaptive or merely epiphenomenal. Despite using selfish-gene models, a number of chapters in this book can in fact be read as convergent with Durkheim’s original thesis on the centrality of communal ritual in generating representations of a ‘totem’ or ‘god’ whose function is to provide a focus for group-level allegiance (cf. Durkheim 1915; Gellner 1989; Deacon 1997).

Although seemingly paradoxical, to model the emergence of group-level phenomena from premises in Darwinian methodological individualism is in principle nothing new. Biological processes have long been recognized as complex and multi-layered. The need to distinguish between levels of analysis, and the possibility of modelling major evolutionary transitions between levels, are notions central to modern Darwinism (Maynard Smith and Szathmáry 1995). Although genes as such are never altruistic, it is precisely gene-level ‘selfishness’ which has driven the emergence of altruism and cooperation at higher levels including that of the multi-cellular organism, the primate coalition or the human speech-based community. Communal rituals can be understood as an expression of human coalitionary strategies, prefigured in many respects by the coalitionary strategies of non-human primates. The apparent incompatibility between the methodological individualism of modern Darwinism and the group-level focus of much social, cognitive and symbolic anthropology is therefore illusory. In texts such as *The Elementary Forms of the Religious Life*, Durkheim (1915) himself took great care to distinguish between animal and human levels of cognition and representation, noting that ‘collective representations’ have no animal counterparts (cf. Nettle this volume). It is ironic that Darwinians are beginning to address such distinctions just as many social anthropologists have decided on a reverse policy, adopting a version of methodological individualism which jettisons Durkheim and group-level analysis altogether in favour of cognitive individualism (cf. Rapport 1997). This trend may explain the recent popularity of Darwinian cognitive anthropologists such as Dan Sperber and Pascal Boyer on social anthropology courses.

As the paradigm-change of which this book is a small part unfolds, social anthropology will inevitably undergo profound restructuring, particularly with respect to its relationships with neighbouring disciplines and with science in general. Yet in one sense, anthropology will remain substantively the discipline it has always been, with its traditional concerns and preoccupations. The basic gains achieved under functionalist, structuralist and more recent social anthropological paradigms will be retained and built upon rather than discarded. But more importantly,



anthropology will be required to develop its own evolutionary perspective on topics of intimate concern to it precisely because none of these areas has so far been of particular interest to biologists.

But what of social anthropology's traditional concerns over the supposed moral and political implications of 'selfish gene' Darwinism? Dawkins' (1976) coining of the term 'selfishness' with respect to genes has been among the most productive of scientific metaphors. It is ironic that symbolic anthropologists and postmodern critics – scholars whose specialist area of study is the world of metaphoric constructs – should have refused to grasp this metaphor as it was intended, insisting instead on a literal interpretation. No biologist thinks that genes are literally selfish; it is just that a gene is in business to make copies of itself, not copies of its competitors. Any gene which fails to follow this imperative will simply become extinct.

Human conceptual thought is intrinsically metaphorical. Whenever we can, we approach the unique and unfamiliar using concepts already well-known and familiar to us. During the time of René Descartes, when mechanical clocks represented pinnacles of human technical ingenuity, the complexities of organic life were conceptualized through the obvious most up-to-date metaphor – animals were essentially 'clocks'. Within the past twenty years, as academics and researchers have become acquainted with modern information technology, cognitive scientists have seen the brain as a 'computer'.

It was inevitable that in modelling the evolution of animal and human social life, the unknown would likewise be conceptualized in terms of the known. When optimal foraging theory was being developed as one of the cornerstones of the evolutionary biology of behaviour during the 1960s, it was done using mathematical tools borrowed from economics. There is no doubt that the prospect of being able to apply concepts derived from modern economics to the study of animal life provided much of the initial impetus driving the 'selfish gene' revolution in the life sciences. However distant from biologists' dispassionately mathematical thinking, the metaphor of competition between genes as competition in the capitalist marketplace gave us many of the core concepts of modern Darwinism, from 'costs' and 'benefits' to 'investments', 'returns' and strategies for competitively maximizing 'gains' rendered measurable in terms of a 'common currency'.

It is only when a metaphor is exploited uninhibitedly that its limitations begin to become apparent. Superficial application of 'free market' conceptual models to palaeolithic hunter-gatherers leads to a picture of the first human societies as individualistic and competitive. But among specialist palaeoanthropologists, this position is nowadays a minority one. Key and Aiello (this volume) point to the centrality of allomothering and

other forms of intra-female reproductive cooperation in driving the emergence of distinctively human forms of social organisation. Recent studies of the emergence of language (Dunbar, Hurford, Nettle this volume; see also chapters in Hurford et al. 1998) link speech closely with the evolution of cooperation.

Drawing on data from primatology and hunter-gatherer ethnography, Darwinian psychologists David Erdal and Andrew Whiten (1994, 1996) attribute the evolution of hunter-gatherer egalitarianism to a cooperative strategy of 'counter-dominance' which results from escalating Machiavellian status competition. Here, selfishness at the level of the gene leads to an evolved strategy of coalitionary resistance to subordination, driving up the costs of dominance to the point where the strategy of seeking control over others is simply no longer affordable. Erdal and Whiten describe the earliest human hunter-gatherer social systems as outcomes of such strategies, culminating in a 'don't mess with me' egalitarian ethic. An implication of all this is that while palaeolithic hunter-gatherer social systems may not have fostered competitive individualism, their methods of establishing and maintaining egalitarian, cooperative relationships can still be understood in the light of analyses derived from economic theory. Darwinian cost/benefit theory, dispassionately applied to the study of human origins, can lead to scientific conclusions not necessarily predictable in advance.

It should be stressed that borrowing methods from a neighbouring discipline need not entail wholesale acceptance of the associated conceptual baggage. When evolutionary biologists drew on the mathematics of modern economics to aid them in understanding animal behaviour, they did not thereby subordinate themselves to the economists' agendas or priorities. What were borrowed were certain of the ways in which economists think about such problems, along with their mathematical tools – much, in fact, as economists themselves had earlier borrowed these tools from physics.

Neither the problems which biologists choose to study nor the ways in which they formulate their answers have much to do with conventional economics. There is no capitalist agenda, no profit to be maximized. By the same token, as anthropology and the social sciences come to adopt the Darwinian perspective, they will not suddenly have to busy themselves with the problems which traditionally have interested biologists. What they will continue to do is anthropology, using the methods and questions of anthropology. The difference will lie in how they think about those problems.

Our appeal, then, is to common sense and to the prospects offered by new perspectives. Nothing would be gained if social anthropologists were to become biologists. Our aim in editing this volume has instead been to



illustrate some of the ways in which anthropologists might do better anthropology.

## REFERENCES

- Boyd, R. and Richerson, P. J. (1985) *Culture and the Evolutionary Process* (Chicago: University of Chicago Press).
- Boyer, P. (1994) *The Naturalness of Religious Ideas. A Cognitive Theory of Religion* (Berkeley, Los Angeles, London: University of California Press).
- Byrne, R. and Whiten, A. (1988) *Machiavellian Intelligence. Social Expertise and the Evolution of Intellect in Monkeys, Apes, and Humans* (Oxford: Clarendon Press).
- Cavalli-Sforza, L. L. and Feldman, M. W. (1981) *Cultural Transmission and Evolution* (Princeton NJ: Princeton University Press).
- Dawkins, R. (1976) *The Selfish Gene* (Oxford: Oxford University Press).
- Dawkins, R. (1993) 'Viruses of the mind', in Dahlbom, B. (ed.), *Dennett and His Critics* (Oxford: Blackwell), pp. 13–27.
- Deacon, T. (1997) *The Symbolic Species. The Co-evolution of Language and the Human Brain* (London: Penguin).
- Durkheim, E. (1915 [1912]) *The Elementary Forms of the Religious Life*, trans. J. W. Swain (London: Allen & Unwin).
- Erdal, D. and Whiten, A. (1994) 'On human egalitarianism: an evolutionary product of Machiavellian status escalation?' *Current Anthropology* 35 (2): 175–83.
- Erdal, D. and Whiten, A. (1996) 'Egalitarianism and Machiavellian intelligence in human evolution', in Mellars, P. and Gibson, K. (eds), *Modelling the Early Human Mind* (Cambridge: McDonald Institute Monographs).
- Gellner, E. (1989) 'Culture, constraint and community: semantic and coercive compensations for the genetic under-determination of *Homo sapiens sapiens*', in Mellars, P. and Stringer, C. (eds), *The Human Revolution. Behavioural and Biological Perspectives on the Origins of Modern Humans* (Edinburgh: Edinburgh University Press), pp. 514–25.
- Hamilton, W. D. (1964) 'The genetical evolution of social behaviour (I and II)', *Journal of Theoretical Biology* 7: 1–16; 17–52.
- de Heusch, L. (1982) *The Drunken King, or, The Origins of the State* (Bloomington: Indiana University Press).
- Humphrey, N. K. (1976) 'The social function of intellect', in Bateson, P. P. G. and Hinde, R. A. (eds), *Growing Points in Ethology* (Cambridge: Cambridge University Press), pp. 303–17.
- Hurford, J. R., Studdert-Kennedy, M. and Knight, C. (eds) (1998) *Approaches to the Evolution of Language: Social and Cognitive Bases* (Edinburgh: Edinburgh University Press).
- Huxley, J. (organizer) (1966) 'A discussion on ritualization of behaviour in animals and man', *Philosophical Transactions of the Royal Society of London*, B 251: 247–526.
- Kuhn, T. (1970) 'The structure of scientific revolutions', *International Encyclo-*

- pedia of Unified Science*, Vol. 2, 2nd edn (Chicago: University of Chicago Press).
- Laland, K. N., Kumm, J. and Feldman, M. W. (1995) 'Gene-culture co-evolutionary theory: a test case', *Current Anthropology* 36: 131–56.
- Maynard Smith, J. and Szathmàry, E. (1995) *The Major Transitions in Evolution* (Oxford: N. H. Freeman).
- Pinker, S. (1997) *How the Mind Works* (London: Allen Lane, Penguin).
- Rappaport, N. (1997) 'The "contrarities" of Israel: an essay on the cognitive importance and the creative promise of both/and', *Journal of the Royal Anthropological Institute* (n.s.) 3: 653–72.
- Sahlins, M. D. (1977) *The Use and Abuse of Biology. An Anthropological Critique of Sociobiology* (London: Tavistock).