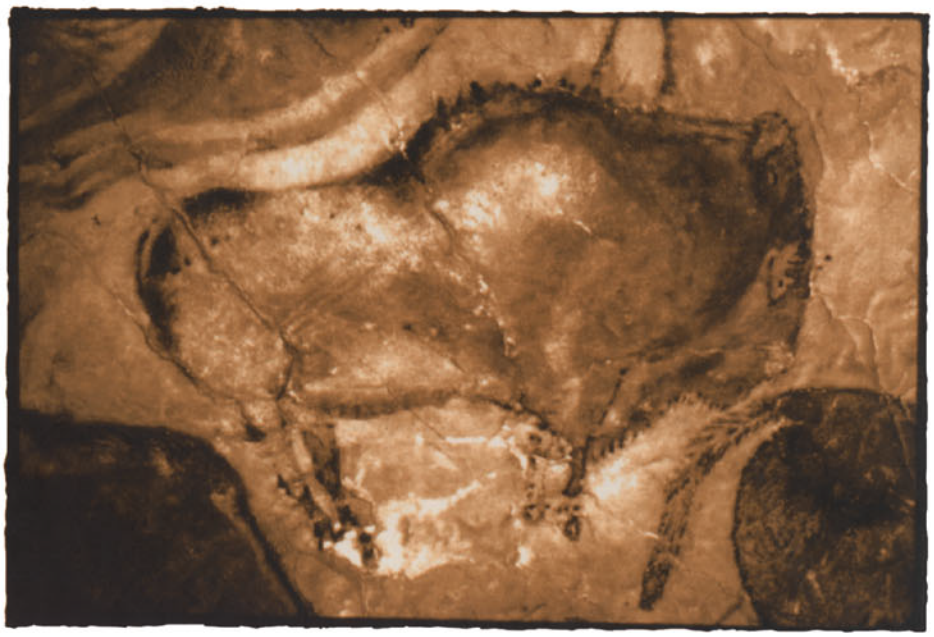
CREATIVITY

IN HUMAN EVOLUTION AND PREHISTORY



edited by

STEVEN MITHEN

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CREATIVITY IN HUMAN EVOLUTION AND PREHISTORY

edited by

Steven Mithen

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CHAPTER ONE
INTRODUCTION
The archaeological study of human creativity

STEVEN MITHEN

To be a good archaeologist one needs to maintain a childlike wonder at those objects we dig up from the ground and the monuments to which we journey. As soon as one loses that sense of awe at the achievements of past individuals and communities, one is on the slippery slope to an academic blackhole, where doing archaeology is no different from doing accountancy. How could past people come up with their ideas—if indeed that is what they did—about the shape of stone tools, the design of cave paintings and the burial of their dead? And how could those seemingly mundane activities that we take for granted, such as acquiring food, building walls and discarding waste, have been undertaken in such an immense variety of ways, many of which we could not have imagined? A very creative mind seems to be the 'bottom line' answer to such questions: a mind that appears to have no bounds in what can be conceived and achieved and which lies at the root of the cultural diversity and change that is so evident from the world around us, let alone the 2.5 million years of the archaeological record.

Archaeologists see more of cultural diversity than those who restrict themselves to the present. They also take upon themselves the burden of explaining this diversity. So surely it is archaeologists who have the most vested interest in understanding this phenomenon of creative thought. Without such understanding, we will never get beyond that crucial, yet so limiting, childlike wonder about the past. This may lead us to gasp at new discoveries, such as the 30,000-year-old paintings from Chauvet cave (Chauvet *et al*. 1996), or the 400,000-year-old wooden javelins from Schöningen (Thieme 1997), and then set us to work at unravelling the economic and social contexts in which these were made. But it also constrains by allowing us to invoke 'the creative mind' as an explanation, without seriously considering what this might mean.

What after all is creativity? Is this a special type of thinking? And if so, is it the preserve of geniuses alone or one that we all share? Or perhaps creativity is an integral part of ordinary thought. Does the term 'creativity' have any value in our attempts to understand the past, or is it just a distraction? Perhaps it is something worse—an imposition of our modern-day values on to the past. For the notion of 'creativity' appears to be extraordinarily valued today in all fields. Hence artists can be forgiven for their lack of drawing skills in light of the creativity they show, while business invests vast sums in management seminars about how to increase creative thought. In our obsession with creativity are we simply attempting to naturalise the idea by claiming its universal existence among all societies in space and time, and hence support the values of our own particular society? And in so doing, are we simply writing the present into the past?

UNDERSTANDING CREATIVITY

Where can those of us whose time is spent with the objects made by long-dead people acquire the understanding of human creativity that we may intuitively feel we need if we are going to achieve

satisfactory interpretations of those objects? We might try consulting a spate of recent books by philosophers and psychologists that have addressed this issue; books with titles such as *The Nature of Creativity* (Sternberg [ed.] 1988), *The Creative Mind: Myths and Mechanisms* (Boden 1990), *Creativity: Beyond the Myth of Genius* (Weisberg 1993) or *Dimensions of Creativity* (Boden [ed.] 1994a). Or we may consult less recent books, as trying to unravel the nature of creative thought has been a constant concern in those disciplines. So one might also try *The Act of Creation* (Koestler 1964) or *Creative Person and Creative Process* (Barron 1969).

This strategy of looking into other disciplines was certainly the one I adopted during the last decade as I considered various aspects of early prehistory that seemed to require reference to creative thought for adequate explanation, such as Palaeolithic art and Mesolithic foraging (Mithen 1990, 1996). But as a strategy it has not been wholly successful. Although there is much of value for archaeologists in these works, and particularly in those by Boden (1990, 1994a), so much of the writing by philosophers and psychologists about creativity seems irrelevant to the issues that archaeologists need to address, and the type of data they have available.

The dominant theme within these works is how particular individuals arrived at what, with hindsight, were designated as creative thoughts (in addition to those referenced above, one might consider Gardner 1993, 1994; Simonton 1984; Weisberg 1993). These are predominantly studies of artists and scientists, and in some cases politicians, working in the late nineteenth and early twentieth centuries. Some examples, such as Kekulé's dreams about phantom snakes (which, he claims, resulted in the discovery of the molecular structure of benzene), recur to the point of tedium. Other key subjects include Picasso, Darwin, and Watson and Crick.

Studies of this type seem of little value to archaeologists for several reasons. First and foremost is the focus on particular individuals. Those individuals may be the ones who have been designated as particularly creative in their work, such as Picasso or Einstein, or they may be anonymous individuals in light of the trend towards seeing creative thought as an element of human thought in general and not necessarily linked to the phenomenon of 'genius'. Now while the thoughts and actions of individuals play a critical role in archaeological theory (Shennan 1986; Mithen 1993), particular individuals in prehistory are inaccessible to us, except in extraordinary circumstances. While we may believe that reference to individuals is a vital element of archaeological explanation, we cannot identify particular individuals and analyse why they, rather than others, were responsible for key innovations that influenced the course of prehistory. So, in light of the overwhelming focus on the thought processes of particular individuals in the literature that seeks to understand creativity, so much of that literature is unhelpful to our task as archaeologists.

Even within those periods of study in which a focus on individuals is feasible, there is a growing realisation that to do so imposes a severe constraint on our understanding. Schaffer (1994) has challenged the 'heroic model' of discovery. As he explains, when one removes the myths about single inspirational moments and flashes of genius by past artists and scientists, one finds that 'discovery starts to look less individual and specific, and more like a lengthy process of hard work and negotiation within a set of complex social networks' (1994: 16). Yet the ease with which one can slip back into a biographical mode of analysis for invention and discovery, rather than tackling these complex social networks, means that in the majority of studies particular individuals have maintained their positions of paramount importance. Exceptions do exist. Martindale (1994), for instance, has attempted to devise quantitative measures for the creative output of an entire society and then explored how this varies through time. Nevertheless, such studies are the exception and it is one of the valuable attributes of archaeology that we are forced out of the 'heroic' mode of thinking—as we cannot trace specific individuals, we are forced to focus on those 'complex social networks'.

But the social networks that archaeologists consider are inevitably different to those alluded to by Schaffer (1994). He could embed Faraday's discoveries in the field of electromagnetism into the particular social network of the Royal Institution of the 1840s and monitor how Faraday was elevated into a 'cultural hero' by his contemporaries. Archaeologists consider social networks at a much coarser spatial and chronological scale.

The degree of time resolution that archaeologists can achieve is obviously crucial. The existing literature on creative thought relates not only to particular individuals, but often to a very short period in their lives — the years immediately preceding Picasso's painting of *Les Demoiselles d'Avignon* in 1907, or Watson and Crick's discovery of the structure of DNA in 1953. Well, even with the remarkable developments in absolute dating methods of the last decade, prehistorians are never going to be able to examine cultural developments over a matter of years. It is unlikely that the first order standard deviation on AMS radiocarbon dates will fall below ±50 years. As a consequence, much of the existing discussion about how particular social contexts influenced the emergence of apparently creative thinking is as irrelevant to archaeologists, as is the focus on individuals.

Reference to understanding the social context of creative thought leads to a further inadequacy with the current literature on creativity for our needs as prehistorians. Almost without exception, this literature concerns creative thought in western capitalist society during the late nineteenth and early twentieth centuries. Even though capitalist society is wholly anomolous in terms of the span of human history and prehistory, generalisations are attempted from this basis to the general nature of creative thought. A prehistorian is unlikely to find much of value in this literature, as the behaviour they study arises from fundamentally different social contexts and the nature of human cognition cannot be divorced from those contexts (Hodder, in Renfrew *et al*. 1993). Even with the slightest knowledge of the diversity of human societies within which people have lived, the enterprise of finding generalisations about human thought processes from a reliance on recent western society is an enterprise doomed to failure.

Just as the social context that psychologists have studied to understand creativity is too narrow, so too is the biological context. If early prehistorians are asked about the nature of human thought, one of their first questions will be 'what type of human?'—the restriction of the term human to our own species alone, *H. sapiens sapiens,* is a practice adopted by very few archaeologists in light of the great anatomical and cultural similarities between *H. sapiens sapiens* and other members of the *Homo* genus. But is creative thought among anatomically modern humans the same as that among Early Humans, such as the Neanderthals or *Homo erectus?* Is there a difference between creative thought of anatomically modern humans before and after what appears to be an explosion of symbolic behaviour that occurred 35,000 years ago? Not surprisingly, those psychologists and philosophers who have addressed the nature of creativity have not asked such questions, let alone considered the existence of creative thinking among our closest living relatives, the great apes. What is surprising, however, is that they appear not even to have recognised that these are critical questions to address if we are to understand the nature of creativity—all aspects of human cognition can be fully understood only when firmly embedded into an evolutionary context.

So it is readily apparent that the existing literature on creative thinking has limited value to archaeologists. We deal with time frames, social contexts and often biological species that are incompatible with existing theories about how creativity arises and can be explained. But this is not a 'problem' with our discipline. Quite the reverse. It is a problem with the existing literature on creative thought. This needs to be broadened if we are to gain a general understanding of creative thought in humans. This literature needs to escape from its obsession with late nineteenth-and twentieth-century western society and particular individuals within that society. Similarly, it needs to adopt a much greater time depth to its studies so that creative thinking can be examined in an evolutionary context. A hint of recognition exists in the current

literature. Hence Boden (1994a and this volume) asks 'how is analogical thinking possible', after recognising that this may lie at the heart of creative thought. A complete answer to this requires an evolutionary perspective, yet none emerges.

Indeed it appears quite remarkable that the immense literature on creative thinking has drawn so little on the data from the archaeological record. Yet this reflects a problem that appears widespread among psychologists and philosophers, and even some anthropologists. For instance, Boyd and Richerson (1996) published a theory regarding the relationship between accumulative cultural change and imitation that is easily falsified by the merest acquaintance with the Palaeolithic archaeological record (Mithen in press). Paul Bloom (in press), writing about the evolution of language, states that 'It turns out that there are data from linguistics, psychology and neuroscience that bear directly on the question of how language evolved'—what about archaeology and palaeo-anthropology? Even two of the most prestigious philosophers of mind, Daniel Dennett (1996) and Jerry Fodor (1996), who in a recent exchange of views in the journal *Mind and Language* fundamentally disagreed with each other regarding the evolution of the mind, find that they can agree that this issue cannot be addressed 'until the data is in'. Well, if they took a moment to examine an archaeological textbook they would see that much of the data is not only 'in', but it has been in for many years and subject to immense analysis, interpretation and discussion by archaeologists. In general, the archaeological record appears to be largely ignored by those wishing to make generalisations about the nature of human thought or culture change, and archaeologists should not let this continue. Why? Because we know that without the perspectives offered by the archaeological record, one will only ever get a narrow, biased view of humankind. And it follows that, without examining the prehistory of creative thought, one will only ever get a narrow and biased view of the nature of human creativity.

ARCHAEOLOGICAL STUDIES OF INNOVATION AND CREATIVITY

I have so far identified two reasons why this book, and others like it, are required. First, because, as archaeologists, we regularly find particular artefacts or deal with societies and cultural developments that appear to reflect periods of particularly creative thought in prehistory. Many archaeologists regularly invoke the word 'creative' as either a description or explanation, epitomised in the 'creative explosion' of the Upper Palaeo-lithic. Yet, as far as I am aware, there has been very little thought by archaeologists as to what this word actually means and to whether the concept of creativity helps us to understand and interpret the past. So I believe that archaeologists need to apply their minds to this issue. Second, as archaeologists are concerned not only with understanding the past, but also with much broader issues about the nature of culture change and of being human, I believe that an archaeological perspective on creativity will contribute to the emergence of a general understanding of the phenomenon of creative thought.

There has, of course, been some important previous work by archaeologists on the issue of creativity, although this has largely been in terms of the closely related theme of innovation. Indeed, while I have traced the need for this book by looking at the broad academic arena in terms of research into creativity, it is also important to see where this book sits in the development of archaeological thought alone. Perhaps its root lies with a paper written two decades ago by Colin Renfrew (1978) entitled 'The anatomy of innovation'. This was a paper that both confused and stimulated me as an undergraduate, but one that asked the same basic questions that lie behind this volume—where do new ideas come from and how does the social context influence their adoption and dissemination?

Innovation was also the theme of a 1989 book edited by Sander van der Leeuw and Robin Torrence entitled *What's New?* In their introductory chapter the editors recognised a problem that continues to exist today: 'creativity has generally been studied in terms of the processes which take place to bring together the

ingredients of an idea with very little emphasis on external factors' (Torrence and van der Leeuw 1989: 6). By external factors, they are implicitly referring to the social and economic contexts in which new innovations arise. It was notable, however, that those studies within *What's New?* that addressed creative thought most directly were either ethnographic, such as Rabey's (1989) study of innovation in contemporary Andean technology, or purely theoretical and speculative. Peter Allen's exposition of the claimed new evolutionary synthesis of self-organising systems proposed that 'creativity and change find a place together with structure and function in a new scientific paradigm' (Allen 1989:277). Such statements are of little value when archaeological studies that explicitly address creativity remain lacking from the discipline. Other references to creativity were also of limited value as their meaning was opaque. Consider McGlade and McGlade (1989: 281), for instance:

> The key element in this process [of innovation] is creativity, which is regarded …not as the specialist preserve of a particular group of individuals in society but rather as representing the sum total of human potentiality—in a sense a latent species of 'noise' which may be triggered by a wide diversity of social and cultural circumstances.

As archaeologists we need to do better than this.

One of the questions Torrence and van der Leeuw asked in their introductory chapter in *What's New?* was why, in spite of a widespread belief that innovation is a universal human trait that is almost limitless, 'has this creativity previously been so underplayed in anthropology and archaeology?' (Torrence and van der Leeuw 1989:4). Two possible reasons were proposed: first, that only 'successful' innovations have ever been thought worthy of study, and consequently those innovations that either failed or did not become widely spread have been ignored; second, that success was further defined in terms of progress. A consequence of this is that changes in the functions of objects have been accorded much greater significance than changes in style alone.

Creativity does not appear to have been accorded any more attention since *What's New?* was published than before, and I suspect that there are more profound reasons for it being so underplayed by archaeologists than those that Torrence and van der Leeuw proposed. Sometimes it appears that every opportunity to avoid the issue is taken. A good example of this is how the notion of 'entoptic' images, which arise when people are in altered states of consciousness, have suddenly become the explanatory factor in so much of prehistoric rock art. Entoptic images consisting of spirals, grids and dots are supposedly universally seen by people when they enter an altered state of consciousness due to features of the human nervous system. After Lewis-Williams and Dowson (1988) argued that entoptic imagery played a significant role in the rock art of the San, almost any occurrence of spirals, abstracts or imaginary beasts in Upper Palaeolithic art (Lewis-Williams 1991; Lorblanchet and Sieveking 1997) and later prehistoric rock art (e.g. Bradley 1989; Dronfield 1995, 1996) have been claimed to be entoptic imagery. Even imagery on Iron Age coins has been interpeted in this fashion (Creighton 1995).

Now it is clear that much creative art during the twentieth century was prompted by the use of drugs to place the artists in altered states of consciousness, and that the use of drugs is ethnographically widespread and they have been widely used in historical periods and most likely throughout prehistory. But to use entoptic imagery as an 'off the peg' explanation for extremely complex designs in prehistoric art simply enables archaeologists to avoid asking questions about the human imagination, creative thought and the symbolism of prehistoric art. When reading such claims, I am reminded of how Salvador Dali (1970:97) claimed that he had never taken drugs to create his paintings because he *was* the drug—

> why should Dali use drugs when he has discovered that our world is a world of people with hallucinations, where theories, like that of relativity, add to the three dimensions of space and a fourth which is time, the most surrealist and the most hallucinatory of spatial dimensions.

Indeed Timothy Leary, the prophet of LSD, described Dali as the only painter of LSD without LSD (Dali 1970). By such an uncritical use of ideas about entoptic imagery, archaeologists are in effect finding an excuse for not addressing issues about the remarkable creative features of the human mind when in an unaltered state of consciousness.

CREATIVITY AND COGNITIVE ARCHAEOLOGY

While this book hopes to build upon the previous ideas of Renfrew and those in *What's New?* about innovation, I also view it as a contribution to the development of a mature cognitive archaeology. The term 'cognitive archaeology' was introduced during the early 1980s to refer to studies of past societies in which explicit attention is paid to processes of human thought and symbolic behaviour. Quite how this can be done remains unclear, and a diversity of approaches and studies falls under the poorly defined umbrella of cognitive archaeology (see Renfrew *et al*. 1993). These can be grouped into three broad categories, none of which has explicitly tackled the issue of creative thought.

The first are those studies that began in the late 1970s and that not only laid emphasis on the symbolic aspects of human behaviour but also adopted a post-modernist agenda in which processes of hypothesis testing as a means of securing knowledge were replaced by hermeneutic interpretation (e.g. Hodder 1982, 1986). As such, these studies began as a reaction against what was perceived, largely correctly, as a crude functionalism that had come to dominate archaeological theory, and then attempted to provide a new academic agenda for the discipline epitomised in the volume by Mike Shanks and Chris Tilley (1987) entitled *Re-Constructing Archaeology*. While the critique of functionalism was warmly received and has had a longlasting effect, it was soon recognised that the epistemology of relativism, the lack of explicit methodology and the refusal to provide criteria to judge between competing interpretations in the more extreme of these studies constituted an appalling academic agenda. Consequently, this type of cognitive archaeology now has a marginal place within the discipline.

A contrasting type of cognitive archaeology has attempted to provide an equal emphasis on symbolic thought and ideology, but sought to do this within a scientific frame of reference in which claims about past beliefs and ways of thought can be objectively evaluated. As such, this archaeology has been characterised as a 'cognitive-processual' archaeology by Colin Renfrew (Renfrew and Bahn 1991) and is broadly the academic context in which I would situate this book (although individual contributors might object, and I dislike the term 'cognitive-processual').

Cognitive-processual archaeology covers an extremely broad range of studies that can themselves be broken into two concerns. One is about cognition as representation and has involved studies of ideology, religious thought and cosmology (e.g. Flannery and Marcus 1983; Renfrew 1985; Renfrew and Zubrow 1993). Such studies argue that these aspects of human behaviour and thought are as amenable to study as are the traditional subjects of archaeology, such as technology and subsistence, which leave more direct archaeological traces. Of course, when written records are available to supplement the archaeological evidence, reconstructions of past beliefs can be substantially developed (Flannery and Marcus, in Renfrew *et al*. 1993).

The other area of cognitive-processual archaeology is about cognition as information processing. This has seen a focus on human decision making, and argued that explicit reference to individuals is required for

adequate explanations of long-term cultural change. Perlès (1992), for instance, has attempted to infer the cognitive processes of prehistoric flint knappers, while Mithen (1990) used computer simulations of individual decision making to examine the hunting behaviour of prehistoric foragers. Another important feature has been an explicit concern with the process of cultural transmission. In such studies, attempts have been made to understand how the processes of social learning are influenced by different forms of environment and social organisation (e.g. Mithen 1994; Shennan 1996). More generally, it is argued that the long-term patterns of culture change in the archaeological record, such as the introduction, spread and then demise of particular artefact types (e.g. forms of axe head), can be explained only by understanding both the conscious and unconscious processes of social learning (Shennan 1989, 1991). These two areas of cognitive-processual archaeology—cognition as representation and cognition as information processing—stand rather isolated from each other, and it is hoped that the studies of creativity within this volume help to bridge this divide.

A third category of studies in cognitive archaeology, although one that could be subsumed within 'cognitive-processual archaeology', is those concerned with the evolution of the human mind. As the archaeological record begins 2.5 million years ago with the first stone tools, it covers the period of brain enlargement and the evolution of fully modern language and intelligence. While the fossil record can provide data about brain size, anatomical adaptations for speech, and brain morphology (through the study of endocasts), the archaeological record is an essential means to reconstruct the past thought and behaviour of our ancestors, and the selective pressures for cognitive evolution.

The last decade has seen very substantial developments in this area, although significant contributions had already been made by Wynn (1979, 1981). He attempted to infer the levels of intelligence of human ancestors from the form of early prehistoric stone tools by adopting a recapitulist position and using the developmental stages proposed by Piaget as models for stages of cognitive evolution. While there were other important attempts at inferring the mental characteristics of our extinct ancestors and relatives from their material culture, such as those by Glynn Isaac (1986) and John Gowlett (1984), it was in fact a psychologist, Merlin Donald (1991), who first proposed a theory for cognitive evolution that made significant use of archaeological data in his 1990 book *Origins of the Modern Mind*. His scenario, however, has been challenged by my own work (Mithen 1996), which attempts to integrate current thought in evolutionary psychology with that in cognitive archaeology, and by that of Noble and Davidson (1996), who place greater emphasis on perception and give a more central role to language in the evolution of thought. This evolutionary category of cognitive archaeology has been, perhaps, the most active during the last decade as it has meshed with a general growth of interest in the evolution of the human mind (such as in the emergence of evolutionary psychology).

While these three categories of cognitive archaeology differ in significant ways with regard to both form and content, they also share some over-riding features that form the basis for this volume. The first is that an understanding of human behaviour and society, whether in the distant past or the present, requires explicit reference to human cognition—although there is limited agreement on quite what nature that reference should take. Second, the study of past or present cognition cannot be divorced from the study of society in general —individuals are intimately woven together in shared frames of thought (Hodder, in Renfrew *et al*. 1993). Indeed, the study of past or present minds is hopelessly flawed unless it is integrated into a study of society, economy, technology and environment. Third, material culture is critical not only as an expression of human cognition, but also as a means to attain it. It is evident that the remarkable development of culture since 30,000 years ago, and especially its cumulative character of knowledge (something that had been absent from all previous human cultures), is partly attributable to the disembodiment of mind into material culture—epitomised in the storage of information in paintings and carvings (Donald 1991). In this regard,

material culture plays an active role in formulating thought and transmitting ideas, and is not simply a passive reflection of these. Understanding this relationship between material culture and human cognition is one of the key tasks for the future of cognitive archaeology.

This book hopes, therefore, to make a contribution to the field of cognitive archaeology by continuing to struggle with the theoretical and methodological issues of how reference to the human mind can be made in archaeological interpretations—something that is *a priori* taken as a necessity. Human creativity has not been a prominent issue in the postprocessual, cognitive-processual or evolutionary categories of cognitive archaeology, the boundaries between which are, of course, extremely blurred. This book is intended to fill that gap and provide a contribution to the emergence of a more mature cognitive archaeology.

THIS VOLUME

I invited the contributors of this volume to present papers at a session at the TAG (Theoretical Archaeology Group) conference at Reading University in December 1995. Several of the invited contributors reacted with a degree of incredulity at my request for papers: "What", they asked, "can I say about creativity?" So to facilitate their own thinking, I circulated the précis of Margaret Boden's 1990 book *The Creative Mind* which had appeared in *Behavioral and Brain Sciences* in 1994 (Boden 1994b). Are the ideas in this paper, I asked, of any value to your own archaeology?

I used this article by Boden as it epitomised to me the strengths and weaknesses of the current literature about creativity. The article, and more generally the book that it summarises, had been of great inspiration in my own work, and I had found Boden's idea that creativity is about the 'transformation and exploration of conceptual spaces' to be most useful. Yet her work lacked an evolutionary perspective and draws solely on case studies of individuals (and computers!) in recent western society. So would those particular ideas about creativity be of value when one's concern is with different time periods, when specific individuals cannot be identified, and when the isolation of activity into discrete domains of 'science' and 'art' is unlikely to have existed? Well, some of the participants in the conference session chose to draw on the paper, as well as on Boden's 1990 book, while others did not. Whether they found Boden's ideas useful or not can be judged from the chapters in the book.

The chapters in this book largely follow the contents and sequence of those papers presented at the TAG meeting of 1995. It will be readily apparent to anyone with the merest acquaintance with archaeological thought during the last two decades that they include chapters by perhaps the three most distinguished theorists working in British archaeology, and who few would deny as having anything other than 'creative minds' when it comes to the practice of archaeology: Richard Bradley, Ian Hodder and Colin Renfrew. With their vast knowledge of the archaeological record, and their varied and at times markedly contrasting attempts at interpretation, these appeared the most important archaeologists to ask about the nature of creative thought in prehistory. Ian Hodder chose to address this issue in light of the long time perspective that the archaeological record provides, while both Richard Bradley and Colin Renfrew tackled specific case studies from later European prehistory.

Four other very distinguished academics were invited and agreed to contribute. Margaret Boden, a cognitive scientist, began the conference session by summarising her views of creative thought, informed as they are by her interests in artificial intelligence. Robert Layton provided a view on creative thought from the perspective of a social anthropologist. He has worked extensively at the interface between archaeology and anthropology, and as author of a seminal book on the anthropology of art (Layton 1981) appeared ideally suited to ease the move from thinking about creativity in modern western society to that in prehistory. Clive Gamble, who during the past decade has produced some of the most innovative ideas in

Palaeolithic archaeology, addressed the issue of Neanderthal creativity—which to many may sound like a contradiction in terms. Unfortunately, he was unable to contribute his paper for publication. Richard Byrne, a pioneer in the study of thought among nonhuman primates, undertook the equally challenging task of examining creative thought by apes and monkeys.

After the conference session, it became clear that a few additional chapters were required for a sufficient examination of creative thought in prehistory. For these I turned to those archaeologists who I consider are producing some of the most exciting current research within the discipline, who specialise in a wide range of chronologial periods and issues and who, I believed, would have something of value to write about creativity —again much to their initial incredulity: Mark Lake, Rick Schulting, Simon Stoddart, Carline Malone, Mary Stiner and Steve Kuhn.

With their contributions, the chapters in this book fell naturally into three groups: 'Perspectives on creativity' (Part I) from a cognitive scientist (Boden), an archaeologist (Hodder) and an anthropologist (Layton); 'The evolution of human creativity' (Part II) with a sequence of chapters, dealing with the common human/ape ancestor (Byrne), the first *Homo* (Lake), the Neanderthals (Kuhn and Stiner) and modern humans (Mithen); and 'Creativity in later prehistoric Europe' (Part III) with contributions addressing issues of burial (Schulting), architecture (Bradley), temple building and figurative art (Malone and Stoddart) and the changing role of the horse in later European society (Renfrew).

It is my impression that all of these authors do maintain an almost childlike wonder at the artefacts, tombs and buildings they deal with, whether these be Oldowan choppers or the wooden wheels of Iron Age carts. But all of them have also attempted to supplement this with an attempt to understand the phenomenon of creative thought with regard to the particular periods and issues with which they are concerned. As such, this book hopes to contribute not only to our understanding of the past, but also to the present, to the nature of human creativity which is central to the nature of being human.

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