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Editorial

Neo-Lithics special issues aim to launch fresh thoughts into research dispositions and to indicate needed research developments or agendas. This issue on *The Symbolic Construction of Community* aims to explain that – and exemplify what – we neglect of available Neolithic research potentials when cooperation with evolutionary, cognitive and neurobiological sciences is not intensified further. Joachim Bauer and Marion Benz were the perfect tandem and guest editors for this topic, supported by Trevor Watkins and the intellectual inputs to his and Klaus Schmidt’s Templeton Workshop in Urfa, October 2012.

Confined in our Neolithic foci while trying to survive in the daily struggle created by information avalanches, as well as various administrative and academic pressure and their developments, we forget that prehistoric research should be more than a mere effort in history: Don’t we have – beyond *l’art pour l’art* – the responsibility to become a partner of life sciences, to translate and make our results available to those disciplines that try to understand the human being from evolutionary, cognitive and neurobiological perspectives? This special issue of *Neo-Lithics* shares the efforts to open these new doors of archaeological cooperation and transdisciplinarity.

When talking (H.G.K.G.) about this Editorial with one of this issue’s guest editors (Marion Benz), we immediately addressed the considerable differences we see in the formal and informal ways Neolithic symbolism of the Northern and Southern Levant is expressed. We found ourselves “translating the Neolithic” when we became tempted to trace this feature through the two large regions’ history, and to recognize these differences even in their present-day ideological structures and dispositions. We stopped this brain-storming, but this left us with the question: can such basic regional differences in psycho-social imprints be excluded for the Neolithic?

Hans Georg K. Gebel & Gary O. Rollefson

Preface

Marion Benz and Joachim Bauer

When in 2010 Hans Georg K. Gebel, co-editor-in-chief of *Neo-Lithics*, asked us to contribute to a special issue on *Conflict and Warfare in the Near Eastern Neolithic*, we didn't realize that this would be the beginning of a fascinating cooperation. At that time the focus of our research was the opposite of warfare: one of us (M.B.) was dealing with the question of how people created cooperative structures as mobile bands became sedentary; and the other (J.B.) was attempting to understand, from a neurobiological and psychological perspective, why humans cooperate (and why they so often don't). Given this background, we decided to jointly analyse how, at the beginning of the Neolithic era, humans managed to reduce sharing to a circumscribed group and accepted a certain degree of social inequality. How did they cope with life in permanent villages, with its increased potential for aggression and alienation, without constant conflict?

Although we both, for different reasons, were not then able to contribute to the *Conflict and Warfare* issue, the above mentioned questions remained much in our minds. We felt that the impressive figurative art of northern Mesopotamia was a promising test for our theories. The suggestion that we guest-edit this *Neo-Lithics* special issue gave us the opportunity to develop some of our ideas.

Neurobiological research of the two last decades has prepared the ground for this type of trans-disciplinary approach by demonstrating the reciprocal dialectical influence of the brain's matrix with environment, socialization, and praxis. Consequently only by considering both culture and biology can we gain a more holistic, synthetic understanding of the evolution of social and cognitive dynamics, which are recorded so fragmentarily, sometimes virtually invisibly, in the archaeological record. Archaeology must include all aspects of anthropology – biological, psychological, social, and cultural – if we wish to cross the threshold from mere description of material to interpretation and from subjective phenomenology to an empirical cognitive archaeology in which the focus is upon humans and their being-in-the-world. Although such a complementary approach has already been established in palaeoanthropology (e.g., Mithen 1998; Donald 2001; Gowlett *et al.* 2012) concerning the advent of modern *homo sapiens* or, slightly later, the 'Big Bang of Art' of the Upper Palaeolithic, these trans-disciplinary approaches are all-too-often ignored, or at best just an 'epilogue', with regards to the transition to Neolithic lifestyles.

However, there are exceptions. For many years Trevor Watkins has advocated a neurobiological evolutionary approach for the understanding of neolithisation in the Near East. The suggestion by Hans Georg K. Gebel that Trevor Watkins write a

second keynote was thus an invaluable enrichment of the present issue. Trevor Watkins' *longue durée* perspective embeds archaeological data into the much wider process of human evolution, and he suggests niche theory as a powerful heuristic device. In cooperation with the excavator of Göbekli Tepe, Klaus Schmidt, he has initiated the project "Our place: our place in the world", funded in 2012 by the John Templeton Foundation. The invitation to participate in the kick-off conference of that project in Şanlıurfa and to visit Göbekli Tepe was an outstanding opportunity for both of us, for which we are very grateful to the organizers and, of course, also to the John Templeton Foundation. It gave us the chance to reconsider some of our previous ideas and to advance the work on the *Neo-Lithics* special issue, for which Trevor Watkins suggested the title *The Symbolic Construction of Community*, which alludes to an inspiring booklet published in 1985 by the anthropologist Antony P. Cohen. Because of our profound admiration for this author's enlightening analyses of the social aspects of symbols, we greatly appreciated this proposal. Our goal is to advance further along this track and promote an evolutionary and media-psychological approach to the interpretation of early Holocene symbolism.

We therefore not only reconsider processes similar to those discussed in the *Conflict and Warfare* issue – though from the opposite, but complementary, perspective of social dynamics and conflict management – we also hope to fulfil the call of Lee Clare's and Hans Georg K. Gebel's (2010: 3) introduction for the enlargement of the community by disciplines hitherto neglected in Neolithic research. It is a great honour for us that celebrated scientists from such diverse areas as psychology, biology, ethnology, ethology, sociology and archaeology have accepted our invitation to comment on our keynotes. We are very thankful to them for sharing their ideas with us and for their inspiring comments that have encouraged us to add some thoughts about the unconventional and unexpected relationship between archaeology and neurobiology. The different – for most archaeologists new – perspectives which the contributions of this issue add to the ongoing discussion have allowed us to explore in a more multi-faceted way than ever before one of the most fundamental social changes with which humans have ever had to cope.

In closing, we wish to thank all those excavators who do not spare any effort to bring all these invaluable treasures to light. Without their painstaking work, it would never have been possible to get even a glimpse of this exciting but puzzling past which we here are attempting to see synthetically. Our thanks also go to Craig Crossen, Lee Clare and Deva Jebb-Albaba for the thoughtful editing of our texts, and to the *ex oriente* team, especially Dörte Rokitta-Krumnow, for her ex-

cellent work in the production of this issue. Last but not least, we cordially thank Hans Georg K. Gebel for his confidence in bestowing upon us the guest-editorship, for his sympathetic and always encouraging support, and for knotting strings where hitherto we had not suspected there could be any network. We'll appreciate any comments, and we will be happy if some of the fascination which we have felt, and still feel, for the topic will be passed on to others and thus inspire further exciting discussions.

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Neolithisation Needs Evolution, as Evolution Needs Neolithisation

Trevor Watkins

Two points in particular made by Jacques Cauvin (1994, 2000) struck me and have stayed with me: he wrote that neolithisation was driven by a ‘psycho-cultural’ transformation in the way that people imagined their world; and he repeated the question that Braidwood had asked, why did neolithisation (for Braidwood, the term meant the adoption of crop cultivation and animal herding) happen around the beginning of the Holocene, and why not earlier. For ‘psycho-cultural’, substitute the term cognitive-cultural, meaning the way that humans can make and ‘read’ symbolic cultural representations (among the most familiar to us might be spoken or written statements, road signs, or symbols of religious allegiance). And Cauvin’s repetition of Braidwood’s question ‘why then? why not earlier?’ implied that the cognitive-cultural facility with symbolic representation was evolved among people at that time, as a stage in a long-term evolutionary process.

For many of us, neolithisation has become a multi-disciplinary field of research in its own right, and we tend to turn inwards on our subject and the community of our colleagues, paying little attention to where our field of study fits into the wider scene. If neolithisation is a complex developmental process, and if prehistoric archaeology is a scientific enquiry, we should be able to set the neolithisation process within the long-term processes of human history. However, our Neolithic field of research sits in the middle of a strange cognitive dissonance. It is a double bind, in that it operates in both directions. On the one hand, we, together with archaeologists and historians working on periods later than the Neolithic, generally disregard the theories of those working on the longer term story of human evolution; there has been little attempt to link our Neolithic narratives into the long-term story of human prehistory. And, on the other hand, the multi-disciplinary battalions working on varied facets of hominin evolution seem to have decided that the conclusion of their story is reached either with the emergence of our species, *Homo sapiens*, or when humans began to produce two- and three-dimensional representations at the beginning of the Upper Palaeolithic about 40,000 years ago.

In the last 25 years the story of human evolution has expanded beyond the simply biological, and more attention has been focused on the evolution of the human brain and the emergence of what we know as the human mind. We are told that we humans today are scarcely different from the earliest *Homo sapiens* of 150,000 years ago in terms of the shape and form of the brain. But over that time-span *Homo sapiens*’ cognitive and cultural faculties have evolved quite spectacularly. Research in the cognitive evolution of hominins has developed rapidly, and general knowledge of some of its recent discoveries and hypotheses are the matter of

popular science paperbacks (Pinker 1994, 1998; Mithen 1996, 2005; Dunbar 1997, 2004; Plotkin 1997, to name the most obvious examples). At the centre of the evolutionary theories concerning cognition and the mind is the recognition that the evolution of human cognition is inter-dependent with the evolution of human societies and modes of communication seen, for example, in the focus on the evolution of language (e.g. Pinker 1994), the labelling of the process by Robin Dunbar as the evolution of the ‘social brain’ (Dunbar 1997, 1998, 2003), the huge contribution of Merlin Donald (1991, 2001) on evolving modes of communication and the human mind, and the importance of cooperation and altruistic behaviour (e.g. Tomasello 2009; Pagel 2012).

We are surely wrong to accept that *Homo sapiens* was already in possession of a ‘modern mind’, or ‘modernity’, by 40,000 years ago, implying that no significant cognitive and cultural evolution has occurred since that time. That perception has gathered a good deal of publicity beyond the group of academic researchers who have proposed and refined what has sometimes been called ‘the human revolution’ (Mellars and Stringer 1989; Stringer 1999; Mellars *et al.* 2007). McBrearty and Brooks (2000) showed that the explosion of art in the European Upper Palaeolithic is an illusion created by the arrival of *Homo sapiens*; they show that there was a long prehistory of symbolic representation in Africa (and see now Henshilwood and d’Errico 2011). From the opposite chronological direction, Colin Renfrew has argued forcefully that the idea that a fully modern mind had emerged by 40,000 years ago is at odds with the facts: essential characteristics of ‘modern’ human life (for example, living in large, permanent, settled communities, and the ability to create ‘institutional facts’) emerge only in the Holocene (Renfrew 1996, 2008; Renfrew *et al.* 2009). It seems to me self-evident that the level of symbolic representation and symbolic behaviour that we now know from the Neolithic of southwest Asia is a scale order different from what we see in the Upper Palaeolithic and earlier: the Neolithic represents a qualitatively different situation, and not simply a greater quantity of the same kind of Upper Palaeolithic things.

We are wrong if we think that evolution is of little or no significance for humans in geologically recent times. Recent research has shown that genetic mutations have been accumulating more rapidly than ever before, especially in the Holocene period (Cochran and Harpending 2007). Lactase persistence (the adaptation that allows adults to continue to digest milk and milk products) and alcohol tolerance, for example, have evolved in only certain populations, in consequence of the cultural adaptation whereby people domesticated certain species and began to use their

milk (Gerbault *et al.* 2011), and began to use cereals or cereal products for brewing beer.

If we wish to carry the human evolutionary story forward, it is in the area of human cognitive abilities with culture that we should concentrate, rather than the individual brain and mind. A key characteristic of the brain of *Homo sapiens* is its plasticity. The ability of the human infant to use its social environment and learn from an expanding circle of parents, siblings, and community is unique, forming the ‘wiring’ of neural networks as the infant brain doubles in size (labelled the ‘cultural intelligence hypothesis’, *e.g.* Herrmann *et al.* 2007). That plasticity, which continues through human childhood and adult life, is closely coupled with an ability to learn, based on an evolved capacity for cultural, or social, learning (Boyd *et al.* 2011; for a book-length treatment Sterelny 2011). The extraordinarily rich and complex cultural knowledge in which we today are immersed is only possible because our brains have evolved to enable us effectively and efficiently to learn, transmit, offload and share such knowledge. It has developed through a long, and accelerating, process of gene-culture co-evolution (Boyd and Richerson 1985, 2005; Feldman and Laland 1996). Social and cultural learning are not unique to hominins, since the apes and some other primate species show various (very low) levels of capacity in this regard. It is therefore a difficult matter to define to what degree these learning capacities had evolved at any particular point in the evolutionary history of the hominins, or within the relatively brief (in evolutionary terms) history of *Homo sapiens*.

Another aspect of modern humans that is critically important to our functioning, and which has certainly evolved, is what has variously been called the extended, embodied, embedded or distributed mind. In other words, our minds are not confined within the brain. How to describe and define (and name) this phenomenon intrigues philosophers (Clark 1997, 2008; Dennett 1997, 2000; Clark and Chalmers 1998; Sterelny 2010). As with the process of gene-culture co-evolution in the previous paragraph, so with shared cultural memory and material culture media, the challenge is to define the stages in the process, and to calibrate them against our dated archaeological and palaeo-anthropological data (for which Mithen 1996 provides the model). Much of the evolutionary process of shared cultural memory and material culture media (which includes writing, printed books, and electronic media) has been within the lifetime of our species, *Homo sapiens*, and recent history shows us clearly that it has accelerated rapidly within the last ten years, five centuries, or twenty millennia.

These evolved characteristics of our contemporary human cognition and culture – extraordinary plasticity of the brain, facility with cultural learning, facility with systems of symbolic representation in material cultural media, and what is variously called the extended or distributed mind – are recognized as essential for living in any modern community. I have argued in a number of papers that they were present 12,000 years ago, at the beginning of the Neolithic, but not present in the

same way or to the same degree in earlier times, for example, in the Upper Palaeolithic. These capacities were evolved to the high degree that we can recognize because they were essential to the building (both metaphorically and literally) of the new large, permanently co-resident communities that developed through the Epipalaeolithic and early Neolithic (Watkins 1992, 2004a, 2004b, 2006, 2009, 2010). They were necessary to enable people to share the social or cultural memory that constituted their social identity of the community through collective actions, which were often ceremonial or ritual in performance (Watkins 2012, in press a, in press b). It should be remembered that people sustained communities of several hundred, and in some cases several thousand, individuals that, although changing and developing, remained stable over many centuries. These autonomous communities functioned, so far as we can see, without devolving power, authority or decision-making to a socio-political hierarchy, implying that all individual members were active participants in the community in ways that are unfamiliar to most of us. And we should also not forget that these Epipalaeolithic and early Neolithic communities actively engaged in local, regional and supra-regional networks of sharing and exchange that we can recognize archaeologically, although we do not understand their functioning and purpose (Watkins 2008).

Much of the exploration of ideas such as gene-culture co-evolution, the social brain, and the distributed mind postdates Mithen’s landmark book (Mithen 1996); the diverse research in human cognitive and cultural evolution, developmental and social psychology, neuroscience, brain, mind and consciousness is moving very rapidly. Another sub-field of evolutionary research, niche construction theory, is a very recent development, emerging among biological scientists little more than a decade ago (Odling-Smee *et al.* 2003, its first monograph-level treatment), and rapidly gaining attention and support among evolutionary biologists. It seems very relevant to any discussion of the evolutionary processes within neolithisation. The theory is deceptively simple, but it changes the way that the evolutionary process is modelled. Organisms in many species (humans included) construct for themselves niches of various forms (earthworms modify their immediate soil conditions, birds, bees, ants and termites make nests, rabbits and puffins make burrows, beavers make dams and lodges). The niche becomes a micro-environment which may to some extent exclude pressures from the general environment, and at the same time may act as the effective environment within which the next generation of the organism is born and grows, thereby affecting the selective pressures on the population’s evolution. In short, within the constructed niche evolution becomes a two-way process, in which the organism modifies its environment, and the niche constitutes the environment that exerts selective pressure on the organism in a continual cycle across the organism’s generations.

The originators of the niche construction theory quickly realized its application within human evolution

in the form of cultural niche construction (Laland *et al.* 2001, 2010; Laland and O'Brien 2010, 2011; O'Brien and Laland 2012). While recognizing that humans have used cultural means to construct niches, they have been mainly interested in the biological implications of, for example, the domestication of animal species, and the further implications such as the acquisition of a degree of immunity to diseases that have transferred to humans from their domesticated animals, or the acquired tendency for lactase persistence or alcohol tolerance. Some anthropologists and evolutionary scientists have begun to explore the cultural implications of cultural niche construction (Mesoudi *et al.* 2006; Mesoudi and O'Brien 2008a, 2008b; Odling-Smee and Laland 2009; Arbib 2011; Collard *et al.* 2011; Gintis 2011; Kendal 2011), but the fullest engagement with the subject is to be found in Kim Sterelny's recent book (Sterelny 2011). He develops an account of the complex of positive feedback loops within the human cultural niche that have allowed groups to develop, sustain and transmit from each generation to the next highly complex bodies of cultural knowledge. Some have referred to the adaptation of the environment in niche construction as 'ecological engineering', often producing an 'ecological inheritance' for successive generations. Sterelny (2003: 147) therefore refers to cultural niche construction as 'epistemic engineering', and in that regard he might easily be joined with those who write of 'cognitive' niche construction.

Cognitive niche construction represents a further extension of niche construction theory, which seems to me to offer very rich potential for exploring the nature of Neolithic communities (*e.g.* Clark 2006; Bardone and Magnani 2007; Pinker 2010). In this perspective, our cognitive activities are not internal processes that occur within the isolated brain; rather, embedded within our cultural and cognitive niche, our minds extend into the material world, exploiting those external cultural resources that can enable us in the process of deciding, thinking about things, or using things. Merlin Donald encapsulates the central role of culture in our cognitive abilities thus: 'Culture is the store-house of crucial replicative information for certain aspects of our collective cognitive matrix, without which we cannot reproduce the cognitive systems by which we now function as a species. The memory repositories of culture allow our species to transmit across generations the codes, habits, institutional structures, and symbolic memory systems that are needed to operate a significant portion of the processes of modern cognition in human culture' (Donald 2000: 20). When Karola Stotz describes this as the 'ontogenetic niche', she seeks to show that the 'cognitively plastic human child is immersed in a rich cognitive-cultural niche that scaffolds the development of typically human cognitive abilities not just superficially via association but with architectural consequences' (Stotz 2010: 496).

How did modern humans come to be this way? A difficulty arises because what is described by some of these authors is how cultural or cognitive niche con-

struction applies in principle, that is, as illustrated in present-day western contexts or in ethnographically recorded recent contexts. Another difficulty arises because ideas such as cultural or cognitive niche construction are very new and are not yet clearly defined. A third difficulty is that the functioning of the cultural or cognitive niche and its evolutionary progress was clearly a very complex process; Sterelny (2011) describes it as involving a number of inter-dependent positive feedback loops. Working out the evolutionary processes that have generated the kind of cognitive niche with which we in today's western world are familiar, or where the process stood and how it might apply in the Neolithic, are tasks that await attention. The task will not be easy, but it has the potential to be very productive and rewarding.

One of the positive feedback loops almost certainly involved in the evolution of the cognitive niche operates in the inter-dependence between the demographic scale of the cultural community (that is, the number of those participating within a single cultural community) and the complexity and sophistication of the cultural capital 'owned' by a cultural community. There is good evidence that the size of the social group, or population unit, is important for the storage and transmission of cultural knowledge (*e.g.* Shennan 2000, 2001; Richerson *et al.* 2003; Henrich and Henrich 2006, 2007; Henrich *et al.* 2010). This is the essential content of Sterelny's book (2011), where he argues persuasively that there is a series of positive feedback loops: in particular, larger population units (the social size of the cultural niche) ensure the safer, more stable conservation and transmission of greater bodies of cultural knowledge, and encourage more helpful innovations, while a greater body of cultural knowledge, a more sophisticated cultural toolkit permit further population increase. Conversely, there is evidence of small and isolated cultural communities that have shrunk in size and have lost cultural knowledge (*e.g.* Henrich 2004).

Of course, the benefits of rich, effective and robust stocks of cultural capital and the capacity to adapt and innovate do not come without costs. And the costs of increasing the size of community beyond that level reached around 50,000 years ago were the demands of greater cooperation and trust among people who do not know each other well, and the increased risks of cheats and free-riders (Henrich and Henrich 2007; Tomasello 2009; Sterelny 2011: Chap. 5). Living together in the cognitive-cultural niche of a permanently settled community of several hundred other individuals required of everyone a very high degree of commitment to cooperation and altruistic behaviour. And at the same time everyone was required to accept on trust that all the others in the community to whom they were not related, did not know as neighbours, and did not work with day by day, were equally committed to cooperation and altruism for the good of the community.

Larger population units imply developed norms of behaviour and social institutions. While 'hands-on' apprentice learning, as Sterelny describes, was very well

suiting to the needs of sustaining knowledge and skills in a range of areas of practical life, norms of behaviour and institutions – ‘institutional facts’, as they are described by Searle (1995, 2010) – require new and more sophisticated means of representation, communication and intergenerational transmission. It seems to me that the dramatic changes that we see in the Epi-palaeolithic and early Neolithic of southwest Asia in terms of subsistence economy, population density, large, permanently co-resident communities, and a whole range of symbolic cultural phenomena challenge us to interpret them in terms of the evolutionary theories that have been outlined here, especially the idea of the emergence of the cognitive-cultural niche construction.

In sum, there is a great deal of potential to expand and develop ideas about the evolution of the cognitive, cultural and social skills beyond the stage that had been reached at the time when *Homo sapiens* was expanding out of Africa and rapidly colonising Asia and Europe. Bringing together these evolutionary theories with our archaeological knowledge of the Epipalaeolithic and Neolithic of our region by means of new interdisciplinary research partnerships will open the way to a new and deeper understanding of the processes at work in the process that we know as neolithisation. In doing so, we shall be contributing to the extension of evolutionary theory, and particularly (cognitive, or cultural) niche construction theory. At the same time, we shall be bringing evolutionary theory into the story of the development of the social, cultural and political forms of historical times. Progress in these enquiries will therefore not only benefit our ability to understand the processes operating in the Neolithic, the period in which we have invested our research; it will also contribute to the expansion of evolutionary theory, and its applicability to recent human history.

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Symbols of Power – Symbols of Crisis? A Psycho-Social Approach to Early Neolithic Symbol Systems

Marion Benz and Joachim Bauer

Introduction

In this keynote paper we will argue that the symbolic repertoires of early Neolithic societies in Northern Mesopotamia are consistent with communities in a liminal stage. The ‘eternal’ fixing of symbols in stone, as well as the establishment of visible territorial markers, are interpreted as signs of communities beginning to free themselves from nature, from natural mutability (‘domestication of time’), and from nature as sole creator of communal space (‘domestication of space and of social behaviour’), though daily life continued to be dominated by the presence of animals. The increase of public display and the ‘petrification’ of ritual behaviour points to the importance of symbolic devices, and indirectly to the obvious need for strengthening social networks, that were in danger of disintegrating into conflict, violence, or even war.

Symbols are efficient media for creating, enhancing, and fixing communal identities and for influencing individual as well as social behaviour (Cohen 1985). The possibility of manipulating cognition, memory, and behaviour by the determination and use of ritual (symbolic activity), of architecture (spatial symbolism), and of symbols has been demonstrated by neuroscience. This influence can either be overt or it can be subliminal and subconscious, as in priming¹ (Edelson *et al.* 2011; Doyen *et al.* 2012). The earliest known intensive standardization and public demonstration of symbolic systems in the Near East appeared during the early Holocene (~ 9650-8300 calBC), and coincided with increased territorial commitment and the domestication of plants and animals. For an in-depth understanding of the socio-ideological changes at the transition from foraging to farming it is therefore essential to understand the characteristics of this symbolic system.

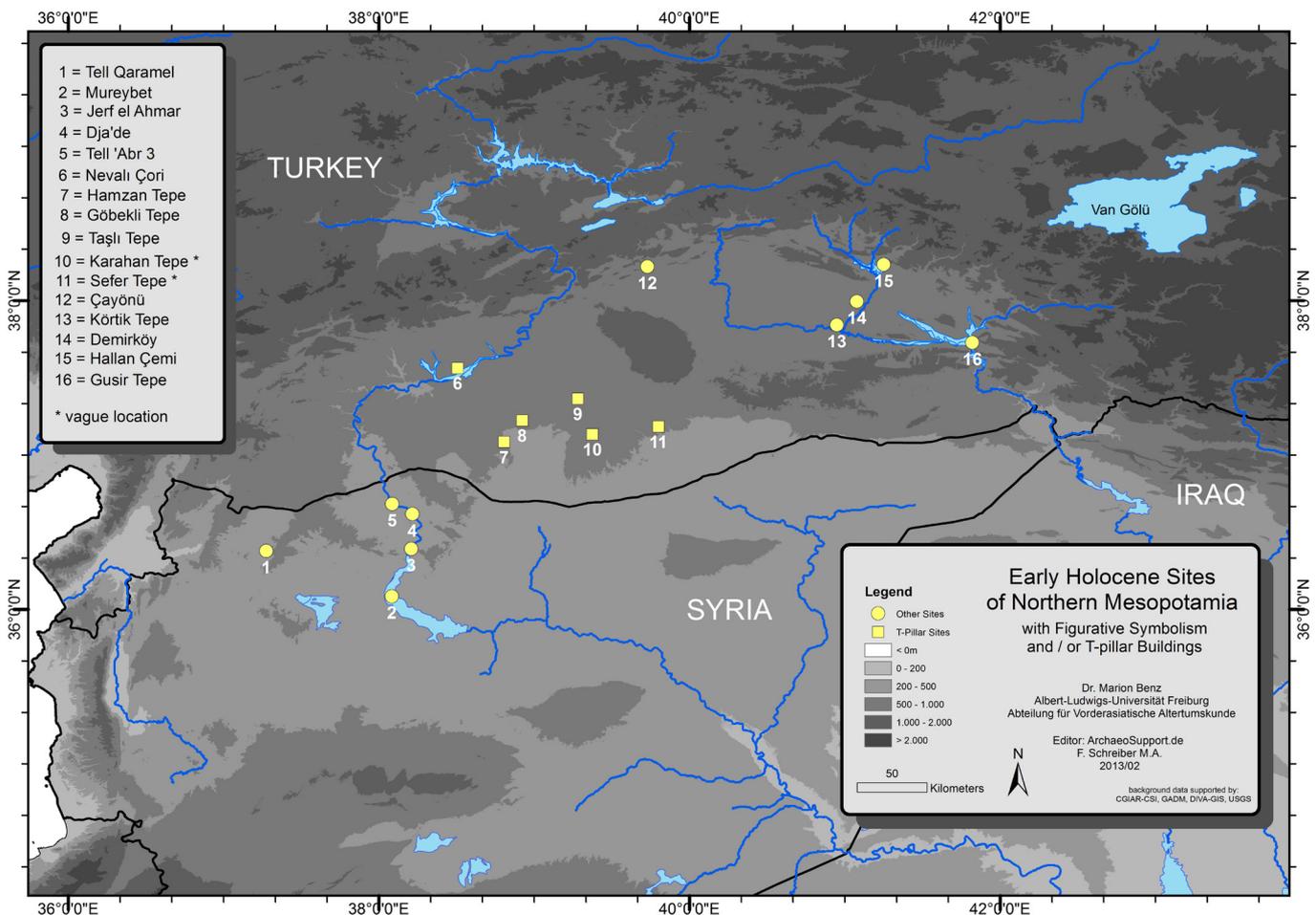


Fig. 1 Early Holocene sites of northern Mesopotamia with figurative symbolism and/or T-pillar buildings mentioned in the text (map: design MB; editor: ArchaeoSupport F. Schreiber).

In the 1960ies, Robert Braidwood was one of the first to emphasize the cultural factors triggering the adoption of farming. His considerations added aspects of human creativity and agency to the then-prevalent focus upon extraneous causes and launched the socio-religious theories about neolithisation.

In his earlier works, Jacques Cauvin considered social changes as decisive (1978: 77): '[...] For the first time, then, some communities avoided their fission and found a solution how to cope with the contradictions which traversed them by discovering new types of social relationships' [translation MB]. In his book 'La naissance des divinités' (1997), Cauvin extended his thesis to religious changes. Brian Hayden (1992), following Barbara Bender (1978), argued that agriculture was initiated by power-seeking individuals who wanted to exploit surplus production for 'empowering feasting' (Dietler 2006). Since the 1980s theories based on social and ideological changes thus enriched former environmental determinism, culminating in such influential theoretical publications as e.g. Ian Hodder's 'Domestication of Europe' (1990).

The figurative representations and special buildings excavated at 'Ain Ghazal (Rollefson 1986), Çayönü (Özdoğan 1999), Hallan Çemi (Rosenberg 1999), and Nevalı Çori (Hauptmann 2011), followed by the discoveries of rich symbolic repertoires at Göbekli Tepe (Schmidt 2011), Jerf el Ahmar (Stordeur *et al.* 2000), 'Abr 3 (Yartah 2010), Tell Qaramel (Mazurowski and Kanjou 2012), and Körük Tepe (Özkaya and Coşkun 2011), seemed like 'empirical proof' of the socio-ideological theories.

So far, however, interpretations of the figures have been based either on retro-projection of historical or recent meanings, or on semiotic approaches. But text-analytic methods and structuralism have been criticized in anthropology and countered by recent iconic theory (Boyer 1993: 16-19; Boehm 2010: 45-52). Classical approaches neglect on the one hand mediality and on the other the ambiguity and intersubjectivity of symbolic meanings (Cohen 1985). The ways in which symbols are selected and represented (*repertoire, materiality, attitude*), how they are propagated (*materiality, standardization, ubiquity*), and their adaptation to other contexts, are processes which illuminate the organization of social and ideological systems. Nevertheless as of yet these processes have not been studied systematically.

We therefore argue for an approach which, first, reconstructs the contexts in which these symbols were used and, second, analyzes the mediality and emotions inherent in the symbolic systems. Hopefully this will help us understand the ideological changes within these societies from their own ('emic') perspective. We accordingly suppose that the figures were more than mere signs, but symbols or indexes / metaphors (Wagoner 2010: 13-14).²

We consider the following arguments and suggestions a road map to several interconnected ways for gaining a 'dense description' (Geertz) of early Holocene symbolism. Given the similarity of all human (*homo*

sapiens sapiens) minds, the advances in social neurosciences can no longer be ignored in the interpretation of prehistoric imaginary.

Material and Method

The images upon which our arguments are based were compiled during the SIGN Project (Benz in press) and the work of both authors. Our approach owes much to modern ideas of iconicism (Boehm 2010), to theories of media, and to studies of materiality (Boivin 2008; Gillespie 2010; Nünning *et al.* 2010; Wagoner 2010). In contrast to earlier approaches, which sought for the symbolic meaning of the figures, our focus is on the praxis, in which these representations are used and on their emotional impact.

For example, snakes are ubiquitous symbols during the early Holocene but their symbolic meaning probably would have differed from society to society. So the search for a precise universal meaning is destined to fail from the start.

We are interested in the media and contexts in which objects were presented, in their propagation and frequency, and in their relationship to their environments. Additionally, our emphasis is on essential qualities of the representations and how they were pictured. Images turn absence into presence and vice versa, thereby creating a surplus of sense and of sensation (Boehm 2010: 211). Pictures thus play an important role in socialization and in the documentation and transmission of knowledge. Picturing an object or scene also suggests control and mastery over that object or situation – or at least the desire for control and mastery.

Imagination and emotions, though dependent on socialization and on personal experience and character, can be guided in certain directions by pictures. In other words, the impact of figurative themes is not only determined by their symbolic meaning, but also by sensations they evoke and by their materiality (Benz in press). This allows us to consider the intentions and influences of the symbolic repertoire of early Holocene societies in the absence of written sources.

Our study has two basic theoretical assumptions:

- 1) There exist *anthropological universals* which encourage certain decisions and actions, and make others less probable. Though human decisions and actions will never be predictable, recurring patterns allow the formulation of probabilities concerning behaviour and emotional reaction.
- 2) We are convinced that *materiality matters* in two special ways:
 - a) We expect some materials to favour or constrain certain behaviours; but we do not see agency in inanimate objects unless humans ascribe agency to them (Boivin 2008; cf. Knappett 2005).
 - b) The choice of certain materials can be an indicator of behaviour, skills, and concepts.

Our approach had theoretical input during the Templeton Foundation Conference organized by Trevor Watkins

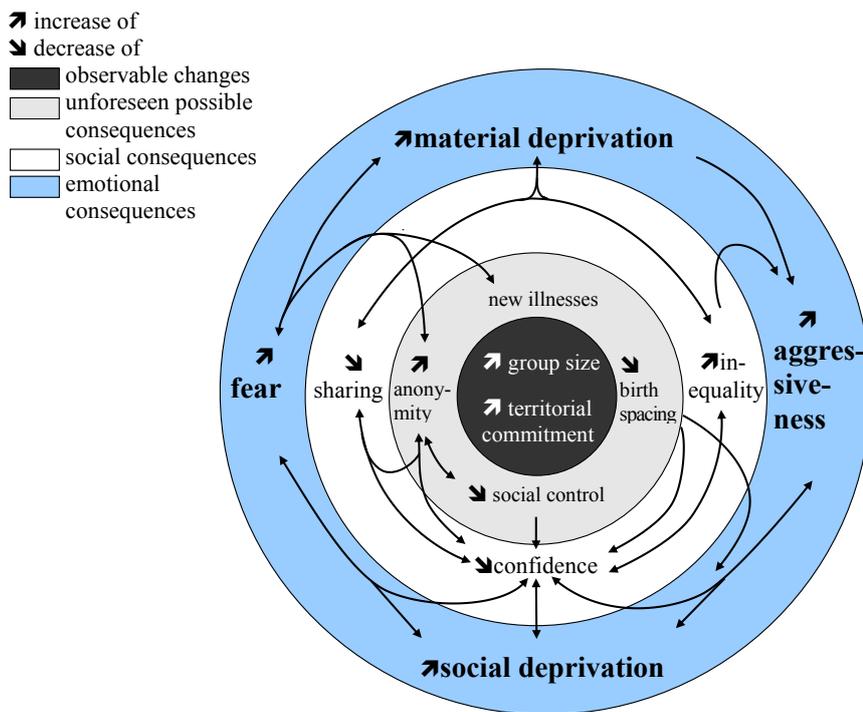


Fig. 2 Possible social and mental consequences of increased sedentarism.

and Klaus Schmidt (Watkins 2012), and we hope that it will continue the discussions of the conference and the interdisciplinary approach promoted by Trevor Watkins since many years (*e.g.* Watkins 2005, 2011).

Because of the uneven distribution of figurative representations, with the central and southern Levant relying on different, non-figurative symbolic systems (Benz *in press*), we concentrate on the sites mentioned in Figure 1. This collection does not pretend to be exhaustive, but tries to compile evidence for an ‘emic’ interpretation of the symbolic system.

The Context

The transition from mobile to sedentary life was a major challenge for social interaction (*e.g.* Kuijt 2000; Gebel 2010a, 2010b). In the archaeological record of the Near East an increase in settlement size and a concentration of settlements near perennial water sources during the early Holocene can be observed. Ethnographic analogies suggest that a reduction in mobility may have led to an increase in fertility and a reduction of birth spacing, if the diet is adequate. Therefore if groups did not split, an increase in population densities would be expected (Benz 2000). However, closer cohabitation not only of humans, but also of humans with their domesticated animals, might have caused an increased frequency in diseases and the appearance of hitherto unknown diseases.

In these larger permanent villages traditional expectations of prosocial behaviour and egalitarian ethos could no longer be met (Gebel *in press*). The enhanced commitment to territory and the increased population densities demanded new definitions of sharing. Generalized reciprocity – that is, shared access to land and resources – was reduced to select groups.

Also, in larger groups daily face to face interactions between individuals became less frequent. Since sharing is not a given fact but a learned behaviour, it is undermined when social control diminishes. So in larger communities incidents of individual social apostasy increased (Benz 2000: 124-128, 2010). As a consequence, confidence in ‘others’ might well have been reduced.

Moreover, increasing labour specialization and differentiation might have resulted in the increased prestige and rewarding of individuals with special skills and knowledge. Possible psychological consequences of the above described changes can be modelled by analogy with the data of the social neurosciences (Fig. 2; Bauer 2008, 2011; Krohne 2010).

In a self-reinforcing process, social and material deprivation (a consequence of the reduction of generalized reciprocity) can lead to an increase in aggression and fear. Fear of hitherto unknown diseases might have increased the general fear of the ‘other’. Mistrust fosters the projection of the cause of disease, and of other misfortunes, onto other persons.

These social challenges probably had physical as well as psychological consequences. For example, distrust inhibits the flow of oxytocin, which promotes the capacity for empathy, and increases the flow of testosterone, which is well-known for enhancing the level of competitiveness (Domes 2007; Bauer 2011: 188; van Wingen *et al.* 2011). The willingness to cooperate then probably decreased, while the potential for aggression increased. This mechanism is dialectic, because competitive situations also increase the amount of testosterone in male individuals (Mazur and Booth 1999).

The modelled consequences are not forcing, but if they appeared, new concepts of social interaction had to be found. The symbolic system of Northern Mesopotamia is one way how this could have been managed.³

The Symbolic System

Boyer (1993) has convincingly elaborated three themes that should be analysed during ethnographic fieldwork to describe religious symbolic systems: 1) cognitive concepts, 2) adoption of knowledge, 3) ritual action. A separation of religious and social domains would be an anachronism for prehistoric concepts, so it is sensible to adopt Boyer's classification to the whole symbolic system – what he advocated for himself (Boyer 1993: 25).

Our description of the symbolic system starts at a point zero of knowledge as we neither have any information about the cognitive concepts of these communities, nor on the processes of adoption and transmission. However, a study of the figures which were represented, their frequency, and their relationships can help us determine something about their social and ritual significance.



Fig. 3 Relief of a lion or panther, in a crouching position on pillar P27, Göbekli Tepe, southeastern Turkey. Photo courtesy of the German Archaeological Institute, Nico Becker.

Animals

An increase in figurative designs can be observed in Northern Mesopotamia with the advent of the early Holocene. The most important types of animals are:

1. Animals that are powerful: felines, such as panthers and lions; canoidea like fox, dogs, and wolves⁴; boars; and bulls. A bear might be represented on the so-called totem pole at Göbekli Tepe (Schmidt 2011: Fig. 35).
2. Poisonous animals like snakes, scorpions, and centipedes.
3. Animals inhabiting two different environmental milieus simultaneously:
 - a) Birds, which are creatures of both the earth and the air, in the form of ducks, cranes, and eagles or vultures.
 - b) Reptiles, which dwell on the earth and in water, particularly snakes and lizards but possibly also turtles / tortoises.
4. Spiders and flying insects.
5. Less frequent are goats and ibex, gazelle, onager and sheep.

Unique to Körtik Tepe is a representation of a deer and a stylized design of a creature interpreted as a larva (Özkaya and Coşkun 2011: Figs. 31-32).

Large animals were most often shown in profile. In contrast, lizards, scorpions, insects, and spiders were represented from the top. However there are some exceptions. For example, a bull at Göbekli Tepe is pictured in profile but with its head *en face* (e.g. Schmidt 1999: 15). Whereas the top-down perspective for the small animals seems to be natural, the frontal view of the bull's head implies the intention to show both horns. Moreover, its head is lowered between the shoulders, as if in preparing to charge.

This aggressive attitude is paralleled by a high relief of a feline on a stone pillar of Göbekli Tepe (Fig. 3; Schmidt 2011: Fig. 28). Several sculptures of powerful animals were originally built into the walls (Schmidt 2008: 30-31). Their heads protruded into the inner space, thus enhancing the threatening atmosphere of that area. The aggressiveness of these animals is expressed by their bared teeth, their powerful paws, and the long tusks of the boars. The bodies of the lions and boars are always presented in a forcefully realistic style. Many of the representations of powerful animals, and of humans (s. below), are ithyphallic.

By far the most frequently shown poisonous animal is the snake (Figs. 4-6). A clue to the interpretation of snakes is given by a stone sculpture from Nevalı Çori on which a snake is shown crawling up the back of a human head (Fig. 6). The ominousness of this scene is obvious, given the poisonous nature of many snakes of south-eastern Anatolia; but its exact meaning is not obvious.

Birds are pictured either abstractly or realistically. A very common abstract bird design from Tell 'Abr 3 to Körtik Tepe displays an oval to rectangular body with outstretched wings and a small beak (Fig. 4.3;

Coşkun *et al.* 2010: Fig. 7; Özkaya and Coşkun 2011: Fig. 17). Realistic bird representations were found at Jerf el Ahmar on a small pebble (Fig. 4.10, Stordeur *et al.* 1996), and in two sculptures of raptors with a conspicuous beak that were built into a wall and partly protruded into the room (Stordeur 2010: Fig. 15.1). This emphasis on the beak is repeated on a small figurine from Göbekli Tepe (Schmidt 2011: Fig. 16) and by the large bird sitting on top of a human head on a stone pole discovered at Nevalı Çori (Hauptmann 2011: Fig. 24).

Unambiguous representations of vultures appear during the early Holocene only at Göbekli Tepe (Becker *et al.* 2012: Figs. 20, 23). On Pillar 43 one is depicted over a headless ithyphallic human above an oversized, long-necked bird, probably a goose or swan. The pillar is broken, so it is not entirely clear that the man is sitting on the latter, but he holds his right arm up as if trying to grasp its neck. The vulture balances a disc on his left wing, the meaning of which is obscure. That it might be an isolated head is suggested by another relief in the same area on which a vulture is said to be associated with a detached head (Becker *et al.* 2012: 35).

Another possible representation of a bird is engraved on a pebble from Tell 'Abr 3 (Fig. 4.4). It is interpreted by the excavator as a raptor (Yartah 2010: Fig. 9b, pers. communication) and is associated with two snakes and dots to the right and left of its head. We will return to this pebble when discussing human representations and their associations.

Representations of waterfowl are very common. For example, on the base of a stone pillar at Göbekli Tepe are seen a row of ducks (Schmidt 2011: 34).

Abstract Symbols and Plants

Abstract symbols like concentric circles, sometimes with four to six rays, are ubiquitous over the entire region. But possible representations of plants are very rare (*e.g.* Özkaya and Coşkun 2011: Fig. 18). A sign interpreted apotropaically as a hand by Ludwig Morenz (2009) might instead be a plant, given its association with rows of small dots which might be rain or seeds (Figs. 4.5; 5.1). A vertical scratch with two diagonal branches was considered a tree by Morenz and Schmidt (2009) (Fig. 4.12). The actual occurrence of plant images would be easy to underestimate because plants can be so easily abbreviated to abstract signs.

Other abstract signs include chevrons singly repeated in vertical rows or aligned, mostly in several parallel lines, similar to snakes and water. Among the most puzzling images are the H-signs unique to Göbekli Tepe.

Humans

Human figures are seen in a great variety of sizes, from very small figurines to several-meter-high T-shaped pillars. The anthropomorphic figurines from Nevalı

Çori include both males and females. Often the small figurines have been deliberately decapitated (Morsch 2002).

The human representations from Göbekli Tepe are almost all male, with the genitals clearly shown. The one female representation is a 'graffiti' from the younger phase scratched in a rather crude style on the stone slab of a bench: it is of a naked woman in frontal view with legs spread (Schmidt 2006: Fig. 28, 2011: Fig. 15). On the 1.90 m high stone 'totem pole' at least two humans are held by either a predator (feline or bear) or by a human dressed in a cape of fur with the head of such a predator (Schmidt 2011: Fig. 35).

The most striking, but abstract, human representations are the T-pillars of Göbekli, Sefer, Hamzan, Karahan, and Taşlı Tepe (Schmidt 2006; Çelik *et al.* 2011) and of Nevalı Çori (Hauptmann 2011) (Fig. 1). Some of these pillars, the so-called *Nevalı Çori* type, have arms and some kind of scarf. However their upper parts – which are supposed to be the heads – are never pictured as faces. Although these pillars have been interpreted as representations of supernatural beings and gods (Schmidt 2006: 117; Becker *et al.* 2012), nothing unambiguously suggests their sacred or religious character. The deliberate omission of facial features gives the pillars the aspect of types or archetypes, akin to *imagos*.

The body of the pillars are often densely crowded by wild animals and abstract signs. Two central pillars at Göbekli Tepe have loincloths, implying that they are males (Becker *et al.* 2012). *Nevalı Çori* type pillars clearly increase in frequency at Göbekli Tepe during the second phase (Schmidt pers. communication). This synchronizes with the presence of similar pillars at Nevalı Çori itself and with a decrease in animal depictions on the pillars. In general the size of the pillars diminishes during the 9th century calBC.

Some human representations from Körtik Tepe have features relevant to the discussion that follows. For example, a human figurine on one stone vessel has two long antennae or feathers on its head (Özkaya and Coşkun 2012: 13). The importance of this accessory is shown by two human representations on another stone vessel, which – despite the high degree of abstraction – clearly also have these attributes (Özkaya and San 2007: Fig. 18). The exaltation of the head by special adornments reflects the wish to make one's appearance more impressive and taller and is often used by shamans.⁵

The size of the human representations varies greatly, but they are often shown in close association with animals and usually smaller than the animal figures: they do not yet dominate the animal universe around them. Though the large pillars of Göbekli Tepe seem to be an exception insofar as they are taller than the animal representations, they are densely 'populated' by animals. The architectural accessories of the communal buildings enveloped the participants of rituals within a universe of animals. Some of the sculptures seem to be emerging from the pillars or walls, thus enhancing

the animals' presence and their impact upon the space around them. The emancipation of humans from the natural universe was only at its beginning. It culminated during the later phase of the aceramic Neolithic in the natural-sized, free-standing male stone sculpture found in the city centre of Urfa (Hauptmann 2011, for a more detailed differentiation of this development s. Stordeur 2010).

In conclusion, the discoveries of the last two decades have verified the increase in human representations at these sites, which many years ago led Cauvin to suggest a 'birth of gods' here. However, it is far from certain that the anthropomorphic figures had any religious meaning.

Associations

The identification of regular associations of symbols might make it possible to determine cognitive concepts and the adoption and propagation of conventionalized expressions of these concepts. Some of the associations have already been mentioned: the human with the head-gear is associated with, and usually smaller than, snakes and scorpions, and between these figures are concentric circles. In light of this recurring association, the presumed raptor on the above-mentioned pebble from 'Abr 3 might instead be a human image (Fig. 4.4): the dots to the left and right of its head, which otherwise would be difficult to explain, could therefore be abbreviated versions of the concentric circles. This standardized association of a human with poisonous animals is striking. The only scorpion represented at Göbekli Tepe is associated with a headless human.

Abstract birds with parallel zigzag-lines which possibly represent water or snakes are another recurring motif (Coşkun *et al.* 2010). Some of the associations of snakes with other animals might give evidence on the connotation of snakes. On a pebble from 'Abr 3 (Fig. 4.3) seven birds and two snakes surround a horned animal. A diagonal line runs through its body, suggesting that it has been killed. Similar associations are represented on pebbles from Jerf el-Ahmar (Fig. 4.10) and Tell Qaramel (Fig. 5.9), although the style is different and the horned quadruped is not clearly represented as dead. On Pillars 1, 30, and 33 at Göbekli Tepe a sheep and another quadruped are confronted by a group of snakes and a spider (Peters and Schmidt 2004).

Another recurring theme, very frequent at Körtik Tepe, is that of concentric circles with horizontal and four diagonal rays (Coşkun *et al.* 2010: Fig. 2; Özkaya 2007: 47) (Fig. 7). In some cases antithetical pairs of horned animals are shown above the horizontal line. This association is highly standardized. Though some elements of that theme (in particular the 'sun-like' symbol) are represented on very different media – from large stone slabs at 'Abr 3, to small pebbles at Tell Qaramel – the complete pattern is represented exclusively on globular bowls. Thus this particular relationship of medium and motive was highly conventionalized.

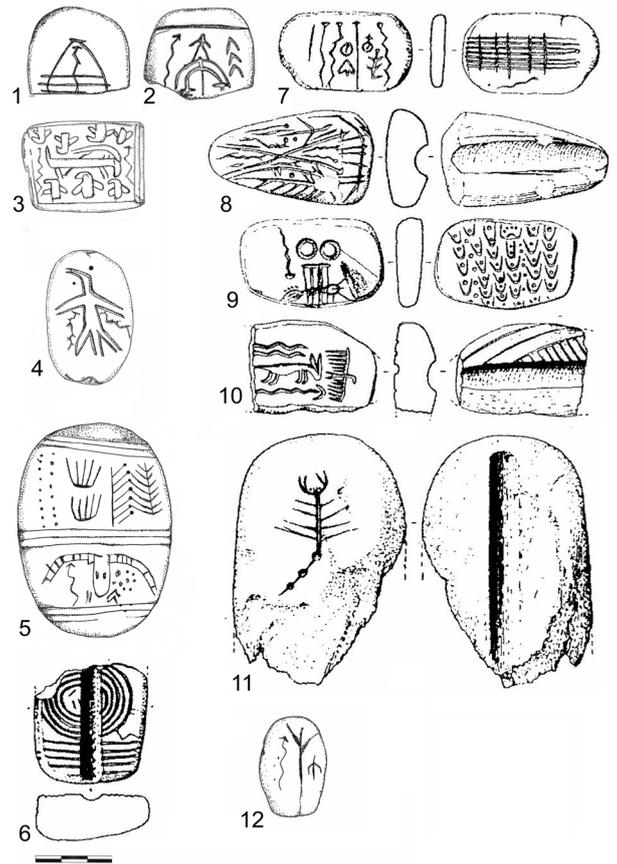


Fig. 4 Figurative decoration on pebbles and shaft straighteners (PPNA-EPPNB), all items are reproduced at the same scale. 1-5 Tell 'Abr 3 (Yartah 2004: Fig. 18.3, 2005: Fig. 7.3., 2010: Figs. 9, 9b, 11b), 6-11 Jerf el-Ahmar (Stordeur *et al.* 1996; Stordeur 2010); 12 Göbekli Tepe (Köksal-Schmidt and Schmidt 2007: 107, Kat-Nr. 164).

Mediality

Studies of mediality focus on the material (the 'picture carrier' of classical iconology) in which motives are represented, but they also include considerations of reflexivity – the possibility to interfere with the media – propagation, and adaptation. They emphasize concepts of dialectical and processual, triadic relationships between creator, sign, and receptor (Nünning *et al.* 2010; Wagoner 2010). Although much information will remain inaccessible for prehistoric cultures, by studying these processes we can gain some evidence for socio-ideological relationships of early Holocene communities.

Materiality

The most striking difference between the early Holocene and the Epipalaeolithic in iconographic media is the increased use of stone. This suggests that new concepts of time, community, and space had been adopted. For example, the small pebbles and the stone vessels with the symbolic representations found from

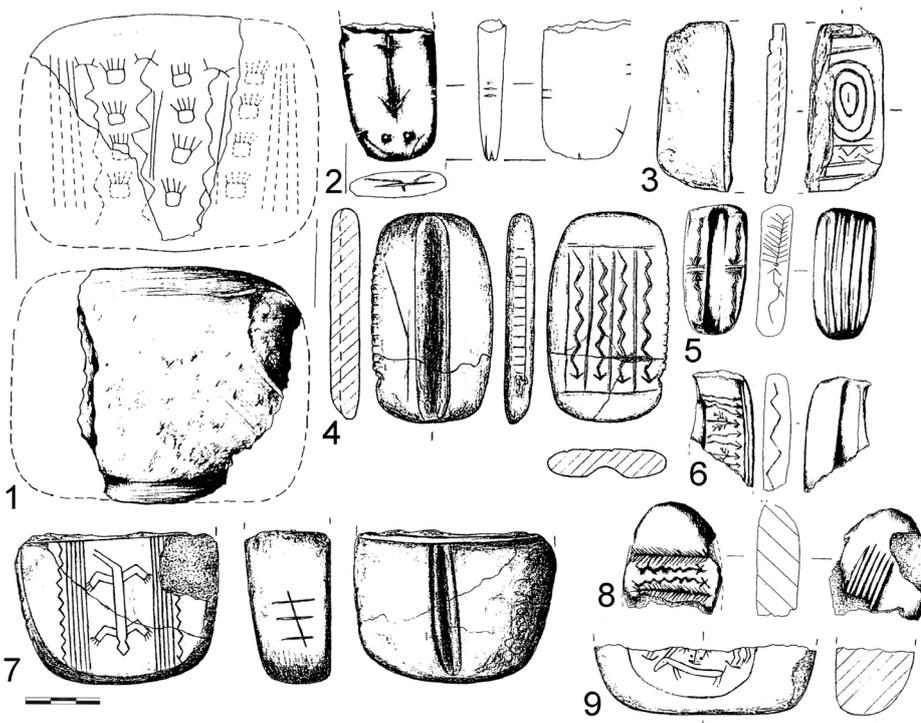


Fig. 5 Figurative decorations on pebbles and shaft straighteners from Tell Qaramel. All items are reproduced at the same scale. (Mazurowski and Kanjou 2012; 1= Plate 74,7; 2= Plate 83,6; 3= Plate 74,4; 4= Plate 75,1; 5= Plate 79,5; 6= Plate 75,3[=70,6]; 7= Plate 69, 3/5 [according to Mazurowski 2004: Fig.12 Plate 69,3 and 5 belong to one item]; 8= Plate 70, 3; 9= Plate 70, 2).

Gusir Höyük (Karul 2011) in southern Anatolia to Tell Qaramel (Mazurowski and Kanjou 2012) in north-western Syria (Fig. 1) could have carried concepts or messages between individuals and preserved knowledge, social identities, and ideological concepts for future generations.



Yet this intended preservation seems to have been ignored in the burial rituals at Körtik Tepe, where the corpses were completely covered by sherds of stone vessels and pieces of broken axes (Özkaya and Coşkun 2011: Fig. 12). The destruction of such hard material required enormous efforts, implying that this was considered a very important act. Although some stone vessels were repaired during the time of their use, indicating their high value, they were not preserved over generations but destroyed for certain dead persons. Such acts might suggest that certain possessions of the dead were endowed with a sacred character. The earlier-mentioned broken figurines may point to similar practices.

The megalithic monuments at the hill-top sites in south-eastern Anatolia and the communal buildings of Jerf el Ahmar, Djadé, 'Abr 3, Nevalı Çori, and Çayönü established rituals in certain extraordinary landscapes or in special positions on the edge of the villages (Özdoğan 1999; Stordeur *et al.* 2000; Yartah 2005; Çelik *et al.* 2011; Hauptmann 2011; Schmidt 2011). The technological skill and expenditure of energy required for the erection of these buildings unambiguously expressed the power of these communities. By extracting the large stones, engraving this hard material, and raising the pillars, the community demonstrated its power.

The act of erecting itself has a high symbolic meaning and expresses self-confidence (Boivin 2008: 52; Voss 2011). The hilltop monuments are solidified communal work that strengthens the corporate identity and demonstrates its power to others. By the establishment of space within these buildings, access can be controlled

Fig. 6 Nevalı Çori, south-eastern Turkey, head with snake; limestone. Şanlıurfa Müzesi. Early to Middle PPNB. Photo courtesy of Euphrat-Archiv, Berlin-Heidelberg.



Fig. 7 32 stone vessels of that standardized form and motive have been found at Körük Tepe (Coşkun *et al.* 2010: Fig. 2a-b).

and regulated. The layout of the communal buildings, most of which were at least partly dug into the earth, suggests they were rather dark when in use. Despite the enormous efforts involved in their construction, the public buildings at Djadé, Jerf-el Ahmar, Çayönü, and Göbekli Tepe were later deliberately filled, some after burning (Özdoğan 1999). Though the precise reasons for all this are unknown, presumably they were similar to the reasons for the destruction of the small figurines at Nevalı Çori and of the grave goods at Körük Tepe.

Adoption and Propagation

The symbolic repertoire and style display some highly conventionalized and ubiquitous symbols – particularly snakes and birds, but also felines, scorpions, and horned quadrupeds. There is such a conventionalized style that Köksal-Schmidt and Schmidt (2007: 97) have suggested a ‘book of patterns or models’ from which the motives were drawn, though there are some local variations.

These motives can be pictured on different scales, by different materials, and in different contexts, and appear in both domestic use on stone vessels and bone amulets, and in community use on engravings on stone benches in buildings. These pictures were therefore part of daily life.

Recurrent associations show that the standardization did not involve only the copying of the motives themselves, but the adoption of the ‘story’ behind the pictures. Some of the recurrent motives were so standardized that even the carrier of the pictures were similar. Some objects might have been imports; but the adoption of the motives was often a creative incorporation into local cultural contexts.

On one hand, the externalization of knowledge made the propagation of symbols easier and indepen-

dent of individuals, thus giving the possibility to reach a wider community. On the other hand, the right to determine the precise meaning and the standardization of symbols does imply a certain authority. This might have led to emerging hierarchies (Benz in press).

Emotions

One of the most remarkable changes in the ‘revolution of symbols’ is the aggressive attitude of some of the animals (Schmidt 1999, 2006; Stordeur 2010). In contrast to Palaeolithic art⁶, their mere presence was obviously not considered sufficient to demonstrate these animals’ strength and power: now their most threatening features were highlighted, especially bared teeth and horns. And deadly scorpions and snakes became ubiquitous motives.

Research in neurosciences has shown that there are basic emotional reactions. Though it is debated which emotions can be considered as the most basic, fear is unanimously accepted as genetically fixed and universal to all people (Ekman 1992; Bauer 2011; *cf.* Davidson 1992). The interpretation of, and cognitive reaction to, basic emotions are individually different and determined to a certain degree by cultural conditioning. Moreover, humans are able to communicate feelings by gesture and speech. Emotional contagion can already be observed in babies, and the capability for empathy develops when the child is able to make the self-other distinction (Bauer 2005; Rizzolatti and Sinigaglia 2008).

These observations have two implications for social commitment: the basic emotional reactions make it possible to trigger similar reactions in most humans by certain media; and emotional contagion, empathy, and communication can meld individual feelings into a public mood.

Discussion

Our study of the context and mediality of early Holocene symbolism has shown several important features which imply certain behaviours and throw light onto social and ritual practises within these societies.

1. First of all there was a **petrification** of symbols (codification of ritual scripts and symbols) as well as of space (by monumental architecture). Similar symbolic systems were pictured on objects of bone.
2. There was a basic **standardization** of symbolic systems from north-western Syria to extreme south-eastern Turkey with some variations in local style.
3. The animals featured are either dangerous, deadly, and / or powerful species, or creatures inhabiting two different environments of the biosphere.
4. The **selection and style** of the represented animals created a threatening atmosphere in the generally dark buildings, an atmosphere probably enhanced by flickering fires.
5. **Human representations** are present from the beginning of the Holocene and increase during the 9th millennium BC. Except for the monumental T-pillars of Göbekli Tepe, these representations do not dominate the animals, but show them in a close relationship. But even the T-pillars are densely populated by a variety of wild animals. Male gender is emphasized at its extreme at Göbekli Tepe (Hodder and Meskell 2011); but at other sites gender seems to be more equalized.

The rich symbolic repertoire is a solidification and documentation of knowledge concerning the environment, and above all about animals. Although the act of picturing implies mastery of the thing pictured, the pictures themselves show humans in close relationship to animals. As the selection of animals does not reflect the importance of prey (Peters and van den Driesch 1999; Özkaya *et al.* 2011), symbolic values seem to be inherent. The symbols were not only represented in the special buildings, but on different media. Their display in stone made them a durable publication – in the literal sense – of knowledge and understanding.

The new materiality not only facilitated the propagation of cognitive concepts to a wider public, it gave some elites the opportunity to establish a symbolic canon, to claim the right to interpret the symbols, to restrict access to ritual places, and, by erecting monumental communal buildings, to claim dominance (probably as a group) over a territory. Time-binding media were thus combined with space-binding ones (Boivin 2008: 142).

The newly-prevalent medium of stone reduced the possibility for interference with the medium. Whereas hunter-gatherers have (ritual) gatherings at special natural places, and their rituals have a certain script, the establishment of a fixed repertoire of symbols made social and ritual behaviour less flexible: changing the established order became more difficult. This implies the authority of those who were allowed to determine the concepts.

The basis for that authority remains unknown, but there must have been some special competences or skills that merited special consideration (see below). So, in contrast to the southern Levant (Gebel *in press.*), in Northern Mesopotamia, territoriality and commitment to permanent circumscribed social entities preceded the establishment of a production economy.

Given the possibility for conditioning behaviour and emotions through a well-established canon of symbols, and having in mind that emotions influence our decisions and behaviours considerably (Damásio 1994; Ackermann *et al.* 2012), this ascribed power should not be underestimated.

The prevalence of threatening animals was chosen to enhance the power and competence of dominant agents by publically demonstrating a danger, which had to be overcome collectively (thus reinforcing cooperation and loyalty) and by the suggested ‘need’ of potent agents as protectors (thus accepting hierarchies). The emphasize on male gender might be explained by a rise of competitive contexts, in which male individuals react with increased testosterone levels and are more prone to dominant behaviour than women (Mazur and Booth 1999; van Wingen *et al.* 2011).

Many aspects of the new symbolic systems underscore the liminal character of these communities:

- The impersonality of the T-pillars and their spatial organization in a circle suggest collective social concepts. However the two central pillars might have symbolized two exceptional persons, possibly with special cognitive capacities or skills.
- Local adaptations of interregional themes and site specific features demonstrate the independence of local groups.
- Though hording had become accepted, the Potlatch-like, deliberate destruction of symbol objects was a regular practise. Similarly, the deliberate ‘burial’ of communal buildings demonstrates an annihilation of the intention to create ‘eternal’ traditions. In contrast to institutionalized ideologies, cultural memory had not (so far?) become a dictum for the present and future.

These seemingly contradictory behaviours point to societies in transition, in which the claim of (male) elites to set socio-religious practices and socialization had to be reinforced by the intense use of symbolic media. Humans were still in close relationship with animals and emancipation of nature was only at its beginnings. Several practices, such as the destruction of objects and the two main types of animals, as alter-ego spirits (animals of power) and as supporting spirits (animals inhabiting different ecological spheres), and the garments of human representations point to shamanistic concepts (Stutley 2003; Basilow 2004; Kasten 2009; Müller-Ebeling and Rättsch 2011). Similarly, the evocation of dangers and of a threatening atmosphere is a characteristic feature of shamanistic practices (Zinser 1991). In a social environment of mistrust and new illnesses, the ability to cure and to avert misfortune was a strong argument for authority, but new illnesses and decreasing close personal

relationships also meant a challenge for shamans whose authority relies solely on the acceptance by the audience (Basilow 2004: 26). The picturing of threatening animals can thus be interpreted in two ways:

- a) An evocation of potential threats to increase the influence of the shaman.
- b) An effort to convince the community that the shaman's skills, powers, and natural and supernatural connections were strong enough to protect the community.

However, the fixation of symbols and space, the monumentality, and the time transcending concept do not match with shamanistic flexible and situational behaviour, but anticipate concepts of hierarchic social and religious institutions.

Conclusion

With the climatic stabilization of the early Holocene and the proliferation of a rich flora and fauna, sedentarisation accelerated. Villages and communal hilltop buildings structured the landscape. Life in circumscribed communities of increased population densities enhanced the potential for aggression (Gebel 2010b, in press) and, according to our theoretical model, the fear of 'strangers' and of 'strange environments'. Traditional social norms, like generalized reciprocity, and open access to resources and land, no longer worked and were threatened by emerging elites.

We suggest that the increase in and the 'petrification' of symbolic systems were symptomatic of a crisis in traditional social and probably shamanistic values (Schmidt 2006: 256). Direct personal relationships became more difficult. The public display of symbols and new forms of rituals became necessary to convince group members to accept new rules and to strengthen corporate identities (Watkins 2005). The imagery of Göbekli Tepe implies that male agents were accepted to set social behaviours and ritual scripts. Fear and danger, whether real or imagined, were monopolized by these individuals and publicly displayed to make group members perceive a need for strong leadership and thereby accept emerging social differentiations. Though shamans were good candidates as an emerging elite, successful hunters or political leaders (or groups) might also have gained in power (Guenther 2010). With the standardization of a symbolic system, natural learning was more and more replaced by cultural learning: those who were not socialized in a particular symbolic system, or refused to accept it, were probably excluded. We thus turn evolutionary cognitive theories upside down: not a change of cognitive capacities made the externalization of symbols possible but social developments demanded new forms of communication, socialization, and teaching (*cf.* Watkins 2010), which then influenced human behaviour and cognition. The plasticity of the cerebral functions (Bauer 2008) allowed new capacities to be activated; but others, essential for survival in flexible and fluid hunter-gatherer communities, probably diminished.

In conclusion we again refer to the *early* Cauvin (1978: 77): *Agriculture was above all a domestication of the human species*. Once communities had accepted the new rules of social commitment, aggressive symbols declined in use (Stordeur 2010). This decrease was already evident in the decreasing size of the T-pillars during the 9th millennium BC. In large Neolithic villages like Aşıklı (Özbaşaran 2012) the new system had been successfully adopted and a new socio-psychological balance found.

Prospect

We have painted the picture with a rather large brush: a more micro morphologic analysis is necessary to determine the form of the rituals – Boyer's third heuristic category – held at sites like Göbekli Tepe (Dietrich *et al.* 2012). The emotional effects suggested here have to be considered in more detail, including experiments on sensory and audio-visual perception. Only then will it be possible to compare the prehistoric record with such sophisticated ritual models deduced from ethnographic studies and presented by Harvey Whitehouse at the Templeton Foundation Conference. Detailed studies of the symbolism and chronology of each site will help us understand similarities and differences more clearly.

Endnotes

¹ Priming means that 'an upstream stimulus – not realized – results in an implicit memory consolidation which, in consequence may influence downstream behaviour considerably' (Elger publ. communication 27.7.2012). Further studies, especially on the effect of bodily and audio-visual perception, are necessary for better understanding the effects of priming.

² The differentiation of these heuristic categories has its strength in modern societies. Yet, for the study of prehistoric societies, they are of little analytical value, as an index in one social context might gain an additional function as a symbol in another community.

³ Other media were possibly used in the Levant to enhance social commitment. Though in Jericho (Kenyon 1959) and in Wadi Faynan 16 (Finlayson *et al.* 2011) large communal constructions have been found, the public demonstration of social commitment focused on trans-generational social relationships, namely the exposition, plastering, and reburial of skulls (Benz 2012).

⁴ Schmidt (2006: 124) pointed to the difficulty to distinguish between foxes, dogs, wolves, and jackals in figurative representations at Göbekli Tepe. We have therefore used the undifferentiated Latin term *canoidea*.

⁵ A possible human figure with 'high headgear' has been found in the filling of a building at Göbekli Tepe (published without scale) (Schmidt 1999: 12).

⁶ For a more detailed comparison with Upper Palaeolithic cave art see Christensen (2010).

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What Makes the Neolithic So Special?

Robin I.M. Dunbar

The Neolithic probably represents the single most important transformation in human evolutionary history. Much can, of course, be made of each of the many preceding and following phases of our evolutionary history: each was a response to an environmental challenge of some kind, a challenge that was solved by some new anatomical, physiological or cultural adaptation. But none really compares with the Neolithic for two important reasons. One is the source of the challenge; the other is the nature of the solution. I want to frame my comments on these two keynote papers in terms of these two issues.

First, the source of the challenge. Much has been made of the Neolithic as a period of innovation and invention, notably in respect of farming and the agricultural revolution. There can be no question about the facts or their importance: farming certainly played a central role. Instead, I want to suggest that the central issue for the Neolithic was not farming or the way farming solved (or didn't solve) a food crisis that had beset the populations living in the Levant and its immediate environs 12,000 years ago. The really important change is much simpler: settlement. In my view, the implications of the shift from forager-style societies to settlements have been radically under-appreciated in archaeology. Marion Benz and Joachim Bauer allude to the nature of the problem, but I really want to place this centre-stage.

Living in groups incurs costs for animals. These typically come in two forms: direct and indirect. Direct costs arise from competition between individuals for limited resources, and can involve physical conflict; indirect costs arise in part from the fact that the larger the group the further it has to travel each day to meet its nutritional requirements, and in part from the fact the physical proximity of other individuals inevitably raises stress levels (in essence, the commuter effect). Both of these indirect costs increase as group size increases, and in the limit they can become prohibitively high. While the costs of travel are a serious problem (Dunbar *et al.* 2009), the real problem for primates is the stresses imposed on females (in particular) by the close proximity of other individuals. The low levels of harassment and threat that inevitably occur as individuals bump into each other while foraging are trivial in the individual case, but the accumulation of these over many weeks and months has dramatic consequences for females' menstrual endocrinology: through a somewhat complex physiological chain, they shut down the female menstrual cycle and can leave low-ranking females with radically reduced infertility (Bowman *et al.* 1978; Dunbar 1980; Abbott *et al.* 1986; Smuts and Nicholson 1989; Hill *et al.* 2000). This effect can be so strong that, in some species of monkeys, being the tenth ranking female in a group can result in complete

sterility (Dunbar 1980). This same phenomenon has been well documented in humans (Howlett *et al.* 1984; Harrison *et al.* 1986; Sanders and Bruce 1997). Animals can only cope with living in large groups if they can diffuse these adverse consequences in some way.

Chimpanzees (for whom travel time costs quickly become prohibitive as group size increases: Lehmann *et al.* 2007) and human forager societies solve both these problems in much the same way: by adopting forms of fission-fusion sociality that allow the community to split up into a number of smaller foraging parties that range semi-independently within the community's territory. This simultaneously reduces the travel demands of foraging and the number of individuals in close proximity (thereby minimising the infertility costs). This neat solution was thrown out of the window with the rise of permanent settlements during the Neolithic and must have imposed immense strains on these communities until they found suitable solutions. The pressure to do so may explain why the Neolithic revolution appears as a revolution (*i.e.* is marked by a – relatively speaking – very rapid transition from one state to another). There are two separate issues here.

The typical hunter-gatherer community (the term refers to an explicit level of grouping) consists of about 150 individuals (with a range roughly 100-250) divided into 3-5 camp groups (or bands) of about 30-50 members (Dunbar 1992; Zhou *et al.* 2005; Hamilton *et al.* 2007; Layton and O'Hara 2010). Individuals reside in camp groups, but these are of limited stability, changing membership on a monthly rather than annual scale (Lehmann *et al.* in press). Making permanent settlements out of camp groups clearly isn't a problem since, in effect, these already exist in forager societies: the only difference is their permanency. Camp groups represent a size of group that humans seem to be able to cope with reasonably well. Settling an entire community of 150 in the same place, however, is an entirely different matter: it inevitably ramps up the tension and stress to a level that natural human psychological mechanisms were not designed to deal with. In fact, it recreates the very problem that the fission-fusion system of foraging societies was specifically designed to solve. The inexorable increase in the size of settlements that was then set in train merely compounded the problem, creating a second phase crisis that differed from the first because it extended settlements beyond the natural human community size. To see why this second phase was more demanding, I need to make a brief detour.

In forager and other small scale societies, the natural community of 100-200 individuals is maintained through personal relationships and intermittent face-to-face interaction (Sutcliffe *et al.* 2012). Although the limits on community size are in part imposed by cognitive constraints (itself determined by neocortex

volume: Dunbar 1992; Powell *et al.* 2012), a secondary constraint is imposed by the frequencies with which individuals interact and the time that can be devoted to social interaction (Roberts and Dunbar 2011). Relationships require a certain level of time investment to be functional, and this limits the number of individuals that can be held in a given quality of relationship. As a result, our personal social networks are structured as a series of layers of increasing size but decreasing relationship quality, with the layers corresponding to the amount of time we can afford to give to individual members (Sutcliffe *et al.* 2012).

In this respect, settlements of ~150 individuals do not pose any challenges in terms of social integration and cohesion since they can rely on the normal everyday patterns of interaction; they merely incur the additional costs created by the stresses of living in close proximity. Increasing community size above 150, however, adds a further significant problem: the need to integrate additional people who fall outside the limits of those with whom we can interact on a regular basis. New mechanisms for creating social cohesion and integration are then needed.

Each of these two steps involves very significant costs for foragers proposing to occupy permanent settlements of the kind that eventually became universal as the Neolithic proceeded. Without finding solutions to these problems, the rise of villages and towns – and eventually city states – would not have been possible. Farming would, of course, have been part of this package, simply because the switch from a semi-nomadic lifestyle to a settled one would not have been possible without a more concentrated food source. A hunter-gatherer economy rapidly exhausts the supplies of both animals and gatherable plants in the immediate vicinity of even temporary settlements, forcing foragers to travel further and further away as time passes. However, farming is the solution to a constraint, not the selection pressure that favoured living in permanent settlements (as is implied by the fact that reliance on farming seems to result in a significant deterioration in nutrition with knock-on health consequences: Bowles 2011). Indeed, there is no particular reason for living in settlements of more than family-size in order to farm: subsistence (as opposed to commercial) farming can be done just as easily in single family units or in band-sized units, and this would have the major advantage of avoiding the stresses created by living in larger communities. In short, something else motivated the switch to settlements, and farming was needed to make that switch possible. And once that switch was in place, a solution was needed to mitigate the social and reproductive costs that arose as a result.

The issue in large settlements is really one of minimising the free-rider problem. Human (and, more broadly, primate) communities are implicit (or, in some cases, explicit) social contracts: members of the community have to be willing to give up some of their more immediate demands in order to allow all members of the community to share equally in the benefits provided

by the community. We live in communities to gain a benefit (for primates, this is universally protection from predation) but pay a cost to do so in terms of the direct and indirect costs noted above. Both benefits and costs are directly related to group size. When the costs exceed the benefit, community (or group) size will be whittled down as individuals (or families) leave until the benefits once again exceed the costs. Part of the costs arise from individuals (free-riders or freeloaders) who take the benefit of the social contract but avoid paying all the costs (*e.g.* by not contributing to some communal activity or by taking/stealing resources from others). Left unchecked, these costs would rapidly lead to the dispersion of the community, and so, if grouping provides desirable benefits, some mechanism is needed to keep free-riders in check. Some form of punishment is usually considered necessary, associated with formal enunciation of the rules by which community members should live. In traditional small-scale forager societies, this is achieved mainly through dance and shamanistic (*i.e.* ecstatic) forms of religion. Phenomena like trance dances that are the core to these religions act, via a Durkheimian effervescence, to produce an endorphin-based sense of bonhomie that binds individuals to each other within the community (see Dunbar 2008, 2012).

This cues in what, to me at least, is perhaps the one other glaringly obvious feature of post-Neolithic settlement societies: formal (or doctrinal) religions associated with evidence for special places of communal worship and/or formal priesthoods. Religions of this kind are invariably associated with high gods (gods that can observe what mere mortals cannot and, more importantly perhaps, impose punitive sanctions on those who fail to toe the line) (Roes and Raymond 2003; Johnson 2005; Atkinson and Bourrat 2011; Bourrat *et al.* 2011). Unlike the shamanistic religions of forager societies, doctrinal religions (as their name implies) require symbolic representations to communicate what amounts to a theology so as to be able to justify their ‘moral’ line. However, it seems that these informal mechanisms only work on the scale of the community, and that larger groupings cannot be bound together in this way. Doctrinal religions are the solution and they achieve this by shifting the solution from an endogenous, bottom-up, endorphin-based mechanism to an externalised, top-down, punishment-based one (without necessarily foregoing the endogenous mechanism, which still continues to play a role) (Coward and Dunbar in press).

All this, I think, reinforces the symbolic perspective advocated by Marion Benz and Joachim Bauer in their paper, and the argument for an evolutionary perspective that Trevor Watkins promotes in his paper. Trevor Watkins raises a further point in his contribution that I want to take a few moments to make some separate comments on. This is the important concept of niche construction.

Niche construction theory (Odling-Smee *et al.* 2003) was developed as an addendum to conventional

Darwinian evolutionary theory (much as Hamilton's inclusiveness theory had been in the 1960s). Its main point was to remind us that organisms influence their environment as much as the environment influences the organism. As such, it shares a number of similarities with Dawkins' earlier concept of the *extended phenotype*. Social groups are, in many ways, the archetypal example of niche construction: the organism's (social) behaviour creates a new environment (the group) that itself both has further ramifications for the physical environment *and* feeds back on the individual in the ways we have alluded to above. As such, niche construction theory is a rather technical reminder that feedback loops exist in biology and necessarily play an important role. As such, this is not particularly new, but it does serve as an important reminder that biological processes can become very complex. It does not, however, mean that individuals consciously plan to create the effects it describes.

The issue that concerns us here is the role that this concept might play in archaeology. It is undoubtedly the case that farming provides a nice example of niche construction (although not uniquely so, since many other animals alter their environments in somewhat similar ways, including husbandry). But short of reminding us that all organisms are embedded in biological systems that involve complex feedback loops, I am not entirely sure exactly what work the concept can do in archaeology as either an explanatory or a heuristic device. In what way would the use of this concept alter the kinds of explanations one would want to give for a particular site or period that would not already be covered quite adequately by conventional archaeological discourse? My instinct is to say: not very much.

The issue here is perhaps about levels of explanation. Conventionally, biologists distinguish between four general types of explanation: mechanistic, functional, ontogenetic (developmental) and phylogenetic (historical). These are known as *Tinbergen's Four Why's* (after Tinbergen 1963), but they derive originally from Aristotle's philosophy of biology. These four kinds of questions are logically and biologically independent of each other, but taken together they constitute what might be considered a complete (or 'rounded') account of a phenomenon. We do not, however, have to answer them all at once, since the answers to any one do not necessarily affect the answers to any of the others. I suspect that archaeologists mostly concern themselves with mechanism-level questions (how climate affects farming, why people might have liked a particular style of pottery, whether a particular symbol or vessel is designed to serve a particular purpose and is subject to particular laws of physics, physiology or psychology).

Niche construction really relates to functional questions, which for biologists refers exclusively to the selection processes that drive evolution (*i.e.* how a phenomenon affects an individual's genetic fitness). It points to the fact that the fitness payoffs may be modified as an organism changes its environment, and hence that these (sometimes modest, sometimes large)

adjustments to the payoff functions need to be taken into account when calculating fitness. However, we do not need to know how the processes of evolution work in order to answer questions at the mechanisms level (in other words, do perfectly decent archaeology), not least because it will be almost impossible to estimate fitness consequences given the serendipitous nature of the deposition processes. Instead, we can assume that there is some proper explanation at the functional level that someone will one day supply, and meanwhile we can get on with doing archaeology. The hedge is perhaps simply that having a sound evolutionary framework may guide us to finding the right questions to ask when interrogating archaeological data, and prevent us making elementary mistakes by proposing processes that are biologically implausible. In this respect, niche construction theory may be a useful reminder that such explanations are likely to be complex, but I am less than convinced that it will itself answer any questions we might have.

I have framed my comments mainly in terms of the stresses created by living in groups and the processes humans have evolved or invented to mitigate these in order to be able to do so. Care needs to be taken not to confuse this with group selection, which in evolutionary biology refers to a very specific process whereby groups (or species) themselves are the units of selection, with group/species survival being the basis for the evolutionary cost-accounting (evolution occurs as a result of the differential survival of groups or species). This view contrasts radically with the standard Darwinian view in which the individual (or, more correctly, the gene, for which the individual is commonly taken to be a reasonable proxy) is the unit of selection and the level at which fitness is calibrated (only genes survive or go extinct, with individuals and species being essentially epiphenomena). The two views lead to very different predictions about the world, and very different kinds of explanations for the evolution of organisms and the traits they bear. Because communities as a whole can sometimes survive or die out as a consequence of some event (Pompeii-like extinction at the hands of a violent natural event, or extermination at the hands of neighbours), it has sometimes been supposed that group selection may be common in humans. In fact, there is no convincing evidence for group selection in this sense, even in respect of culture – not least because the conditions under which group selection (which, I hasten to add, is in principle perfectly possible as an evolutionary process) can overwhelm individual/gene-level selection are very restrictive and likely to be extremely rare.

In contrast, my analysis of the problems faced by human communities during the Neolithic is concerned with *group-level* selection. This notes that *some* phenomena that influence an individual's fitness arise through effects at the level of the group as a whole (collective action, group defence, cooperative hunting, teaching, *etc.*), thereby creating a layer of benefits that is separate from (and in some cases antithetical to) those created at the individual level; nonetheless, notwithstanding the

fact that these benefits accrue at the level of the group, the cost-accounting of evolution still occurs at the level of the gene. In effect, the individual has to trade off group-level and individual-level costs and benefits when making decisions about how to behave. Because benefits and costs come from two separate levels, this inevitably creates a tension: if individuals in a community cost these out differently (I may gain more by pursuing my selfish aims at the expense of the group's collective action, but you may gain more by going with the group), the free-rider (or collective action) problem is an inevitable consequence of group-living, and individuals who wish to live in groups may need to find ways to mitigate its effects. Like niche construction theory, group-level selection theory adds complexity to the standard Darwinian model, but does not challenge it.

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Centres of Congregation

Colin Renfrew

Introduction

The excavation of Göbekli Tepe has transformed our understanding of Early Holocene symbolism in Northern Mesopotamia, as Benz and Bauer demonstrate well in their keynote article. But it has done more than that. It has promoted further reflection and analysis upon the entire transition to food production and sedentism occurring early in the Holocene period, allowing us to examine again the wise aphorism of Cauvin (1978: 77) that agriculture was above all a domestication of the human species, as Benz and Bauer note in the conclusion of their paper (this volume: 20). This is the theme which Watkins develops in his keynote paper. Here he makes little explicit reference to Northern Mesopotamia. Again inspired by Cauvin, he suggests ‘we should be able to set the neolithisation process within the longer-term processes of human history’ (Watkins this volume: 5).

In this short comment I would like to suggest first that when seeking to understand the origins of agriculture and of sedentism it is not sufficient to restrict the discussion to Northern Mesopotamia alone. Transitions to agriculture were brought about also in Peru, in Mesoamerica and in China at very early times, and subsequently in other areas also. It must be necessary, if we are to speak in general terms, to take these cases also into account. And if we do so, aspects of Göbekli Tepe find resonances in some of these other areas.

Consideration of these cases, in particular of coastal north Peru at the time of the first food production there, brings out one special significance of Göbekli Tepe. It seems to be the first instance of a class of monuments widely seen later on other continents. It is the world’s first known centre of congregation. It can indeed be recognised as such by the monumentality of its architecture, and by other significant features. It can claim to be the world’s earliest known regional ritual centre. Most of the other sites in Northern Mesopotamia considered by Benz and Bauer may be discussed largely in local terms. Many had a building or area which could be identified as serving a ritual purpose. But in doing so, they will usually have served the local community. Even a great site like Jericho may be recognised as a settlement, occupying its own territory and serving its own population, even if it was linked by trading networks (Renfrew 1975) through neighbouring communities with more distant sources of raw material, on a ‘down-the-line’ basis. Göbekli Tepe stands out for its monumentality (Schmidt 2012) and for its regional pre-eminence. The interesting analysis by Banning (2011), in his critique of the view that Göbekli Tepe served as a temple, argues that domestic aspects of the site should not be overlooked. But even if that point be taken, the scale of this great accumulation of monu-

mental buildings (perhaps erected and used in sequence rather than simultaneously) seems without parallel in the Early Holocene of the region.

Broadening the Frame

The term ‘neolithisation’, upon which Watkins following Cauvin relies, is not a happy one. It owes its currency to Gordon Childe, who first authoritatively defined the ‘Neolithic Revolution’ (Childe 1936). Childe’s revolution was rightly seen as a demographic phenomenon, centering upon the development of food production and of sedentism. But Childe, in his terminology, relied upon the ‘Palaeolithic’ versus ‘Neolithic’ distinction formulated in the nineteenth century by such pioneers as Lubbock (1865), who were impressed by the chipped stone axes (‘handaxes’) of the European ‘Palaeolithic’ and the polished stone axes of the European ‘Neolithic’. These terms simply do not work on some other continents, notably in the Americas, where handaxes of the Middle and Lower Palaeolithic are not found. Partly for that reason the term ‘Neolithic’ for cultures experiencing or immediately following the agricultural revolution has never found favour in the Americas. There the favoured terminology of ‘Formative’ or ‘Early Formative’ (Steward 1955) may not seem notably more clearly self-explanatory. But if we are wishing to compare sites like Caral in Peru (Shady Solis *et al.* 2001; Shady and Kleihege 2008) with Göbekli Tepe, or with Early Formative sites in Oaxaca, the term ‘Neolithic’ is not helpful, and the ugly substantive form ‘Neolithisation’ less so. This is not intended as a criticism of the arguments set out in Watkins’ paper, which are lucid and persuasive, but a less parochial terminology would better serve his admirably generalising approach.

Centres of Congregation

The challenge offered by Watkins’ interesting paper is to set the advent of food production and of sedentism ‘within the long-term processes of human history’, and indeed to analyse more effectively this ‘domestication of the human species’. This, I suggest, may be advanced by recognising Göbekli Tepe as an early example of a class of sites and monuments which we may identify as ‘centres of congregation’. These are locations to which people come from near and far to meet and to undertake exchanges of a symbolic nature, often in the course of ritual activity.

The participants come *from near and far*. Such centres therefore serve a local population, but their special feature is that they serve also as symbolic attractors (see Renfrew 2007a), inducing visitors, sometimes pilgrims,

from a much larger region. In this respect they can be said to exercise ‘action at a distance’. There they have their counterpart in natural sources of rare or useful raw materials, which are natural attractors for the traffic in material goods (Renfrew 1975). But in this case the traffic and the exchange is a symbolic one, fulfilled and enacted by the interpersonal interactions which take place at the centre of congregation, and by the ritual obligations which are fulfilled there.

The participants *undertake exchanges of a symbolic nature*. In many cases they assemble together periodically to do so. Often this assembling process is facilitated by large plazas, theatral areas or courts, where there is adequate provision for spectators, who in a sense are participants in the symbolic exchange. These are documented archaeologically by places of assembly, such as the plazas of coastal Peru (Haas and Creamer 2008). They may be marked by monumental installations, as for instance at Monte Albán in Oaxaca, or indeed at Stonehenge in England. In a much more recent period, Chaco Canyon in New Mexico has functioned as a ‘centre of high devotional expression’ (Renfrew 2001). Yet although periodicity is a feature of such centres, the ‘attraction’ may not always work its power by bringing together large numbers of people. There are places of pilgrimage (using that term carefully so as not necessarily to imply credence in a deity) which are effective in inducing visits of numbers of people on a sequence of occasions over the months and years rather than a simultaneous congregation of thousands. The sanctuary at Keros in the Cycladic Islands of Greece (Renfrew 2012) may fall in that category.

The exchanges at such centres of congregation often take place *in the course of ritual activity*. The archaeological evidence for ritual is not always easy to interpret (Kyriakidis 2007). The common features of time patterning and repetition, together with formality, do however frequently leave material indications.

Centres of Congregation and Agricultural Origins

Barbara Bender (1978) was one of the first to develop the idea that the inception of farming was in large measure a social phenomenon, motivated by the need to provide food for congregations of hunter-gatherers at their periodic meetings. Her remarks seem almost prophetic in the light of the new evidence for feasting, and in particular for communal drinking, at Göbekli Tepe (Dietrich *et al.* 2012).

In 1974 I formulated a number of generalisations about ‘Polity and space’, of which the third (Renfrew 1974: 105) is relevant here: ‘*Basic social groups do not exist in isolation but affiliate into larger groups meeting together at periodic intervals.*’ Among hunting groups the meeting place itself may vary from time to time (Birdsell 1973) but the phenomenon is a widespread one. There is ethnographic evidence for periodic meetings of hunter-gatherer bands. But archaeological evidence for such meetings in the late Pleistocene or early Holocene

periods is, not surprisingly, rare. The painted caves of the Franco-Cantabrian Upper Palaeolithic were not in general suited to accommodating large numbers of people, and there are indications that some of them were visited only rarely, and by small numbers. On the other hand the open-air sites in the Côa Valley, in the Upper Douro region of Portugal, may well have been important periodic meeting places (Zilhão 1997; Baptista 2009; Luis 2011). The number of engravings at some locations there, and the strikingly dense palimpsest engravings might support that view.

There are regions of the world where monumental constructions are a feature of the ‘Formative’ or ‘Neolithic’ or early agricultural stage, before the beginnings of what is often termed ‘complex’ society. One standard model for the evolution of socio-cultural complexity sees the development of monumental architecture as a feature associated with the rise of a state society, often accompanying urban formation. Such a model was indeed well outlined by Childe (1936), for whom the ‘Urban Revolution’ followed some millennia after the ‘Neolithic Revolution’. The paradigm example in his study is the formation of the city state in Sumer. Another would be the formation of the state in Oaxaca in Mexico, which is often equated with the first formation of the great centre at Monte Albán (Blanton 1983). There the construction of the earliest major public buildings may be equated with the formation of a hierarchically ordered state society.

Increasingly, however, we can recognise early manifestations of monumentality at a much earlier date, indeed at a date coincident with the emergence of agriculture rather than with the emergence of a hierarchically structured state society, which is often an urban society. Göbekli Tepe has sparked off this discussion for the case of Western Asia. But it is a discussion with much earlier origins in South America, going back as far as Michael Moseley’s *The Maritime Foundations of Andean Civilisation* (Moseley 1975). One focus of his study was indeed on the origins of state societies, but Moseley also emphasised the rapid formation of villages and towns, sometimes with monumental structures, at an earlier time when the rich marine resources of north coastal Peru were an important part of the subsistence base, with cultivated food plants only gradually taking the preponderant role. It was only a millennium later that major inland centres developed, notably the great ritual site at Chavín de Huántar (Burger 1992; Kembel and Rick 2008).

The standard periodic divisions in Peru are just as quaintly conventionalised as the ‘Neolithic’ terminology criticised above. There the term ‘Initial Period’ along with the ‘Early Horizon’ (Kembel and Rick 2008: 51) may be ascribed to the development of a hierarchical or state society such as is sometime argued for Chavín (although Chavín does not fit easily into the ‘state’ categorisation). Earlier in the sequence comes the ‘Formative’ (Kaulicke 2008), and before that the ‘Late Preceramic’ or ‘Late Archaic’ (Haas and Creamer 2008). These terms are likewise difficult to define in a satisfactory way, and

not coherently applicable in other parts of the world. The observation remains valid, however, that for a whole series of early sites on or near the coast, such as Aspero and El Paraíso, and indeed Caral, there are impressive monumental constructions going back to the Late Preceramic period, around 2500 BC (Sandweiss *et al.* 2009). The imposing nature of the monuments and plazas at Caral has indeed led Shady and Kleihege (2008) to claim Caral as ‘the first civilisation of America’. And Shady Solís (2008) has systematically listed the criteria by which Caral might appropriately be termed ‘urban’. But while the material is indeed impressive, I feel that it attests to a phenomenon that is in its way more remarkable. Caral, for all the scale of its monuments, does not have clear evidence, in its repertoire of artefacts found, of the social hierarchy that is usually equated with a state society.

These sites on and near the north coast of Peru, the Norte Chico (Haas and Creamer 2006, 2008: 45), where monumental structures emerge with or even before the transition to a diet based largely upon agriculture, are manifestations of a phenomenon which can be recognised at other key areas in the Holocene period – for instance in Malta (Evans 1971). It is not appropriate to associate them with the development of a ‘state’ society of the kind to which the term ‘civilisation’ is often attached. They may well in Peru be designated as ‘Late Preceramic’, since pottery is not found. And interestingly they lack evidence, for all their imposing monumentality, of the rich figurative repertoire observed in the relief carvings at Göbekli Tepe, as so coherently analysed by Benz and Bauer. It may be that early figuration was first used there on textiles which have not been preserved. But the rich figuration which is seen in the same area two millennia later, for instance at Cerro Sechín (Lerner *et al.* 1995) is not yet apparent.

These cross-continental comparisons may at first seem to risk superficiality. But they have a relevance to the issues so effectively raised in the paper by Watkins, if one is able to escape the restrictive terminologies of periodization. It is clear that the transition from a hunter-gatherer way of life to one based upon farming was in many cases accompanied by the development of systems of thinking and of communication which may be regarded as symbolic systems and also often as semiotic systems. These no doubt accompanied the formulation of what John Searle (1995) has termed ‘institutional facts’ which involves the development of more clear-cut concepts, better-defined concepts, within society (Renfrew 2007b: 126-127). Although we do not have access to the speech of these communities, we can glimpse the emergence of such concepts through their figurative representation, as in the case of the relief carvings and sculptures at Göbekli Tepe. Yet we can glimpse them also in the architectural forms and in the planning at that site, as in the plazas and monumental constructions in the Late Preceramic of north coastal Peru. Something of the same may indeed be detected in western and northern Europe, as evidenced by the rich repertoire of monumental architecture, sometimes termed ‘megalithic’, which is seen at or after the time of the transition to a farming economy.

It does seem useful, therefore, to distinguish this developing symbolic richness and variety at or soon after the early transition to farming from the development of state society (and often of the city), which is a process arising when artefacts and social roles within society are more varied and further differentiated than at the time of the early transition to farming.

Ritual and Monumentality before Religion

These reflections, and indeed the two keynote papers, serve to clarify a distinction which is sometimes overlooked. For it is clear that the early farming societies of which we are speaking, and specifically those specified in Western Asia and in South America, developed well-defined patterns of behaviours which may properly be termed ‘ritual’ (Kyriakidis 2007). The monumental architecture and the figuration together suggest performative practices which were periodic, repetitive, and well-structured.

Yet they do not, in the cases cited, give evidence for the reverence of specific deities, if these are conceived as specific supernatural and immortal beings with the power of influencing human affairs (Renfrew 1985: 11-26). Deities, in this sense, are often seen in the context of a state society (Renfrew 2012). In Peru it is difficult to doubt the divine status of the creature depicted on the *lanzón* at Chavín de Huántar, but we do not see iconic representations of deities in the third millennium BC sites in the Norte Chico of Peru (but see an alternative view in Haas and Creamer 2008: 48, fig. 3.2). In Western Asia the early temples of Sumer, already in the Uruk period are generally considered on well-argued grounds to be the homes of deities. But at an earlier period, not long after Göbekli Tepe, the ritual features at Çatalhöyük, regarded as indicative of worship of a deity or deities by an earlier generation of scholars, are no longer automatically viewed in that light (Bloch 2010).

Early Symbol Systems and Cognitive Archaeology

These considerations may be regarded as issues in cognitive archaeology, which is not yet a well-developed field. Its exploration is the task which now lies ahead. The central distinction, as I see it, is very well set out in the paper by Benz and Bauer. As they put it: ‘In contrast to earlier approaches, which sought for the symbolic meaning for the figures, our focus is on the praxis, in which these representations are used and on their emotional impact’. That is precisely the distinction which has been claimed for cognitive archaeology, where the emphasis is not on what they thought but how they thought (Renfrew 1994, 2005; Malafouris 2013).

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On Cultural Niche Construction and Materiality

Bo Dahl Hermansen

I. In ‘Neolithisation Needs Evolution, as Evolution Needs Neolithisation’, Watkins points out that the study of neolithisation has largely been an inward-turned practice: In spite of their multi-disciplinary character, Neolithic studies have generally neglected to understand neolithisation within a broader framework of the long-term processes of ‘human history’. This is due to a disregard, on part of archaeologists and historians, to take notice of evolutionary theory; and to a general trend in evolutionary studies to consider human evolution completed with the emergence of *Homo sapiens* in Europe, or with the emergence of representational art in the European Upper Palaeolithic. Watkins demonstrates convincingly that there was, in fact, no sharp break in human evolution in the Upper Palaeolithic, arguing that symbolic representation emerged earlier in Africa than in Europe, and that important biological mutations only emerged in the wake of domestication of plants and animals (his examples are alcohol-tolerance and lactase-persistence). Thus, one can only agree with the author that it makes sense to expand the study of human evolution into more recent scenes and to incorporate the Neolithic in the grand narrative of human evolution. Watkins feels that if we as archaeologists can contribute to this endeavor, a particularly great potential for future Neolithic research would seem to lie in the sphere of human cognition. He introduces concepts like social brain and distributed mind, and offers an outline of the multi-disciplinary range of involved sciences. Particular attention is paid to the recently developed ‘niche-construction theory’, and especially cognitive, or cognitive-cultural, niche construction. In Watkins’ perspective cognitive niche-construction is seen as both constitutive of, and constituted through, the ‘extraordinary plasticity of the human brain, facility with cultural learning, facility with systems of symbolic representation ..., and ... the distributed mind.’ This he sees as the main evolutionary trend within a complex system of ongoing feedback relations through which the human organism changes its environment, while the constructed niche ‘to some extent’, at least, replaces the natural environment as generator of selective pressures on the organism through its generations. From the early Neolithic this process has continued up to the present, with an evident and ever increasing acceleration. For Watkins, then, the challenge is to define stages in the evolutionary process and ‘to calibrate them against our dated archaeological and palaeo-anthropological data.’ All this reminds me of earlier evolutionary approaches in archaeology; and I fear that we may be approaching a new era of reductionism in archaeological research, in which that ‘extraordinarily rich and complex cultural knowledge’, which Watkins clearly treasures, becomes reduced to the status of an evolutionary

mechanism. To judge from Watkins’ oeuvre this is by no means his intention, but it certainly is what happened in earlier evolutionary approaches, such as the ‘new archaeology’, in which culture was reduced to be ‘man’s extra-somatic means of adaptation’ (e.g. Binford and Binford 1983: 121). Now instead, with cognitive niche construction-theory, culture seems to become a piece of ‘environmental engineering’, an artificial mechanism for selective pressure on the human organism and its cognitive capacities.

II. As a Neolithic scholar Watkins is interested in the evolution of human cognitive capacities and in that explosion of symbols, which Benz and Bauer associate with ‘mediality’ in their paper ‘Symbols of Power – Symbols of Crisis? A Psycho-Social Approach to Early Neolithic Symbol Systems.’ While Watkins sees a great potential in cognitive, or cognitive-cultural, niche construction-theory, he largely views this potential as a perspective for the future. Not surprisingly, though, Benz’ and Bauer’s paper may be taken as a step towards a program for such research.

At the outset Benz and Bauer express interest in the organization of social and ideological systems, implicitly, it would seem, as an instance of cognitive niche-construction. They assert that the ‘ways in which symbols are selected and represented ..., how they are propagated ..., and their adaptation to other contexts, are processes, which illuminate the organization of social and ideological systems.’ For this reason they advocate an approach, which attempts to reconstruct contexts of emerging symbolism and then to analyze ‘the mediality and emotions inherent in the symbolic systems.’ This will then be helpful in understanding ideological change, and a dense description, in Clifford Geertz’s sense, is claimed to be a long term goal. Benz and Bauer commit themselves to a focus on ‘praxis’ and emotional impact, rather than to elucidate the meaning of symbols. This is an ambitious program, and much of it is commendable although there are some points of disagreement between us. In the following I shall restrict myself to comment on three problematic issues. The first concerns the authors’ understanding of materiality, the second is about the propagation and adoption of imagery and the dissemination of the ‘story’ behind it. The third deals with the notion of early Neolithic shamans.

II.1a One of this paper’s premises is that ‘materiality matters’ in two ways: **a)** inanimate objects have no agency unless so understood by humans, but they may ‘favour or constrain’ certain forms of behavior; and **b)** the selection of certain materials may serve to indicate behavior, skills, and concepts. Concerning this premise, my view of materiality is perhaps (?) different

from Benz' and Bauer's. To give an idea about what I see as our possible difference, I briefly summarize evidence from Shkārat Msaied from a local perspective and offer an interpretation (*cf.* Hermansen in press):

Excavation in one of the buildings at Shkārat Msaied has revealed a peculiar structure with an area of c. 25m². This building was constructed on top of an earlier structure, part of which was incorporated into its interior space as a visible architectural feature (Kinzel *et al.* 2011), serving as a reminder of the earlier building, perhaps of village origins. Thus the house appears as a palimpsest of past and present; and at some point it was set apart as an architectural frame of mortuary disposal (Jensen *et al.* 2005: 124 f.; Hermansen *et al.* 2006: 3 ff.; Kinzel *et al.* 2011: 44 f.).

A probably female skeleton was found on top of a stone installation inside the doorway of the house. Arms were placed inside the rib-cage, legs in front of it, and skull and mandible removed; arms, legs and rib-cage were found in articulation. With this skeleton were found four ovi-caprine mandibles. Human remains were also found in a subfloor cist, sorted according to categories, some in articulated position. One additional stone cist contained a scatter of human bones with no body parts in articulation, as did the fill between the cists. It seems, then, that **a**) the 'decapitated' corpse found on the stone installation was relatively fresh with soft tissue preserved; **b**) the sorted bones in the first cist stemmed from bodies in different states of decomposition; and **c**) the bone scatter in the second cist and the surrounding floor fill are from bodies with little or no soft tissue left. I take this as an example of van Gennep's three stage model of *rites-de-passage* (van Gennep 1909): **1**) The stage of separation probably took place before bodies were cut into pieces. **2**) Dismemberment may have demarcated promotion to a liminal state, in which it was important to keep the bones of the dead in strict order to avert pollution and cosmic disaster. **3**) The completed transformation of the dead is then suggested by the disorderly bone fill. The division, sorting, and reassembling of body parts, suggests that the human body was considered a partible entity, which could be fragmented and reassembled in new combinations (Fowler 2004: 23 ff.) to secure the irreversibility of death and promote the dead to a new mode of being as a collective body of ancestors. A few might have been selected for remembrance. One such character could have been the headless (probable) female found on the stone installation, and with whom four ovi-caprine mandibles were deposited. Butchering, and consuming, domestic animals on such occasions would no doubt have served to bond members of this early Neolithic community in the context of renegotiating social relations after the loss experienced at death. Since domestication was in an early stage at Shkārat Msaied, this must have played a dominant part in their self-understanding, and domestic animals may therefore have been viewed as inalienable to people or relations, and hence endowed with some form of personhood.

Most buildings reproduced the same layout as the mortuary house, which was oval/circular, with a stone built installation next to the doorway. This trans-spatial feature may have linked housing units, conceptually and functionally, with each other and with the installation in the mortuary house on which the headless corpse was found (Hermansen and Jensen 2002: 92). Thus, it would have associated housing units and their inhabitants with this house and its dead inhabitants. The house also incorporated the visible remains of an earlier building, perhaps related to the foundation of the village. This house, then, must have been a powerful actant in its own right, highly charged, as it was, with the extreme sensory stimuli related to such mortuary practices, with the emotional tension related to the loss experienced at death, and with its solid rooting in the past. In the light of work by scholars such as Marcel Mauss (1950), Marilyn Strathern (1991), Roy Wagner (2001), Alfred Gell (1998), and Chris Fowler (2004), the combined evidence, then, suggests that personhood, or some other capacity for agency, was not so much considered to reside in discrete human bodies, as to be distributed through networks of relations, which included both people, animals, and things, living as well as dead, wholes as well as parts, and probably at all levels of the collective.

Incidentally, it seems to me that Benz and Bauer do ascribe agency, at least to representational art, throughout their argument: they see a causal relation between Neolithic imagery, emotional, bio-chemical, and behavioral responses *etc.* This is indeed agency and, as shown above, materiality as I see it is much about how agency flows through entangled relations of people, cohabiting species, things and concepts; or perhaps more to the point in a discussion of imagery and mediality: between 'artists', 'indices', 'prototypes', and 'recipients', as mapped in Alfred Gell's theory of the 'art nexus' (Gell 1998: 12ff.). Perhaps, then, our views do in fact converge in a common interest in art and agency.

II.1.b One of the most interesting parts of the paper is about how the new, material media facilitated a widespread and effective propagation of early Neolithic imagery. The standardization in style, motives and associations is taken by the authors to imply that Neolithic people and communities did not simply copy motives. Rather, through a 'creative incorporation into local cultural contexts' they adopted the 'story' behind the imagery. While I agree to that, I do feel that the question of what was actually transferred through this imagery needs further deliberation. Perhaps I dare turn to the humanities to suggest the complexity of the problem and a possible answer: *E.g.* narrative may be defined as the 'verbal designation or the graphic, sculptural, choreographed, or other depiction – broadly, the discursive relating – of a transition from one state of affairs to another' (Davis 1992: 235). Three levels of interpretation can be distilled in a narrative: *Fist*, the 'fabula', or 'story material', which encompasses

its constitutive elements and causal relations (Davis 1992: 238). Next is the 'story', the particular version in which the fabula is told (Davis 1992: 239). Third is the level of the 'text', the specific style, grammar, and formulation in which the story is communicated (Davis 1992: 239). Perhaps, then, it may be suggested that what was transmitted through early Neolithic imagery was a package of fabulae, represented in durable media as recurring associations of specific figures. These fabulae could then be creatively transformed at the levels of story and text, in order to accommodate local needs and personal styles.

II.1c Benz and Bauer emphasize the importance of the imagery's emotional impact. They point out that motives largely consist of animals with aggressive attitudes and of poisonous animals, such as snakes and scorpions. Human representations are often male, sometimes ithyphallic, and sometimes adorned with headgears that make them appear larger and more impressive, all designed to evoke fear (and may I add, awe?). While I find this plausible, I disagree with the authors' interpretation that the picturing of dangerous animals suggests 1) an 'evocation of potential threats to increase the influence of the shaman', and/or 2) an 'effort to convince the community that the shaman's skills, powers, and natural and supernatural connections were strong enough to protect the community.' Both interpretations seem to reduce shamans to cynical power-brokers, whose purpose was to manipulate audiences emotionally to the enhancement or maintenance of their own position. I contend that early Neolithic shamanism, if that is what we are dealing with, must be taken seriously as an experientially based ritual practice, and the shaman as '... a gifted person ... a cosmic traveller, a healer, a master of spirits, a psychopomp, an oracular mouthpiece ...', whose powers 'are combined and organised round the central faculty of trance; of so altering his consciousness at will that he can communicate with the inhabitants of the supernatural world' (Blacker 2001: 209). Such must have been the common understanding, which enabled some early Neolithic shamans to rise above their peers, if indeed they were shamans.

III. Having read Benz' and Bauer's contribution, my response to Watkins' paper seems over-pessimistic, but the past trajectory of evolutionary thinking in archaeology is discouraging. So, let me express the hope, here, that things turn out differently this time. This hope, which I believe Watkins shares, is at least partly fulfilled with Benz' and Bauer's contribution in so far as we all seem to share a common interest in, perhaps even congruent approaches to, mediality as an instrumental component of neolithisation.

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The Territoriality of Early Neolithic Symbols and Ideocracy

Hans Georg K. Gebel

On an Imperative of Neolithic Research

Beyond a doubt, both key notes draw our attention to one very important fact: Near Eastern Neolithic research has reached a point where a further non-involvement of cognitive and neurological sciences and evolutionary theory would culminate in stagnation and the neglect of available research potential. I am a staunch believer that the incorporation of these disciplines is imperative; it is the path that we must take, and in doing so I further ask whether we, as prehistorians (or archaeologists), should not at least attempt to interpret – or at least present – our tangible empirical data in such a way that they can be evaluated by colleagues working in the fields of the cognitive or neurological sciences. When it comes to the essence of historical work, are we archaeologists (including all archaeo-biologists) only responsible for interpreting a stratigraphy, reconstructing labour division from flint assemblages, and land use practices from animal bones and charcoal, or the like? Isn't archaeology more? Should it not be an integral part of a trans-disciplinary approach to multidisciplinary research focusing on us moderns as the (current) culmination of a history of evolutionary dispositions, cognitive skills, and neurobiological adaptations? Hasn't archaeology also the responsibility to provide insights and critical views on the development of the human ethos, and its commonly cited traps and fallacies? Certainly, neolithisation created a new social (and thus also medial, *sensu* Benz and Bauer) phenotype in human social evolution (which I have termed elsewhere *Homo neolithicus*, cf. Gebel 2010a, 2010b, 2013), a phenotype that still dominates our present ethos (*sensu* human ethology). Doesn't this mean that research on Neolithic evolution, cognition and neurological furnishings provides the means to better comprehend human development in later periods and up to the present? Before I am warned about propagating a 'Neolithisation of archaeology', I should like to return to our main subject¹...

I consider it a problem to selectively comment on ingredients of the keynotes, only for the reason that I disagree or have different views on these, or because I agree while I am not sure if we mean the same thing when using the same terms. Thus, I restrict my comments to some general assessments and offer additional views on the territoriality of symbols.

General Comments

Watkins' keynote does not necessarily follow a different intention to that of Benz and Bauer, while it is obvious that despite the mutual appreciation of Cauvin's thoughts both have a different background and sub-

stratum. The evolutionary approach taken by Watkins advocates recent niche construction theory originally developed in evolutionary biology. Accordingly, factors which explain evolution in biology (species create their microenvironments to 'exclude pressures from the general environment', and these niches 'constitute the environment that exerts selective pressure ... in a continual cycle across the organism's generations') are applied to explain 'human evolution as cultural niche construction'. On the other hand, and based on Trevor Watkins' publications from the last decade, it is evident that he sees evolution neither 'de-entangled' – as simple niche construction theory sometimes appears to do – nor does he understand evolution as a linear process (a problem I see with previous such applications in archaeology).

The keynote by Benz and Bauer might be considered an application of just the thing that Watkins' is demanding, albeit that symbols and their transfer (mediality) are only one area of Neolithic evolution, and this to a varying degree in the Neolithic periods of different regions. I am strongly against a 'Göbeklisation' of Neolithic research, meaning that increasingly all the different regional Neolithic developments are seen with reference to the record from Upper Mesopotamia. Certainly, it appears to me that their (Benz and Bauer's) concept of mediality and emotions is presently the most pertinent approach to Upper Mesopotamian PPNA symbolic systems, though we should certainly fail if we were to apply it to more informal symbolic systems, e.g. those of the PPNB cultures in the Southern Levant. If the claim were to be made that the mediality/emotions concept is applicable to all Neolithic regional trajectories, I would definitely question this claim with regard to the subject (mediality) of the approach, though not for its psycho-social side (emotions *etc.*). Is mediality a holistic concept, *i.e.* when applied does it behave systemically, covering all issues of socio-economic and ritual identities? It may even turn out that mediality is in fact a single focus approach, only pertaining to certain contexts of a Neolithic system, in spite of representing an holistic key to the symbolism of the Upper Mesopotamian PPNA world. These remarks are clearly the sum of my personal research standards (Gebel 2010a), *i.e.* my understanding that approaches to the Near Eastern Neolithic need to be holistic, as part of a systemic framework, and they must be able to identify and respect regional variability in all sectors of a Neolithic system.

Additionally, I see methodological problems in bringing together the emic perspective and the modern ideas of iconicism, theories of media, and materiality theories as intended by Benz and Bauer; especially the latter has become subject of extensive academic subjectivism. Yet, speaking from my own experience,

I fully support Benz and Bauer's two basic theoretical assumptions that 1) anthropological universalia exist, and 2) that materiality matters. But what are described there as the two special ways of comprehending materiality (under a and b) should perhaps rather be referred to as the known ingredients of the commodification concept, in the frame of which the treatment of such tangible and intangible materials would remain within a controllable and testable system (Gebel 2010a).

I refrain from commenting on ideas relating to: 'the liminal character of these communities', 'local adaptations of interregional themes and site specific features demonstrate the independence of local groups', 'petrification of symbolic systems', 'male agents were accepted to set social behaviours and ritual scripts' *etc.* Certainly, these are most interesting thoughts, though requiring more explanatory statements.

Concerning the crises argument related in Benz and Bauer's keynote, I would like to draw attention to the interacting dispositions (or psychological adaptations) that I feel would have developed from the gradual establishment of productive milieus in the Early Neolithic (*cf.* Gebel 2010a, 2010b). In the frame of the so-called Conservation Thesis², I have formulated that 'Neolithic progress and growth were not the result of conscious acts or sought-for innovations, but rather the result of measures to sustain a current life mode; in other words, in tendency they were 'defensive'. The immediate satisfaction of life needs took priority over any effort toward social, economic/technological, or ideological alteration'. When projected on the Göbekli focus of the two keynotes, this implies that the establishment of such symbolic systems, or the externalisation and canonisation of symbols, is not the result of a cognitive process but rather the result of a basic need, the need to sustain a current life mode by coping with newly arising social and ideological challenges of fast growing social aggregates in the Upper Mesopotamian grasslands. We have to imagine that the Early Holocene Upper Mesopotamian grasslands were the largest coherent system of steppe habitats in the Near East, hosting rich populations of ungulates and cereal stands. It must have provided stable sources of food, thus allowing a tremendous growth of its human inhabitants in a short time span. Their population dynamics must have reached critical stages in which only a mutually respected, powerful system of shared norms and values could keep in check increasing stress levels affecting larger parts of the steppe populations. Simultaneously, the late hunter-gatherers of these areas needed to establish centres in order to medially distribute these norms and values. It may well be that the bearers of this new *ideocratic*³ system were individuals comparable to shamans, who may have furnished the system by exerting fear, aggression and through the promotion of their own exclusiveness. In this respect, I consider the introduction of externalized symbols and their emotionally supported propagation in geographical centres as an emerging element of crises development. For me, the outstanding and strong *Early Neolithic*

medial optimum in Upper Mesopotamia is the reaction to another strong and outstanding optimum, that of the region's vast grassland sources and the growth and momentum which they unleashed. The legacy of these strong cognitive impulses, however, has remained a constant in human evolution, also providing the substratum of tools and experiences for subsequent religious and ideological systems which we still use today as a means of managing and align-ing large social aggregates and manipulating stress situations. The cognitive side of this development is not imaginable without the increase in complexity and interaction of constantly shifting commodification regimes.

On the Territoriality of Symbols

As mentioned above, the environmental cornucopia of the Early Holocene in Upper Mesopotamia needs to be considered as a special milieu in which new and more externalized and canonized types of symbolic territories developed as an essential need. Neolithic regions in other parts of the Near East developed less differentiated, less powerful and less formal symbolic territories, and we have to expect that in Neolithic societies at the semi-arid fringes natural agencies for a long time dominated cultural ones in the formation and preservation of value systems supported by symbols.

In productive milieus like the Neolithic, the commodification of symbols requires that physical and intangible territories are created as a means to structure and manipulate risks that are a threat to social life and its economic foundations. (I expect that informal symbolic systems reflect a reduced need to structure and manipulate risks). In these territories, symbols (and their application) help to align behaviour; their development is promoted by new behavioural patterns and by use. In order for symbolic systems to emerge, modify and interact, followers are required; the symbolic systems become territories of their own, in which social, economic and ideological transactions receive a space and validity. I am convinced that our 'first' cognitive disposition for symbols relates to the motivation to avoid and channel conflict, triggering our 'second' cognitive disposition with symbols: to create segregation and exclusiveness of those who are not accepted or who are excluded from the symbolic system. This is a productive way to commodify and use symbols and the social and ideological territories they provide. It is in this point that differences in symbol usage by foragers and producers may be identified.

Symbolic territories apparently share many functions with physical territories, especially as symbolic territories may have physical spaces allocated; in this respect they mark, represent, personalise and defend ideas, beliefs, traditions, *etc.* However, most Early Neolithic symbolic territories appear in informal physical contexts. Thus, it was a surprise and is of persisting fascination that there are Early Neolithic contexts in which a symbolic territory was bestowed

an exclusive and highly elaborated formal space, from the very beginning most likely even outside a sedentary context:

The symbolic territories of Göbekli Tepe are by no means informal. In a way, the round structures and their furnishings are an explicit testimony to the existence of imagistic and emotional modes of rituals, serving here to demarcate a doctrinal symbolic territory and ritual sphere. I consider the emotional modes of ritual as constituents of a Göbekli Tepe ideocracy⁴. Although far from being understood, this rule of ideas must have already acted (and failed) beyond the formation of a mutual social and ritual identity which we should expect for Neolithic times. It may have anticipated something very modern, something related to a prolific physical development which imploded in Göbekli because the cognitive skills for it were not yet developed: the introduction of doctrinal symbolic territories.

Endnotes

¹ When the term 'symbols' is used in this contribution, I refer to Neolithic symbols.

² The Conservation Thesis cannot be seen isolated from the Efficiency, Repetition, Innovation and Exclusion Theses (from Gebel 2010a: 51):

1) Conservation Thesis: Neolithic progress and growth were not the result of conscious acts or sought-for innovations, but rather the result of measures to sustain a current life mode; in other words, in tendency they were 'defensive'. The immediate satisfaction of life needs took priority over any effort toward social, economic/ technological, or ideological alteration.

2) Efficiency Thesis: Changes were only tolerated and permitted when all other possibilities for attaining a goal by more easy and inexpensive means had failed.

3) Repetition Thesis: Unsuccessful and disadvantageous behaviour was repeated in modified forms by following generations because sedentary learning remained more restricted to individual expertise than being a transferable/negotiable group-knowledge.

4) Innovation Thesis: Progress and innovation were the result of exploration impulses generated by attitudes during periods of surplus supplies. The surpluses caused growth, which led to more complex social and economic structures, which in turn caused more stressors and further exploration impulses. Stressors from cataclysms also triggered innovations.

5) Exclusion Thesis: Growth resulted in tangible/intangible

diversity, which led to more exclusive/segregative behaviour and a decline in generalized reciprocity. The more productive a social unit, the less ready it is to share with outsiders, which tends to increase supplies.

³ In Neolithic contexts, the term ideocracy (*ideocratic*) refers to formal doctrinal religious or other ideological systems which provide the power and legitimation to maintain hierarchies, symbols and other value systems, and/or other structures (and vice versa, of course). It is introduced (and proposed) here to apply this distinction to Neolithic religious or other ideological systems which use more informal or 'less mandatory' means to maintain their hierarchies, symbols and other value systems, and/or other structures. The Göbekli findings, especially the doctrinal character of their imagery, make it essential that this distinction is introduced to Neolithic research.

⁴ For an explanation of ideocracy see endnote 3.

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Human Cultural Defense: Means and Monuments of Ensuring Collective Territory

Christa Sütterlin and Irenäus Eibl-Eibesfeldt

Joachim Bauer and Marion Benz discuss two topics in their paper, territoriality and symbols of power, which appear to have been connected for a very long time. However, there is also strong evidence for a third related topic, it too sharing a similarly long history: monuments and memorials.

The need to endow environmental structures with *meaning* is a typically human one. An undefined environment can appear scary and threatening. It is in this necessity that the beginnings of sign markings in human culture may be sought (Eibl-Eibesfeldt and Sütterlin 1997). The securing of environment and the acquisition of exterior space as personal space is a recurrent archaic feature among Homo. It is, however, not one that is exclusive to humans: non-sedentary bonobos build symbolic „sleeping nests“ to mark places during daytime (Fruth and Hohmann 1994), and we know that all kinds of vertebrates and invertebrates mark their territory by use of chemical scent trails (Eibl-Eibesfeldt 1987: 159 f.).

Earliest markings (or signs) in human culture are found in Bilzingsleben (Thuringia, Germany) from *ca.* 250 000 years ago. These consist of simple parallel lines of about the same length scratched on a tibia bone (Herrmann and Ullrich 1991) and which might have served as a property marker, *i.e.* for the identification or individualization of the object (Eibl-Eibesfeldt and Sütterlin 1997: 29 f.). The hypothesis that this pattern served the communication of a group by its specific symbolic code remains open.

Human culture and history are bound in myths and memory, and the need to indicate a secure place of common gathering and identity seems to be a function that has been present from the very beginning. Hunter-gatherer societies decorated places of cult and encounter; this we know from Palaeolithic caves, and Bushmen caves found in the Drakensberge (South Africa), which are adorned with highly distinctive paintings. These caves do not show signs of habitation or daily use. As such, places of cultic activity are not per se limited to the Neolithic (Eibl-Eibesfeldt and Sütterlin 2008).

Cultural memory, however, seems to be a highly selective process – like the one we cultivate as our biographic memory. Not everything that happens finds its memorial form in stone or bronze. In the frame of the term cultural memory Assmann (2000: 18) identifies the concept of ‘canon’ which serves to enhance the connective structure of a culture towards time resistance and invariance. The ‘canon’ represents the ‘*mémoire volontaire*’ of a society, the ‘owed remembrance’ in contrast to the fluent and fluctuating kind of oral traditions in earlier advanced civilizations. Socie-

ties construct self-images and promote cultural identities by developing a highly specific memory culture.

Parts of this memory culture are constituted by symbols – like flags, relics or monuments (see below), other parts take the form of rituals (Sütterlin 2000). Rituals are structurally based on repetition and repeatable elements of imagined or memorized history. This creates a strong cohesion within the larger group and reliable forms of ‘eternal presence’ (Boesch 1983; Burkert 1998). In Irian Jaya (West Neuguinea) the Eipo repeat the mythical act of cultural foundation by planting cordylines around the men’s house, bolstered by stone wedges to stabilize the floor, thus continuing a tradition that was practiced by their cultural ancestors. Through this act a common ancestry is invoked within the larger group, thereby enhancing social cohesion (Eibl-Eibesfeldt 1995: 472). While oral traditions of myth telling repeat and represent events as a narrative mode in time, rituals also evolve in space.

Monuments as Built Cultural Memory

Monuments and memorials, as we term them today, are distinguished parts of the built environment in most cultures, traditional and modern. They refer to eminent persons or events as examples of a cultural memory (Eibl-Eibesfeldt and Sütterlin 2005). In traditional cultures they are treasured as (or within) a central structure referred to as a meeting-, clan- or men’s house where sacred objects are stored. They constitute explicit documents of a shared cultural memory passed on from a more or less mythical time of clan- or community-origins – similar to the town halls and memorials of our towns and cities. In clan-houses people meet, confer about common decisions, and at special occasions disclose the treasured ceremonial objects for the worship of ancestors.

‘Ancestors’ are frequently ‘cultural heroes’ who founded the village, planted the first trees and settled the territory. For example, the ‘honey-ants’ clan of the Walbiri (Mount Allen, Australia) worship ‘Churinga’, holy stones decorated with linear engravings which represent the trails of the ‘honey-ant’ ancestor. The central circle figure represents a clay pit in the north east of the Yuendumu settlement where there was access to ground water. This is the home of the (mythical) chief of the ‘honey-ant’ clan who established landmarks like hills (represented by other lines). The bowed lines indicate the paths of the chief. The lines are ritually marked into the sand or on a rock, and initiated young men are given a piece of wood or stone into which they engrave a copy of the pattern. In this

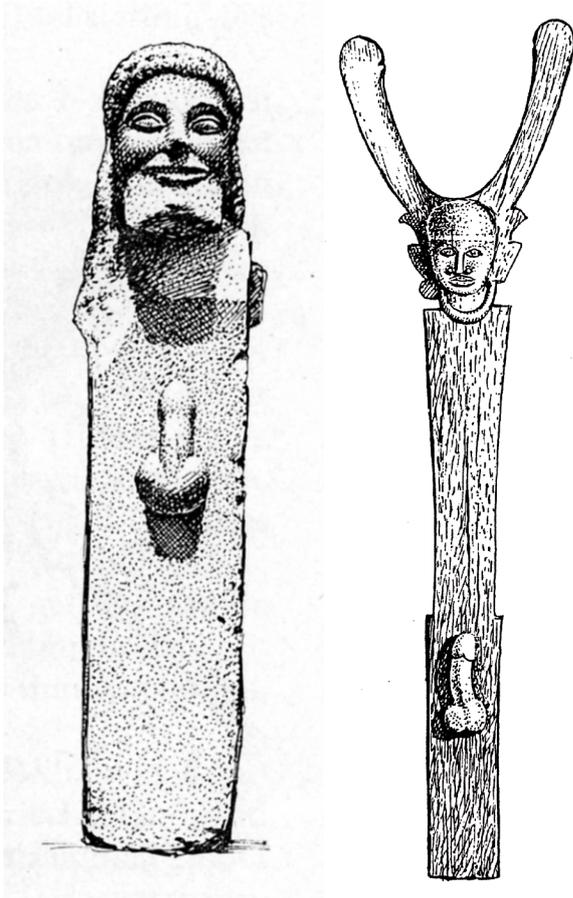


Fig. 1 a) Herme of Siphnos. 490 - 480 bc (Wickler 1966. After a reference of the National Museum Athens). b) House-guardian figure ('Siraha') from Nias (Indonesia) (Wickler 1966).

ritual the myth is memorized, the attachment to the clan and the affinity to the territory are consolidated. The Churinga remain the property of the initiated for a lifetime; following initiation, the stones are buried until the next feast (Eibl-Eibesfeldt 1995: 470ff.). The initiated are now members of the clan or group.

There are further aspects in the context of monuments or memorials, in particular concerning their territorial function and origins (derivation). So far we have talked about the cohesion induced by memorials. Collective memory binds and welds members of the group, and objects or buildings relating to this memory are mostly positioned at the centre of a community and its territory, like the cult- and men's houses (Sütterlin 2006). But there are other functions, too.

Origins of monuments are sometimes documented in historical sources. For example, in ancient Greece there were the simple piles of stones used to denote boundaries and fields (see Eitrem 1912). This custom has parallels in more anthropomorphic signs or pillars erected in similar places and positions. Lullies (1949/50) associates these – like Eitrem – with the known pillar-stones of a possible phallus shape (signum Mercurii), sometimes also with a bearded head, known as *Hermāi* (herms). This anthropomorphic version displays an erect phallus at the anatomically correct position, *i.e.* in the centre of the pillar (Fig. 1a). Personalization however seemed to be secondary; for example, Lullies mentions archaic wooden examples that renounce any elaboration of a head or face.

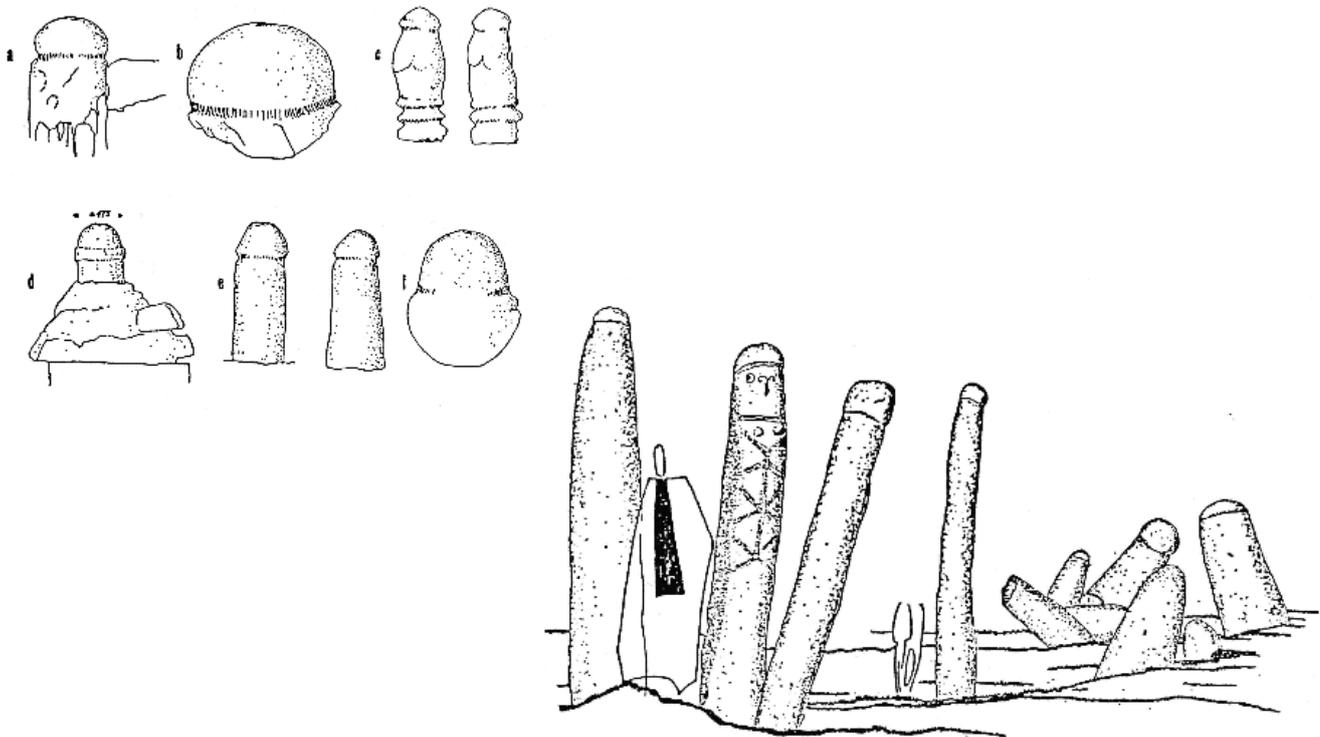


Fig. 2 Left: cult and border stones, Iron Age from Brittany (France) (Charrière 1970: 173). Right: phallic megaliths from Ethiopia (Charrière 1970: 174).

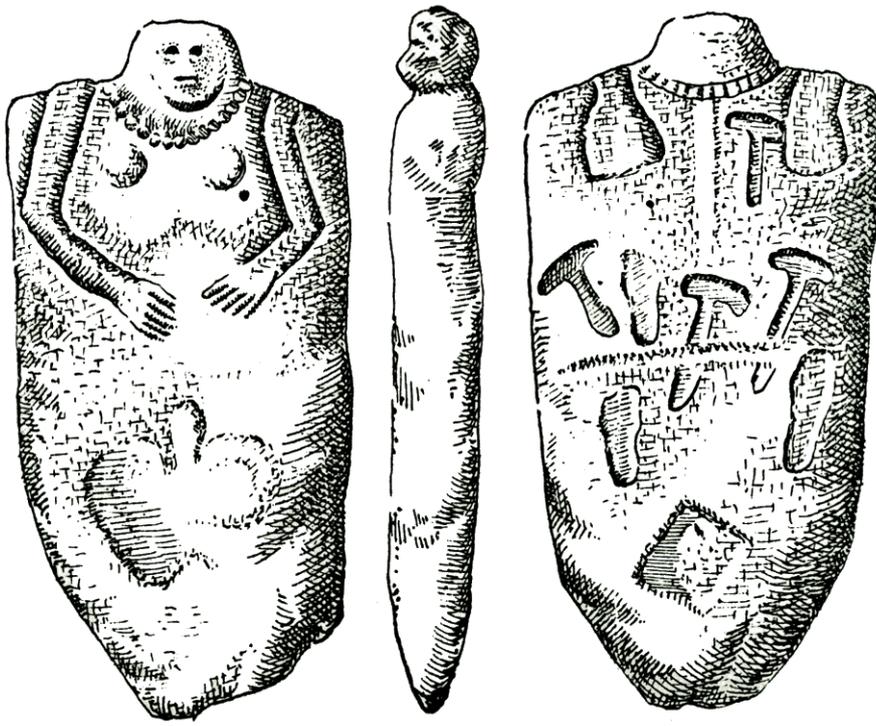


Fig. 3 Anthropomorphic stele from Neolithic Hamangia culture (h: 1.94 m) (Narr 1975).

In this context, mention should also be made to a popular figure known as *Priapos* who was worshipped along the eastern part of the Greek coast and who displays comparable phallic attributes. In Greek mythology *Priapos* was a god of fertility and protector of livestock in the fields, comparable to the scarecrows in more recent times. According to his protective value, the figure – regularly made of wood or in stone – was also erected in private gardens, often holding a cane or club with which to chase thieves (Herter 1954). Lullies (1949/50) traced the origin of this figure back in the pre-Indo-German period (4000-3000 b.c.) and connected it with occurrences in Asia Minor and Etruscan sepulchral art.

Phallic Symbolism in Territorial Defense

Evidently the tradition was widespread, but similarity per se is not sufficient to confirm the existence of a universal trend or expression. As we mentioned above, for *Hermai* as for *Priapos*, similar attitudes and *functions* could be assigned with regard to positioning in the landscape. Phallic display coincided with apotropaic (protective) values under defined spatial conditions.

Along this line we find many more documents of a similar morphology with related functions. As pointed out by Charrière (1970) and Marcireau (1979), phallic stones and pillars were customary symbols in the North of Europe (Britanny, Sweden) and in Africa (Ethiopia, Nigeria) (Fig. 2). They served as ritual stones (menhirs), often near burial grounds (Eitrem 1912) or as markers of frontiers and borders (Herter 1954). Burial grounds were not only worth protecting, the living also had to be protected from the spirits of the deceased.

Near Cerne Abbas (England) the figure of an ithyphallic giant (carrying a huge club) was formed by cutting the turf and exposing the chalk of the hill. Celtic origins are cited (Ross 1967). The erotic misunderstanding was predictable, but is adjusted by the contextual attribute. Again apotropaic functions appear. Neolithic stele-statues have been found in Upper Italy (Lunigiana) with engraved weapons near graves (Anati 1981), these showing surprising analogies with an example found in the Hamangia Culture (Neolithic Romania): an anthropomorphic stele with incised face, (breasts?) arms and hands, and also a phallus sign in the lower part. The back is incised with daggers, spears and axes – aggressive war symbols in all (Dumitrescu 1985; Eibl-Eibesfeldt and Sütterlin 1992: 105, 111).¹ The stele was found within a *kurgan* (tumulus)-formation (Fig. 3).

To give extra-European examples: In the pre-Columbian site of San Agustín (Columbia) the Parque Archeológico, covering an old ancestors cult site (*ca.* 1000 b.c.), features monumental stele-figures that served as guardians (Willey 1985). The holding of weapons is combined with highly aggressive teeth and (ithy)-phallic display (Däniken 1984: 177). The site has also provided evidence of ancient funeral rooms, tracks, drainage ditches, and field boundaries.

The aggressive (phallic) aspect of peripheral figures is frequently found in the Far East. The Nyatapola Temple in Kathmandu (Nepal 18th c.) is defended by horse-like phallic animals in the corner posts, and in Java we find ithyphallic guards in the entrance zone of the Sukuh Temple near Solo (15th century). Axes and horn symbols complete the defensive impression (Fig. 4) (Eibl-Eibesfeldt and Sütterlin 1992: 163).

Turning to modern traditional cultures, we find guardian figures with aggressive and / or phallic display in official, religious and private contexts in abundance,



Fig. 4 Phallic entrance figure from Sukuh temple near Solo (Java, Indonesia). Photo: C. Sütterlin, 1986.



Fig. 5 Phallic threatening guardian figure from Bali. Private collection I. Eibl-Eibesfeldt.

and particularly well documented in the Indonesian and Melanesian region. Territorial aspects are evident in the positioning at the front of entrances to temples as well as in private compounds and gardens. Private guardian figures are still ubiquitous in Bali (Indonesia), though excessive phallic display is only one communication among others. Additional aggressive behaviours include the showing of the tongue, of the buttocks and of the teeth; these features are often acrobatically combined in order to increase the protective function of the figure (Eibl-Eibesfeldt and Sütterlin 1992: 135 ff.). Older examples are made in stone (tuff or pumice), re-

cent ones in wood; these figures rarely exceed the size of our local garden gnomes (Fig. 5). Impressive phallic display is also found in the warlike figures (*tekoteko*) that top the gables of Maori Meeting Houses in New Zealand. They bear a long stick or club and aggressively stick out the tongue (Tischner 1971). The latter belongs to the usual greeting behaviour towards foreigners among Maori, ritualizing an ambivalent behaviour for communicating welcome! Expressive phallic Uli figures in New Britain are posted in fields and near graves, and guardian figures in Nias (Indonesia) take the form of the classical phallic herm, supplemented with giant horns (Fig. 1b).

Here we should not overlook figures found adorning Medieval churches which by their 'grotesque' expressions and behaviour are meant to scare off demons and evil spirits from the holy district. Among grimacing mugs and faces the genital display of both sexes plays a prominent role (Eibl-Eibesfeldt and Sütterlin 1992: 87 ff.). Many of them were destroyed or removed in gothic times since they showed indecent behaviour. Examples for phallic exhibition are, however, still found at Champagnolles, Saint Palais, Sémur en Brionnais, Sémur en Auxois (France) and at Fromista (Spain). For the aggressive – non-erotic – understanding of the display, associated expressions of threat or disdain are evident (Fig. 6). In a figure on the choir stalls at Lorch (Germany) where the display is obvious, one hand grasps the beard – another more discrete male dominance display (Eibl-Eibesfeldt and Sütterlin 1985). This gesture was misunderstood as yawning; the figure is more popularly referred to as the 'Gähnteufel'.

Highly revealing are phallic dominance symbols on Medieval town gates (Terno, Todi, Spello, Landau *etc.*). Transcultural elements of phallic symbolism also include amulets and protective figures – from Celtic pendants to Senufo brass figures, and Japanese amulets in thumbnail formats (Eibl-Eibesfeldt 1970; Eibl-Eibesfeldt and Sütterlin 1992: 166 ff.).



Fig. 6 Figures from the roof gable of San Pedro de Cervatos (Spain) with protective genital display. Photo: I. Eibl-Eibesfeldt.

The Ethology of Phallic Display

The correlation of aggressive phallic display of dominance and territorial defense seems to have at least some phylogenetic roots. Observations among non-human primates (baboons, guenons *etc.*) have revealed interesting coincidences. While others eat, move or rest, some male individuals sit as guards with their backs to the group, at the same time exposing their genitals. It was first suggested that this behaviour was a means of protecting the group against predators, but this appears not to be true. When predators do appear, the ‘guards’ disappear discretely. On the other hand, if members of neighbouring groups approach, the guards become sexually aroused (Fig. 7) (Wickler 1966).

Genital display is an *intra-specific* imposing behaviour among primates. Ploog and MacLean (1963) point out that squirrel monkeys display their erect penis in encounters, and high ranking male individuals casually mount lower ranking males to confirm their superior hierarchical position. The behaviour is described as dominance gesture derived from ritualized mounting: a symbolic action that has lost its sexual motivation and acts as signal in social communication. ‘Socio-sexual signals’ (Wickler 1966) serve to stabilize the social ranking order in hierarchical primate societies.

Relicts of such behaviours in humans can be observed in ritualized forms of social behaviour, as reported by Vanggaard (1971). Access rites to youth groups often rely on submission of a novice to an older member or chief – in a more or less sexual form. In a symbolic modification he is handed a ritual spike. In this context, one might mention the punitive rape of a French official by Algerians during the Algerian war in the sixties of last century; France was the occupying force (Fehling 1974: 20). Tales of Priapos also report punitive rape if a thief was caught (Fehling 1974: 18). In daily life the verbal ‘fuck off’ or ‘fuck you’ has survived as a swearword. It easily serves to establish a dominance position (Jay 2009). In West New Guinea men still wear prominent

penis gourds. In case of defamation of enemies or attunement for a fight, men rhythmically hop in a row (Eibl-Eibesfeldt 1987: 724 f.; Eibl-Eibesfeldt and Sütterlin 1992: 176 ff.). Ritualized forms of behaviour often stay at the base of nonverbal communication to which our perceptual system has adapted. Art therefore can be seen as a further form and level of ritualization (Sütterlin *et al.* 2013).

Discussion

The use of artefacts as visual symbols constitutes among others a means to uncouple behaviours from their performer – in terms of personal dispense. It creates new scopes of diversification, transformation, enhancement, and accumulation. This touches the wide province of myths and symbolism.

The origin of oral traditions lies at the very beginning. Myths are told in recent indigenous cultures, *e.g.* among the Eipo in West New Guinea and the San in Botswana, but originated much earlier. Pictorial traditions however seem to arise only later, most evidently in prehistoric dimensions of the Upper Palaeolithic (Aurignacien). From this period finds of sculptures are certainly rare, but when they occur they generally depict animals. However, these are not neutral illustrations of the existing fauna of that time; and not even the full range of fair game is illustrated. Instead, the choice relates to animals of power. Even anthropomorphic representations display attributes of selected animals such as lions, bears, snakes or the stag, irrelevant of their size, *e.g.* in the Geißenklösterle, Hohlenstein-Stadel, Les Trois Frères (Murray 1970; Müller-Beck and Albrecht 1987: 75).

Powerful animals not only project notions of higher powers, they are also especially well-suited for demonstrating human identification with these powers in ritual (*e.g.* by taking on the guise of powerful animals through the wearing of masks and costumes). Mythical names and tales may vary from culture to culture, but the mor-

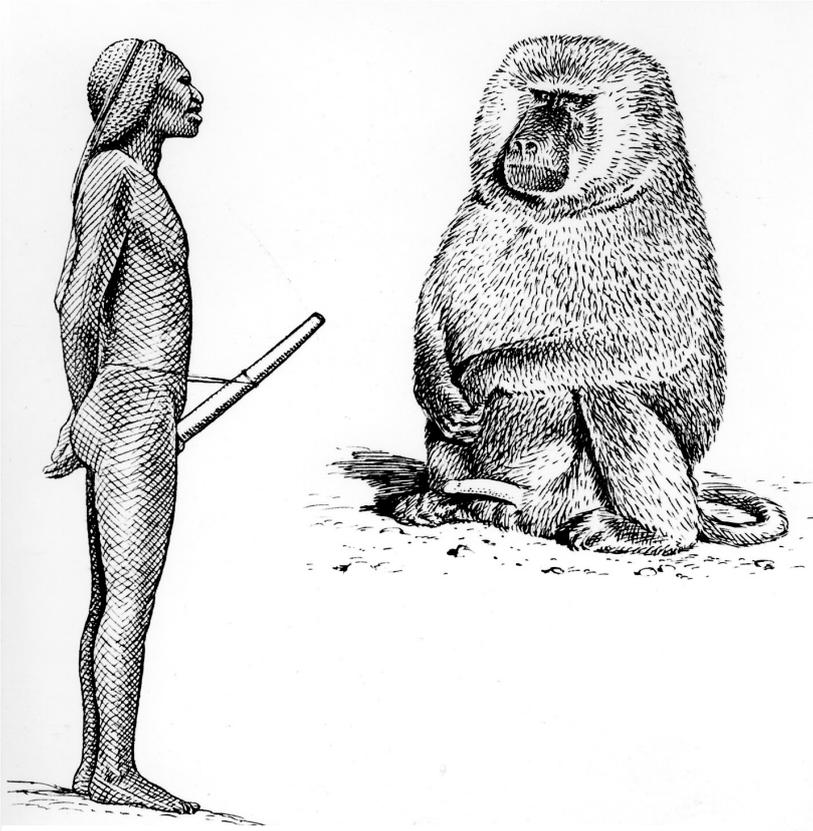


Fig. 7 Left: phallus demonstration, Kogume, Konca River (Papua New Guinea) (Eibl-Eibesfeldt 1995: 725). Right: male baboon sitting as a guard with its back to the group, at the same time exposing its genitals (Wickler 1966: 433).

phology of power – to which our perception has adapted in an evolutionary process – is a quite consistent one. ‘Cernunnos’ in Celtic mythology, ‘Quetzal’ in the Aztec religion, the ‘Jaguar-God’ of the Olmecs, the ‘Rangda’ witch in Bali, are all equipped with the specific attributes mentioned above. The envisaged powers (or representatives thereof) deemed responsible for numerous inexplicable events can only be confronted in this way. Fear is one of the most ancient universals in organisms, be they human or non-human. The apposition of (aggressive or defensive) attributes or ‘costly signals’ has high status in the animal world. Fangs, claws, antlers, manes and feathers belong to this package (Sütterlin 1994). From a very early time, these particular elements have been a universal part of magic impression management. As such, they do not differ greatly from the getup and display of modern shamans or chiefs in modern traditional societies or the blazons and scutcheons of modern traditional pubs. It is the same with amulets.

The symbolic change, with the addition of some specific functions in the Neolithic, cannot (and should not) surprise. The accent on new assignments with respect to territorial differentiation and demarcation, as proposed by Marion Benz and Joachim Bauer, can be seen as a shift in emphasis to the peripheral implementation of the more defensive or aggressive types of monuments, while a symbolism which implies collective group memory, and thus serving cultural identity, is most often located in central monuments. Memorials cultivating the fame of ancestors, mythical heroes, triumphs in conflicts, gain of territory or associated groups *etc.* still represent a selectively positive and pro-social aspect of group solidarity in central communal places.

Endnote

¹ The discussion about a possible hermaphrodite character of the figure is resolved from our part by the argument of an enhancing use of accumulated apotropaic motives.

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Symbols, Language, Ritual, and Scale

Pamela J. Stewart (Strathern) and Andrew Strathern

These are stimulating and deeply thoughtful papers that essay integrative work on ritual and symbolic practices, bringing together archaeological findings with anthropological interpretations, in pursuit of explanations for observed changes in the form of material remains from Northern Mesopotamia. The emphasis on creativity is shared with aspects of post-processualist work on symbolism in British archaeological writings, and at the same time goes beyond this work by incorporating approaches from other disciplines such as neuroscience, as well as adopting a standpoint on materiality and embodied practice akin with the work of the archaeologists Nicole Boivin (2008) and Christopher Tilley (2004) in their recent work. These approaches derive both from the practice theory of Pierre Bourdieu (1977) and from the earlier phenomenological work of another French scholar and public intellectual, Maurice Merleau-Ponty (1962). Practice theory and embodiment theory, with their shared roots in aspects of phenomenology, are front runners in the field of contemporary theorizing in social and cultural anthropology, and we share with the authors a general perspective on rituals that draws on these topical arenas of thought.

Since phenomenological approaches all invoke subjectivity or sensibility of persons as experiencing agents in social life, a difficulty immediately presents itself when we engage in imaginative time travel in relation to archaeological findings. We have no living field interlocutors and must ask ourselves questions which ideally only the original actors could answer. Appeal to comparative cases as well as general theory is thrust upon the analyst in these circumstances. Starting from ascertainable material findings, spatial structures, and hints of symbolic meanings, interpretive archaeologists attempt to link these finds to analytical schemes of their own creation. (In passing here we note that analogous problems of interpretation face living persons when they contemplate the material effects of disasters and attempt to recreate in memory the structures and their meanings that held sway prior to the occurrence of their destruction. We draw here on our work in what we have called the new field of Disaster Anthropology and the wide scope it offers for fieldwork and theorizing about disorder and the recreation of order in social life.)

In the present papers several powerful tools are brought to bear on this process. The general context is the transition to sedentarism, growth in the size of local groups, and the construction of material items as mechanisms of control or power wielded by leaders or rulers. The key idea is one shared by many theorists, including in at least one case speculations on the origins of human language (Logan 2007). Logan argued that language emerged as a tool of communication between people when groups increased in size and social

relations became more complex, requiring enhanced objective means of conceptualization and the sharing of meanings in the service of social cohesion. What Logan called the extended mind (as per the title of his book) he thought of as emergent from this process of innovation, such that language and culture in general are seen as having co-evolved. To this idea of co-evolution Benz and Bauer have added an important dimension, connected with power. They interpret, in particular, the creation of durable forms of ritualized architecture and iconic representations of power as a way of strengthening networks that might otherwise fall into situations of conflict and violence. Of course, these same mechanisms might also be put to work to promote external violence or war, by the same token as strengthening internal cohesion. The overall argument, however, is clear, that changes in material culture follow on from the centripetal effects of sedentary farming practices, and that the concomitant social processes were the drivers for the elaboration of material symbols of power. An innovative aspect of this work is the attempt to bring together, rather than oppose, functional, interpretive, and cognitive analysis under the rubrics of power and the imaginary.

The analyses proceed with a broad flourish and invocation of special themes such as the introduction of the notion that 'shamans' formed a part of the emerging political process. In our comments here we focus on certain aspects of the account, taking the Benz and Bauer paper first, then the paper by Watkins, and finally comparing them.

First, there is the issue of what is meant by the term emergent. Emergence implies transitions on a trajectory. Is the emergence here really a transition from nature to a cultural world separated from nature? Since all human views of something called nature are themselves products of culture, nature as a symbol travels along with all cultural processes of development. Animals are at all stages good to think with (as per Lévi-Strauss 1962) and good to prohibit (as per Meyer Fortes 1987). Materials are a part of nature and remain so in some degree even after they are fashioned into stone pillars or slabs over a grave site. The emergence referred to is perhaps, then, to a liminal phase not away from nature but to a different appropriation of nature and materiality in the service of social complexity and hierarchy. If anything, the great proliferation of iconic 'representations' of animals and birds, captured in architectural forms, marks the continuing appropriation of nature as a symbol of power. The sovereign beast is put to work by the sovereign human in a material metaphor. This view also corresponds to the idea that elements from the past are recaptured and carried forward into new purposes via a method of recursion, thus becoming a part of space-

time continuum (*cf.* Kuskin 2013). It is this process of re-objectifying that can lead to what Cauvin described as ‘the Birth of Gods’, or the two-step appropriation of an image from ‘nature’ and its transformation into an artifact that embodies vitality or power. The ‘Birth of Gods’, striking as it is as a metaphor, does not necessarily capture this act of appropriation, especially since notions and ritual practices about ancestor figures often precede and then run in tandem with the creation of figures transcending the nexus of kinship or move these into the realm of political power or ritual power outside of kinship.

Two further points intersect here in our discussion. The first is about kinship. The societal structures that are being analyzed here are ones in which kinship, descent, succession, and affinal alliances were probably important. Although it is perhaps not feasible to draw specific inferences about this from the iconizations shown in the material realm, general theory would predispose us to consider that kinship systems would evolve and be transformed *pari passu* with sedentarization and agriculture, for example in terms of the intersection between kinship and territorial boundaries or in the use of kinship metaphors to describe the polity.

Second, regarding the material ‘representations’ themselves. From general ritual theory, it is plausible to regard these not just as symbols in some abstract sense, as signifying particular values. Rather they are perhaps performative realizations or instantiations of power, which are thought to be efficacious in their own right. Viewed in this way the lion statues would not only represent political strength but would embody and project it in a salient and emplaced manner. To speak of the functions of ‘art’ forms in this way stresses not simply their functionality as ‘standing for’ something else, but their performativity in actually exercising power, bridging over from the ‘imaginary’ to the ‘real’ by means of their materiality.

Another side to the analysis is the question of the roles played by leaders. On the material front, desirable architectural creations require resources and the organization of labor, and these factors in turn require structures through which they can be made to happen. On the spiritual side Benz and Bauer mention the potential role for shamans as leaders. The term ‘shaman’ has been applied to a range of ritual and political leadership roles, either in themselves or in conjunction with chiefly leaders. Benz and Bauer situate these shamanic figures in their portrait of liminal historical structures in transition from hunter-gather economies to agricultural activities. Comparative analysis would be needed to fill in this kind of model. This is a topic that we ourselves have worked on, having co-founded a research focus at the Institute of Ethnology in Academia Sinica in Taipei, Taiwan, dealing with shamanic practices in contexts of change in Asia and the Pacific, which ran for three years, and most recently we contributed a chapter to a volume on Shamanism and Violence edited by Diana Riboli and Davide Torri (2013). The analysis of the functions of shamans in relation to both the production and the

control of violence may be situated in a broader domain of discussions about the relationship of religion and violence in general (see, *e.g.* Stewart and Strathern 2013; Strathern and Stewart 2013). Shamanistic practices are not exclusively associated with any one political system, but they are, by their very nature, adaptable to fluid situations of change in which the creative performativity of the shaman’s art can find expression. They might well, therefore, play a special part in a model of liminal transactions such as Benz and Bauer propose. It should be noted also, from the comparative context, that shamans can be female as well as male figures, and healing capacities are often attributed saliently to such female shamans, and their connections with ancestral predecessors from whom they are thought to draw their special powers.

Trevor Watkins has placed these kinds of issues into further focus with his observations regarding the transition to Neolithic cultural practices and evolutionary theory. The picture of the co-evolution of culture and the extended mind that we have alluded to above is essentially identical with the general models cited by Watkins. We would only reinforce our point that the evolution of language capacities needs specifically to be factored in. Of course language and cognition are not exactly the same, and basic cognitive patterns may underlie different linguistic manifestations. However, language, cognition, and culture are bound to be significantly connected, to say the least, and language provides a supreme flexibility for the communication of thought and action, both in collective and in personal or individual terms, as argued forcibly long ago by Edward Sapir (1921) and echoed by many theorists subsequently (Duranti 1997, 2009). The chief point of the new linguistic anthropology (built clearly on much earlier insights), as expressed by a leading exponent of it, Alessandro Duranti, is that language is viewed as ‘a cultural resource and speaking as a cultural practice’ (Duranti 1997: 2). Such a view situates language within culture but also gives a special role to culture as a mode of being based on communication and transmission of knowledge and values. Watkins further mentions in this context the significance of the development of literacy. There has been much argument about this topic in cultural anthropology theorizing, the overall conclusion being that literacy is as literacy does and varies in function with context (see, *e.g.* the early work by Goody and his later reformulations, Goody 1968, 2000). Literacy, at any rate, is situated crucially in the domain of language and obviously greatly increases the capacity for scales of communication and the capacity for exercising powers as well. So, all in all, language usages are a crucial factor in the whole debate about cultural evolution and stand as an intermediate variable between cognition, on one hand, and culture / society on the other. We should also pay close attention to the way in which the powers of metaphor in general and the elasticity of kinship concepts in particular must have fed into the maintenance of the kinds of autonomous communities that Watkins cogently points out were

able to maintain themselves over long stretches of time.

Since the kinds of community scale and the practices attributed to communities that Watkins delineates are clearly comparable to those found recently in places such as the New Guinea Highlands, there is another arena here for the imaginative application of insights into the archaeological records. When Outsiders first came upon these communities in what is now Papua New Guinea in the early 1930s, stone tools were the basis of flourishing economies and exchange systems involving regional alliances and networks. There is a huge literature on all this, to which we ourselves have substantially contributed (e.g. Stewart and Strathern 2002, with refs.). The expression and handling of violence and the mechanisms of peace-making through compensation have been studied in detail (again, e.g. Strathern and Stewart 2011). While the model of invoking individual big-men as the instigators or originators of agricultural practices may or may not be substantiated, what is clear is that once agriculture has been established there are opportunities for big-man syndromes to develop.

It is important also to recognize, as Benz and Bauer do, the significance of ritualized actions in creating and defining communities. Non-verbal ritual actions go hand in hand with the development of verbal means of expression. Each contributes a different domain of experience to the construction of what Watkins describes as niche-creation. In social anthropology the equivalents of niche-creation are the concepts of embodiment and emplacement. A niche is a node in a broad context of embodied relationships that gain their meaning from their emplacement within the configurations of a landscape. By putting these concepts together we can follow the spirit of these two keynote papers in bringing about synthetic modes of theorizing about how human societies have developed over time and space. Scale is an important element, but it is in some ways not an independent variable but a product of other more detailed processes of autocatalytic creation in which language, ritual, and technology all interact to make increases in scale possible.

What makes ritual special in the evolution of the kinds of practices we have been discussing? Drawing on ritual theory (see, e.g. Stewart and Strathern 2010) and on our co-authored book *Ritual: Key Concepts in Religion* (Stewart and Strathern 2014) we want to suggest three ways in which rituals work to strengthen social processes of adaptation in groups. In an interesting way the argument here recapitulates a part of the structural-functionalist theorizing of Radcliffe-Brown, but places this into a contemporary framework of thought (see Radcliffe-Brown 1965).

First, and in the most conventional sense, rituals formalize relationships and give them a settled appearance. The petrification of ritual symbols is an example of this process, but it is only one example of a much broader feature. This point is cognate with Roy Rappaport's early formulation that rituals turn analogical relationship into digital ones (Rappaport 1968, 1999).

Second, ritual is a prime means whereby such digital images are made storable in memory and therefore become a guide and a resource for the future. Rituals enable recapitulations of relationship in time and space to be enacted and brought forcibly to mind (and here we mean the extended mind). The fundamental theorizing of Harvey Whitehouse and James Laidlaw on different modes of memory and religiosity comes into focus here (e.g. Whitehouse and Laidlaw 2004, 2007).

Rituals can act both as conservative and as transformative agencies in social process, in part because of their imagistic and paralinguistic character. Victor Turner (1985) creatively referred to ritual as culture operating in the 'subjunctive mode'. That mode includes cognitive processes. It also includes the capacity to create versions of reality that bring the imaginary into play and can provide deep motivations to people. Rituals are therefore powerful social and cultural instruments both for innovation and for consolidation of relationships and are eminently adapted to extending the scale of such relationships through recursive processes of framing at different sociopolitical levels. Rituals provide the energy that acts as a transducer to frame both small-scale and larger units together in terms of shared values. An essential part of this capacity lies in the power of ritual to tap into patterns of cognition at an embodied level, hence also Rappaport's point that with regard to ritual, people have to be present for the enactment of rituals; and this is also related to Rappaport's pronouncement of ritual as the basic social act, joining the collective and the individual together (Rappaport 1999: 137).

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Crisis Needs Shamans, as Shamans Need Crisis? Shamans as Psycho-Social Professionals in Early Neolithic Symbol Systems

Ulrike Bohnet

According to how the multi-disciplinary field of studying neolithisation fits into a wider scene within the long-term processes of human history, it seems necessary and inevitable that arguments should be brought for new approaches to early Holocene symbolism in Northern Mesopotamia (Benz and Bauer this volume). In order to gain a more profound understanding of ideological changes and psycho-social consequences at the transition from mobile to sedentary lifeways (as the contextual background of the changing symbolic systems) a one-dimensional causality is certainly not appropriate. According to the interdisciplinary approach promoted by Trevor Watkins, referring to *anthropological universals*, and paying attention to mediality, ambiguity and inter-subjectivity of symbolic meanings in a reconstruction of the contexts of usage and the inherent emotions of the dialectical, triadic relationships between creator, sign and receptor, a 'dense description' of an early Holocene symbolic repertoire seems to serve as a joining approximation. But how should we best approach the shelves of gained *emic* perspective of liminal societies during the psycho-cultural process of Neolithisation?!

According to our familiar cognitive niche within today's western world (Watkins this volume), even a 'dense description' will always adhere in the fictional character of describing a culture out of the categories of another, besides revealing structures of meaning for an *emic* interpretation (Geertz 1983; Gottowik 1997).

From an ethnological perspective, and in accordance with recent iconic theories and my own experience, there are other challenges to be faced: even in recordable ethnographic contexts from the present, we encounter living humans with their various forms of communication and individualities, including the sharing and performing of social and cultural memory,

which in turn constitute social and collective identity. In contrast to prehistoric archaeology, in the case of recent human history there are other issues at stake: there are no secluded processes as in the early Holocene; the presence of the 'observer' always alters the process (Bernard 1994; Silverman 1994). Even if the method of restudy cannot be applied to the prehistoric material, the

psycho-social approach to early Neolithic symbol systems (in an attempt to arrive at *emic* interpretations of symbolic systems at times of capacious change and even crisis) can be accessed through carefully selected recent ethnological records.

As an ethnologist and researcher specializing in shamanistic influenced societies in Siberia and Central Asia, I want to talk about some aspects of the keynote, dealing with the sites mentioned in Figure 1 (Benz and Bauer this volume) and with special attention to representations of animals and humans that are relevant to the affiliated associations and discussion. Selected ethnographical records are of particular significance to this discussion, because they might provide some explanations for symbolic representations recorded at Göbekli Tepe and Körtik Tepe, especially concerning animals and human figurines which display attributes that might be interpreted as antennae or feathers – associated with the extended headgear of shamans. Of course there is an extensive amount of ethnographical data which focuses on ritual practice in specific indigenous communities, albeit that comparing these with early Neolithic symbol systems requires great care (Clottes and Lewis-Williams 1997: 19). Firstly, mention must be made to the recent discussion of shamanic interpretations of prehistoric symbolic repertoires (Ries 1993: 42; Clottes and Lewis-Williams 1997; Hultkrantz *et al.* 2002: 122) which is even more complicated than the classification of recent forms of



Fig. 1 Tyvan shaman O. Oolovitch with headgear, Tyva 2002.
Photo: U. Bohnet.

especially concerning animals and human figurines which display attributes that might be interpreted as antennae or feathers – associated with the extended headgear of shamans. Of course there is an extensive amount of ethnographical data which focuses on ritual practice in specific indigenous communities, albeit that comparing these with early Neolithic symbol systems requires great care (Clottes and Lewis-Williams 1997: 19). Firstly, mention must be made to the recent discussion of shamanic interpretations of prehistoric symbolic repertoires (Ries 1993: 42; Clottes and Lewis-Williams 1997; Hultkrantz *et al.* 2002: 122) which is even more complicated than the classification of recent forms of

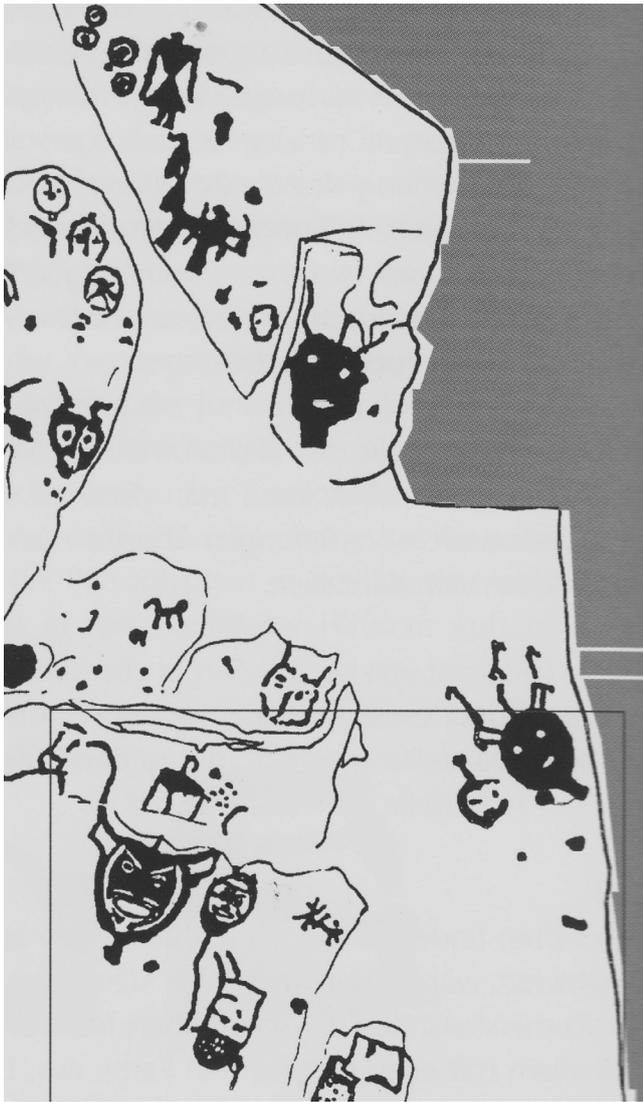


Fig. 2 Tyvan petroglyphs, Mugur-Sargol (Devlet 1998: 42).

shamanism (Alekseev 1987; Müller 1997: 26 f., 28 f.; Stuckrad 2003: 36-58; Znamenski 2007: 42 f., 165 f., 225 f.). Regarding the enormous range of meanings ascribed to shamanism as neuropsychological based religious phenomena with ritual specialists operating in altered states of consciousness (Vajda 1959: 456 f.; Hultkrantz 1973: 25; Eliade 1994; Shirokogoroff 1999), shamanic worldview opens as a multi-layered complex of imaginations and actions: a dazzling cosmos of associations.

Holocene symbolic representations feature several aspects which overlap with shamanic concepts: a multi-parted universe with animal-shaped supporting spirits and alter-ego spirits (Müller 1997: 42-46; van Alphen *et al.* 1997: 94-101; Solov'eva 2009a: 44-48) as well as depictions of garments reminiscent of recent shamanic costumes (Zinser 1991: 21 f.; Müller 1997: 72-79; Gorbacheva and Federova 2000: 182-184). Comparisons, especially of the headgear, with related 'petrifications' of human faces/masks with 'antennae', 'horns', 'feathers' or 'snakes' *e.g.* in the Neolithic of Siberia or the Russian Far East¹, suggest that such headgear reflects the wish by the shaman to render

himself taller, *i.e.* more impressive. Recent shamans from South Siberia (Fig. 1) use this special 'wire' for connecting with spirits in the upper worlds, while other interpretations assign shamans with attributes and the extended power of animals (Hamayon 2009: 70-76). Derived from the shamans' core function as 'crisis managers' and their responsibility to help their communities as mediators between the different spheres of spirits and people (Hamayon 1993; Müller 1997: 92 f.; Bulgakova 2009: 96 f.; Solov'eva 2009b: 82 f.) in life-threatening situations (diseases, bad hunting, climatic challenges, death), the appearance of these new figurative representations in the symbolic system might refer to challenges experienced in the search for new concepts of social interaction. Even if we could prove that representations of special animals at special places are in fact fearsome, I would still disagree with the proposal that these were used by shamans as a means of convincing group members of their strong leadership abilities, and in doing so advancing themselves into the emerging social elite. According to recent ethnographic records and my own observations in indigenous communities with practicing shamans, these weirdly gifted crisis-managers are certainly not power seeking individuals – even if they do have a special position within their respective communities. The power of the shaman must be seen in the context of the natural world and its forces, '[...] but never understood as a task of power within the community' (Hamayon 2009: 81, translation UB). As their function was dialogical and relied on their acceptance by the audience, shamans' authority would have been deeply rooted in their skills, their performing powers, and the cultural and symbolic memory they transmitted across generations (Kortt 1991; Müller 1997: 92-99).²

What's more, the *emic* interpretation of featured animals within the shamanic context may not necessarily evoke fear. In addition to the aforementioned skills in dealing with powerful alter-ego spirits (Stutley 2003), supporting spirits can use any animalistic form, which can include non-poisonous insects – such as wasps – or even harmless squirrels (van Alphen *et al.* 1998: 93 f.; Gorbačeva 2009: 140-142). Besides representations of 'typical' iconographic shamans' animals, such as sphere-crossing birds, frogs and reptiles, the very individual meanings and interpretations of animals should also be considered. Contemporary shamans practice a highly individual knowledge, often forwarded to them by the spirits themselves (Müller 1997: 55 f.; Solov'eva 2009a: 48-49). Therefore, by associating 'stories' of power and crisis with apparently ubiquitous symbols in the early Neolithic, these would have become accessible and recalled by people living in the vast area of Northern Mesopotamia.

Concluding this discussion of principal figurative representations in the context of shamanistic worldview, in my opinion further consideration must be given to the proposition that changes in symbolic systems is symptomatic of a crisis in shamanistic values. While the conjunction of increasingly standardized

symbolic repertoires and social consolidation of early Neolithic societies is portrayed in a plausible and perspicuous way, a more extensive database would be required to establish the occurrence of such crises. Even if the interpretability of shamanistic values is expressed (Hultkrantz 1973: 25): ‘Practically every scholar forms his own opinion of what constitutes shamanism’, there are some explicit definitions for naming shamanistic practices in an adequate way. Certainly, shamans had to adapt concepts and ritual behaviour to the on-going threatening challenges of social organisation and common resources. However, as flexibility and situational behaviour is an essential part of the shamanism phenomenon, crisis is their eminent realm; it would be a key aspect of their routine during transitional periods. Monopolizing fear as a means of accessing emerging social and religious institutions may have played a minor role, but it was certainly not a tool used by power-hungry shamans vying for influence against political leaders or successful hunters. Shamanistic concepts would adapt and continue to operate throughout developing sedentism and syncretism (Vajda 1959: 477f.; Fridman 2004; Sem and Fedorova 2009: 164-167).

Basically, I can adhere to the mutual cause and interaction of shamanism and crisis situations. Yet, thought must be given as to whether – and in which ways – shamanistic values could have featured in the early Neolithic. Even the new psycho-social approach to early Neolithic symbolic systems, albeit aware of the *emic* perspective of Holocene societies, is just another approximation of the multi-layered function and behaviour of shamans in communities at a liminal stage. Linking the prehistoric symbol systems to values of today’s shamanism is what some contemporary shamans search for: for them, Neolithic and Bronze Age representations play an important role in the engineering of their shamanistic identities, roots of which are sought in prehistoric times (Devlet 1998; Kenin-Lopsan 1998: 90-91; cf. Fig. 2).

Endnotes

¹ For example, at Sikatchi-Alyan where predominant figurative representations of individuals with extended headgear on single stones close to the Amur River bring to mind the more recent masks of Nanaj and Udege shamans (Ivanov 1954: 572; Brentjes and Vasilievsky 1989: 52-57).

² As containers of cultural knowledge, Siberian shamans became main targets of anti-religious propaganda during Soviet times; their relentless persecution was based on a misinterpretation of their special ritual and social function; they were branded as cheaters and power-hungry (Müller 1997: 86; Gorbacheva and Federova 2000: 306-310; Gorbačeva 2009). As incarnations of pre-Soviet indigenous identity and spiritual authorities, the shamans of Tyva, Chakassia, Buryatia and from the Russian Far East are experiencing a revival in popularity, with an ever increasing demand for their skills in combatting the many new challenges of post-Socialist life (Johansen 2004; Bohnet 2009; Charitonova 2009).

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An Entirely New Interaction with the Animal World?

Klaus Theweleit

In my opinion, the **domestication of animals** was a crucial element that contributed to cultural developments in initial sedentary communities living in the ‘*Turkish Fertile Crescent*’. I like to refer to these new flicks of the synaptic switch as ‘*cognitive leaps*’. In this context, I will deal first with reviews previously compiled by Jared Diamond in his ‘*Guns, Germs, and Steel. The Fates of Human Societies*’ originally published in 1997 (Diamond 2005).

Initial domestication represents a new level of civilization, though here we must ask ourselves what exactly this step actually meant for people who first began working with – and manipulating – animals. In approaching this question, we must first be aware of the chronological depths involved; the whole process began with the dog some 14.000 year ago (approx. 12.000 calBC). Other than the dog...

‘All species for whose dates of domestication we have archaeological evidence were domesticated about 8000-2500 B.C. (...). (...) the era of big mammal domestication began with the sheep, goat, and pig and ended with camels. Since 2500 B.C. there have been no significant additions’ (Diamond 2005: 165-166).

The horse was domesticated at 4.000 calBC. Indeed, in an attempt to acknowledge the achievements of these millennia, assigned by him to the period of the great human enterprise of animal domestication, Jared Diamond employs some quite thought-provoking phrasing:

‘But big mammal domestication virtually ended 4,500 years ago. By then, all of the world’s 148 candidate big species must have been tested innumerable times, with the result that only a few passed the test and no other suitable ones remained’ (2005: 166).

Examination, testing, candidates: This refers to something more precise than the brisk transference of terms from our academic discussion to what we might assume were the ways people were organising their lives in Eurasia at around 9.000 calBC. Certainly, the phrasing implies a degree of *modernity* in the ways in which our ancestors interacted with and treated animals. So, how do we *domesticate*? In a first step, one must *choose*. One needs to determine which species can (and which cannot) be domesticated. It cannot be ruled out that some animals domesticated themselves, for example by seeking proximity to human settlements so as to profit from regularly accumulating food waste; in this way, scavenging wolves would have *turned themselves* into earliest dogs (Morris 2011: 88). It follows that the idea to domesticate may well have been founded on prior knowledge of such processes. In this case, for early farmers it was merely a matter of selecting the species to be domesticated.

The more practical side to this approach is *entrapment*. This means separating an animal from its herd or pack. Separation required the construction of buildings, fences or stables. The animal had to be fed, thus requiring the study of its eating habits. It was also useful to be aware of things that might make it uneasy and how it could be kept calm. For example, antelopes cannot settle when they are fenced in, even to the extent that they jump up against high fences, preferring to break their legs than to lay down, be fed, and remain in captivity. In contrast, the sheep is slower and reacts quite differently.

It took centuries of studying, experimenting and observing, and perhaps even millennia, until sufficient knowledge had accumulated:

Wild animals have to dispose of a combination of several characteristics, in order to not only be tameable but a possible candidate for domestication. Thus it is plain that domestication succeeded worldwide only with 14 big mammals – of which 13 originate from Eurasia. The fourteenth species was the lama / alpaca in the Andes (Diamond 2005: 168-175).

In other words, attempts would also have been made to domesticate all other species; the species for which domestication could not be achieved were eventually left alone. One example is the zebra and this for two reasons: not only does the zebra bite (like most other animals) but once it has bitten it rarely loosens its grip, *i.e.* keeping hold of human flesh. Secondly, it cannot be caught by snares or lasso; it recognises approaching ropes and can usually dive out of reach (Diamond 2005: 172). For this reason, there are very few records in the history of human/animal interaction for the domestication of zebras, though it has been noted as a specialty of some African royal courts. Result:

‘... possible candidates of big mammals were indeed domesticated by humans rather quickly (...) – and trials of domestication with other animals failed; e.g., none of the many ungulates that roam in the savannahs of south and east Africa was ever domesticated’ (Diamond 2005: 171).

This shows that, at some point, attempts would have eventually ceased to domesticate animals not suited to this process. Elephants as work animals: yes. As pets: no. Lions: neither nor *etc.*; but the cow, she is happy when someone relieves her of a full udder. Therefore, we are dealing with a large-scale experiment over millennia, and the acquired knowledge is passed on from generation to generation. Quite certainly, this process would also have brought deaths from bacterial contaminations, *i.e.* until humans and animals could live in close proximity without killing one another; this is a further definition of domestication: *immunisation*. This did not simply fall into the domesticators’ laps over night;

it was a by-product of this large-scale scientific test in the progressive civilization of early societies. Once a species was domesticated, the next step would have involved the collation of knowledge about best and most effective breeding methods. In my search for suitable terms by which to refer to the different stages of this procedure, we begin with what might first be termed selection or *segmentation* (Ger. *Segmentierung*), which is followed by the *sequencing* (Ger. *Sequenzierung*) of acquired knowledge.

Exactly the same procedures were applied by early farmers to plants: selection of largest grains of wild wheat; the sowing process; careful observation of the yield at harvest time; rejection of grain with low yields; collation and passing on of acquired knowledge; cross-breeding; and the study of winter resistivity and storage potential. Once again, these processes follow the principal of *segmentation* and *sequencing*. An interim step would have been the study of results and the practical application thereof, *i.e.* the rejection of low quality materials, followed by renewed *segmentation* and *sequencing*. Neighbouring villages and adjacent communities would also have taken note, thus providing the basis for future development. This was not *natural selection*. No, these evolutions were man-made. They were founded on *segmentation* and *sequencing*:

'By imposing such mental structures on their world, Hilley Flankers were, we might say, domesticating themselves' (Morris 2011: 101).

Accordingly, in their keynote Marion Benz and Joachim Bauer paraphrase Jacques Cauvin (1978: 77) that *agriculture was above all a domestication of the human species*.

Selection and sowing processes of crops and animal breeding strategies at the time of early domestication show that from this time onwards the lifeways of people living in Eurasia were no longer *natural*; they had undertaken self-made and controlled interventions in the natural world. These were scientific processes which created artificial links between life and economy; to use a modern term, it was a form of *'Biopolitik'* (biological policies). These were breeding processes. Yet, they were not simply *artificial*, they were also artistic. People were producing life contexts artificially and artistically; and at least in Eurasia this has not changed since.

Segmentation: one divides; one separates. One fences in, feeds, and separates again: Oxen are placed in front of ploughs; cows were sent to slaughter (taboo in some cultures). Eurasian breeding culture knows few taboos; the only exceptions is made for our *closest* animal companions, cats and dogs; all others have landed in the cooking pot and in the stomachs of their keepers; chopped into pieces; first for nutritional purposes, later in the name of science. *Segmentation* always leads to other processes (repetitions and their consequences) which in turn become rules, culminating in the formulation of *concepts*. When something proves worthwhile, it is continued (until it becomes something that we might refer to as *tradition*), the non-scientific (or concealing) term for *repetition*.

Everywhere? No, not at all. After a brief review of world cultures *suspicion* arises; a suspicion that those cultures which survive and prosper are the very same cultures whose economy and learning processes are founded on the principles of *segmentation* (Ger. *Segmentierung*), *sequencing* (Ger. *Sequenzierung*), and *conceptualisation* (Ger. *Konzeptualisierung*). All other cultures, especially those which are based on *more natural* and *more holistic* methodologies, predominantly *religious* concepts, are those which have failed.¹

Now we turn our attention to the T-Pillars and the early Neolithic animal representations. First, with reference to the worked material: *stone*. A question at this point: are there any (even rudimentary) remnants of colour adorning the animals depicted on the pillars? Differences between the representations at Göbekli and the cave paintings from previous millennia appear evident. A new stage. Nowadays, one speaks less frequently of *cave paintings*, preference instead given to the term *rock art*; this change in terminology is linked to recent insights, for example from Portugal, which have demonstrated that many such paintings were originally applied to open-air (exterior) surfaces, from whence they have long since eroded. Only in caves have they remained far better preserved. Cave paintings were colourful affairs; they not only depict animals which would have inhabited the painter's direct environment, but they were records of animals which had (in some cases) already disappeared, *i.e.* had become extinct or had left the region due to changed climatic conditions. Some representations served not only as a medium for illustrating particular animals, they also imparted something quite different; they probably have been clan-symbols. As suggested by the many *abstract* signs found painted to cave walls, depictions were not mere *pictures*, they were sign systems: the earliest form of *writing*.

When Benz and Bauer refer to the animal representations on the pillars at Göbekli Tepe as symbols, they are assuming that these also comprise elements in a *sign system*. However, the Göbekli representations differ from the cave paintings in a second respect. They were made in stone, designed to last, and were therefore probably less colourful. The step to producing reliefs (from picture and sign to *sculpture*) went hand in hand with a changed perception of reality; this was a first attempt at constructing this reality by using a three-dimensional medium.

If it is correct that animals depicted (or better recorded) on the T-Pillars are only species which occurred naturally in the same environment as our early farmers and animal domesticators, then it is likely that the pillars indeed fulfilled a special function in the time leading up to earliest animal domestication, perhaps in the context of *invocation rituals* which saw those animals ear-marked for domestication captured in stone, analogous to their captivity in domestic settlements.

In cases where a single animal is depicted on a pillar, I take this as visible evidence for the process of *segmentation*. Here, I see much less a representation of

the aggressiveness of a wild animal (bared teeth, sharp claws) and more the attempt to gain *control* over this animal power. As previously mentioned, there were most certainly attempts made to domesticate lions or panthers, and perhaps also snakes. The (later) Indian *snake charmers* certainly came from somewhere.

One pillar displays a sequence of snakes. It is difficult to say what function these snakes may have had, but the concept of *sequencing/repetition* is clearly attested.

It is in the course of *segmentation* and *sequencing/repetition* (in all possible fields) that I see the aforementioned *new flicks of the synaptic switch* in the brains of these early Eurasian farmers and stock breeders (our direct technological-cultural forebears). Segmentation, sequencing and conceptualisation (which in the course of the millennia have been subjected to further *miniaturisation*) have become the prevailing methodologies of *Western* cultures up to the present day: *Neurosciences*, microbiology, particle physics, computerisation, nanotechnology *etc.*

Benz and Bauer stress that there are very few, perhaps even no indications that the stone pillars were related to particular deities. According to Ian Morris, earliest religions developed from ancestor cults in the Turkish part of the Fertile Crescent from around the 8th millennium calBC. Excavations have revealed numerous burials beneath house floors, where the skulls were sometimes removed. These skulls are found in houses or sometimes in graves; some were treated in special ways, plaster being used to recreate an individual's facial features (*n.b.* this is observed on more male than female skulls). The *faces* applied to the skulls were painted; they were displayed in special places in the houses of the living, and they were consulted, particularly at times of approaching danger or when inhabitants were confronted with other challenges (Morris 2011: 102)².

Meanwhile, the living had become convinced that when they died, humans did not just disappear from the face of the earth. People believed that the dead could still exert some degree of influence; perhaps there was concern that their superior knowledge, over which they may have presided in life (or which became ascribed to them after death) would otherwise be lost to the community. In order to guarantee consultation, their skulls were covered with plaster, painted and placed on shelves. In time, this would have led to beliefs in gods and deities.³ In other words, gods evolved as a by-product of the new sedentary lifeways, and even from this early time, they were probably considered corrupt. Of course, none of this was ever *recorded*; this tale is told only by the archaeological finds; among these are the plaster-covered skulls found in the houses of the living and in burials beneath house floors. These finds constitute first evidence for a belief system with transcendental gods.

Klaus Schmidt writes that the pillar enclosures at Göbekli Tepe can be interpreted as a '*cultic centre to whose construction humans from all over the region*

had contributed' (Schmidt 2012: 105) and Morris (2011: 96) goes on speculating: '... it certainly looks like a regional sanctuary, perhaps a place for festivals where hundreds of people congregated for weeks (...). However, one thing seems certain: never before in history had such large groups worked together.'

Cultic feasting; but in whose honour? If humans are not celebrating *higher beings*, then they are usually celebrating themselves. The prehistoric visitors to Göbekli Tepe may have been celebrating recent advances, first important steps arising from their new sedentary lifeways: new stone-working technologies (which would be preserved for posterity in the architecture of their settlements) and – where the contents of their representations are concerned – an entirely new interaction with the animal world. This interaction would eventually lead to the domestication of livestock and the assignment of animals into additional groups, *i.e.* not only *hunnable* or *non-hunnable*, *edible* or *poisonous*, *friendly* or *dangerous*, but now also into *useful* or *non-useful* (or *harmful*). The animal was about to become part of the human working-process; certainly, it cannot be ruled out that ritual incantations also arose from this process.

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Endnotes

¹ A late effect of animal domestication: The domestication of wild animals in Eurasia had one further catastrophic consequence for the inhabitants of other continents: the evolution of human pathogen germs which would later (in historical times) provide European conquerors with an unexpected weapon of biological warfare against indigenous peoples. Molecular biological studies show that most of these infectious germs originated from bacteria or viruses from domestic animals with which the ancient agricultural societies (=Europe, Asia) had lived in closest contact. For example, the measles virus stems from the virus of the rinderpest, and human influenza viruses from pigs and ducks. After thousands of years of being confronted with mutated domestic animal germs, the Eurasian population had become at least partly immune, while inhabitants of other continents lacked this immunity (Diamond 2005: 206-207). According to Diamond (2005: 211), 95% of the indigenous populations of the Americas fell victim to viruses and bacteria to which Eurasians were already immune.

² Until now, no plastered skulls have been found in Northern Mesopotamia. Ramad and Aswad in southwestern Syria are the most northern sites where this ritual is documented during the Pre-Pottery Neolithic. It is only during the Pottery Neolithic that this custom spread further north and northwest, where plastered skulls have been found in Central Turkey, at Köşk Höyük and at Çatalhöyük (Benz 2012). (editors' note)

³ For a more detailed description see Benz (2010, 2012).

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Reply

Extending the Scope of the Neolithic Conversation

Trevor Watkins

When I wrote my paper at the invitation of Hans Georg Gebel and the guest-editors, it was addressed to *Neo-Lithics*' readers, with no knowledge of who was to be asked to comment on it. Both Colin Renfrew and Hans Georg Gebel comment on the close focus of both papers on a particular sub-period of the Neolithic (the early aceramic Neolithic) in a particular sub-region (north Mesopotamia) of southwest Asia. Renfrew advises that the focus on southwest Asia needs to be expanded to include other regions of the world; Gebel notes that the situation in the sub-region on which both papers concentrate is not typical for the wider region, and draws attention to developments through the Neolithic period, which equally require attention. It so happens that in recent years both Marion Benz and I, for different reasons and in different ways, have become more closely engaged in our research with material from north Mesopotamia in the earliest Neolithic. I believe that our attraction to the potential of this period / region is quite similar to the attraction of the unique site of Çatalhöyük, with its vivid and dramatic symbolic imagery, that encouraged Ian Hodder to devise his major research project there. Of course, there are questions as to how representative the material from a regional group of sites can be; and questions concerning the further unfolding of the process through the Neolithic and beyond (not to mention where the earlier, Epipalaeolithic stages in the process can be found within the north Levant and north Mesopotamia). It is my hope that the approaches referred to in both the keynotes will be found helpful in the particular contexts where they are being put to the test; and, if that is the case, these approaches can be extended to other sub-regions of southwest Asia, to the longer time-frame of the whole Neolithic, and to the equivalent periods in other parts of the world.

Hans Georg Gebel again proclaims his belief that our approaches to the analysis of the Neolithic should be holistic; and of course neither of our papers attempts a holistic analysis. For my own part, I can assure Hans Georg that I am working towards an holistic account of the early Neolithic, and I am sure that cultural niche construction theory offers us the framework within which we can work out the many and complex feedback loops that link different sub-systems to one another. But this was not the occasion or the place to attempt to sketch out such a scheme: here, I wanted to make a general argument for broadening the field of view of our Neolithic research in order that we may see our Neolithic world (however restricted our focus) growing out of a very different Palaeolithic.

I want to respond to two particular comments, but first I should note that I found the other comments both stimulating and helpful. In particular, I found myself nodding with approval as I read the comments of Süt-

terlin and Eibl-Eibesfeldt, and of Stewart and Strathern, because, from their different disciplinary backgrounds, they support views that I have expressed concerning the significance of symbolic architecture, ceremony and ritual performance, and the material expression of collective memory in recent publications. Klaus Theweleit's proposal of an emergent cultural and cognitive facility with segmentation, sequencing, and conceptualisation takes us into new territory, and I would like to be able to discuss it with him. I suspect that these skills with imagery and imagination may relate to the capacity for recursion, which Michael Corballis (2011) argues is fundamental to modern human thought and minds, and thus modern language. I have argued that the capacity for recursion, already present in fully modern language from before 50,000 years ago, was evolved by the beginning of the Holocene to serve the need for new modes of forming collective memory and identity through complex, recursive forms of external symbolic storage systems (Watkins 2012).

It was a particular pleasure to find that two scholars of global reputation, Robin Dunbar and Colin Renfrew, whose work I have long admired and relied on, not only gave my paper close attention, but also offered the ideas that it expressed general support. For more than forty years, I have been impressed and influenced by Colin's original ideas and cultural theories. But it was the chance of hearing Robin Dunbar give a Munro Lecture at Edinburgh University in 1993 on the subject that became his enormously successful book *Grooming, Gossip and the Evolution of Language* (Dunbar 1997) that first excited me to think of human cognitive evolution. About the same time I discovered Merlin Donald's (1991) book *Origins of the Modern Mind*, which further excited my interest in what Colin has labelled cognitive archaeology, or the archaeology of mind (Renfrew and Zubrow 1994).

Colin Renfrew is very supportive of both keynotes and the approaches that they recommend. His reading of my paper leads him to remark that the terms 'Neolithic' and 'neolithisation' are relevant only in Europe and (parts of) Asia. If we believe that the new, large, permanently co-resident communities whose settlements, elaborate architecture, monuments and rich symbolic material culture characterize the earliest Neolithic of (parts of) southwest Asia emerged in an evolutionary process, then we should be able to observe the same phenomenon, *mutatis mutandis*, in other parts of southwest Asia, and other regions of the world. I accept entirely Renfrew's point that such terms have strictly limited usage; the term 'neolithisation' is misleading within southwest Asia, since much of the process unfolded in the preceding Epipalaeolithic period. It would indeed be easier to bring together the cultural pheno-

mena of different regions of the world if our technical and chronological terminology was not so regionally idiosyncratic. I have (very recently) argued that we specialists in the prehistory of southwest Asia should abandon the terms Epipalaeolithic and Neolithic because of the (Palaeolithic-Neolithic) differentiation that they imply (Watkins 2013). Likewise, I argued for the abandonment of loaded and imprecise culture-period labels such as Natufian, PPNA and PPNB in favour of a neutrally-labelled sequence of absolutely dated periods after the model of the oxygen isotope, or marine isotope series used globally by geomorphologists and palaeoenvironmental scientists.

Like Renfrew, I strongly suspect that evolutionary processes parallel to those in southwest Asia unfolded in Peru and Mexico, where there is similar evidence of monumental communal architecture more or less contemporary with the earliest evidence of plant domestication, and long before the emergence of archaic states (see, for example, Burger and Rosenwig 2012). I agree that it is desirable to test whether the hypotheses sketched between the two papers here is applicable in other regions of the world identified as primary centres of the domestication of plants and animals. However, these hypotheses have to be proposed somewhere, and here they are proposed for southwest Asia, just as Gordon Childe's original hypothesis of a Neolithic revolution was first proposed.

From the very first sentence, I was fascinated to read Robin Dunbar's comment. His work over twenty years has investigated and elucidated the long-term social, biological and cognitive evolutionary processes that have differentiated the genus *homo* from its closest primate relatives. To find that he attributes the greatest importance to the Neolithic transformation in human evolution was exciting, truly exciting. To my knowledge, this is the first occasion that he had addressed the Pleistocene-Holocene transition / transformation. His analysis of the challenge that was faced and the solution that was generated by Neolithic communities is exceptionally helpful. I have referred to Dunbar's publications in almost everything that I have written over the last decade or so. In his comment here he says everything that I would wish to have said myself, and he gives it authoritative support throughout.

There were two other matters in particular that he addresses: the nature and role of religion in the early Neolithic communities, and my application of cultural niche construction theory to the emergence of those communities. Dunbar differentiates two kinds of religion expression and experience: he has described a primal form of religion whose rituals and practices are endogenous, bottom-up, and endorphin-based (for example, Dunbar 2004), which he contrasts here with religions that involve anthropomorphic supernatural beings, and that are led by people who have authority on doctrinal matters. This latter type of religion, he observes, can be associated with codes of morality and seems to be generally present in later, post-Neolithic, large-scale and hierarchically organized societies. By

implication, the question is, in which camp do we place our early Neolithic societies: do the extraordinarily elaborate symbolic representations of the earliest Neolithic of northern Mesopotamia and the Levant indicate the emergence of a novel kind of religious belief and practice, the transition to a doctrinal religious form (Whitehouse 2004)?

Jacques Cauvin was quite clear on the subject, titling his book on the Neolithic *Naissance des Divinités* (Cauvin 1994). At least some of the participants in the John Templeton Foundation-funded project at Çatalhöyük tend towards the view that the transition to a doctrinal type of religion was taking place in the early seventh millennium BC, towards the end of the history of the settlement on the east mound (Whitehouse and Hodder 2010). We should await the second round of publication from that project, which I believe is imminent. Meanwhile, a second John Templeton Foundation-funded project, directed by Klaus Schmidt and myself, has as one of its main questions to ask if the monumental and communal architecture, sculpture and sign-making of the earliest Neolithic of northern Mesopotamia embodies an ideology that we can describe as religious. Our project asks whether those communities were defining their own identities, their identities in relation to one another, and their identities within a cosmic world. We are certainly engaged with archaeological material that was richly meaningful to those who built it, made it, moved in it, gazed at it, or handled it. It is impressive, emotive and striking for us today, but very challenging for all of us, and not just for archaeologists. An additional difficulty for us contemporary researchers is that we, who are accustomed to be dependent on language, words and text, are unfamiliar and unpractised with the physical modes of symbolic representation and expression that were developed by our Neolithic communities.

Dunbar doubts the usefulness of cultural niche construction theory as a means of modelling the formation of Neolithic communities and networks of interaction; he prefers to think in terms of group selection theory. There was not space in my paper here, and there is even less space in this response, to explain properly how cultural niche construction theory may be helpful in investigating the neolithisation process (or why I find group selection theory unappealing). I will interject at this point a response to the comment of Stewart and Strathern, who refer to the 'extended mind' and embodied cognition. It seems to me that notions of embodied, embedded, extended or enacted cognition (see, for example, Menary 2010) all take their perspective from the psychology of the individual as agent and the individual mind. What immediately appeals to me about cultural niche construction theory is that its perspective is the two-way interaction between culture and cognition, which allows one to think of the dynamic capacity of culture (*cf.* Malafouris 2004). Together with the philosopher of evolution Kim Sterelny, I have recently co-authored a substantial paper on cultural niche construction and the Neolithic process (at present it is submitted for consideration for publication); I hope that, if/when

it is published, I can send a copy of Professor Dunbar and show him why we think that cultural niche construction theory is so important throughout the life-time of the species *homo sapiens*, but crucially important to understanding the transformation of human society and culture around the Pleistocene-Holocene transition. I hope that we shall learn more of his thoughts and be able to continue the debate that is begun here.

Following Sterelny (2011), the cultural niche that *homo sapiens* had evolved by 50,000 - 25,000 years ago allowed the accumulation and robust transmission of large, complex, and diverse bodies of skills and knowledge. Sterelny outlines social mechanisms of cultural learning that he describes as apprentice learning. In order that the larger, and more permanent aggregations of population of the Epipalaeolithic and early Neolithic could emerge, this capacity was evolved further in the Pleistocene-Holocene transition so that the cultural niche was engaged in 'cognitive engineering' (the phrase that worries Bo Dahl Hermansen) upon the minds of those who were born and brought up within that niche. Although he does not refer to niche construction theory, Merlin Donald explains how 'Our brains and minds can be deeply affected by the overwhelming influence of symbolic cultures during development. Some cultural changes can actually remodel the operational structure of the cognitive system' (Donald 2000: 19). He gives as an example the effect of literacy on cognition, which has been the subject of much research. He explains how the brain's general architecture is not affected, but under the influence of culture its functional architecture is significantly changed as children become embedded in a culture of literacy. Steven Mithen experimented on himself with intensive study and practice of music over a period of time; in consequence he found that – in Donald's terms – the operational structure of the cognitive system was changed (Mithen 2005). Finally, one only has to recall that we may not respond easily to the slogans of advertisers who assure us of a product's superior performance: but psychologists can tell us that, below the horizon of conscious thought, we respond to the imagery, and even the colours, modes of 'cognitive engineering' that today's sophisticated advertising agencies know very well how to employ.

What advertisers seek to do is rather sinister because of its deliberate manipulation of our ignorant and unthinking minds. But what I have in mind is a process in which those who design and execute the buildings, sculptures, figurines and the small sign-bearing objects are cultural agents rather like the artist in Alfred Gell's (1998) conception of art and agency; they make things (just as authors do with writing books) within a cultural context, and the things that they create in turn become agents acting upon those who see, handle, or inhabit them. I think that what we see, as the Epipalaeolithic develops into the Neolithic, is a qualitative change in the way that communities created and lived within their cultural niches, the step change being the kind of 'cognitive engineering' that the new kind of large community required and the new form of cultural niche allowed.

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Epilogue

Neurobiology Meets Archaeology: The Social Challenges of the Neolithic Processes

Joachim Bauer and Marion Benz

The aim of this special issue questions which of the many possibilities available can best be used to understand the symbolic cultural remains from northern Mesopotamia at the time of the ‘Neolithic Revolution’. Despite having slightly differing foci, the inspiring texts contained herein recognise there is some common ground to be shared amongst (see Watkins’ keynote and the comments of Bohnet, Dunbar, Gebel, Hermansen, Renfrew, Stewart and Strathern, Sütterlin and Eibl-Eibesfeldt, Theweleit, all this issue). One central aspect emphasised unanimously by several authors (Benz and Bauer, Dunbar, Gebel, Stewart and Strathern, this issue) concerns the reasonable supposition that the transition to a new sedentary lifestyle, with herding and cultivation, proved to be a fundamental challenge. Their hypothesis is that these challenges were caused by social and cognitive stressors. These stressors were the consequence of a regional increase in population density that, in turn, had possibly caused resource shortages. According to these considerations, the process of neolithisation appears as an attempt to master social and cognitive stressors, to counteract the centrifugal dynamics of social disintegration and to secure the survival of human communities under new and difficult conditions.

In his comment, Robin I.M. Dunbar (this issue) advocates the convincing hypothesis that parallel to the neolithisation explicit social structures were emerging, which were secured by disciplining ‘top-down’ mechanisms meant to ensure social cohesion despite new living conditions (*i.e.* increased population densities and the therefore necessary production of food). According to Dunbar, ‘top down’ structures had replaced ‘endorphin-based’ forms of communality. We share this point of view because of neurobiological observations from roughly the past 15 years showing that humans are endowed with a ‘social brain’; meaning, human beings primarily aim at social community and cooperation (Insel 2003; Bauer 2008a, 2008b, 2013a). A sufficient amount of experienced social acceptance has been shown to be a decisive trigger for the activation of neurobiological systems of motivation – and therewith the release of messenger substances, above all dopamine, engendering a feeling of vitality. To avoid social disintegration and destructive aggression (caused by an increase of population densities and resource deficiencies, Bauer 2013a) was probably the central task and challenge for early Neolithic communities (Gebel 2010).

Neolithisation as a Coping Strategy for Social Stressors

The authors of this issue are not only in agreement concerning the assumption that our Neolithic ancestors had to face fundamental social challenges, but also in considering *how* early human cultures mastered these challenges at the beginning of sedentism. They describe three general lines of development, which probably evolved simultaneously and should – at least in our view – be considered equally important. At first, it seems that it was necessary to master and secure living together through social structures and order. It is only through such a common order that it was possible to enforce shared values, norms and mechanisms of cooperation. These elements were meant to persist under the new conditions of living together in larger communities, when face-to-face relationships with everybody were no longer possible (Dunbar, Stewart and Strathern, Sütterlin and Eibl-Eibesfeldt, Theweleit, Watkins, this issue).

Social order is not an end in itself; it serves a socially relevant purpose. Thereby, a second aspect comes into play – the evolution of sedentary lifestyles became paralleled by the development of several new technologies (Dunbar, Stewart and Strathern, Theweleit, Watkins, this issue). Above all, these technologies concerned farming and herding, but probably also new methods of preparation, production and perhaps even the preservation of food (*e.g.* baking bread, making honey or producing alcoholic beverages) (Dietrich *et al.* 2012). New technology in these fields correlate with implicit and explicit knowledge, which could be transferred horizontally but were almost always imparted vertically, to descendants (*i.e.* they had to be taught). A secure transmission of knowledge requires ordered social structures and procedures, and perhaps also rituals (including initiation rituals). It thus becomes clear that both the first aspect (social structures and order) and the second one (transmission of implicit and explicit knowledge) are closely correlated.

A third aspect arises from the former two – the development of a common cultural identity, of a ‘shared system of thinking’, of a phenomenon which several authors of this issue refer to as ‘distributed mind’ or ‘extended mind’ (Hermansen, Renfrew, Stewart and Strathern, Watkins, this issue). People who live together in lasting or even permanent social systems do not only share numerous implicit daily routines and activities, but also explicit knowledge and – as a result of both – concepts about life as a whole (*i.e.* anthropo-

logical concepts and also initial cosmological ideas). It can be assumed that such a shared identity (respectively, such an ‘extended mind’) was manifested in the material record by engrained symbols, imagery and buildings. However, these material manifestations were not only the expression of a shared social identity but also served in the identification of affiliates or of non-affiliates – of oneself, but also of strangers (Benz and Bauer, this issue). With the beginning of the early Holocene, for the first time, these identity-generating symbols were fixed durably in stone as well as on other materials (*i.e.* bones and probably textiles too) according to a canonised repertoire. They were on public display, omnipresent from tiny amulets to monumental pillars. Transferring these observations to social identities means individual autonomy and flexibility were subjected to collective identities – at least in public discourse. It also implies, perhaps more importantly, that it was possible to communicate these identities independent of persons, time and space. This is one of the decisive criteria to maintaining groups with more than 150 members (Gowlett *et al.* 2012: 697).

The Process of Neolithisation in an Evolutionary Perspective: Biological Systems as Agents of Evolution

The integration of neolithisation into a higher-level evolutionary context, as suggested by Trevor Watkins (this issue), is a fascinating idea. The term ‘niche construction’, which he describes, means biological actors (*i.e.* living organisms) are not only passively subjected to their environments (to which they have to adapt), but that they themselves – unintentionally or intentionally – *actively* engage with each of their environments. In this way, they influence the environmental factors that are critical to their own fitness and, ultimately, determine their chances to resist the pressure of selection and to reproduce successfully. The impact of living actors on their environments is certainly not a negligible epi-phenomenon of evolution, as it is shown by the oxygen enrichment of Earth’s atmosphere – at first by oxygen-producing bacteria and later on by vegetation (Bauer 2010). Living systems are not only passively affected but are also always actors of the evolution. This is a description that, it is interesting to note, also seems to apply to the – as termed by Dunbar – ‘units of selection’ (*i.e.* the genome, rather than the single gene) (McClintock 1983; Bauer 2010; Shapiro 2011; Attwater and Holliger 2012). Several observations indicate that genomes are able to react to the impact of serious stressors with a remodelling of their own structures (Bauer 2010).

In Watkins’ description of the development of an evolutionary ‘niche’, he cites its creation by the coordinated communal action of Neolithic humans. As a consequence of this ‘niche construction’ during the Neolithic period, the human species, through advancing the process of civilisation, began to influence the

conditions of their own survival in a hitherto unknown way. The new selection conditions, altered by human-kind, were not only the consequence of this socially coordinated collective action but, moreover, meant the newly created social structures, in turn, only favoured those sub-populations of the human species, which were (or are) willing to subordinate themselves to the explicit social (‘top-down’) structures. In this manner, an evolved unprecedented form of social cooperation was practised. Whether the thorough distinction, advocated by Dunbar (this issue), of ‘group selection’ (from which he distances himself) and ‘group level selection’ (favoured by him) is substantiated is a matter of ongoing scientific debate (Bauer 2010; Nowak *et al.* 2010; Nowak 2012; Wilson 2013).

A Neurobiological Format for Socially Shared Schemata of Experience and Behaviour: The Mirror Neuron System

From a neurobiological perspective, there is another interesting point that is worth elaborating on here. In his lucid keynote (this issue), Trevor Watkins justly highlighted the neuronal plasticity of the human brain. The traditional model of a unidirectional causal chain from the genes to the function of cells and organs, and on to human behaviour has been proven inadequate. In fact, the multifaceted relationship of genes and human experience and behaviour is bi-directional. Genes are not autistic actors but their activities are constantly regulated by signals, which not only result from the way we move, act or feed ourselves but, above all, from the social experiences we are faced with (of course, we can contribute to shaping the social environments we live in) (Bauer 2013b). Against this background it becomes clear why the social conditions we live in truly and demonstrably mould the morphological fine tuning of our brains, a phenomenon called ‘neuronal plasticity’ (Eisenberg 1995; Bauer 2013b).

As mentioned above, the process of the ‘Neolithic Revolution’ is characterised by social and technological changes. The new implicit and explicit knowledge, linked with the development of new technologies and concepts, had to be transmitted (*i.e.* taught) if they should not sink into oblivion. The massive bias from implicit to explicit learning processes in favour of the latter, as it exists until today, is probably not present at the onset of the Neolithic. At the earliest, it could only be developed with the invention of writing and, pervasively, only after the invention of printing. At the beginning of the Neolithic, implicit knowledge was overwhelmingly selected to be taught (*e.g.* the handling of plants, animals or food). The transmission was based, above all and as originally formulated by Albert Bandura (1977), on ‘observational learning’, completed by ‘imitative learning’. Experiments indicate (Buccino *et al.* 2004) the neuronal basis for both processes, ‘observational learning’ and ‘imitative learning’, is the mirror neuron system, which was only discovered at

the end of the last century (Rizzolatti and Craighero 2004; Bauer 2005; Rizzolatti and Sinigaglia 2008).

Initially discovered in the brains of macaques, the existence of mirror neurons in the human brain has today been proven beyond any doubt (Hutchison *et al.* 1999; Mukamel *et al.* 2010). In the brain of a person observing an action, mirror neurons produce a neuronal simulation of that observed action. In the brain of the observer at the moment of the observation, not only are the motor aspects of the observed action simulated but so are all somato-sensory and emotional aspects, which are related to all human action. There is good reason to assume that intuitive, or unconsciously initiated, imitations as well as the facilitation of activities, which are both caused by the observation, have their neurobiological basis in the mirror neuron system. According to our hypothesis, the mirror neuron system is more than just the container for the neuronal programmes of the socially shared procedures within a social community. The mirror neuron system, in reality, could quite possibly be the carrier of the socially shared neuronal programmes, which constitute a socially shared meaningful space and, thus, the initially mentioned ‘extended mind’ or ‘distributed mind’.¹

The Neolithic Transformation: Is There a Testosterone Factor and Which Role Does the Shaman Play?

An aspect paid little heed to by our colleagues – apart from Christa Sütterlin and Irenäus Eibl-Eibesfeldt’s contribution (this issue) – concerns the question of how far back in the archaeological record of Upper Mesopotamia must one go before the initial stages of gender role differentiation can be discerned. This question arises in view of the striking and manifest display of male genitals in human and animal representations, and the implicitly documented ‘testosterone bias’ in the communal buildings of Göbekli Tepe. Unless future excavations will prove the contrary, Göbekli Tepe probably was not a permanently inhabited site. Instead, it was possibly some form of a central meeting place within a regional catchment area of several settlements (see Renfrew, this issue). If this assumption holds true, it would favour the suggestion that Göbekli Tepe might have been a ‘centre of congregation’ (Renfrew, this issue) for men from several surrounding settlements. Finally, it is striking that within the buildings of Göbekli Tepe, until now, only representations of animals were found. No plants, at least not in a figurative style, were recorded.

The culmination of these findings arouses even more questions. Were the communal buildings a place where young men passed through initiation rites? Are considerations completely aberrant that interpret features of the buildings as indicating males may have begun determining the newly created ‘top-down’ structures at the beginning of the Neolithic? (see also Benz 2010). In turn, this leads us to ask: Who was then able to accu-

mulate power and prestige so that he/she (or a group of people) became capable of commanding others to build monumental architecture, produce canonised vases or accept dogma, or even ‘ideocratic’ structures (Gebel, this issue)?

In our keynote paper, presented herein, we argued that possibly the fear – or at least the awe – evoking style and monumentality of the Göbekli Tepe buildings was the intention of a community in a liminal stage. This juncture was where the power of traditional flexible ideologies was flaking and the credence in the shaman was to be re-established. Ulrike Bohnet and Bo D. Hermansen (this issue) doubt that these symbols were initiated by power-seeking shamans. We agree, in so far as we do not think shamans enlarged their power to other spheres such as economy or politics. Yet, the shamans’ role as mediators in times of crisis, in bringing order into disorder (Strathern and Stewart 2013) and in territorial (spatial as well as ideological) defence (Stewart and Strathern, this issue) would be worth reconsidering in detail. This is particularly true because the genital-showing practises might also be interpreted, according to Christa Sütterlin and Irenäus Eibl-Eibesfeldt (this issue), as signs of territorial defence. Systematic analyses of the role of the shaman in transitional times throughout the ethnographic record would allow future researchers invaluable insights.

The symbolic systems of the early Holocene leave little doubt that shamanistic rituals played an important role. However, they also display a hitherto unknown canonisation. Whether the symbolic synchronisation can be considered evidence for an ‘ideocratic’ system, as argued by Gebel (this issue), needs further consideration. Nevertheless, it certainly was in strong contrast with the flexible and individualistic ideologies of shamans.

There is one final, but no less important, aspect worth mentioning because it does not align with a shamanistic worldview, which is based on animistic, relational conceptions of the environment (Bird-David 2012). In elaborating on this feature, Klaus Theweleit (this issue) argues that the Neolithic (he especially refers to the domestication of animals) led to a different conception of the world; or what Pamela J. Stewart and Andrew J. Strathern (this issue) formulated so convincingly as ‘a different appropriation of nature and materiality in the service of social complexity and hierarchy’. Instead of a holistic animistic approach, humans started to ‘separate’ (domestication), to ‘sequence’ (breeding) and to ‘conceptualise’ (dogma) (Theweleit, this issue). Important constituents of what has also been designated as ‘reductionism’, segmentation and sequencing have since become a basic premise of western cultures. This is not to deny that animistic perspectives still exist in all societies (Albers and Franke 2012). Nonetheless, their relative importance has shifted. The flexible has been replaced by dogma, and the wild by the domestic. At least at that point, the shaman’s sphere of communication with spirits of animate objects and for bringing order into the relationships with these spirits probably

had to be shifted to other domains. Or should we see the monumentalisation and increasing public display of likely traditional symbols as evidence for the preservation of something that was at risk of vanishing? Did the shaman play the role of a first ‘conservator’, thus offering space for innovation by granting stability and security in the sphere of familiar traditions?

Segmentation has also dominated neurobiological research for a long time with the concept of the human brain functioning in a modularised way, as if it were a Swiss knife (for a summary see Mithen 1998). But it is simply the complex fluidity and interplay of cerebral modules and the dialectical relationship of external stimuli and internal neurobiological mechanisms that characterise the brain of *homo sapiens* (Mithen 1998; Donald 2001; Bauer 2013b). That neurobiology and archaeology are now able to meet is due to the re-synthesis of modularised brain functions that previously were analysed in a reductionistic way. This re-synthesis demonstrates that the brain is far more capable than to only picture and segment its environment photographically, acoustically and in its three-dimensional form. The decisive step, which was completed in the social neurosciences (Rule *et al.* 2013), was to understand that the brain (above all, the human one) can perform neuronal resonances. This means it is capable of reconstructing mental states that were, or are thought to be, in the brains of others. This ability allows for changes in perspectives and empathy. Through these fresh approaches the pathway is open for a new dimension of scientific analyses of a multifaceted and fascinating cooperation (Watkins 2011). Nevertheless, combining these new neurobiological approaches with culture-specific, contextual analyses of ethnographic and pre-historic data remains a major challenge.

Endnote

¹ Vittorio Gallese (2003) speaks about an ‘S-identity’ transported by the mirror neuron system.

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