

4. Artefacts, symbolism and narrative

In the last chapter, I argued for thinking of both our sensory, perceptual, and our technical and aesthetic sensibilities as being products of natural selection; and for believing that, to greater or lesser degrees, their evolutionary histories inform how they operate today. I suggested that collectively, they may conveniently be referred to as the sensory-kinetic-affective mode of engagement with artefacts. That mode, taken together with its more recently evolved counterpart addressing symbolic and narrative meaning - the symbolic-narrative mode - accounts for all the possible ways in which artefacts may have significance and meaning attributed to them. In this chapter it is to this second, symbolic-narrative mode that I turn.

This chapter falls into three parts: in the first, I review contemporary understandings of the possible relationships between the emergence of consciousness, symbolic thought, and language, with a view to establishing the extent to which material culture contributed to and was affected by these processes; in the second, I will consider the evolutionary arguments for believing that myth-making and story-telling have long been a central function of language, with a similar focus on the consequences of that for our engagement with artefacts. For a symbolic meaning to arise, the meaning must be intended and, as argued in the previous chapter, in the case of the watering pot and the woodscrew, I maintain that, however else they may have been thought of, and irrespective of their subsequent fates as bearers of meaning, in all probability no *symbolic* meaning was intended by their creators. The laptop I reserve for a comprehensive analysis in the chapter following.

Thus, in the third part of this chapter, I review the 'adaptive themes' suggested by these exercises forming its earlier sections, as well as testing the beginnings of a relationship between the parts of the model. I do this by reflecting on three more of the 'bore-hole' artefacts - the Egyptian scarab, the Roman denarius and the Ardabil carpet - for evidence of their workings. For the purposes of this limited exercise, I am reflecting on them only in terms of how

they may have been thought of at the time of their creation, rather than thereafter.

This emphasis on language, rather than artefacts as such, is for three reasons: firstly, as noted, in this chapter my concern is with the symbolic and narrative uses of artefacts; yet symbolism and narrative are fundamental aspects of (indeed, more commonly associated with) the workings of language and story-telling; therefore, as we operate in a world where both linguistic and material modes of symbolic expression operate, some inclusion of and comparison with language is inevitable. Secondly, thinking about the evolutionary basis for language and language-use has preoccupied more thinkers over a longer period of time, than their equivalents in the field of artefacts; therefore it would be foolhardy not to review the findings of such literature, in order to establish the extent to which they might - or might not - apply in the realm of artefacts. Thirdly, of those who have thought about the evolutionary basis for our engagement with artefacts, most have been concerned with notions of aesthetics and 'beauty', or technology, or as indicators of cognitive evolution (as reviewed in chapter three), rather than with the emergence of the symbolic uses of artefacts as such.¹ Among the exceptions to this general observation, are Chris Knight and Steven Mithen, and reference will be made to their reflections throughout.

4.1 Symbolic thought, artefacts and language: origins and links

The relationships between language, and the physical, spatial world (which includes objects and artefacts) and physical bodily action (kinetic sense) are many and complex, with each attracting a range of opinions as to how they should be interpreted. I do not propose enumerating all of them here. However, I will touch on a few, as they shed light on how, as language emerged, our relationships with objects and artefacts might have developed. To do this, I will initially consider three propositions: that language is built on pre-existing mimetic and gestural communication; that it arose to deliver social intelligence; and the third and once conventional view, considered sufficient

explanation of itself - that it arose for practical purposes, primarily in order more effectively to secure resources - which will be addressed in relation to the second.

At a later point, I shall consider a fourth explanatory model: this seeks to account for the emergence of both language and our symbolic uses of artefacts in relation to the development of reflexive consciousness, with a view to developing artefacts as a mode of thought.²

4.2 *Mime and gesture*

Many argue that a gestural or 'mimetic' (as in 'mime', rather than 'meme') form of communication either preceded or accompanied the appearance of spoken language as such. In a carefully argued scenario, Merlin Donald promotes the former: 'Mimetic action,' Donald writes 'is basically a talent for using the whole body as a communication device.'³ It is 'intentional but not linguistic'.⁴ Chris Knight (in company with Michael Studdart-Kennedy and James Hurford) acknowledges gestural communication as a 'protolanguage'. They write:

We are justified in regarding mimesis...as a unitary mode of representation, peculiar to our species, not only because it emerges naturally, independent of and dissociable from language in deaf and aphasic humans unable to speak, but also because it still forms the basis of expressive arts such as dance, theatre and ritual display. The dissociability of mimesis from language also justifies the assumption that it evolved as an independent mode before language came into existence.⁵

Mimesis may, of course, have incorporated artefacts. James Kaput (in a paper seeking to extend Donald's argument), writes of mimesis as 'reenacting or replaying events using the body *or objects*'⁶ (emphasis added). Thus, according to this school of thought, there is a possibility that the history of our contemporary practices of attributing symbolic meaning to artefacts stretches

back to some time before our acquisition of the symbolic system of language; and that once, in our evolutionary past, it operated without reference to its more recently evolved, vocal equivalent.

Some have argued for neural links between motor actions and language. Motor actions are mostly controlled by the cortex of the left hemisphere of the brain. Gesture requires motor actions, but so too does speech. Separately, W. H. Calvin⁷ and Robin Allot⁸ have each argued for thinking of language as a collection of neural exaptations of circuitry originally evolved to execute throwing actions; quite independently again, Evans speculatively concurs.⁹ Doreen Kimura noted that aphasia (loss of language) is often related to apraxia (loss of intentional movements) and that sometimes this can be traced back to strokes affecting the cortex of the left hemisphere.¹⁰ One cannot help wondering whether the habit of the tongue, curling around the upper lip when concentrating on some particularly deft manual task is not a legacy of the shared motor-neural evolutionary history.

But Dunbar¹¹ is sceptical that gesture preceded language, as is Deacon:

...gesture [most] likely comprised a significant part of early symbolic communication, but...it existed side by side with vocal communication...Rather than [being] substitutes for one another, gesture and speech have co-evolved complex interrelationships throughout their long and changing partnership.¹²

In fact, in either scenario, artefacts might plausibly have featured. Pointing requires that it is understood that the act *refers* to something. As noted in chapter three, non-human primates do not point at objects to illustrate something to another of their kind, whereas humans habitually do. Provided symbolic thought were already in place, the habit of allowing one thing to represent another, absent thing may have preceded and joined, or emerged as an integral part of spoken language, operating alongside other, evolved 'qualifiers' (facial expression, prosody, etc.,) of what was being said.

Irrespective of which sequence actually occurred, there is evidence from other fields (as will be shown later in this chapter) that our mental representations of the physical, spatial world profoundly inform how thinking, and therefore language operates, both in terms of how language itself works, as well as what it is used for, in terms of story-telling, myth and literature. As will be shown, in some respects, the physical retains a primacy over the linguistic.

4.3 Language: a utilitarian or social adaptation?

Dunbar and Mithen both favour the emergence of language as primarily a further step in the servicing of ever more complex, but adaptive, social structures that our ancestors increasingly supported. Dunbar observed how non-human primates in the wild invested much time in grooming activities. Grooming soothes by releasing endorphins into the body. Grooming, he argues, is a necessary way of expressing and maintaining alliances within a primate group - a form of social mediation. However, it is 'expensive': it uses both hands and takes up time, which might otherwise be devoted to securing resources. Further, only one alliance can be maintained at a time; and, if sufficient resources are to be secured, there is an upper limit on the amount of time which can be devoted to grooming. As a consequence, because each addition to the group increases the number of possible relationship permutations and, therefore, the level of social complexity each individual must keep track of, there is an upper limit on group size. It is useful to remember at this point Dunbar's observations regarding the number of levels of intentionality it is thought chimpanzees can sustain: only two, compared with humans' upper limit of six.

The answer, according to Dunbar, was language, which takes its place as a social mediation mechanism. Beginning as a sort of social noise-making which gradually acquires symbolic content, language frees up the hands and enables relations with more than one individual to be negotiated at a time; and its purpose, as the title of his book, *Grooming, Gossip and the Evolution of*

Language implies, is gossip, that is information as to who is doing what to whom and why. A key piece of research cited by Dunbar to support this hypothesis suggests that on average, even today, we spend two thirds of our time talking about 'social topics'.¹³

Oppenheimer, in a recent study (which places the appearance of language some 2.5 million years ago), is scathing with regard to Dunbar's hypothesis, finding it hard to take seriously that something as trivial - as he sees it - as gossip, could prompt so momentous a development as language, or the achievements which, in his view, it facilitated:

The human family moved from lowly scavenger-gatherers to one of the top predators on the African plain...Surely, this was not by dint of gossip and social point-scoring. Chimps who have been taught to communicate by sign language certainly concentrate more on food issues than on social chit-chat.¹⁴

Yet for practical (and present) purposes, this apparent split is more imaginary than real: however much practical tactics needed to be discussed before the hunt (and doubtless they did, if it were to succeed), it could hardly be undertaken without sufficient social cohesion for collective action; nor could the individual in such a group survive in such physically dangerous circumstances without a clear picture of who is to be trusted, and who not. The two positions are not mutually exclusive.

4.4 Archaeology confirms a complex picture

Indeed, the archaeological record from modern humans seems to bear this view out. Mithen (broadly following Dunbar) in his 1996 work *The Pre-history of the Mind*, suggests that, having begun as a narrowly and exclusively social activity, language may thereafter have become a general purpose facility, by means of which all manner of practical or social matters might be mediated. As noted in chapter three, in his scenario, symbolic thought and language enable

social, natural historical and technical intelligences to operate, not in isolation, as he argues they had among hominids, but in co-operation, with each informing practice in the other.

Thus if, as Oppenheimer would have it, language arose the more efficiently to secure resources, it might be expected that there would simultaneously be an increase in sophisticated, specialist tools of greater practical effectiveness - which there is. If, on the other hand, language is thought to have emerged to mediate ever more complex social relationships, then the social mediatory power of artefacts, in the form of 'special' artefacts - including what we have come to call 'art' - might be thought to increase. Indeed, this happens as well. Yet, as noted in the introduction, the division between 'useless' art and 'useful' design is modern, to some extent artificial and unenforceable and - in the context of anthropological researches among our ancestors, no less than among modern hunter-gatherers - unhelpful. Reflecting on the many elaborate designs incorporated in Upper Palaeolithic tools, Mithen writes:

Indeed, it is very difficult to draw any distinction between what is a piece of "art" and what is a "tool", and such artefacts epitomize the absence of any boundaries between different types of activity.¹⁵

Even the 'art' such as that found at Chauvet can be thought of as 'useful', in that it is thought to embody advantageous intelligence of the wildlife it portrays,¹⁶ while evidence from modern hunter-gatherers points to just such a heterogeneous agenda informing the making of tools. In making arrowheads, for example, the San of the Kalahari balance an array of pertinent considerations:

When designing the shape of an arrowhead hunters take into account the physical properties of the raw material, the functional requirements of the arrowhead, such as whether it should pierce vital organs or slash

arteries, and also how the shape can send social messages about either personal identity or group affiliation.¹⁷

Thus, the practical and social are simultaneously addressed in the creating of an artefact.

4.5 *Consciousness, language and artefacts*

I turn now to an argument which suggests a further mental function for artefacts. In *Consciousness Explained*, Dennett takes the view that the most important effect of language (and why, accordingly, individuals rather than groups possessing it might be selected for) was not primarily its function as an agent of communication, but as a device by which problems might be solved by an individual possessing an evolving brain. This originated, he argues, as problem-solving by groups - hence the vocalisation - but then became problem solving by the individual alone 'talking to himself'. He reasons that for the solving of some problems, intelligences which may have evolved discretely in separate parts of the brain might need to be brought together; and that - in the absence of the appropriate neural circuitry - language represents the most likely medium by which this might have been achieved. Thus, talking to oneself *sotto voce* (so as not to attract predators?), he argues, became an extra-neural means of providing the necessary links. He writes:

Such an act of autostimulation could blaze a valuable new trail between one's internal components. Crudely put, pushing some information through one's ears and auditory system may well happen to stimulate just the sorts of connections one is seeking, may trip just the right associative mechanisms, tease just the right mental morsel to the tip of one's tongue. One can then say it, hear oneself say it, and thus get the answer one was looking for.¹⁸

If true, there may be parallels for how we think of the material environment. Mithen has had some telling afterthoughts following *The Prehistory of the Mind* arising, partly, from reflecting further on Dennett's proposition. In a subsequent paper, he allows he is persuaded:

Such private speech seems to me as the only means by which that trail between planning, fracture dynamics, motor control and symmetry [the cognitive skills required in the making of handaxes] could have been forged in the early human mind. His [Dennett's] figure from *Consciousness Explained*...can be modified quite easily to relate to handaxe production to suggest how several modules were bundled together to create a cognitive domain within the early human mind.¹⁹ (fig. 21)

Here, therefore, we return to the relationship between language and thought. In shifting the emphasis of his 1996 argument, he proposes that it was wrong, as he had himself suggested, to think of the florescence of the Upper Palaeolithic material culture merely as a *consequence* of massive changes in cognitive power arising from the 'dissolving' effects of language between the natural history, technical and social brain modules, arguing instead that - like language - it was simultaneously also an *agent* of that change:

An evolved psychology cannot be so easily escaped as I had imagined and the clever trick that humans learnt was to disembody their minds into the material world around them: a linguistic utterance might be considered as a disembodied thought. But such utterances last just for a few seconds. Material culture endures.²⁰

In other words, it might be useful to think of artefacts, not just as exercises in communication - which, self-evidently, at one level they often are - but as *thinking*. (Mithen's other observation regarding the different temporal qualities of spoken language and artefacts will be returned to in chapter five.)

4.6 Artefacts as thinking

One does not have fully to embrace Dennett's account of how consciousness came to be - or, with respect to artefacts, Mithen's assertion as to the contribution to the process artefacts may have made - to extract some plausible indications as to the mental uses to which artefacts may be put. Certainly, the suggestion that one should think of artefacts as a means of thinking (rather than as communication, to which thinking might eventually lead) is a deeply suggestive one. Intuitively, it seems to correspond with common experience: the process, surely, of re-organising (say) the furniture, the ornaments or mementoes, and the photographs of family and friends in a living room is obviously, partly, an act of aesthetic creation, following the principles outlined in chapter three; yet, partly, it may be an act of assembling an account of one's values and relationships primarily *satisfying to oneself*. In moving things around one is re-organising one's thoughts in ways that would be more difficult to achieve in one's head alone, in the absence of artefacts. The 'public', symbolic, narrative, communicative side of the exercise is, in this example, the inevitable corollary to such an undertaking since the space has a public dimension.

4.7 The consequences for artefacts of this alternative view of language

This view of the uses of artefacts is extrapolated from speculations about the origins of language, the implication being that they may operate in comparable - though not identical - ways. As Knight *et al* put it, 'many linguists insist that the primary function of language is conceptual representation, not communication'.²¹ At first, this may seem at odds with Dunbar's primarily social explanation for language's emergence (and by implication might seem to detract from the primarily social role for artefacts being developed here). Yet it need not. Most of the contributors to *The Evolutionary Emergence of Language* (from which the comments of Knight, *et al*' are taken) argue that language 'including its distinctive representational level - is intrinsically social,

and can only have evolved under social selection pressures.²² Language may be a means of articulating conceptual representations, but many of the most important of those are social in character.

4.8 Social contracts, myth and ritual

Before considering the possible parallels between our uses of artefacts and one of the most important uses of language (in the form of myths, storytelling and literature), I will - broadly following Knight *et al* - make good one final, possible shortcoming of Deacon's position, and in so doing, establish evolutionary reasons why it is reasonable to expect those linguistic 'artefacts' (myths, etc.) to further adaptive ends; and, inevitably, by implication, propose that to the extent that more tangible artefacts support narratives, they too may be expressing this shared, evolved agenda.

In Dunbar's account, grooming - which is costly - is supposed to have been replaced by language, which is not. Following both the Handicap Principle (that signals must be costly to be believed), and the proposition that (probably), at the beginning of the process by which language emerged primate Machiavellian intelligence would have applied, such circumstances would have provided ample opportunities for individuals to deceive: males might be deceived by females as to the paternity of offspring (for which the males were providing); or deception by those who failed to contribute to collective provisioning efforts, yet nonetheless claim a share in the resources. Had this, indeed, been the case, then as an evolutionary adaptive development it would very soon have died out. If, as Dunbar argues, language arose to meet primarily social, organisational purposes, how, in such circumstances, might what is being said (its symbolic value, in other words) be given credence? Part of the answer proposed by Deacon (and broadly consistent with positions adopted by Knight,²³ and Maynard-Smith and Szathmáry²⁴), is the concept of *social contracts*, combined with myth and ritual. In modern societies, Maynard-Smith and Szathmáry argue, groups which in the past would have been independent and in competition with one another are obliged to co-operate.

Co-operation depends both on the rational formulation of laws, or social contracts, in the common interest, and on myth and ritual that instil group loyalty.²⁵ As Maynard-Smith and Szathmáry concede, humans often behave irrationally, and they do so because of the power of myth and ritual; indeed, that 'co-operation is [often] induced by myth and ritual, and not by reason, and individual behaviour depends on an innate capacity to be influenced by ritual.'²⁶ Thus an innate, evolved pre-disposition for behaviour to be influenced by ritual and myth will be selected for, provided it proved advantageous to individuals within the group and, perhaps, advantageous for the group (although they are ambivalent about the likelihood of group selection).

Artefacts may have 'indexical' significance. Acheulian handaxes, for example, gave an immediate indication of the genetic fitness of the bearer, but they did not symbolically represent some absent thing or state. Critically, Deacon argues that such rituals demanded that what had been indexical had to become symbolic:

Out of these ritual processes for constructing social symbolic relationships, symptoms of the process itself (exchanged objects, body markings, etc.) can be invested with symbolic reference. Tokens that served indexical purpose within the ritual symbol construction become symbolic because of it. Rings, ceremonial clothing, and ritual scarring are indices of having participated in a symbolic transition, and thereby can become symbolic of the same relationship.²⁷

Thus, it is argued, the symbolic thought essential for the cementing of complex social relationships gave rise to ritual and myth, which lent credibility to language, as well as enabling artefacts to be the bearers of symbolic meanings central to the maintenance of social cohesion.

4.9 Our brains are evolved to create stories

As noted in chapter two, to make sense of the physical environment, brains become *informavores* desperate for information. In organising information to make useful sense, brains have what Dennett calls an *epistemic hunger*,²⁸ literally, a need for stories. At the simplest levels, the brain is adept at manufacturing apparently missing parts in order to create the 'narrative' - thus the *phi* effect. Such a perception arising from a comparatively low-level sensory input can barely be described as a 'narrative' in the fuller, conventional, intentional, 'story' sense more usually found in the linguistic sphere. Yet it would seem that, at all levels, in the face of incomplete information (which is surely just a part of being human), our brains are adept at being creative. According to the neuropsychologist Paul Broks, the left hemisphere of the brain is quite capable of 'confabulating':

It does this for all of us, every waking moment. It edits our conscious experiences, makes them comprehensible and palatable. It is the brain's spin-doctor...A human being is a story-telling machine. The self is a story.²⁹

The novelist, A. S. Byatt, concurs: 'Narrative is as much part of human nature as breath or the circulation of the blood'.³⁰

4.10 Myth and utility

It is generally expected that art will address the emotional, cerebral, or metaphysical, rather than the practical. Yet, as the examples of Upper Palaeolithic cave paintings and decorated tools indicated, it has been a commonplace of human life not to separate the two. We cannot know what the stories of our Pleistocene ancestors were about. However, some work has been done on the stories of hunter-gatherer societies today. Scalise Sugiyama studied 600 stories told by the Apache, Crow, Selknam, and Yanomamo peoples of North America. Each group is geographically and culturally distinct from one

another, so their stories have been created independently, rather being the products of cultural transmission. On the basis of this evidence, Sugiyama suggests that contemporary 'hunter-gatherers use narrative as a conduit of subsistence-related information', that is, information about the securing of food and other resources.³¹

In a similar vein, Peter Gärdenfors cites an account of stories contained in song and dance rituals contributing to the survival of an Australian Aboriginal tribe, who

...survived a long period of extreme drought. One of the elders of the tribe led them for half a year, without the support of maps or anything similar, through a series of more than 50 waterholes over a distance of more than 600 kilometres, even though he had only visited a few of these waterholes and then decades ago. He had learnt where they were located through the song cycles that together with totemic dance rituals constitute the Aboriginals' myths of the 'animal ancestors'.³²

Comparable accounts based on anthropological studies of the !Kung suggest that the bestowing of 'spiritual' significance on the material environment served primarily practical, rather than their apparent metaphysical ends.³³

In this way, myth can be seen simultaneously to combine several functions: it can be a means of storing advantageous information, the more effectively to exploit the resources of a physical environment; partly, it can provide satisfactory accounts of origins, and therefore foster cohesion to groups (and support ritual), and thereby contribute to the sense of belonging among the individuals in it; and lastly, by addressing the metaphysical, myth can help to explain aspects of the environment which might otherwise seem inexplicable.

The truth of these observations will become more apparent, once the three bore-hole artefacts are reconsidered at the close of this chapter.

4.11 *Evolutionary literary criticism*

I turn now to a discipline devoted to the study of more contemporary narrative practice. A novel school of *evolutionary literary criticism* has emerged in America. I have suggested that in our evolved minds, the spatial and physical has, in some respects, retained a primacy in how we represent things which may be abstract. Interestingly, just such an inference is a key element in the position adopted by Joseph Carroll, Professor of English at the University of Missouri St Louis, and author of *Evolution and Literary Theory*.³⁴ According to this discipline's tenets, it is only possible fully to understand literary texts, if evolutionary imperatives - principally, the concept of inclusive fitness - is routinely referred to (a proposition to which I will shortly return); however, a further central precept requires the acknowledgement of an objectively 'real', physical environment. Carroll explains:

I would argue - in company with Karl Popper, Konrad Lorenz, Tooby and Cosmides, John Bowlby, and other evolutionary theorists - that cognitive and linguistic categories have evolved in adaptive relation to the environment. They correspond to the world not because they "construct" the world in accordance with their own autonomous, internal principles [as Jaques Derrida and Michel Foucault have argued] but because their internal principles have evolved as a means of comprehending an actual world that exists independently of the categories.³⁵

Thus, from Carroll and his colleagues' perspective, the types, purposes and practices of linguistic outputs have evolved, partly, in order better to negotiate the physical environment. He asserts:

...representation, including literary representation, is a form of "cognitive mapping." That is, representation is an extension of the organism's adaptive orientation to an environment that is, in the first place, *spatial*

and physical. The concept of “mapping” is not merely a metaphor for an abstract cognitive activity. Abstract activities are, rather, an extension of the primary cognitive function that locates the organism within its *concrete, physical environment*.³⁶ [Emphases added]

In the first place it is spatial and physical; in the second, it is surely social. One does not have to sign up to the narrow practice of re-examining the ambitions of Elizabeth Bennet in *Pride and Prejudice*³⁷ for evidence of behaviour consistent with inclusive fitness, to allow that Carroll’s undertaking confirms the more general truth: that story-telling - as suggested by much of the evidence cited above - may once have served adaptive ends, and that it may still.

‘Literacy’, in the sense that Carroll intends it to be understood, extends beyond literature, as such:

[It signifies] both oral and written forms of narrative, verse, and dramatic enactment. Writing is an extension of oral communication. Literacy is less than 10,000 years old, and it should be clear that no claim is being made [by him] that literacy and its offshoots are themselves adaptations. When I speak of the adaptive functions of literature, I mean to signify the adaptive functions of oral antecedents of written stories, poems, and plays. The same arguments that apply to these oral forms will be understood as extending to their counterparts in written language.³⁸

4.12 Language as artefact: the written word

Despite Carroll’s insistence on the extent to which they share functions, it is worth noting, in passing, that the innovation of written, as opposed to spoken language, lent that language something of the durability hitherto only enjoyed - as Mithen indicated - by artefacts. The spoken word evaporates once it is uttered and only by being subject to repetition (and by turning it into verse or song to assist memory) could it be sustained over time. Written

accounts, by contrast, could survive and be referred to across generations and, indeed, recovered from periods of neglect. Nor should it be forgotten that countless belief systems which had hinged around the transmission of oral myth came to be supplanted by the religions of 'the book', which persist to this day; and the books on which their authority rests have often been fashioned as exceptional objects in their own right. Language thus came to resemble artefact.

Further, written language is perhaps the most powerful, flexible symbolic tool humans have yet developed. It has already been noted that Dennett and Mithen propose a role for spoken language as a mode of thought. Merlin Donald ascribes to written language the change from what he terms 'mythic culture' to 'theoretical culture' where ideas can be sustained *and developed over* generations. The one, he argues, is gradually supplanting the other. Like artefacts, the written word can augment the brain's capacity to store memory.³⁹

4.13 Inclusive fitness?

The concept of inclusive fitness - as described in chapter one - is an interesting one and according to Carroll and others of a similar mind, it helps explain, at a level beyond the motivational goals we consciously experience, why those motivations came to be. We have evolved to behave, so the argument runs, as 'inclusive fitness maximisers'; thus, actions which, superficially, seem to have little directly to do with reproduction (such as the securing of resources) can nonetheless be explained by the extent to which they contribute to inclusive fitness and to overall reproductive success. Thus, an individual may perform an act of altruism towards, say, a brother or cousin. The advantage to the individual is that these, her relatives, share some of her genes; by helping the relative, she contributes to the chances of passing on some of her own genes. Carroll asserts:

The more closely any motive impinges on the elementary principles of inclusive fitness, the deeper it goes into the regulative structure of species-typical motives. The two behavioural systems that most directly impinge on inclusive fitness are survival and reproduction.⁴⁰

Carroll's is among the more sophisticated expositions of the proposition. Such a mechanism seems to help explain some relationships (and so one would expect Carroll and his colleagues to meet with some measure of success in their endeavours).

Yet Maynard Smith and Szathmáry do not think inclusive fitness alone sufficiently powerful an explanation fully to account for human society:

The prevalence of cultural inheritance makes such an approach inadequate, although one should not underestimate the role of relatedness in influencing the behaviour of individual humans.⁴¹

David Buller is similarly and more comprehensively scathing, arguing that as an explanation, the mechanism of inclusive fitness: '...is empirically inadequate; for human behaviour too often fails to promote inclusive fitness.'⁴² If we are so intelligent, he asks, why are we not more effective at securing it? Dismissing suggestions that this lack of correspondence is sufficiently explained by arguing that we embody behaviour which evolved to meet the conditions of our evolutionary environment, but that conditions in our own contemporary environment are very different (the time lag argument once more), he nonetheless suggests that:

...evolutionary explanations of our motivational strategies do not complement our ordinary motivational goals. Rather, they simply explain why the motives that we manifestly possess constituted more adaptive motivational strategies than any alternative motivational strategies in our ancestral population. Thus, the evolutionary part of evolutionary

psychology does not lead us to replace our conception of human motivation with an alternative picture of what “truly” motivates us to behave as we do, it simply informs us of how our manifest motives contributed to the fitness of our ancestors.⁴³

By this view, evolutionary psychology might - as I have argued - help account for why, for example, we take pleasure in symmetry: it contributed to fitness (in helping us both to survive and reproduce, with inclusive fitness as but one aspect of this); but it should not, argues Buller, be turned to for some hidden set of psychological goals, which, once identified, replace explanations which rest on our own senses of why we do things, because, he maintains, we do things for the reasons we already know. It is not necessary to re-invent Freud.

An alternative counter-argument to the proposition that it is inclusive fitness which ultimately prompts behaviour has been touched on earlier in another context: the social contracts we enter into are *not* invariably about reproductive ends. As noted, both Maynard Smith and Szathmáry, and Deacon, favour social contract explanations for the basis of human society. Deacon is at pains to suggest that, even in their modern forms, rituals - including marriage - as well as pubertal rites of passage, cannot be explained primarily in terms of their reproductive effects:

Social roles are re-defined [at these rituals] and individuals are explicitly assigned to them. A wife, a husband, a warrior, a father-in-law, an elder - all are symbolic roles, not reproductive roles, and as such are defined with respect to a complete system of alternative or complementary symbolic roles.⁴⁴

Thus, some are wedded to inclusive fitness, and others recognise the value of social relationships which contribute to social stability. At the risk of being accused of invariably favouring heterogeneity as a means of short-

circuiting theoretical conflict, once again I suggest these are not mutually incompatible; that they may co-exist; and that their co-existence is - partly - demonstrated by the symbolic meanings which, in practice (as will be shown by analyses of the remaining bore-hole artefacts), we actually attribute. Our social structures are, I argue, hybrids.

4.14 What can artefacts do at the symbolic level?

The purpose of this chapter is to establish some of the things it might be reasonable to expect an artefact to do at the level of symbolic or narrative meaning. I have suggested that, in terms of how we use artefacts, apart from their immediate, practical utilitarian functions (if any), they can be used either to communicate (including augmenting gestural communication, with or without language); or they can be used to facilitate reasoning or other forms of thought; or they can have symbolic meanings ascribed to them in the support of socially cohesive myth and ritual (or any combination of these). Given that both language and artefacts can be endowed with symbolic significance in the service of ritual; and, further, having noted the utilitarian dimension of both cave paintings and myth as repositories of valuable information, it might be reasonable to expect the uses of artefacts to further the following adaptive behaviours common, it seems, to all expressions of symbolic thought:

1. the securing of resources;
2. the passing on of genes, including -
3. the furthering of inclusive fitness;
4. the mediating of relationships within a group;
5. the mediating of relationships between groups;
6. the expression - as conscious beings - of an individual sense of identity;
7. the expression of an all-embracing account of the world (religious or scientific).

It might be argued that only the first five of these are genuinely adaptive behaviours, and that functions six and seven are only adaptive, insofar as they further these first five. This may be so. However, I argue (as first proposed in chapter one) that for humans, the psychological imperative of a sufficiently satisfying sense of identity is inseparable from the will to live, and therefore survive. I propose that point seven, like point six, is another human universal and that it too is genetically based.

I shall return to these themes in the analysis of the scarab, the denarius and the carpet.

4.15 Symbolic meaning is flexible

I propose that, at the symbolic level, any artefact could further any of the objectives listed above; that, equally, it could further all of them at one time; that, logically, it could also further any combination of them - or, of course, none of them. In writing of the function of linguistic symbols, Tomasello makes some observations regarding a child's perceptions of a dog. I take them to apply equally to physical symbols:

...in different communicative situations, one and the same object may be perceived as a dog, an animal, a pet, or as a pest...As the child masters the linguistic symbols of her culture she thereby acquires the ability to adopt multiple perspectives simultaneously on one and the same perceptual situation.⁴⁵

Thus, I argue, the same artefact - like the same dog - can support any number of symbolic meanings, depending on context.

4.16 Sensory-kinetic-affective data informs attributions of symbolic meanings

One precondition for actively attaching a specifically symbolic meaning to an artefact must be an *intention* to communicate. I have suggested that we

engage with artefacts by means of the sensory-kinetic-affective mode, and the symbolic-narrative one. I suggest further that, in practice, we will often oscillate between these modes, on some occasions following the prompts of our perceptual biases, and the technical or aesthetic pleasures they inform; on others, literally shaping our physical environment until it yields satisfying symbolic or narrative accounts. I maintain it as a near-universal of the way in which we design, that in the conceiving and realising of a thing, where that thing is *intended* to have a symbolic meaning, those responsible for bringing it into the world will invariably strive to align the object's sensory-kinetic-affective attributes with its symbolic narrative ones, such that those whom the object is intended to affect will judge those results according to their sensibilities as consonant with the intended symbolic meaning.

4.17 *The importance of style: Part 1*

One of the central propositions of this study is that the key linking mechanism between the two modes resides in the concept of style. Style is 'the manner in which the thing is done'. Critically, style may either be the by-product of habitually doing something in a particular way, following some set of precepts or other, or of working within contingent constraints; or it can be the result of *intention*, where calculations are made as to the likely impact of the fashioned article on others. With regard to artefacts, in the first case, it might arise partly out of following the prompts of the sensory-kinetic-affective mode - or of 'thinking through doing' - with little or no thought as to the eventual consequences for any symbolic meaning the artefact might support; in the second, to the extent that they are followed, the prompts of the sensory-kinetic-affective mode will be consciously manipulated, such that the artefact physically embodies a desired style which, its creators hope, will support such symbolic or narrative meanings as are thought desirable. In this second case - but not in the first - there is an intention to endow an artefact with symbolic meaning. Between the one extreme - no symbolic meaning intended - and the

other - symbolic meaning intended - I suggest that there exist any number of possible gradations.

I will develop this theme more fully in chapter five. For now, I propose the above as a provisional description of the mechanism by which - in the environment of its original creation - an artefact might be physically shaped, so as to predispose those with whom it initially has currency towards some *intended* symbolic meaning or other.⁴⁶

4.18 A model for detecting adaptive value in symbolic meaning

The focus of this chapter is on the adaptive value of the symbolic meanings which artefacts may have bestowed on them; therefore the interim model outlined here will have the objective of detecting just such value. In that, it differs from the fuller model outlined in chapter five, which seeks to account for the adaptive value of *all* levels of our engagement with artefacts and provide a comprehensive account of the workings of our sensibilities towards style. In the following short case studies, I will do four things: firstly, as in the analyses in chapter three, I will assess 'costs'. I remind the reader that, following the principle of natural selection, that which is most efficient, in terms of resources (costs) is selected for; and that in the process of sexual selection - within limits - that which is costly is valued, where it is to operate as a credible signal. Symbolism may attend either mechanism. Secondly, I will give an account of the symbolic meanings each artefact may have had bestowed on it when originally created. Thirdly, I will assess the artefact for the 'consonance' between sensory-kinetic-affective qualities and symbolic meaning, as discussed above. Lastly, I will assess the extent to which it might be inferred that these meanings furthered any of the adaptive objectives, also listed above.

4.19 *The scarab*

This scarab (*fig. 1*) is made from steatite (soapstone); it is about a centimetre long; it dates from 1570 BC - 1298 BC at Abydos in Upper Egypt during the 18th Dynasty.

▪ *Costs*

Soapstone was a fairly commonplace material in Egypt at that time. According to Elaine Evans, it would probably have been worked using 'knives, gravers, and simple drills'.⁴⁷ Soapstone is soft, and can be easily worked, but the application of a coloured glaze served to make it harder.⁴⁸ This scarab probably had such a glaze.

The costs of creating this artefact were low.

▪ *Symbolic meanings when created*

Archaeological evidence suggests that, in the pre-dynastic period, Egyptians in the Nile valley had been burying their dead in large earthenware jars filled with the bodies of real *Scarabaeus sacer* or dung-beetles. Plainly, some positive significance had been attributed to them, even then. By the time this scarab was made - the 18th Dynasty - the myth surrounding the beetle was well-established and very popular. The Egyptians lived on the Nile Delta. Their wealth and security depended on the delta flooding the rich silt each year and on the sun rising each day. The Egyptians observed the beetle push a ball of mud - sometimes as big as itself - across the dirt with its sturdy hind legs. They thought all the beetles were male, that the beetle injected its semen into the mud, and then rolled the ball, and buried it in the earth, whereupon its offspring spontaneously emerged from it. In this they were mistaken.⁴⁹

However, in imputing symbolic significance to what they thought they saw, they employed metaphor: the ball resembled the sun. The all-

important sun-god had a number of incarnations, including *Khepri*, that of the sun rising from the earth. Thus, the beetle became associated with the god, and they reasoned that the real sun was actually pushed up over the horizon and across the sky by an invisible dung beetle. The name for the beetle - itself an interesting accumulation of apposite cross-references⁵⁰ - was *Kheper*. The symbolism was extended further, as Evans explains:

Kheper, the sacred beetle, was believed the reincarnation of *Khepri*, the sun-god, being reborn each morning as the young sun, newly emerged out of the earth. *Khepri*, with the great sun-disk before him, would be energized in the other world each morning and roll the sun disk onto the horizon at sunrise and across the sky, just as the beetle rolled its dung ball over the horizon on the earth and buried it in the sands. As the earthly symbol of an aspect of the great life-giving sun, *Kheper* was identified with spontaneous creation, regeneration, so closely associated with eternal existence.⁵¹

Further, in the ancient Egyptian creation myth, *Khepri*, the father of all the gods, created himself out of the earth and says: 'I developed myself from the primeval matter which I made, I developed myself out of the primeval matter.'⁵² Thus, at another level, the scarab came to symbolise for the Egyptians eternal renewal, especially as it affected their own lives. When, like the sun, they passed into the earth - the tomb - they were re-assured that it was only to be re-born; thus the scarab served to remind the wearer that life and death were in a continual cycle.

To add to its amuletic significance, this particular scarab is inscribed with the message: 'Scarab begets the existence of Amun' (*mn hpr im n*), which according to Hassan Khalil means: 'an amulet through the name of

the god Amun: the magic of the sign will give full protection to the bearer of this scarab'.⁵³

This scarab - like most others - may have sometimes had a practical use as a seal.

▪ *Sensory-kinetic-affective and symbolic-narrative consonance*

The function of the scarab (except as a seal) was chiefly symbolic. To support that function, it had only to resemble the dung-beetle sufficiently. This scarab is a dull green-ish colour; the glazes applied were often green-ish or blue-ish, so that, when newly lacquered, the representation resembled more closely its sacred, iridescent, living counterparts.

At the levels of kinetic sense and technical pleasure, it is small, light, easily turned over in the fingers. I have suggested that it might have advertised to others the beliefs of the wearer; but, given its size and lightness, it could just as easily have provided private comfort, worn on a cord, under the clothing. When new, its shiny, glossy surface, its symmetry and regular proportions - all drawn from nature, anyway - would have excited all the right perceptual biases to deliver aesthetic pleasure. Such pleasure would have been wholly consonant with the reassuring symbolic myths of which it was intended to be a token.

▪ *The achievement of adaptive ends?*

Self-evidently, the myths which the scarab symbolised were deeply adaptive, so tied up were they with those factors on which the success of the Nile Valley Egyptians' agricultural existence rested. As with so much myth, it mattered little if the actual details corresponded to objective reality; what mattered was the extent to which the myth prompted

effective behaviour in the exploiting of resources. This it would seem to do. Subscribing to these myths and advertising one's beliefs to others by wearing such an amulet would serve to mediate the social relationships of the wearer; it would potentially make the wearer feel safer, as the amuletic powers of the scarab were thought to protect and bring good fortune. It would also re-assure the wearer of the promise of life after death. Most scarabs were worn by the living, but they were also an integral part of burial and embalming. Some were specially created for this purpose, but it was not uncommon for a scarab which had been worn in life, to be wrapped with that person once dead. Once again, it was thought to confer protection. In this way, it provided the wearer with a tangible reminder that they belonged to an explicable, orderly universe, which promised them eternal renewal. In all these ways, it would have materially contributed to the individual's sense of identity, and of belonging, thus contributing to the will to survive.

Only in the sense that survival is the necessary precursor to reproduction, does the scarab contribute to the passing on of genes and the furthering of inclusive fitness, although countless scenarios could be imagined whereby an artefact such as this might mediate a reproductive relationship. Its cheapness precludes it serving the role of costly 'signalling' in courtship; however, at the symbolic level and in context - and quite independently of cost - it might have had the desired effect.

Finally, it may have served to mediate relationships between groups. War, conquest, administration and trade meant that such scarabs have been found in Palestine, Spain, Italy, Sardinia, Greece and elsewhere, suggesting that Egyptian religious beliefs may have been practised outside Egypt (but were doubtless thought of as 'Egyptian').⁵⁴ Their ubiquity also holds out the possibility that they might, even then, have served as *souvenirs* - shorn, perhaps, of much of their detailed mythic, symbolic

content. Paul Johnson suggests that, some time after this scarab was created, others were being made with just that purpose in mind:

Increasingly, during the first millennium, priests hung about temples in swarms, catering for the growing tourist trade of Assyrians, Persians, Greeks and Romans, by giving conducted tours, telling tales, selling charms, scarabs, amulets and other pseudo-sacrificial artefacts.⁵⁵

4.20 *The denarius*

The denarius is a small silver Roman coin of medium value, struck during the reign of the Emperor Augustus after 7 BC and before 2 AD (*fig. 2*).

- *Costs*

The costs of producing the coin - time and labour devoted to the mining, transporting and smelting of the silver ore, the designing of the shape, of the ornamentation, the making of dies, and so on - would have been considerable, but because of the numbers being produced, the cost of each denarius would certainly not have exceeded its face value as a coin, and can therefore be described as comparatively low.⁵⁶

- *Symbolic meanings when created*

Like the scarab, the denarius is an artefact which was only brought into being to signal or serve symbolic meanings. The denarius would have been symbolic *as money*; and as an imperial and a dynastic statement.

Up until the fifth century BC, the Roman world depended on barter, with cattle as the chief currency. Thereafter, substantial bronze bars, made of metal useful in the manufacture of weapons and tools, took the place of the cattle. These became more or less ornamented, until replaced by

bronze coins - *Aes Grave* - from about 269 BC. In the mid third century BC, the Romans brought Greek artisans from *Magna Grecia* (Southern Italy) to develop a currency based on the more valuable - and therefore lighter, and less cumbersome - silver.⁵⁷ By the end of the second century BC, the denarius had become the standard unit of currency in the Roman world and was worth ten bronze *asses*. In the 140s BC it became worth sixteen *asses*.

Money is an interesting, ubiquitous and extreme example of the principle that, in terms of symbolism, *any thing can mean anything*. Thus, immediately after it was struck, the denarius may have symbolised the kindness of a doting uncle; or part of the just rewards for a day spent selling fish; or an insult, if the buyer of the fish offered it for a quantity the vendor judged to be worth more.

At another level, the coin symbolises the newly-created Roman Empire. The Romans somewhat self-consciously came to see themselves as successors to the - till then - most successful civilisation the (Western) world had seen: Greece. They much admired and imitated their predecessors. Adopting coinage is but one example. During the Republic, a variety of coin types and designs was possible when coinage was being struck variously by magistrates, by the Imperator (the leader of the armed forces), or others. After the murder of Julius Caesar in 44 BC, there followed more than a decade of Civil Wars, during which the Roman world was very nearly split in two, with one half in the east and one in the west. Octavian, Julius Caesar's great-nephew and adopted son, eventually emerged as the victor, and was effectively created the first Emperor by the Senate in Rome in 27 BC. They gave him many titles, as well as bestowing on him a new name: Augustus.

A state might be thought of as congruence between a group of people and their resources - usually defined in terms of territory. Language and culture can contribute to a state's identity and, as an expression of the latter, so too can coinage. Accordingly, Augustus reformed and rationalised the Imperial currency. But the newly established - and stabilised - Empire stretched from Spain to Egypt, and from North Africa to the Netherlands. The coinage - alongside countless other standard features of Roman life, such as amphitheatres, baths and circuses - invited those throughout the Empire, if not to ignore local identity, then at least to acknowledge that it was subsumed within or transcended by the larger, geographically less stable 'place' of the Roman Empire. By contrast with the diversity in coinage before the Empire, types were more or less uniform throughout the Imperial domain, with the profile of Augustus on the obverse, identified by the words 'CAESAR AUGUSTUS'. This image and these words appear here, as on *all* coinage,⁵⁸ throughout the Empire.

The coin symbolises dynastic legitimacy as well: the profile encouraged observers to recognise Augustus as the rightful successor to any other figures so represented on coins of the past; the words refer to Augustus's familial ties with the murdered Julius Caesar, who by now had been elevated to the status of a god. Iconography must not be confused with symbolism, but it can be seen how it contributes to symbolic meaning. Even the crown of laurels on Augustus's head is no mere picturesque addition. The crown of laurels was a symbol given to victors in battle, and it was Augustus's extensive military campaigns which had delivered to Romans the comparative peace of his *Pax Romana*, for which many were grateful.

A further political narrative is represented on the reverse, where the figures of Gaius and Lucius Caesar, Augustus's adopted sons whom he

intended to be his dynastic successors, appear in togas and veiled, each resting a hand on a shield with a spear behind - a very public, non-linguistic statement of political intent.⁵⁹

In daily use, however, coinage may be looked at, but it is rarely *seen* at the level of detail outlined above. Thus symbolism at the doting uncle/fishmonger level would probably have been the more common, with the imperial and dynastic dimensions breaking into consciousness sufficiently often - or so its creators must have hoped - to justify the trouble taken in its design, including the appropriate imagery.

▪ *Sensory-kinetic-affective and symbolic-narrative consonance*

In chapter three, I suggested something of the origins of perceptual biases towards things which glitter. Silver is one such, although unlike say precious gems (in antiquity, at least) it is also a practical material and can be used for high-status, useful objects. That which glitters less - bronze - was less highly prized; while gold, which glitters still more - is at the top of this hierarchy (platinum was then unknown). While the circular shape exhibits the ubiquitous symmetry, and the proportions of the design are attractive, it is chiefly the iconography which supports the symbolic value.

▪ *The achievement of adaptive ends?*

As the account of coinage supplanting cattle demonstrates, money ultimately equates with food, but not all transactions are directly about food. Even so, the inherent flexibility of money means that it can mediate countless complex and otherwise less easily facilitated transactions. At one level these are economic; at another social. Thus all adaptive ends listed before these case studies could be furthered by the denarius from its creation onwards - but that is by no means inherent in the concept of money and, equally, mal-adaptive ends could also be served. Quite what

the balance is, is a much wider question and on its answer hinges the extent to which, at the level of money, the symbolism it enables is adaptive or not.

At the imperial and dynastic levels, the answers are more straightforward. Since Augustus was adopted, as were his protégé sons, Gaius and Lucius, it would seem that Augustus is trading on the evolved preference for acts which further inclusive fitness, without actually furthering it himself; while at the Imperial level, the denarius takes its place among any number of other Roman institutions to provide a symbolic, corporate framework, by which relationships both within and without the Empire might be mediated.

4.21 *The Ardabil Carpet*

The Ardabil Carpet (sometimes spelt Ardebil) was completed in 1539-40 in Tabriz or Kashan in northern Persia (Iran). It has a hand-knotted, woollen pile, on a silk warp and weft. It is 1051.5 cm long and 533.5 cm wide (*figs. 3 and 4*).⁶⁰

▪ *Costs*

The Ardabil Carpet was fabulously expensive to produce, both in terms of raw materials, making processes, design and the attendant labour costs of each stage. Special flocks of sheep were kept for the supply of fine wool for a court carpet - which this is - and the plants for the dyes were cultivated on royal plantations.⁶¹ The silk for the warp and weft and the wool for the pile would each have had to be spun, and then the wool dyed in the different colours. It is an exceptionally large carpet and would have required something larger than the conventional accommodation for the vertical loom. Its design was, in its day, unique and would, therefore, have been very striking. Such is its size and complexity, designing the novel pattern alone would have taken some considerable time to work

out. Originally one of a pair, it took (together with its near-identical twin) about four years to make.⁶² There are 4,194 knots per square metre,⁶³ meaning that some 2,352,730 knots were tied by hand during its creation. To give some idea of the labour costs involved in such an undertaking, a carpet completed in 2000, said to be the largest hand-made carpet in the world (some 70 x 60 metres, compared with some 10.5 x 5.3 for the Ardabil Carpet) at the Grand Sultan Qaboos Mosque in Muscat, Oman, took - according to the company that produced it - three years of continual work by 600 women weavers working in shifts, day and night (or '12 million person hours').⁶⁴

▪ *Symbolic meanings when created*

The carpet's symbolic power operated at at least three levels: at the level of symbolic meaning arising from the imagery of the design; at the level arising from the use of colour, the quality of the design and an appreciation of their spiritual and metaphysical significance; and at the level of political significance. All three are intricately interconnected.

The design is chiefly of plants and flowers organised into a symmetrical medallion at the centre surrounded by 16 oval pendants on a bordered rectangle. Hanging from the two oval pendants which lie along the axis running the length of the carpet are mosque lamps, one larger than the other. The imagery itself, of course, is not symbolic but iconic, in that - like the iconography of the denarius - it resembles the things to which it refers. However, the act of organising these naturalistic motifs (a universal of human art since it began) into an architectonic framework, itself symbolises the control and ordering of nature for human purposes. The purposes here are contemplative, rather than productive, in that it resembles a garden, rather than a field. The Persian word for garden is *pardeez*, from which our own word 'paradise' is derived. The mosque lamps symbolise links with Islam; similarly, the omission of any

representation of the human figure since, in Islam, to do so is often considered idolatrous.⁶⁵

Obviously, the colours have faded, and it is difficult to determine quite what the shades would have been when newly woven. In Islam, colours are regarded as having metaphysical significance.⁶⁶ The mortal can contemplate the divine unity and order of creation by means of two arts: the practice of alchemy or the practice of craft. Alchemy 'the "Science of Transformation of the Human Spirit"' includes a knowledge of colours and the choosing of colours represents a 'certain state of knowledge'. The practice of these two arts was regarded as the process by which the human self might seek union with divine reality and thus achieve purity.

Colour in Islam operates at three levels: at the first level, it is organised according to the system of the three colours and the system of the four colours; at the second level, colours are organised around the number seven, being the sum of the three and the four; and at the third level, it is a system of 28 colours, that is four times the seven colours found at the level below.

The Ardabil carpet appears to be organised around the system of the four colours. They are: red (fire), yellow (air), green (water), and blue (earth). The same colours at the third level (of the 28) have cosmological associations, with each assuming the identity of a planet or other cosmic body.

Thus, conventionally, a craftsman in choosing, say, colours for a mosaic, would bring both alchemy and craft practice together in a spiritual quest. Given the great size of the Ardabil Carpet, and the numbers of craftsmen - or, perhaps, women - who must have been engaged in its manufacture, one cannot but wonder about the extent to which this ideal was practised

in this case. However, devising and organising the design would have similarly been seen as a branch of alchemy, uncovering divine order. Given that the ideal of bringing the arts together existed, and that the 'success' of a design was taken to be a reflection of the success of the practitioner's quest for union with the divine order, the habit of judging designs in that light would have pertained. Thus, at one level, the ravishing beauty of the Ardabil Carpet would have symbolised spiritual insight.

The carpet as a whole was almost certainly designed to further a political agenda. It was commissioned by Shah Tahmasp to furnish the *Jannat Sara*,⁶⁷ a new building at a Savafid national shrine at Arbabil, in present-day Iran. The structure housed the tomb of Tahmasp's father, Shah Isma'il, (1487 - 1524), founder in 1501 of the Safavid Empire. The Empire had only been founded after successful wars against Ottoman, Turkoman and Uzbek rivals, and wars, not all of them successful, continued to mark the early years of the Empire's history. Tahmasp was only 10 years old when he came to the throne.

The new shah's youth sparked a struggle between several Qizilbash factions for the advisory positions that would lead to great influence within the empire. For the first 10 years of his reign, Tahmasp struggled to keep the Qizilbash from revolting, while at the same time, keeping the Uzbeks from taking Khurasan and the Ottomans from taking Tabriz.⁶⁸

Tahmasp's authority over his subjects had passed to him by his father. By increasing the powerful aesthetic impact of his father's tomb and its accoutrements - including this exceptionally large, magnificent and exquisitely executed carpet - he was creating tangible symbols to those around him ('a critical and sophisticated audience of courtiers'⁶⁹) of his legitimacy. The state over which Tahmasp presided as both secular and

spiritual head was shi'ite, in a region dominated by sunnis. Thus, all the levels at which the carpet made reference to Islam and spiritual insights would have been well received, and served only to increase in the eyes of those who saw it in the context of his father's shrine, the carpet's power as a symbol, not only of his secular, dynastic credentials, but of his divine legitimacy as well.

▪ *Sensory-kinetic-affective and symbolic-narrative consonance*

For the symbolic messages Tahmasp wanted delivered to his 'critical and sophisticated' courtiers, only the finest carpet could serve. Thus the choices of colour combinations (at the aesthetic level congruent with perceptual biases, even if consciously chosen for the metaphysical logic outlined above), the fineness and density of the knotting, the proportions and rhythm of the design, the smooth, soft, yielding texture as one knelt on it - all these things would have to be in place. The meandering curves of the design testified to this fineness, as coarser weaves made smooth curves harder to achieve; the finer and tighter the structure and the materials, the more curvilinear the design.

One further detail: when the carpet is knotted and then sheared to give an even surface, that surface - like velvet - will look different, depending on which direction one looks at it. The designers of the Ardabil carpet recognised this, and intended that dignitaries would sit at the end where the weaving had begun (the right of the image in *fig. 3*), so that they would be looking *against* the pile, and thus experience the colours more intensely. The mosque lamp at the far end has been made larger, so that from where they were sitting it would seem the same size as the smaller one, closer to them. Such refinement was hitherto unknown, even in the sophisticated culture of carpet-making then prevalent in Iran.⁷⁰

I would argue that the Arbabil carpet is a spectacular example of consonance between the sensory-kinetic-aesthetic mode and the symbolic-narrative one.

▪ *The achievement of adaptive ends?*

The Ardabil Carpet can be seen to further the causes of genetic replication and inclusive fitness, to the extent that it had power as a symbol of the legitimacy of the Safavid dynasty, of which Tahmasp was the head. It served to articulate something of the relationships Tahmasp wished to establish with his courtiers, symbolising both his spiritual and secular credentials - which in turn would empower him in his attempts to fend off the hostile attentions of his different enemies.

It was, as noted, exceptionally costly and had value - as a 'costly signal' - a very costly signal - of that wealth. At the level of symbols, a calculation must have been made about the extent to which bringing such an exceptional - and exceptionally beautiful - artefact into the world might serve the ends outlined above, for the costs could not be justified at the level of utility as a floor covering alone.

Conclusion

I argue that the capacity for symbolic thought enabled symbolic meaning to be attached both to the organic and inorganic environment, to artefacts and to language. I note that there may have been a gestural, mimetic pre-cursor to spoken language, and that this might have meant that by incorporating places and objects into mimetic communication, the physical was endowed with symbolic meaning before language came to augment communication (and supplant much of what had gone before). I propose that, even if this were not so, the physical can articulate social relationships parallel with the linguistic, sometimes overlapping with linguistic practice, sometimes achieving expressions language cannot deliver. I support - but cannot prove - Mithen's

proposition that the material culture of the Upper Palaeolithic period represents not just communication, but (as with language) a means of enabling the mind to think more effectively by pushing that process outside the brain, and argue that some aspects of common experience seem to confirm that this might be so. Language and material culture, it is argued, emerged to further social and practical (resource securing) ends; these are intimately linked: for a group effectively to secure resources depends, in some measure, on its social cohesion.

I suggest that Miller's proposition, that human creativity emerged as a by-product of sexual selection, may contain some truth; but that so many social, non-sexual, non-reproductive relationships have been critical to survival in social groups for so long, that it would be unreasonable to expect his model fully to explain the gamut of such creativity. I propose that, alongside Miller's mechanism, others - such as social relationships built both out of rational considerations (as in social contracts) and the adaptive power of myth and ritual and the non-reproductive relationships negotiated through them - also serve to provide social cohesion, a sense of personal identity, and, therefore, a desire to survive. I suggest that our brains have evolved (partly) to construct satisfying narratives; and that this is true at all levels, from that of simple perception, to the narratives and myths embodied primarily in language. Meanings bestowed on the physical, including artefacts, can serve to express, support and augment these. Myths - like language itself - simultaneously further adaptive agendas related to the securing of resources and the mediating of all types of social relationships, including sexual ones. In this way, the symbolic meanings ascribed to artefacts can assist in: the securing of resources; the passing on of genes, and therefore the furthering of inclusive fitness; the mediating of relationships within a group; the mediating of relationships between groups; the expression - as conscious beings - of an individual sense of identity; and the expression of an all-embracing account of the world which can be either religious or scientific.

Finally, I have demonstrated through the three case studies of the Egyptian scarab, the Roman denarius and the Ardabil carpet that, indeed, these agendas can be furthered by means of these disparate, designed artefacts; that artefacts *may* serve an adaptive agenda; and that - as with the watering pot and wood screw considered in chapter three - some calculations are made whereby desired social mediatory benefits are offset against costs, in the case of these objects, where part of that power operates at the level of symbol and re-inforcing narrative.

In the following chapter, I will articulate a model which integrates the sensory-kinetic-affective mode of engagement with the symbolic-narrative mode, and which explains more fully how style - the subject of a preliminary consideration in this chapter - is the key to understanding how they interact.

¹ Thus Miller, for example, is chiefly concerned with the value of artefacts as signals (rather than as symbols) and exhibitions of cost; tangentially, he is interested in aesthetics. The nineteen contributors to *Evolutionary Aesthetics*, edited by Voland and Grammer, are preoccupied with the subject implied by the book's title, in other words, the extent to which evolution can account for perceptual biases and the aesthetic preferences which emerge from them, as explored in the previous chapter. They discuss artworks and some industrial products; but again, the focus is not on the *symbolic* meaning of artefacts. Evans is principally concerned with the kinetic, technical side of our engagement with artefacts and makes his case well; but he is clear: technological thought is categorically different to linguistic (that is, symbolic) thought. Such thought is abstract, but neither linguistic, nor symbolic. Obviously this, like the other sensory inputs explored in chapter three, might inform either technical or aesthetic experience, which in turn might affect symbolic and narrative meanings - but such links are, at best, indirect. Miller, G. F., 'Aesthetic fitness: How sexual selection shaped artistic virtuosity as a fitness indicator and aesthetic preferences as Mate choice criteria' in *Bulletin of Psychology and the Arts* 2(1), pp. 20-25. Special issue on Evolution, creativity, and aesthetics. Accessed at http://www.unm.edu/~psych/faculty/aesthetic_fitness.htm on 05.12.03; Miller, G. F., 'A Review of Sexual Selection and Human Evolution: How Mate Choice Shaped Human Nature' described on the website <http://www.sjdm.org/mail-archive/jdm-society/1995-December/000136.html> accessed on 18.08.04, as 'a chapter in press' for Crawford, C., and Krebs, D., (eds.), *Evolution and Human Behaviour: Ideas Issues and Applications* (eventually published as *A Handbook of Evolutionary Psychology: Ideas Issues and Applications*), Laurence Erlbaum Associates, Inc., Mahwah, New Jersey,

1997; Volland, E., and Grammer, K., (eds.) *Evolutionary Aesthetics*, Springer, Heidelberg, 2003; Evans, F. T., 'Two Legs, Thing Using and Talking: The origins of the Creative Engineering Mind', *AI & Society*, vol.12, 1998, pp. 239-260

² Still another option - that language arose out of vocalisations accompanying ritual - will not immediately be considered here. It is a credible position. However, the focus of this study is our relationship with artefacts and not the origins of language, as such. Artefacts often play key roles in ritual, and it is ritual -with its attendant artefacts - which will eventually be considered in the context of the emergence of narrative, as an adjunct to the expression of metaphysical thought, and a means of regulating behaviour.

³ Donald, M., *Origins of the modern mind: Three stages in the evolution of culture and cognition*, Harvard University Press, Cambridge, Mass., 1991; the quote from Donald in this extract is from Donald, M., 'Précis of "Origins of the modern mind"', *Behavioural and Brain Sciences* 16, 1994, pp. 737-91; cited by Kohn, M., *As We Know it*, Granta Books, London, 1999 p. 192

⁴ Donald, *Origins of the modern mind*, p. 168

⁵ Knight, C., Studdert-Kennedy, M., and Hurford, J. R., 'Language: a Darwinian Adaptation?' in *The Evolutionary Emergence of Language*, Cambridge University Press, Cambridge, 2000, pp. 8-9

⁶ Kaput, J. J., On the 'Development of Human Representational Competence from an Evolutionary Point of View: From Episodic to Virtual Culture', in Hitt F. and Santos, M., (eds.) *Proceedings of the 21st annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, Vol. 1, October 1999, p. 3

⁷ Calvin, W. H., 'The unitary hypothesis: A common neural circuitry for novel manipulations, language, plan-ahead and, throwing?', Gibson, K. R., Ingold, T., (eds.), *Tools, Language and Cognition in Human Evolution*, Cambridge University Press, Cambridge, 1993, pp. 230-250

⁸ Allott, R., 'Evolution and culture: the missing link', in van der Dennen, J. M. G., Smillie, D., Wilson, D. R., (eds.), *The Darwinian Heritage and Sociobiology*, Praeger, Westport CT., 1999, pp. 67-81; Allott has written extensively elsewhere on this subject.

⁹ Evans, F. T., 'Two Legs, Thing Using and Talking: The Origins of the Creative Engineering Mind', *AI & Society*, vol.12, 1998, p. 200

¹⁰ Kimura, D., 'The neurological basis of language qua gestures', in Whitaker, H., and Whitaker H, A., (eds.) *Current trends in neurolinguistics*, Academic Press, New York, NY., 1976; quoted by Gärdenfors, P., *Now Homo became Sapiens*, Oxford University Press, Oxford, 2003, p. 195

¹¹ Dunbar, R., *Grooming, Gossip and the Evolution of Language*, Faber & Faber, London, 1997 (orig. 1996), pp. 133-142

¹² Deacon, T. W., *The Symbolic Species: The co-evolution of language and the human brain*, The Penguin Group, London, 1997, pp. 355-356

¹³ Dunbar, p. 123

¹⁴ Oppenheimer, S., *Out of Eden: The peopling of the world*, Constable, London, 2003, p. 25. But then, such chimps were living among humans (who

taught them sign-language) rather than among populations of their own kind in the wild. Is it unreasonable, I wonder, to detect a gender dimension to Oppenheimer's objections, where hunting and practical matters in the wide world are serious (and male), whereas gossip is trivial (and female)? Substitute, (as I shall) some neutral term such as *social intelligence* and Dunbar's proposition, once again, seems still more credible. Dunbar himself is equally dismissive of the 'bison-down-at-the-lake view of language'. Dunbar, p. 148

¹⁵ Mithen, S., *The Prehistory of the Mind: The Cognitive Origins of Art and Science*, Thames & Hudson, London, 1996, pp. 48-49

¹⁵ Mithen, S., *The Prehistory of the Mind*, p. 170

¹⁶ Mithen, S., *The Prehistory of the Mind*, pp. 48-49

¹⁶ Mithen, S., *The Prehistory of the Mind*, p. 172

¹⁷ Mithen, S., *The Prehistory of the Mind*, p. 49

¹⁸ Dennett, D. C., *Consciousness Explained*, Allen Lane, The Penguin Press, London, 1993 (orig. 1991) p. 196; Anecdotal evidence drawn from contemporary experience in support of this idea proves little. However, I think most of us have known, either personally or by the observation of others, or both, instances of people talking to themselves while reasoning their way through some problem or other. In the early 1970s, during a brief stint in a London department store, I got to know slightly a woman whose job it was, each week, to complete some financial returns. She would announce to everyone within earshot that she was 'Just going to do the accounts. I shall be talking to myself, but it's the only way I can do it, so just ignore me.' She would then sit at her desk and 'do the accounts' talking herself through each stage as she did so. Such an announcement was, of course necessary, since (prior to the emergence of the mobile phone - especially in its 'hand-free' guise) talking to oneself is popularly taken as an indication of some incipient mental disorder.

¹⁹ Mithen, S., 'Handaxes and Ice Age Carvings: Hard Evidence for the Evolution of Consciousness' in Hammerhof, S. R., Kazniak, A. W., and Chalmers, D. J., (eds.) *Towards a Science of Consciousness III*, The MIT Press, Cambridge Mass., 1999; accessed at <http://cognet.mit.edu/posters/TUCSON3/Mithen.html>

²⁰ Mithen, S., 'Handaxes and Ice Age Carvings'

²¹ Knight, C., Studdert-Kennedy, M., and Hurford, J. R., 'Language: a Darwinian Adaptation?' in *The Evolutionary Emergence of Language*, Cambridge University Press, Cambridge, 2000, p. 9

²² Knight, Studdert-Kennedy, and Hurford, p. 9

²³ Knight, C., 'Language and Revolutionary Consciousness' in Wray, A., (ed.) *The Transition to Language*, Oxford University Press, Oxford, 2002, pp. 138-160

²⁴ Maynard Smith, J., and Szathmáry, E., *The Origins of Life: From the Birth of Life to the Origins of Language*, Oxford University Press, Oxford, 1999, p. 146

²⁵ Maynard Smith and Szathmáry, p. 148

²⁶ Maynard Smith and Szathmáry, p. 147

²⁷ Deacon, p. 406

²⁸ Dennett, p. 16

²⁹ Broks, P., *Into the Silent Land: Travels in Neuropsychology*, Atlantic Books, London, 2003, pp. 37-41

³⁰ Byatt, A. S., *On Histories and Stories: Selected Essays*, Chatto & Windus, London, 2000, on the dust-jacket. Evidence for this is everywhere to be found: newspapers tell of conflicts around the world which hinge on differing accounts of the significance of past and present events. Veracity, in these would-be factual narratives, is, inevitably, a key issue. Wars are often said to be fought for territory or resources; yet even if this, to some extent is true, closer scrutiny almost invariably reveals that it is the *symbolic dimensions* - the senses of identity, the clashes of culture - which almost invariably motivate their prosecution. Bizarrely, in the circumstances of war or repressive states, prisoners may sometimes be tortured to make them say things they patently do not believe. Our personal histories become intimately linked to and often legitimised by larger, public stories. The public accounts of our personal histories are our reputations (yet another variety of story). Story-telling is a universal human activity.

³¹ Sugiyama., S., 'Food for Thought: The Role of Narrative in Human Subsistence', paper delivered at the Human Behaviour and Evolution Society Annual Meeting, Amherst College, Mass., 07.06.00 - 11.06.00; abstract accessed at <http://www2.bc.edu/~richarad/lcb/fea/arch/hbes2ss.html> on 22.01.04

³² Gärdenfors, p. 201. Gärdenfors takes this account from *The Song Lines*, by the travel writer, Bruce Chatwin.

³³ Mithen, S., *The Prehistory of the Mind*, p. 168

³⁴ Carroll, J., *Evolution and Literary Theory*, University of Missouri, Columbia, 1995

³⁵ Carroll, J., 'Evolution and Literary Theory'; paper by him summarising the argument of his book of the same name (1994); posted at http://www.umsl.edu/~engjcarr/web_documents/ev%20and%20lit%20theory.htm accessed 19 Dec 2003

³⁶ Carroll, J., 'Evolution and Literary Theory'

³⁷ Carroll, J., 'Scenarios of Female Mate Choice in Five Novels of Female Development', paper delivered at the Human Behaviour and Evolution Society Annual Meeting, Amherst College, Massachusetts, U.S.A., 07.06.00 - 11.06.00; abstract accessed at <http://www2.bc.edu/~richarad/lcb/fea/arch/hbes2jc.html> on 22.01.04; also, in passing, Carroll, J., 'The Deep Structure of Literary Representations', *Evolution and Behaviour*, vol. 20, 1999, pp. 159-173

³⁸ Carroll, J., 'The Deep Structure of Literary Representations', p. 160

³⁹ Donald, M., *Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition*, Harvard University Press, Cambridge, Mass., 1991, pp. 269-360

⁴⁰ Carroll, J., 'The Deep Structure of Literary Representations', p. 164

⁴¹ Maynard Smith and Szathmáry, p. 145

⁴² Buller, D. J., 'DeFreuding Evolutionary Psychology: Adaptation and Human Motivation', in Hardcastle, V. G., (ed.), *Where Psychology meets Biology: Philosophical Essays*, The MIT Press, Cambridge, Mass., 1999, pp. 105-106

⁴³ Buller, p. 110

⁴⁴ Deacon, p. 406

⁴⁵ Tomasello, M., *The Cultural Origins of Human Cognition*, Harvard University Press, Cambridge, Mass., 2001 (orig. 1999), pp. 8-9

⁴⁶ I tentatively suggest that responses to style are 'recursive'; that is, a judgement will be made as to the extent to which the artefact is a direct, unmediated expression of the character of the maker, and the extent to which the maker has manipulated the style of the artefact to deliver an effect. In the light of that judgement, a further judgement is made as to the *style of the manipulation*, thus delivering additional, tacit social intelligence (see the full model in the following chapter). This mechanism seems for some reason only to be available in the consideration of the works of others; we struggle to apply it to our own.

⁴⁷ Evans, E. A., 'Ancient Egypt: The Sacred Scarab', article dated 17.04.96, web page from the website of the McClung Museum, University of Tennessee, Knoxville, Tennessee, <http://mcclungmuseum.utk.edu/permex/egypt/egs-text.htm> visited 16.08.04

⁴⁸ From the text accompanying the images of this scarab on the website of The Virtual Egyptian Museum, run jointly by the California Institute of World Archaeology and the Sanusret Collection <http://www.virtual-egyptian-museum.org/Collection/FullVisit/Collection.FullVisit-JFR.html?../Content/STO.VS.01114.P.html&0> visited 16.08.04

⁴⁹ As Evans remarks: 'However, in reality the male and female often work together and it is the female which, after dropping her eggs in the ground, covers them in excrement on which the larvae feed. As the soft dung ball is rolled across the ground, dust and sand attached to it so that it became hardened and was sometimes equal in size to the beetle.' Evans, E. A., 'Ancient Egypt: The Sacred Scarab', article dated 17.04.96, web page from the website of the McClung Museum, University of Tennessee, Knoxville, Tennessee, <http://mcclungmuseum.utk.edu/permex/egypt/egs-text.htm> visited 16.08.04

⁵⁰ Evans again: 'The magical sense of the scarab as an amulet was reinforced through a play on the name it was given. The Egyptian name for the dung-beetle was *hpr*, "rising from, come into being itself," close to the word *hpr*, with the meaning "to become, to change." The word *hpr* later became *hpri*, the divine name *Khepri*, given to the Creation god, who represented the young rising sun.' Evans, E. A., 'Ancient Egypt: The Sacred Scarab'

⁵¹ Evans, E. A., 'Ancient Egypt: The Sacred Scarab'

⁵² Evans, E. A., 'Ancient Egypt: The Sacred Scarab'

⁵³ Khalil, H. M., *Preliminary Studies on the Sanusret Collection*. Manuscript, Musée de l'Égypte et le Monde Antique, Monaco-Ville, Monaco, 1976; quoted on the website of The Virtual Egyptian Museum, run jointly by the California

Institute of World Archaeology and the Senusret Collection <http://www.virtual-egyptian-museum.org/Collection/FullVisit/Collection.FullVisit-JFR.html?../Content/STO.VS.01114.P.html&0> visited 16.08.04

⁵⁴ Evans, E. A., 'Ancient Egypt: The Sacred Scarab'

⁵⁵ Johnson, P., *The Civilization of Ancient Egypt*, Weidenfeld & Nicholson, London, n.d. (1999? Orig. 1978) p.133

⁵⁶ 'Historians are unanimous in the belief that the ancient coin designers were gem carvers. Certainly, the die press, the tool which imprinted the coin's image, has the same appearance as an engraved jewel. The process of minting was simple, demanding very little technology or manpower. Housed in a small wooden or sun-dried brick hut or sometimes even in a temple, the mint was equipped with a clay furnace for melting the metal to the point of pliability. There was also a balance to weigh the coins to their precise metal value. The mint, placed centrally in the room, consisted of an anvil fastened to a tree trunk and the die press. The anvil produced the obverse image, and the die press, the reverse. When the metal pellet was weighed and softened, the minter placed the metal on the anvil and then pressed the punch die on the reverse of the coin to imprint the second image. In order to reinforce the prints on both sides of the coin a hammer was struck on top of the punch die. Errors are common since the ability of the workmen involved in making coins was of varying degrees. A coin might be struck off-center or too weakly, or double struck.' From the University of Saskatchewan Museum of Antiquities website: http://www.usask.ca/antiquities/coins/greek_coins.html#Minting visited 17.08.04

⁵⁷ From the University of Saskatchewan Museum of Antiquities website

⁵⁸ Reece, R., *The Coinage of Roman Britain*, Tempus Publishing Ltd., Stroud, Gloucestershire, 2002, pp. 13-15

⁵⁹ University of Saskatchewan Museum of Antiquities, *Coins of the Emperor Augustus* <http://www.usask.ca/antiquities/coins/augustus.html> accessed 06.02.04. Gaius and Lucius both met untimely deaths, and when Augustus died in AD 14, he was succeeded by Tiberius, another adopted son.

⁶⁰ From the Victoria & Albert Museum website:

[http://images.vam.ac.uk/ixbin/hixclient.exe?_IXSS_=%2asform=search_form%26_IXMAXHITS_=15%26_IXDB_=default%26%24%3dIXALL=ardabil+carpet%26_IXSESSION_=&_IXSR_=xx1&_IXSPFX_=full/t&_IXMAXHITS_=1&_IXFIRST_=1&submit-button=summary&_IXSESSION_="](http://images.vam.ac.uk/ixbin/hixclient.exe?_IXSS_=%2asform=search_form%26_IXMAXHITS_=15%26_IXDB_=default%26%24%3dIXALL=ardabil+carpet%26_IXSESSION_=&_IXSR_=xx1&_IXSPFX_=full/t&_IXMAXHITS_=1&_IXFIRST_=1&submit-button=summary&_IXSESSION_=) visited 16.08.04

⁶¹ Harris, N., *Rugs and Carpets of the Orient*, The Hamlyn Publishing Group Ltd., London, New York, Sydney, Toronto, 1977, p. 27

⁶² Harris, p. 29

⁶³ From the Victoria & Albert Museum website

⁶⁴ 'The Largest Handmade Carpet in History: Press release from Mr. Yazdi, Iran Carpet Company, 10 May 2004. The world's largest hand-woven carpet was produced by the Iran Carpet Company (ICC) at the order of the Diwan of the Royal Court of the Sultanate of Oman to cover the entire floor of the main praying hall of the Sultan Qaboos Grand Mosque (SQGM) in Muscat. The carpet

measures over 70 x 60 meters, and covers the 4343 square meter area of the praying hall, all in a single piece.' From the Jozan Online Magazine on Oriental Rugs and Carpets, http://www.jozan.net/2004/largest_carpet.htm visited on 29.08.04. I have no way of verifying if the claims of Mr Yadzi are true or not.

⁶⁵ The anonymous author of the article 'Carpets in the Victoria and Albert Museum October 31, 2003' writes; 'It is a popular misconception that the Koran forbids the representation of living creatures. Yet any examination of Islamic art reveals it to be populated by a delightful array of animals and humans. In fact, this prohibition is not mentioned in the Koran but appears in the Hadith, the sayings of Mohammed which were compiled by his followers, sometimes many years after his death. The ban is, however, respected for objects intended for religious use, in order to avoid any conceivable taint of idolatry.' From 'Carpets in the Victoria and Albert Museum October 31, 2003' on the website:

<http://www.snakeinformation.com/snakes/siparticles/snakes/snakes-article-136.html> visited 16.08.04

⁶⁶ This information is taken from an article 'Islamic Tradition' ostensibly based on two sources given in its bibliography: Ardalan, N., and Bakhtiar, L., *The Sense of Unity, The Sufi Tradition in Persian Architecture*, London 1973; Gage, J., *Colour and Culture, Practice and Meaning from Antiquity to Abstraction*, Thames and Hudson, 1993, pp. 61-64; on the website:

<http://www.colorsystem.com/projekte/engl/66isle.htm> visited 17.08.04

⁶⁷ Canby, S. R., *The Golden Age of Persian Art: 1501 - 1722*, British Museum Press, London, 1999, p. 47

⁶⁷ Barrow, J. D., *The Artful Universe*, Clarendon Press, London, 1995, p. 149

⁶⁸ *The Islamic World to 1600: The Rise of the Great Islamic Empires (The Safavid Empire)*, The University of Calgary, The Applied History Research Group, 1998: <http://www.ucalgary.ca/applied/history/tutor/islam/empires/safavid/chaos.html> accessed 21.09.03.

⁶⁹ Harris, p. 27

⁷⁰ 'The Surprising Geometry of the Arbabil Carpet' on the Victoria & Albert Museum website

http://www.vam.ac.uk/collections/asia/object_stories/ardabil/index.html visited 16.08.04