Chapter 21

Before and Beyond Representation: Towards an Enactive Conception of the Palaeolithic Image

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A famous philosopher wrote in his *Philosophical Investigations* that the reason '[w]e find certain things about seeing puzzling' is 'because we do not find the whole business of seeing puzzling enough' (Wittgenstein 1953/1958, 212). I do not think that we need any striking experimental demonstration in order to accept the validity of the above claim. A simple example suffices to illustrate what lies at the heart of the matter: look at the two drawings (Fig. 21.1) taken from the so-called 'Panel of the Horses' from Chauvet cave (Vallon-Pont-d'Arc, France). If we ask ourselves what we see when we look at this image the majority of us will immediately and without any particular effort recognize a pair of rhinoceroses facing each other. The ease by which we are able, as modern human perceivers, to make such identifications belies the complexity of the cognitive processes behind them and, I suggest, renders invisible some phenomena of special interest in the study of the Palaeolithic image. Trying to draw out those hidden processes lets us attempt to go deeper into the phenomenology of our perception by asking the following: How exactly do we see, and what exactly do we see when we look at this image printed on paper? What does our experience of seeing really consist of? One might think that these are questions not for archaeology but for neuroscience or psychology of perception to answer. But an additional point that I want to argue in this paper is that as long as we treat cognition and material culture as separate and distinct epistemic domains of human experience our chances of understanding the nature of either are very limited. In considering the case of early imagery in particular, the underlying assumption of this paper is the following: image and perception are continuous; in changing the one you affect the other and thus you cannot understand the one in isolation from the other. The image, I will propose, is not simply the object of human perception; it is itself a historically situated component of human perceptual and cognitive architecture.

So let us return to our question: How exactly do we see, and what exactly do we see when we look at the image below? If we turn to the neuroscience of vision for an answer this will be, more or less, of the following general form: what we really see when we look at this image, what our experience of seeing really consists of, is essentially an internal representation of the retinal image of this image that is automatically constructed and processed in the so-called primary visual cortex (V1) at the back of our heads. More simply, what we 'really see' is a representation of a representation of a representation. Uncontestable as this claim might be, at least on the neurophysiological side, I think most of us would agree that our personal intuition and experience of seeing tells us a different story. For indeed very simply, looking at these two drawings we do not feel anything like seeing them inside our heads, we see them right where they are, printed on the paper in front of us. O'Regan & Noë (2001, 955) provide another, less complicated, example that hopefully will convince even the

Figure 21.1. *Rhinoceroses, the panel of the horses, Chauvet Cave, France. (Re-drawn after Fritz & Tosello 2007, fig. 11.)*

sceptic that there is more to 'seeing' than meets the eye. (Fig. 21.2) Look at the sign below.
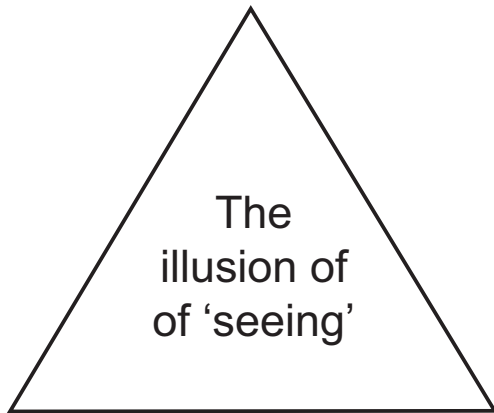

Figure 21.2. *Ceci n'est pas: the illusion of 'seeing'. (After O'Regan & Noë 2001, 955, fig. 4.)*

It may take you a while to realize that the sign does not say: The illusion of 'seeing'.

There are many, and often conflicting accounts, about why most of us, in spite of looking directly at the above sign, fail to notice the existence of the second 'of' or, to give another example, why 'words whose inner letters have been re-arranged can be read with quite anazimg esae'! (Grainer & Whitney 2004, 58), and any attempt to discuss them would have to exceed the scope of this paper. But why should someone choose such a peculiar way to introduce a paper on the images of the Palaeolithic?

I believe that every image one encounters in the world, past or present, embodies a perceptual trick analogous to the one we experienced in the above figure (Fig. 21.2). The cognitive efficacy and affective power of this perceptual trick primarily emanates from the creative conflation of appearance with reality that every image is capable of bringing forth. Paradoxically however, we are rarely ever being aware of this fact. This crucial property of every image usually escapes our conscious attention. The reason for this is not so difficult to imagine. Perception is not simply about directly perceiving the world (Gibson 1966; 1977), it is also, if not primarily, about *learning how* to see the world and *formulating hypotheses* about this world (Gregory 2005; 1990; 1980). Thus, immersed in a predominantly visual culture, and well trained from the early years of our childhood to create and make sense of visual phenomena of the above figurative type, they often appear so familiar to us as 'a sense datum' that we rarely find it necessary to stop and think either about how this recognition is made or about the existence of the image as an entity. We don't ask 'What

is this thing?' or 'What does this thing do?', we rather immediately assume that we are dealing with some sort of visual representation and proceed with questions about its visual content and symbolic meaning. I believe that it is this familiarity that enables us to identify and talk about the image as a representational entity, that also blind us and constrains how precisely this image should be understood. The following quote from the work of Anthony Forge in New Guinea may help to illustrate this point:

> But when [the Abelam are] shown photographs of themselves in action, or of any pose other than face or full figure looking directly at the camera, they cease to be able to 'see' the photograph at all. Even people from other villages who came specially because they knew I had taken a photograph of a relative who had subsequently died, and were often pathetically keen to see his features, were initially unable to see him at all, turning the photograph in all directions. Even when the figure dominated (to my eyes) the photograph I sometimes had to draw a thick line round it before it could be identified, and in some cases I had the impression that they willed themselves to see it rather than actually saw it in the way we do (1970, 287).

This is then the problem with the study of images and more specifically with the cognitive archaeology of images that I will attempt to tackle in this paper. Whenever as archaeologists we turn our gaze upon the image of the past we may find ourselves wondering about a whole series of questions but most likely none of us will ever be puzzled about the most basic fact of all, namely, that the moment we look at the image we have already identified it as an image. It is already an image *of* something, that is, a *representation of* something. From a certain viewpoint this may not seem to be much of a problem. After all it is precisely our perceptual familiarity with the image as a representational phenomenon that transforms, for example, Palaeolithic cave art to an open window on the mind of the past. However although representation might offer the most familiar path to follow if one wishes to approach and understand the coming-into-being of an image, it can also lead to a series of problems. These problems, which will be the focus of this paper, become even more acute when we examine the role of the image in human cognitive evolution. The reason is fairly obvious. In such a context the question of image and representation takes altogether a different significance. It is no longer simply a question about the coming-into-being of the image itself (parietal or mobiliary), it now becomes a question about the coming-into-being of modern human cognition. Palaeolithic imagery is of course only one among the many archaeological traits that are usually brought to

bear upon the question concerning the emergence of behavioural modernity. Personal ornaments and tools, pigments, burials, engraved bones and stones, musical instruments and systems of notation are some of the usual candidates that comprise the archaeological list (d'Errico 2003; 1998; 1995; Mellars 1989; 1996a,b; Bar-Yosef 2002; Noble & Davidson 1996). Nevertheless, the image is undoubtedly the trait that, in spite of probably coming last chronologically, puzzles and fascinates us the most. Perhaps more importantly, it is the trait that very often defines the cognitive standards upon which all other manifestations of modern human intelligence are measured up and interpreted. As Gregory observes 'together with language, making pictures is uniquely human' (2005, 1237). This may also explain why this unique and rather isolated phenomenon of the development of Franco-Cantabrian cave art has been associated, wrongly in my opinion, with some sort of general creative or even cognitive revolution.

The crucial question facing us then, is how those images should be understood and upon which aspects or properties of those images we should focus. As mentioned earlier, for most archaeologists the meaning of the image appears to be grounded upon, if not synonymous with, the notion of representation and symbolism. In what follows I want to challenge this assumption. And in this respect it might be useful first to discuss more precisely when something is a representation and why representation is so important as a concept.

Image and representation

Generally speaking representation can be understood in a double sense: as an object which stands for, refers to or denotes something, but also as the relation between a thing and that which stands for or denotes it. We may distinguish between two major types of representations, namely, 'internal' and 'external'. 'External' representations are those material signs or sign systems that are publicly available in the world, whereas mental or 'internal' representations can be understood as what philosophers call the representational content of a certain intention or belief *about* the world. Now what precisely a representation is and what are the neural correlates of such a phenomenon is far from clear. However, according at least to the dominant computational theory of mind, representations are considered to be the very stuff that our mental engines are made of. More precisely, representation is generally recognized as the principal mechanism by which we feed our brains with information *from* the world and by which we externalize our mental contents *into* the world. It is only natural then that for most archaeologists it is this representational function, the 'symbolic function' or 'symbolling', which defines more than anything else what it means to be a modern human cognizer. Language (Deacon 1997), 'What if?' reasoning (Foley 1995), theory of mind (ToM) capacity (Mithen 1998c; 2000; Leslie 1987), imagination (Harris 2000), all those concepts seem to revolve around and are often understood through the representational idiom. And although we may not have reached as yet any particular consensus about exactly *when, why or how* this precious human cognitive capacity first appeared (e.g. d'Errico 2003; d'Errico & Nowell 2000; McBrearty & Brooks 2000; Noble & Davidson 1991; 1996; Deacon 1997; Klein 2000; Mithen 1996; Donald 1991; 1998; Mellars 1989), there seems to be a broad agreement that the early image offers our best evidence for the existence of this representational mechanism that we often construe as the key feature of modern human intelligence. Many researchers, for example, may dispute to what extent the shape of a so-called Acheulian handaxe should be accepted as the first true example of conscious imposition of form rather than the unintended side effect of a reduction sequence (Wynn 2002; Noble & Davidson 1991; 1996; Ingold 1993; McPherron 2000), or to what extent the engraved ochre pieces from the Blombos cave constitute an irrefutable evidence for symbolic behaviour as d'Errico proposes (2003). But when it comes to the images of the Upper Palaeolithic few people will question that human creativity and symbolic capacity have left an incontestable mark in the archaeological record.

So given all that, is it not then, the representational status of the image and its role in the evolutionary trajectory of human cognition that we need, above anything else, to understand? Admittedly placed against the background of the above considerations my suggestion in this paper of approaching the image *before* and *beyond* representation may sound confusing. So before we proceed further I would like to underline some basic points which may help clarify the reasons for proposing this shift and possibly the reception of the arguments to follow:

The thing I should probably underline first is that, despite my anti-representational disposition in this paper, I do not all together deny the representational character of the image. There is no doubt that the image as a material sign can be seen very often to operate as a form of external representation or as a part of a larger representational structure. What I object to in this paper is the exclusive focus on representation that preoccupies the archaeological interpretation of the prehistoric image.

My overall argument in this paper is that approaching imagery, and more specifically imagery

from the Upper Palaeolithic, solely from a representational perspective is not simply to leave several important questions unaddressed but also to be led, very often, to ask the wrong questions about it. This, I argue, is for two main reasons.

1. The first reason has an ontological dimension and relates to my general contention that, what we call representation is not what really matters in the study of the human mind. As I will discuss below, I doubt that the representational path holds the key to unlock the mysteries of human cognitive evolution. Even if I am wrong and representation does hold such a key, I believe it would be the question of meta-representations that we should be focusing upon. In other words, the crucial question in cognitive evolution is not when people started to represent one thing with another, but rather when they become aware of doing so. More specifically in the case of early imagery, it is one thing to say that the people of the Upper Palaeolithic were creating representations — they certainly appear as representations to the modern observer — it is another to say that the Palaeolithic people were aware or knew they were making representations in some arbitrary symbolic sense.

2. The second reason is a methodological one and can be roughly sketched as follows. Whilst it probably makes perfect sense to see the Palaeolithic image as a representation *of* something — from our contemporary habits of seeing and perceiving — to assume uncritically that this was also the way the image was experienced in its original context is to take as our starting point what should have been the end of our analysis. The above can seriously distort our understanding of how the image might have operated as part of a new trajectory of *material engagement* which, we should bear in mind, unfolds in a world that was to a large extent uninitiated to the psychological power of the image. I am not saying that the light projected from such an image in the past would have followed a different path than that of the physiology of our present visual system would allow. What I am saying is that if we could compare our *perceptual experience* of this image, in the present, with that of our Palaeolithic ancestors, in the past, I doubt that we would find much in common. Of course simply to claim that, is not to say much. The question rather is, on the one hand, what might be the feature that distinguishes those different types of perceptual experience, and on the other, how it might be possible to identify such a feature archaeologically?

Working towards an answer to that, I am looking beyond representation because I intend to pursue the cognitive life of images without the usual presumptions about what this cognitive life might have been and through which mechanisms it became enacted. Two major questions then immediately follow: a) What can an image be if not a representation?; and b) What is the human mind if not the familiar 'internal' representational engine? I start with the latter.

Image, material engagement and extended cognition

Elsewhere I have provided a more detailed exposition of my scepticism about the representational or computational thesis that sees on the one hand the relationship between mind and the brain as that between software and hardware, and on the other, understands the essence of human cognition as that of an 'inner' representational engine (Malafouris 2004; 2005; in press; forthcoming; Malafouris & Renfrew forthcoming). Focusing for our present purposes more specifically on the issue of human cognitive evolution my principal concerns amount to the following: I consider representationalism to be inherently misleading in a double sense: 1) it implies that in human cognitive evolution the hardware (biology) drives the software (culture), leading as such to an inherently dualistic conception of the complex co-evolutionary brain-culture spiral that characterizes hominin evolution; 2) it reiterates the myth of the isolated or unaided mind which invites us to think that the cognitive life and efficacy of *things* is that of a disembodied digit of information written somehow on the neural tissue by way of representation.

I believe that things do much more for the mind than what a strictly representational mental engine would allow them — and we should keep in mind that as the psychologist A. As Costall observes '[p]ictures are admittedly unusual kinds of things, but they are nonetheless things like everything else' (1997, 57). Although the human mind may well possess the capacity to represent the world, the cognitive efficacy of material culture lies primarily in the fact that it makes it possible for the mind to operate without having to do so, that is, to think through things in action without the need of mental representation (Malafouris 2005, 58; see also Brooks 1991; van Gelder 1995). What this hypothesis of the constitutive intertwining of cognition with material culture (cf. also the hypothesis of extended cognition: Clark & Chalmers 1998) implies, among many other things, is that as embodied beings we engage with the world and our cognitive capabilities emerge out of this interaction. As such if internal representations do exist they should be understood as dynamic and action-specific emergent structures rather than as 'passive recapitulations of external real-

ity' (Clark 1997, 51; Clark 2003). Cognition, perception and action arise together, dialectically forming each other. Placed against an evolutionary background the hypothesis of extended mind raises the following possibility: that the intelligent use of material culture precedes intelligent thinking, or more precisely for our purposes in this paper, that symbolic usage of material culture precedes symbolic thinking. Put it in simple terms, the tool is often smarter than the toolmaker and can be sown in time to posses a mind of its own. Or as the philosopher Daniel Dennet suggests in his *Kinds of Minds*

> tool use is a two-way sign of intelligence: not only does it *require* intelligence to recognize and maintain a tool (let only fabricate one) but a tool *confers* intelligence on those lucky enough to be given one (1996, 99–100).

But let us now unfold the significance of the above premises in relation to the first of our previously stated questions: What can an image possibly be if not representation?

Generally speaking, following the usual semiotic avenue, the image can be understood in two major respects; on the one hand we have the obvious Peircian (1955) sense of an *icon*, namely, a 'motivated' sign that operates through some sort of visual resemblance. On the other, we have the 'arbitrary' sense of a *symbol*, that is, a signifier that operates via convention. In this latter case the image is taken to embody a sort of visual code or language and thus invites reading. Indeed according to Mithen (1996, 181) there are at least three mental attributes involved in creating and reading the images of the Upper Palaeolithic: 1) planning and execution of a preconceived mental template; 2) intentional communication; and 3) the attribution of arbitrary meaning. To give another example of the above general line of thinking according to Lewis-Williams a 'pre-existing symbolic vocabulary' must have been certainly in place at the time when Upper Palaeolithic people made those images: 'There must … have been a socially accepted set of zoomorphic mental images *before* people began to make representational images of them' (2003, 266).

Indeed, confronting the striking naturalism of the cave images of Franco-Cantabrian art one is prompted to infer that the mind of the image-maker must certainly have possessed the capacity for retaining in his working memory an image of the creature he was going to depict on the walls of the cave. This capacity for seeing in 'the mind's eye', or what we generally refer to as imagination, must certainly have been in place. But does this imply — to use Lewis-Williams's term (2003, 266; 2002) — an 'already-existing mental symbology'?

I believe that this question should be answered in the negative, in spite the existence of a general consensus in archaeology that supports the opposite opinion. However, let me clarify that it is not the *iconicity* of those images that I am disputing here. No doubt the two rhinoceroses from the Panel of the Horses from Chauvet (Fig. 21.1) 'look like' the animals we know, as is also the case with the majority of animal drawings from this cave. I simply believe that to say that a painting from Chauvet 'resembles', or 'looks like', a rhinoceros, a horse or a bull, does not necessarily imply that these paintings also 'represent' those animals in a concept-mediated referential manner. Iconicity does not in itself imply the existence of consciously manipulable content-bearing tokens, though it certainly sets up, as I will argue bellow, a visually stimulating channel of influence for their creation. I am not questioning the existence of some sort of 'basic level' perceptual categories about those animals. What I am questioning is the prevalent tendency to regard Palaeolithic drawings as the equivalent of 'linguistic signs' and thus as parts of a larger symbolic system in use among the Palaeolithic people which we can decode by looking at the formal, spatial or thematic relationships between the images. No doubt, to depict a living creature on the walls of a cave in such an executive naturalistic manner is an extremely difficult task. However, there is no symbolic or linguistic prerequisite criterion for the accomplishment of this task, no need for a modern 'fully equipped' representational mental engine. What is needed instead is acute perceptual training and sensorimotor co-ordination of an unprecedented type. One needs the ability to attend and retain in one's memory the exact physical characteristics of the features one is portraying. One needs to control the succession of strokes that will generate form and contour. One needs to understand metric proportions, the modulations of colour, and the surrogate function of lines that create the appearance of form. These are the truly significant puzzles concerning the cognitive and perceptual foundation of the Palaeolithic image that we need to solve, and not their symbolic function.

To this end, instructive lessons can be derived from at least three different directions:
1. We have developmental studies with young children which clearly indicate that having identified the pictorial content of an image does not necessary mean that you have also identified the relation of this image with the world (Costall 1997, 56; 1989; 1990). For example when nine-month-old-infants are presented with books containing highly realistic pictures of individual objects and toys they do not simply look at them but engage in all sorts

of exploratory behaviours with them (e.g. manual exploration like feeling, rubbing or striking the picture surface, or even at times grasping the pictures as if trying to pick up the depicted objects). The infants' appreciation of symbolic relations — that is, of a signified as representing something other than itself — emerges gradually in child development. It is only around 18 months of age, and after extensive engagement with pictures, that children are able to point and talk about pictured objects as 'other than itself', that is treat pictures symbolically, as objects primarily of communication rather than action. Infants have to learn through experience that for example 'a depicted toy cannot be picked up and milk cannot be obtained from a photograph of a cup' (DeLoache 2004, 68; DeLoache *et al.* 1998). In fact, the more a depicted object looks like a real object, the more infants explore it.

2. Then, we have the semiology of neuropathologies — especially Autism Spectrum Disorders (ASD) — such as the famous case study of a four-year-old autistic savant, Nadia — a severely retarded girl who had virtually no language and no ability to think conceptually. The case of Nadia's drawings, as discussed by Nicholas Humphrey in 'Cave art, autism and the evolution of the human mind' (Humphrey 1998), reveal that graphic skills like those we see in cave art do not necessarily imply a representational mind endowed with the sophisticated capacities of symbolization, language and communication as it is often assumed (Humphrey 1998). The surprising fact, as noted by Humphrey, is that drawings of this quality are never produced by untrained artists today unless they are autistic, which may point to, among other things, the possibility that the ice-age artists themselves may have been operating at a pre-linguistic non-conceptual level.

3. As both the history and the anthropology of the image have often pointed out: even in those well-testified cases where a representational or symbolic relationship can safely account both for the question 'What is this an image *of*?' and for the question 'What is this an image *for*?' this remains a relationship that cannot fully encompass the cognitive biography and dynamic of the image as a material sign and thus it should not lead us, or be used as a basis for, further unwarranted abstractions and generalizations about its meaning (e.g. Steiner 1998). Images do not simply possess semiological qualities to be interpreted, but an agency potential to be abducted (Gell 1998).

The question thus emerges: If the conventional signifier/signified relationship, that defines an image as an object and 'imaging' as a process, is not one of representation, then how else can it be construed? A good starting point for answering this question can be found in the following suggestion from the anthropologist Tim Ingold: those activities, the products of which a modern Western observer may unproblematically identify as representational art, in a non-modern context may well be 'understood as ways, not of representing the world of immediate experience on a higher, more "symbolic" plane, but of probing more deeply into it and of discovering the significance that lies therein' (1998, 183). But to what precisely does this 'probing' or 'discovering' amount to in the case of Palaeolithic imagery?

The enactive logic of imaging

As discussed previously, the hypothesis of extended cognition material culture as a *tool for thinking* is not simply an expression of intelligent behaviour but very often the necessary condition for the emergence of such behaviour. To describe the semiotic dimensions of this operation, I have introduced elsewhere the notion of 'enactive signification'. This 'enactive conception' derives primarily from the work of Maturana and Varela (Maturana & Varela 1980; Varela *et al*. 1991) where it denotes their conception of mind as action structurally coupled in a network of ongoing interactions. My own use of enactive signification refers to a process of embodied 'conceptual integration' (Fauconnier & Turner 1998; 2002) responsible for the co-substantial symbiosis and simultaneous emergence of the signifier and the signified that *brings forth* the world (Malafouris 2005, ch. 3).

To illustrate what this means a good example to consider is the relationship between counting, fingers and clay tokens (Malafouris forthcoming). From a representational perspective counting is essentially an innate biological capacity of the human brain. Counting with the fingers or with clay tokens is an expression of this capacity in material form. However from an enactive perspective things appear rather different. What in the representational account is understood as an externalization of mental content, that is, numerical concepts are represented in material form, from an enactive view is more of a dense structural coupling between the supposedly 'internal' and 'external' domains of the human conceptual map. More specifically, counting with the fingers or with clay tokens is an integrative projection between mental — the basic biological approximate 'number sense' (Dehaeane 1997) — and physical — e.g. fingers or clay tokens — domains of experience. It is the resulting structural coupling or blend that brings about

the possibility of the meaningful cognitive operation we know as counting and not some innate biological capacity of the human brain. What essentially happens according to the enactive scenario, put in very simple terms, is that the vague structure of a very difficult and inherently meaningless conceptual problem, i.e. counting, by being integrated via projection with the stable material structure of fingers and clay tokens, is transformed into an easier perceptual problem. However, perceptual problems embody a spatial logic and as such can be directly manipulated and resolved in real time and space. Thus the problem (i.e. counting) becomes meaningful, and I want to suggest that when a problem becomes meaningful a material sign has already emerged. The fingers do not 'stand-for' numbers, as it may seem, the fingers *bring forth* the concept of numbers by making visible and tangible the manipulation of their properties.

My suggestion is that it is precisely such an enactive 'bringing forth' that characterizes above anything else the cognitive life of the Palaeolithic image. In other words, I propose that images like the ones we see, already 30,000 years before present, at the caves of Chauvet and Lascaux *before* and *beyond* representing the world they first *bring forth* a new process of acting within this world and at the same time of thinking about it. This thinking however, should not be understood — at least not in the first instance — as that of the 'higher level' abstract or symbolic type. This thinking should be understood in the more basic 'lower level' sense, namely, as a new form of active sensorimotor engagement (O'Regan 1992; O'Regan & Noë 2001; Noë 2005; Hurley 1998). It should be understood as a new form of perceptual learning on a par with the 'bringing forth' or 'bringing out' of a figure by embellishing the natural formation of the rock. Or, alternatively, a practice-induced change in the human ability to perform certain 'unnatural' perceptual tasks.

By taking such a stance on the issue of the Palaeolithic image, it does not mean of course that we can now answer all the difficult questions related to the visual experience and constitution of early imagery. However, what I want to suggest is that such an approach does offer us is an escape route from having to postulate 'magical mechanisms' and internally driven biological mutations to account for the emergence of the image. This sensorimotor account has two major implications. The first is that it enables us to understand seeing and perceiving as a form of 'skillful interactive engagement', as a form of acting in the world rather than as a form of representing the world:

> under the present theory, visual experience does not arise because an internal representation of the world is activated in some brain area. On the contrary, visu-

al experience is a mode of activity involving practical knowledge about currently possible behaviors and associated sensory consequences. Visual experience rests on know-how, the possessions of skills. Indeed, there is no 're' — presentation of the world inside the brain: the only pictorial or 3D version required is the real outside version. What *is* required, however, are methods for probing the outside world — and visual perception constitutes one mode via which it can be probed (O'Regan & Noë 2001, 946).

Turning now to the second and correlated implication, this is that once we recognize visual perception as a mode of probing the outside world rather than representing it, then we may well also conceive the role of the Palaeolithic image as a continuous prosthetic part of this probing mechanism and thus a cultural extension of the visual brain. What this means is that the image instead of being the product of some 'hard-wired' cognitive ability that, for example, the Neanderthal brain was lacking, it should now be seen as the extended part of a new cognitive strategy. We should approach 'imaging', in other words, as the sort of activity that Kirsh & Maglio (1994) term 'epistemic actions': namely, actions whose purpose is not to alter the world so as to advance physically toward some goal but rather to alter the world so as to help make available information required as part of a problem-solving operation. Elsewhere I discuss how such a problem-solving operation can be understood in the context of early religious thinking (Malafouris in press). For our present purposes I want to explore more specifically the possible effect of the image at the level of perceptual experience. My main argument consists of two major premises. The first is that the cognitive and neurophysiological requirements for the perception and creation of these images does not differ from that of ordinary object recognition (see also Halverson 1992a, 402) and as a result no additional hard-wired cognitive requirement is needed to account for their origin. The second is that although no symbolic cognitive requirement is needed, the emergence of the image made possible a new special kind of perception of the world not previously available. The implication of the latter is that the question to ask about Palaeolithic imagery is not 'What kind of mind was needed to made those images?' but instead 'What kinds of minds are constructed by perceiving those images?'.

To better understand the above we need to understand the Palaeolithic image as a perceptual device and the key question to ask to this end is the following: Why does a Palaeolithic image look the way it does? How do lines of pigment depict anything? Answering this basic question will not help us understand
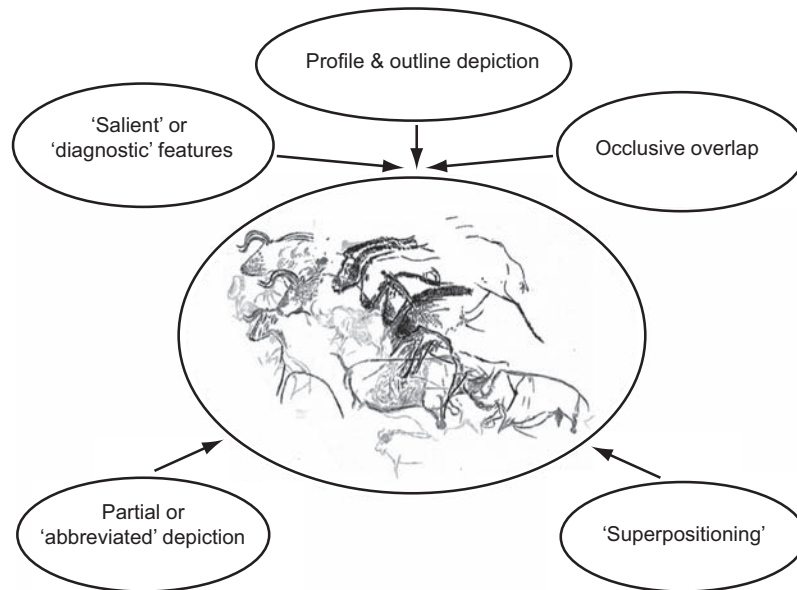
Figure 21.3. *Major perceptual features of Palaeolithic imagery. The panel of the horses, Chauvet Cave, France. (Re-drawn after Fritz & Tosello 2007, fig. 20.)*

what those images mean, but it will certainly help us understand *how* they mean. So let us review some of the most salient perceptual features. In the following sections, I shall be drawing primarily on the work of Halverson (1992a&b).

Pictorial outline
It is generally agreed that cave art is overwhelmingly animal art (with only a few human or human-like images depicted in a different schematic form, and some geometric motifs), and there is a wealth of studies attempting to discern the possible patterns and messages behind the observed groupings and frequencies of animal species depicted. However, one element of vital significance that is often taken for granted is the fact 'above all, Palaeolithic art is an art of outline' (Halverson 1992a, 390) (Fig. 21.3). Although exceptions do occur, as in the famous polychrome figures of Altamira and Lascaux, most of the images, engravings in particular, are of simple outline.

The majority of animal figures are portrayed in profile, often 'strict' profile (only two legs showing) and, as I will discuss below, from a 'canonical' perspective. This is very important because, especially in the absence of background, as is the case with cave art, the silhouette outline of an animal displays the animal's distinguishing characteristics of form and

thus it is 'as recognizable as the fully illuminated creature — in some circumstances even more so'. As Halverson comments:

> The pictorial outline abstracts from the silhouette its only signifying feature, its occluding edge … Thus, although an unnatural artefact, the pictorial outline successfully exploits a fundamental component of natural object perception (1992, 391).

'Occlusive overlap' is also very frequent (especially in the depiction of the legs of a single animal). And the same applies to 'superpositioning', where one figure is drawn over another without any regard to visual occlusion, and also to 'partial' or 'abbreviated' depiction (e.g. heads without bodies, a few lines depicting the outline of head and back or a part of the legs).

Canonical perspective and diagnostic features
Given that different perspective views present different information about any individual object, the view containing the most information should be maximally recognizable. This 'best' or 'most' typical perspective view of an object is called the 'canonical perspective'. Canonical perspectives should be the ones that are most easily identified and categorized as perceptual instances of the object depicted. This implies that there must be also an angle view which depicts any given object in an orientation which
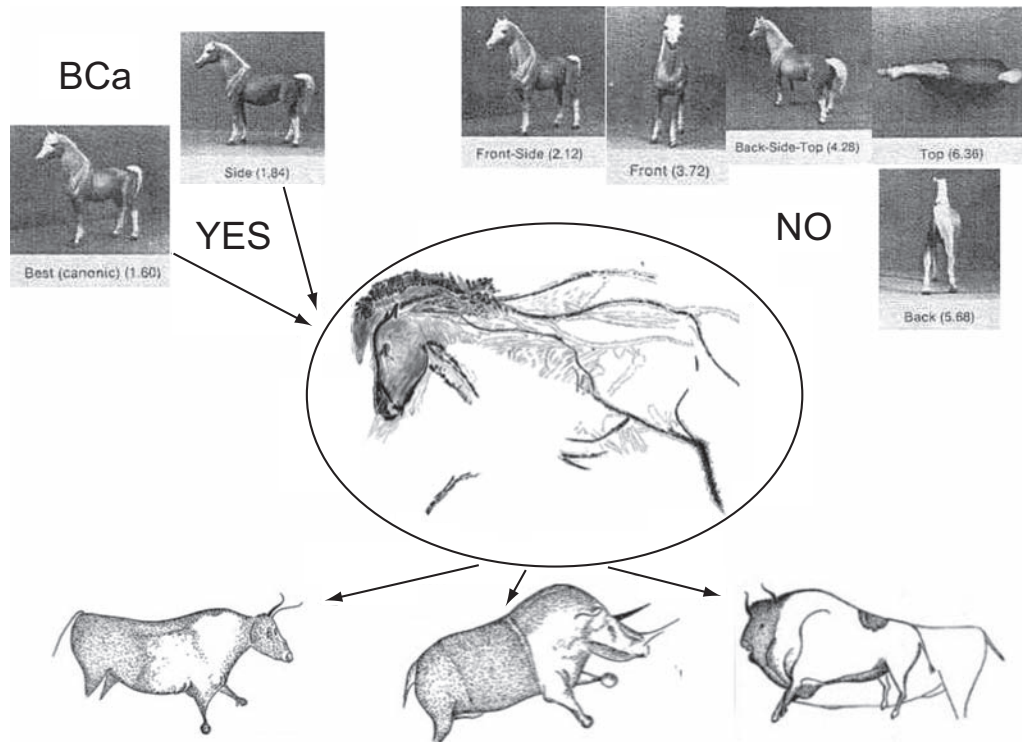
Figure 21.4. *Canonical perspective. (Adapted and re-drawn from Palmer* et al. *1981 fig. 2 and Fritz & Tosello 2007, fig. 21.)*

contains the most canonical and diagnostic features necessary for the recognition of this object. This is a premise that resonates well both with what Merleau-Ponty in his phenomenology of perception defines as the 'maximum grip' (1962) as well as with the Gibsonian notion of affordances (1979). Characteristic in this respect is the study of Palmer *et al*. (1981) which set out to investigate the hypothesis that our knowledge of an object and as such our ability to identify and classify that object is maximally accessible from a privileged or 'canonical' perspective. In their experiment a series of photographs of common objects were shown to various subjects, who were asked, in the first stage, to rate them for *typicality* or 'goodness rating' (that is, how perceptually familiar and accessible they might seem), and in the second stage to identify the object as rapidly as possible. Not surprisingly, the reaction times correlated with the rated *typicality* of the object. Of important note for our present purposes in this paper is the example of a horse figure presented in twelve different perspectives. At the top left corner of Figure 21.4 one can see two of the most rapidly identified views of the horse image, with BC representing the 'best canonic' perspective, that is, the one most rapidly identified. While in the top right corner of Figure 21.4 one can see a selec-

tion of images among the less canonical views which took the subjects much longer to identify. Various explanations can be brought to bear to account for this phenomenon but what is important to emphasize in the context of our present discussion is that non-canonical depictions not only are totally absent from Palaeolithic depiction, but importantly, that most depictions present a consistent preference towards best canonical profile views (Fig. 21.4). Indeed, the two highest rated views in the above experiment i.e., slightly angled and full profile, closely correspond to the prevalent tendency in Palaeolithic depiction. This indicates that the persons which produced those images strongly favored canonical perspective for its ability to embody the maximum perceptual information content (Halverson 1992, 402). In other words, the immediate concern seems to be with maximizing perceptual identification rather than the reading of some more elaborate cultural message. A far more elementary intention of permitting easy recognition of the subjects depicted seems to be at work here, and the extensive use of, simplification and accentuation of 'salient' or 'diagnostic' features, such as animal horns or the use of 'twisted perspective' (i.e. when for example the horns of an animal are shown from the front in a profiled figure), further testify to that.

Gestalt principles

The psychology of perception tells us that a great deal of our ordinary ability to identify patterns and objects in the world can be accounted for by way of some basic principles of perceptual organization. These principles are also known as perceptual Gestalts such as those of proximity, similarity, good continuation, closure, figure/ground etc. (Wertheimer 1938; Koffka 1935; Ellis 1938; Kanizsa 1979) (Fig. 21.6). These are 'basic level' properties of the visual system through which sensations acquire order and meaning and which figure prominently both in the so-called 'direct' and the 'indirect' schools of human perception (Gibson 1966; 1979; Gregory 1990; Marr 1982). What is important to note for our present purposes, however, is the following: although ordinarily we experience the world without having any awareness about the influence that these basic properties exert on our visual apparatus, it is possible, that these implicit properties, if properly materialized can become themselves the object of human perception and thus revealed to us in a conscious way. Consider for example the principle of proximity. Proximity is perhaps the most fundamental of the Gestalt grouping laws, one to which, as many studies suggest (Kubovy & Holcombe 1998), the human visual system is extremely sensitive. What this principle states, in brief, is that visual features of an image that are close together tend to be associated. At the neurological level the processes responsible for this reaction are ones that occur automatically somewhere between the image and the primary visual cortex — their precise location varies according to which school of perception ('direct' or 'indirect') you follow. Nevertheless, although we are not aware of the underlying processes we are certainly aware of their results, and what those results are telling us is how to segment our visual field. If however, we attempt to illustrate this proximity principle on paper using a series of parallel dots, like the ones presented in Figure 21.5, we almost immediately acquire a genuine conscious understanding about what the operation of this principle might be. It is almost as if something of the workings of our own mind is magically revealed in front of our eyes. In some sense, we gain a new perceptual awareness about the hidden operations of our own vision.

Final discussion

Perhaps, by way of conclusion, a useful analogy can be drawn: where the toolmaker brings forth the possibility of a new form of tactile thinking, the image-maker brings forth the possibility of a new form of visual thinking. As the liberation of the prehensile
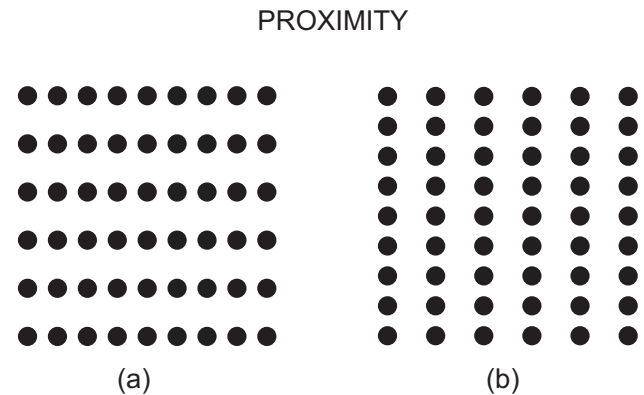
PROXIMITY

Figure 21.5. *The principle of proximity is responsible for seeing in a) a series of horizontal parallel lines of dots; and in (b) a series of vertical parallel lines of dots.*

hand from the requirements of locomotion allowed it to become a privileged interface between the organism and its physical environment, so it seems to me that the liberation of sight from its ordinary experiential requirements, in the case of the Palaeolithic image, allowed the eye to gradually become the privileged interface of human perceiving. To appreciate this point better one should bear in mind that as the psychologist Gibson observed, our visual system has arms and legs, it has evolved so as to visually engage the world, not pictures (Costall 1997, 50). Pictures, objectively considered, are 'thoroughly unnatural, especially outline depictions' (Halverson 1992, 390). In other words, the effected 'liberation of sight' emanates from the unique ability of the image to disrupt or question the ways the world is experienced under normal conditions. By that I do not mean that the image impinges upon the retina of the visual system in a different way from that in which the rest of the world does. What I suggest is, that the image makes it possible for the visual apparatus to interrogate itself and thus acquire a sense of perceptual awareness not previously available. The image, as Gibson observed, 'freezes' some of the structure available in the 'optic array' (for a detailed discussion see Costall 1990). This mediating perceptual role that every image embodies is precisely the feature that the image shares, according to Gibson, with indirect perception. Thus the key question that confronts us in the case of the Palaeolithic image is not whether it signifies the sudden cognitive origin of such a mediating or symbolic mechanism. The crucial question, I want to suggest is rather, to what extent this symbolic mediating mechanisms of indirect perception could have emerged or developed in the absence of the image itself. It is the latter that constitutes my
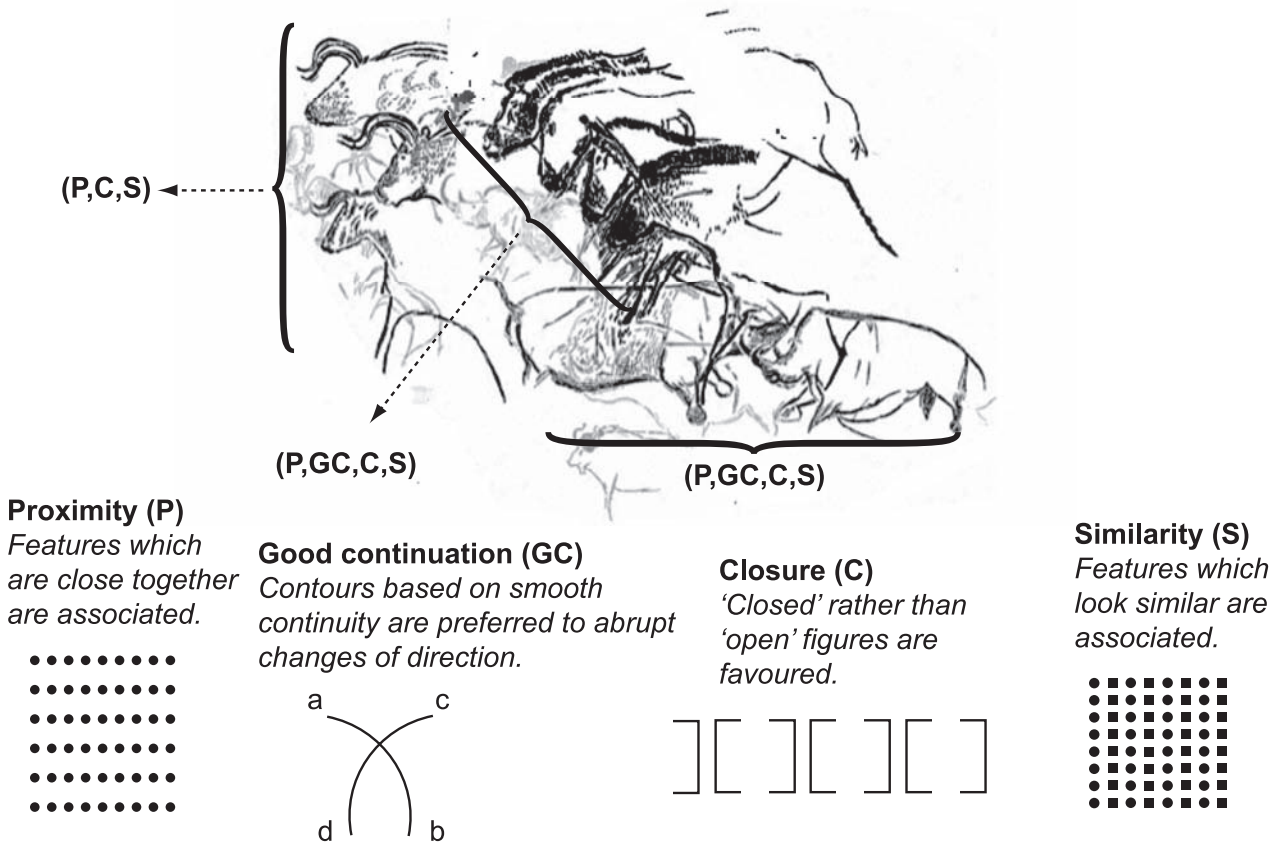
(P,C,S)

(P,GC,C,S)

(P,GC,C,S)

Proximity (P)
Features which are close together are associated.

Good continuation (GC)
Contours based on smooth continuity are preferred to abrupt changes of direction.

a   c

d   b

Closure (C)
'Closed' rather than 'open' figures are favoured.

Similarity (S)
Features which look similar are associated.

Figure 21.6. *Major perceptual Gestalts. The panel of the horses, Chauvet Cave, France. (Re-drawn after Fritz & Tosello 2007, fig. 20.)* **ref in text??**

working hypothesis in this paper. In particular I propose that the principal role of early imagery in the context of human cognitive evolution was to provide a scaffolding device that enabled human perception gradually to become aware of itself. The previously discussed major perceptual characteristics of the Palaeolithic image, such as the outline style and the extensive use of basic gestalts, occluding contours, and canonical perspectives (e.g. Clottes 1996; Deregowski 1995; Halverson 1992a,b; Kennedy & Silver 1979) (Fig. 21.6), testify to this process of creative engagement and of sensory learning.

Those features offer us some of the earliest examples of those key moments in the engagement of mind with the world in which structures of mind meet and identify with structures imposed on materiality. Such a meeting must have had some very important cognitive consequences because it is in cases like these that early humans most probably began to expand and explore their own minds as perceptual systems. Through the process of 'imaging' the underlying mechanisms of human perception are being transformed to an object *for* perception and contemplation. Those invisible

mechanisms become now perceivable visual patterns arrayed and combined in real time and space. In this sense, the image offers a new mode of epistemic access to the world of visual experience.

In this regard it can be argued that, in constructing images, the Palaeolithic person was not simply externalizing the contents of their mind but was exercising once more what they could do better than any other species: the ability to construct external patterns for sensorimotor engagement and let the resulting dense and reciprocal mind/world interaction 'bring forth' their perceptual and experiential content. In other words, the role of the image in the drama of human cognitive evolution was not to provide the static scenery for a 'Cartesian theatre' (Dennett 1995). The role of the image was that of an active material agent. The image was an active part of the world it often represented. The boundary between the 'internal' concept seen in 'the mind's eye' and its external representation on the wall of the cave should be questioned. The cave wall was not simply a 'context' for the 'mind inside the head', it was the outward membrane of the 'mind inside the cave'.

The Palaeolithic image-maker constructs an external scaffold that affords the world to be seen and experienced in ways that the physiology of the naked eye by itself does not allow. This scaffolding also enables a new direct understanding of the human perceptual system and thus offers to the Palaeolithic individual the opportunity to become in some sense, maybe for the first time, the engineer of his or her own perception. The image, as it is also the case with language, enabled humans *to think about thinking*. Once that happens than this basic scaffolding role of the image withdraws and higher (representational) functions for the image can now be introduced.

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