10 What Did They Think?
Cognitive Archaeology, Art, and Religion

Cognitive archaeology – the study of past ways of thought from material remains – is in many respects one of the newer branches of modern archaeology. It is true that ancient art and ancient writing, both rich sources of cognitive information, have long been studied by scholars. But too often art has been perceived to be the province of the art historian, and texts that of the narrative historian, and the archaeological perspective has been missing. Moreover for the prehistoric period, where written sources are entirely absent, earlier generations of archaeologists tended in desperation to create a kind of counterfeit history, "imagining" what ancient people must have thought or believed. It was this undisciplined, speculative approach that helped to spark off the New Archaeology, with its pressure for more scientific methods, as described in Chapter 1. But it also led to a general neglect of cognitive studies among the first wave of New Archaeologists, deterred as they were by the seemingly untestable nature of so many ideas about the cognitive past.

In this chapter, we argue that the skepticism of the early New Archaeologists and the sometimes unstructured empathy of the early postprocessual archaeologists can be answered by the development of explicit procedures for analyzing the concepts of early societies and the way people thought. For example, we can investigate how people went about describing and measuring their world: as we shall see, the system of weights used in the Indus Valley civilization can be understood very well today. We can investigate how people planned monuments and cities, since the layout of streets themselves reveals aspects of planning; and in some cases, maps and other specific indications of planning (e.g. models) have been found. We can investigate which material goods people valued most highly, and perhaps viewed as symbols of authority or power. And we can investigate the manner in which people conceived of the supernatural, and how they responded to these conceptions in their cult practice, for example, at the great ceremonial center of Chavín de Huantar in northern Peru (see box, pp. 410–11).

Theory and Method

It is generally agreed today that what most clearly distinguishes the human species from other life forms is our ability to use *symbols*. All intelligent thought and indeed all coherent speech are based on symbols, for words are themselves symbols, where the sound or the written letters stand for and thus represent (or symbolize) an aspect of the real world. Usually, however, meaning is ascribed to a particular symbol in an arbitrary way: there is often nothing to indicate that one specific word or one specific sign should represent a given object in the world rather than another. Take, for instance, the Stars and Stripes. We at once recognize this as the flag representing the United States of America. The design has a history that makes sense, if you know it. But there is nothing in the design itself to indicate which country is represented – or even that this is a flag representing a nation at all. Like many symbols, it is arbitrary.

Moreover, the meaning ascribed to a symbol is specific to a particular cultural tradition. When we look, for example, at a prehistoric Scandinavian rock carving of what appears to us to be a boat, we cannot without further research be certain that it *is* a boat. It might very well perhaps be a sledge in this cold region. But the people who made the carving would have had no

Two people ride in a ship, or is it a sledge? The precise meaning for us of this Bronze Age rock carving from Scandinavia is obscure without additional evidence.

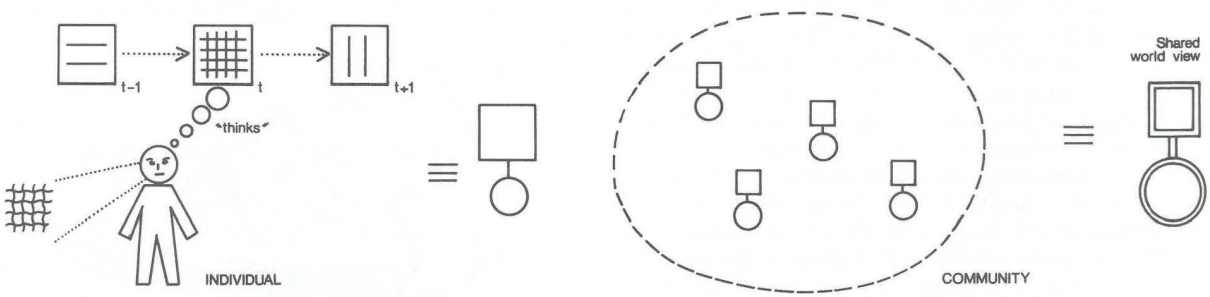
difficulty in interpreting its meaning. Similarly, people speaking different languages use different words to describe the same thing – one object or idea may be expressed symbolically in many different ways. If we were all programmed at birth to ascribe the same meaning to particular symbols, and to speak the same language, the archaeologist's task would be very much easier – but the human experience would be singularly lacking in variety.

It is usually impossible to infer the meaning of a symbol within a given culture from the symbolic form of the image or object alone. At the very least we have to see how that form is used, and see it in the context of other symbols. Cognitive archaeology has therefore to be very careful about specific contexts of discovery: it is the assemblage, the ensemble, that matters, not the individual object in isolation.

Secondly, it is important to accept that depictions and material objects (artifacts) do not directly disclose their meanings to us – certainly not in the absence of written evidence. It is a fundamental of the scientific method that it is the observer, the researcher, who has to offer the interpretation. And the scientist knows that there can be several alternative interpretations, and that these must be evaluated, if necessary against one another, by explicit procedures of assessment or testing against fresh data. This is one of the tenets of processual archaeology, as discussed in Chapter 12. Some processual archaeologists, notably Lewis Binford, argue that it is not useful to consider what people were thinking in the past. They argue that it is the actions not the thoughts of people that find their way primarily into the material record. That, however, is not the position taken here. We start from the assumption that the things we find are, in part, the products of human thoughts and intentions (which the critics of our approach would not deny), and that this offers potentialities as well as problems in their study. They belong, in short, to what the philosopher Karl Popper termed "world 3." As Popper indicated: "If we call the world of things – of physical objects – world 1, and the world of subjective experiences (such as thought processes) world 2, we may call the world of statements in themselves world 3...I regard world 3 as being essentially the products of the human mind." "These...may also be applied to products of human activity, such as houses or tools, and also to works of art. Especially important for us, they apply to what we call 'language', and to what we call 'science'." This insight, however, although a helpful orientation, does not offer us a methodology.

As a first concrete step it is useful to assume that there exists in each human mind a perspective of the world, an interpretive framework, a cognitive map – an idea akin to the mental map that geographers discuss, but one not restricted to the representation of spatial relationships only. For human beings do not act in relation to their sense impressions alone, but to their existing knowledge of the world, through which those impressions are interpreted and given meaning. In the diagram we see the human individual accompanied (in his or her mind) by this personal cognitive map, which allows the recollection of past states in the memory, and indeed the imagining of possible future states in the "mind's eye." Communities of people who live together and share the same culture, and speak the same language often share the same world view or "mind set." To the extent that this is so we can speak of a common cognitive map, although individuals differ, as do special interest groups. This approach is sometimes referred to by philosophers of science as "methodological individualism."

This idea of a cognitive map is a useful one precisely because we can in practice use some of the relevant



Cognitive maps. (Left) The human individual is accompanied by his or her personal cognitive map (represented by a square). The individual responds both to immediately perceived sense impressions and to this internalized map, which includes a memory of the world in the past (t–1) and forecasts of the world in the future (t + 1). (Right) Individuals who live together in a community share in some sense the same world view. To this extent one can speak of a cognitive map for the whole group.

artifacts from Popper's world 3 to give us insights into the shared cognitive map of a given group. We can hope to gain insight into the way the group used symbols, and sometimes (e.g. in depictions of scenes) the relationships between the individuals making up the group. All of this may sound rather abstract. In the rest of this chapter, however, we discuss specific ways in which we can start putting together this shared cognitive map of a given place and time and social group.

INVESTIGATING HOW HUMAN SYMBOLIZING FACULTIES EVOLVED

We often tend to speak of the human species as if all humans are essentially alike in behavior and cognitive ability. This seems to be true for all living groups of *Homo sapiens sapiens*, if one allows for the fact that within every group there is some variation. In other words, there is no convincing evidence for systematic and significant ability differences between living human "races," however they are defined. So when did these abilities of fully modern humans emerge?

Language and Self-Consciousness

Most physical anthropologists agree, as indicated in Chapter 11, that modern human abilities have been present since the emergence of *Homo sapiens sapiens* some 100,000–40,000 years ago. But as we look earlier, scholars are less united. As the neurophysiologist John Eccles put it: "How far back in prehistory can we recognize the beginning, the origin, the most primitive world 3 existence? As I look at the prehistory of mankind, I would say that we have it in tool culture. The first primitive hominids who were shaping pebble tools for a purpose had some idea of design, some idea of technique." To which Karl Popper replied: "While I agree with what you say, I nevertheless prefer to regard the beginning of world 3 as having come with the development of ***language***, rather than ***tools***." Some archaeologists and physical anthropologists consider that an effective language may have been developed by *Homo habilis* around 2 million years ago, along with the first chopper tools, but others think that a full language capability developed very much more recently, with the emergence of *Homo sapiens sapiens*. This would imply that the tools made by hominids in the Lower and Middle Paleolithic periods were produced by beings without true linguistic capacities.

As yet there is no clear methodology for determining when language arose (for physical aspects, see Chapter 11). The psychologist Merlin Donald has suggested a series of cognitive evolutionary stages, with a ***mimetic*** stage for *Homo erectus* (with emphasis upon hominid abilities to imitate behavior), a ***mythic*** stage for early *Homo sapiens* (emphasizing the significance of speech and narrative), and a ***theoretic*** stage for more developed societies, with emphasis upon theoretic thought and what Donald terms "external symbolic storage," involving a number of mnemonic mechanisms including writing. This is an important and interesting field, as yet little developed.

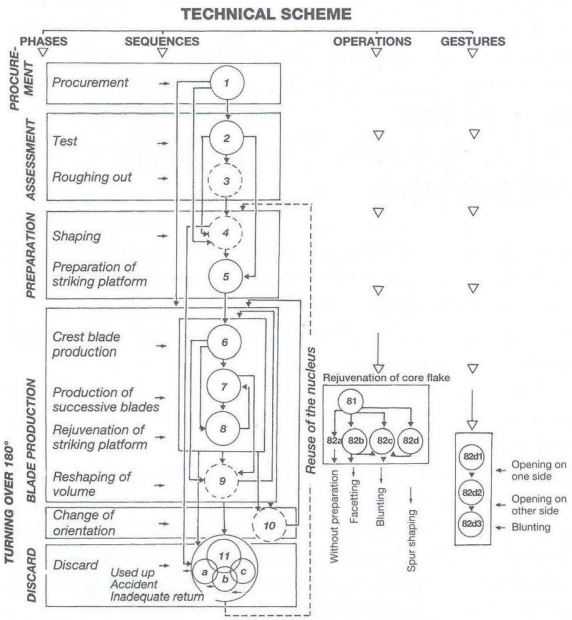
The origins of self-consciousness have been debated by scientists and philosophers such as Roger Penrose and Daniel Dennett, but with little tangible conclusion. John Searle has argued that there is no sudden transition, and asserted that his dog Ludwig has a significant degree of self-consciousness. In his book *The Prehistory of the Mind* Steven Mithen draws upon the work of evolutionary psychologists to discuss the issue, but as yet there is little archaeological or neurophysiological evidence adduced to clarify the matter.

There are several lines of approach into other aspects of early human cognitive abilities.

Design in Tool Manufacture

Whereas the production of simple pebble tools – for instance by *Homo habilis* – may perhaps be considered a simple, habitual act, not unlike a chimpanzee breaking off a stick to poke at an ant hill, the fashioning by *Homo erectus* of so beautiful an object as an Acheulian hand-axe seems more advanced.

So far, however, that is just a subjective impression. How do we investigate it further? One way is to measure, by experiment, the amount of time taken in the manufacturing process. A more rigorous quantitative approach, as developed by Glynn Isaac, is to study the range of variation in an assemblage of artifacts. For if the toolmaker has, within his or her cognitive map, some enduring notion of what the end-product should be, one finished tool should be much like another. Isaac distinguished a tendency through time to produce an increasingly well-defined variety or assemblage of tool types. This implies that each person making tools had a notion of different tool forms, no doubt destined for different functions. Planning and design in tool manufacture thus become relevant to our consideration of the cognitive abilities of early hominids, abilities that moreover distinguish them from higher apes such as the chimpanzee.



The chaîne opératoire involved in the production of a Magdalenian flint blade. Many manufacturing processes involved sequences of comparable complexity.

The analytical concept of the *chaîne opératoire* (sequence of actions) has been developed to make more explicit the cognitive implications of the complicated and often highly standardized sequence of events necessary for the production of a stone tool, a pot, a bronze artifact, or any product of a well-defined manufacturing process. For early periods, such as the Paleolithic, this approach offers one of the few insights available of the way cognitive structures underlay complex aspects of human behavior. French prehistorians Claudine Karlin and Michèle Julien analyzed the sequence of events necessary for the production of blades in the Magdalenian period of the French Upper Paleolithic (see diagram above); many other production processes can be investigated along similar lines.

Procurement of Materials and Planning Time

Another way of investigating the cognitive behavior of early hominids is to consider planning time, defined as the time between the planning of an act and its execution. For instance, if the raw material used to manufacture a stone tool comes from a specific rock outcrop, but the tool itself is produced some distance away (as documented by waste flakes produced in its manufacture), that would seem to indicate some enduring intention or foresight by the person who transported the raw material. Similarly, the transport of natural or finished objects (so-called "manuports"), whether tools, seashells, or attractive fossils, as has been documented (see Chapter 9), indicates at least a continuing interest in them, or the intention of using them, or a sense of "possession." The study of such manuports, by the techniques of characterization discussed in Chapter 9 and other methods, has now been undertaken in a systematic way.

Organized Behavior: The Living Floor and the Food-sharing Hypothesis

In recent years, as discussed in Chapter 2, a particular focus of research has been the nature of the formation processes by which particular archaeological sites were formed. For the Paleolithic period this is particularly crucial, not only because of the long timespan over which the deposits formed, but also in view of the interpretive care needed in respect of the human behavior. This has proved an area of special controversy at important early hominid sites in Africa and elsewhere – for instance, those at Olduvai Gorge in Tanzania, and Olorgesailie and Koobi Fora in Kenya. Scatters of animal bones, many in fragmentary form, have been found with the stone artifacts at some sites. These sites, dating 2–1.5 million years ago, have been interpreted as activity areas, where the hominids who made the tools (supposedly *Homo habilis*) used them to work on animal carcasses (or parts of them) carried there and to extract marrow from the bones. These have been regarded as occupation sites, or temporary home bases, of small kin groups. Various workers including Glynn Isaac have argued that food-sharing among kin groups was taking place. These ideas have been criticized by Lewis Binford. In his view, these are not occupation sites of early hominids but places where hunting animals killed their prey. The humans used tools to extract marrow only after the animals who killed the game had taken their fill. He opposes the notion that early humans transported meat and marrow bones for processing and storing elsewhere.

Much work is going on at present to test these differing hypotheses. It involves the microscopic examination of the tooth-marks or cut marks on the broken bones (see discussion of taphonomy, Chapter 7), and the detailed analysis of the debris scatters on the supposed "living floors." Binford's argument would imply that no very intelligent behavior is involved, and no impressive social organization. The home-base/food-sharing view, on the other hand, implies a degree of

stability in behavior, including social behavior, with more ambitious cognitive implications.

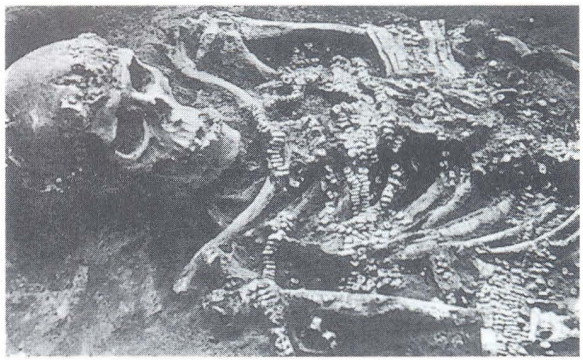
Lithic Assemblages as Functionally or Culturally Determined

When did human groups, inhabiting adjacent areas and exploiting similar resources, first develop behavior and material equipment that was culturally distinctive? This question arises as a major issue when the various Middle Paleolithic stone tool assemblages associated with the Neanderthals (*c.* 180,000–30,000 years ago) are considered: the assemblages generally described as Mousterian. The French archaeologist François Bordes argued in the 1960s that the different artifact assemblages he had identified in southwest France were the material equipment of different groups of people coexisting at that time. These would be an early equivalent of what archaeologists working with later time periods have traditionally termed archaeological "cultures," and equated by some with different ethnic groups. Lewis and Sally Binford, on the other hand, argued that the assemblages represent different toolkits, used for different functional purposes, by what were essentially the same or similar groups of people. They used factor analysis (see box, p. 197) of the lithic assemblages to document their view. Paul Mellars offered a third explanation, maintaining that there is a consistent chronological patterning among the different finds, so that one phase (with its characteristic toolkits) followed another.

The argument has not yet been resolved, but there are many who believe that socially distinct groups, roughly equivalent to what one may term ethnic groups, only made their appearance with fully modern humans in the Upper Paleolithic period, and that the Mousterian finds represent something simpler, perhaps along the lines suggested by Binford or Mellars.

Deliberate Burial of Human Remains

From the Upper Paleolithic period there are many well-established cases of human burial, where the body or bodies have been deliberately laid to rest within a dug grave, sometimes accompanied by ornaments of personal adornment. Evidence is emerging, however, from even earlier periods (see box, overleaf). The act of burial itself implies some kind of respect or feeling for the deceased individual, and perhaps some notion of an afterlife (although that point is less easy to demonstrate). The adornment seems to imply the existence of the idea that objects of decoration can enhance the individual's appearance, whether in terms of beauty or prestige or whatever. A good Upper Paleolithic example is the discovery made at Sungir, some 200 km (125 miles) northeast of Moscow and dating from *c.* 23,000 years ago: burials of a man and two children together with mammoth ivory spears, stone tools, ivory daggers, small animal carvings, and thousands of ivory beads.



Deliberate burial of the dead: an elderly man buried at Sungir, near Moscow, c. 23,000 years ago, with thousands of ivory beads across his chest and a cap sewn with fox canines.

In assessing such finds, one must be sure to understand the formation processes – in particular what may have happened to the burial after it was made. For example, animal skeletons have been discovered alongside human remains in graves. Traditionally this would have been taken as proof that animals were deliberately buried with the humans as part of some ritual act. Now, however, it is thought possible that in certain cases animals scavenging for food found their way into these burials and died accidentally – thus leaving false clues to mislead archaeologists.

Representations

Any object, and any drawing or painting on a surface that can be unhesitatingly recognized as a depiction – that is, a representation of an object in the real world (and not simply a mechanical reproduction of one, as a fossil is) – is a symbol. General questions about representations and depictions for all time periods are discussed in a later section. For the Paleolithic period, there are two issues of prime importance: evaluating the date (and hence in some cases the authenticity), and confirming the status as a depiction. Although it has long been believed that the earliest depictions are of Upper Paleolithic date and produced by *Homo sapiens sapiens*, increasing numbers of earlier examples are forcing us to re-examine this supposition (see box overleaf). The examples given in the box (pp. 392–93)

INDICATIONS OF EARLY THOUGHT

The problem of establishing whether a burial is deliberate or not – and therefore whether it is associated with the idea of respect for the dead – becomes particularly acute when one moves back in time to consider the Neanderthals of the Middle Paleolithic period. On current evidence, the practice of deliberate burial began at this time. The best evidence for the burial of decorative items with the dead comes only from the Upper Paleolithic and later periods, although it has been claimed that a famous Neanderthal burial at Shanidar Cave in Iraq was accompanied by pollen indicating an offering of flowers.

However, there are indications of even earlier rudimentary funerary practices. The Spanish site of Atapuerca, 14 km (8.6 miles) east of Burgos, has revolutionized our knowledge of archaic *Homo sapiens* – a form transitional between *Homo erectus* and Neanderthals in the Middle Pleistocene. Excavation of a limestone cave known as the Sima de los Huesos (Pit of the Bones). Excavation by a team of specialists from Madrid and Tarragona has been going on since 1976.

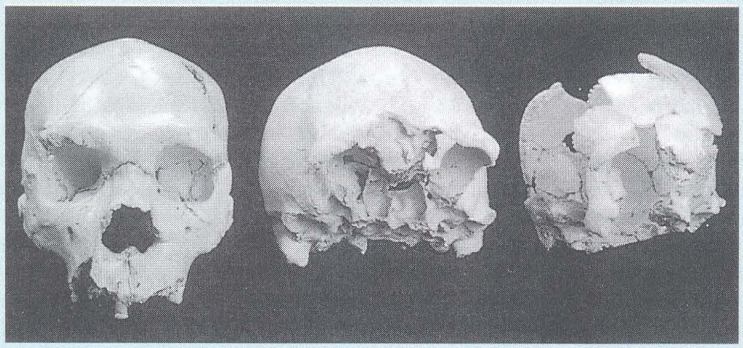
The site is located at the bottom of a 12-m (39-ft) deep shaft. The bones of over 250 cave bears, which probably died during hibernation, were found in its upper deposits; the lower layers, dated to more than 200,000 years ago, have so far yielded over 2500 human bones from at least 32 individuals (based on teeth), and possibly as many as 50 (thus constituting about 90 percent of all pre-Neanderthal bones known from Europe). The bones are mixed up, with no anatomical connections, but all parts of the body are present. Most are adolescents and young adults of both sexes – in fact *c.*40 percent died between the ages of 17 and 21. Since less than a quarter lived beyond their early 20s, they cannot be representative of a full population, and it is likely the older people were disposed of elsewhere.

Juan-Luis Arsuaga, one of the excavation's directors, believes that the bodies may have been deposited in the shaft, over several generations at least, in a form of mortuary ritual which may point to some embryonic religious belief. The lack of herbivore (food animal) bones and stone tools with them implies that they were not accumulated in the shaft by carnivores and that the cave itself was not an occupation site.

Similarly, sporadic finds are being made which suggest that "art" (or at least non-utilitarian markings) did not start with modern humans, as has traditionally been thought, but stretch back as far as *Homo erectus*. For example, a remarkable "figurine" was found by Israeli archaeologists in 1981 at Berekhat Ram on the Golan Heights. Dating to at least 230,000 years ago (the late Acheulian), it is a pebble of volcanic tuff, just over 2.5 cm (1 in) long, whose natural shape is approximately female. Microscopic analysis of the object by the American researcher Alexander Marshack has shown that the groove around the "neck" is definitely humanly made, no doubt with a flint tool, and lighter grooves delineating the "arms" may also be artificial. In other words, the site's occupants not only noticed the pebble's natural resemblance to a human figure, but deliberately accentuated that resemblance with a stone tool. The Berekhat Ram pebble is therefore undeniably an "art object."

Possible evidence for some kind of early ceremony has been found at the Lower Paleolithic Kamitakomuri site in Japan, where three storage pits contained bifaces and other tools; this seems to be evidence of advance planning by *Homo erectus*, while the careful centripetal arrangement of tools in one pit may point to some kind of ritual.

***Bifaces** at the Lower Paleolithic site of Kamitakomuri in Japan, carefully arranged by* Homo erectus *and possible evidence of a very early ceremonial act.*



***Three skulls** from the Sima de los Huesos, or Pit of the Bones, Atapuerca in Spain. This site is producing some of the earliest evidence for deliberate human burial.*

indicate some of the important conclusions that are emerging from the application of new research methods to studies of Paleolithic art.

The analysis at the detailed level should not obscure the enormous cognitive significance of the act of depiction itself, in all the vividness seen in the art of Chauvet or Lascaux in France, or Altamira in Spain. To admire this art is one thing; but to develop frameworks of inference that allow us to analyze carefully the cognitive processes involved is much more difficult. This analytic work is as yet in its infancy. Archaeologists have nevertheless made considerable progress in developing techniques and approaches for studying the behavior of our Paleolithic ancestors, and as further advances are made the pattern of early human cognitive development is becoming ever clearer.

WORKING WITH SYMBOLS

In the previous section we looked at ways in which archaeologists can study the emergence of human cognitive abilities. In this and later sections we will be assessing the methods of cognitive archaeology for anatomically fully modern humans. Before going into details, it is worth outlining the scope of cognitive archaeology as it appears to us today, in the very early stage of the development of the discipline.

We are interested in studying ***how symbols were used***. Perhaps to claim to understand their meaning is too ambitious, if that implies the full meaning they had for the original users. Without going into a profound analysis, we can define "meaning" as "the relationship between symbols." As researchers today we can hope to establish some, but by no means all, of the original relationships between the symbols observed.

In the pages that follow we shall consider cognitive archaeology in terms of six different uses to which symbols are put.

1 A very basic step is the ***establishment of place*** by marking and delimiting one's territory and the territory of the community, often with the use of symbolic markers and monuments, thereby constructing a perceived landscape, generally with a sacred as well as a secular dimension, a land of memories.
2 A fundamental cognitive step was the development of symbols of ***measurement*** – as in units of time, length, and weight – which help us organize our relationships with the natural world.
3 Symbols allow us to cope with the future world, as instruments of ***planning***. They help us define our intentions more clearly, by making models for some future intended action, for example plans of towns or cities.
4 Symbols are used to regulate and organize ***relations between human beings***. Money is a good example of this, and with it the whole notion that some material objects carry a higher value than others. Beyond this is a broader category of symbols, such as the badges of rank in an army, that have to do with the exercise of power in a society.
5 Symbols are used to represent and to try to regulate ***human relations with the Other World***, the world of the supernatural or the transcendental – which leads on to the archaeology of religion and cult.
6 Above all, symbols may be used to describe the world through ***depiction*** – through the art of representation, as in sculpture or painting.

No doubt there are other kinds of uses for symbols, but this rather simplistic listing will serve to initiate the discussion of how we should set about analyzing them. Symbols of depiction provide us with perhaps our most direct insight into the cognitive map of an individual or a society for pre-literate periods. Among literate communities, however, written words – those deceptively direct symbols used to describe the world – inevitably dominate the evidence. Ancient literature in all its variety, from poems and plays to political statements and early historical writings, provides rich insights into the cognitive world of the great civilizations. But, to use such evidence accurately and effectively, we need to understand something of the social context of the use of writing in different societies. That is the subject of the next section – after which we return to the categories of symbol outlined above.

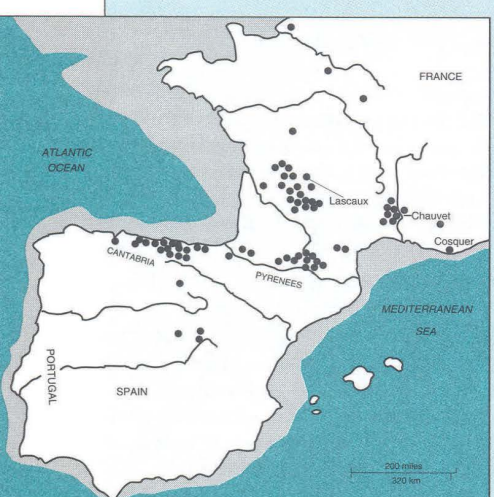
FROM WRITTEN SOURCE TO COGNITIVE MAP

The very existence of writing implies a major extension of the cognitive map. Written symbols have proved the most effective system ever devised by humans not only to describe the world around them, but to communicate with and control people, to organize society as a whole, and to pass on to posterity the accumulated

PALEOLITHIC CAVE ART

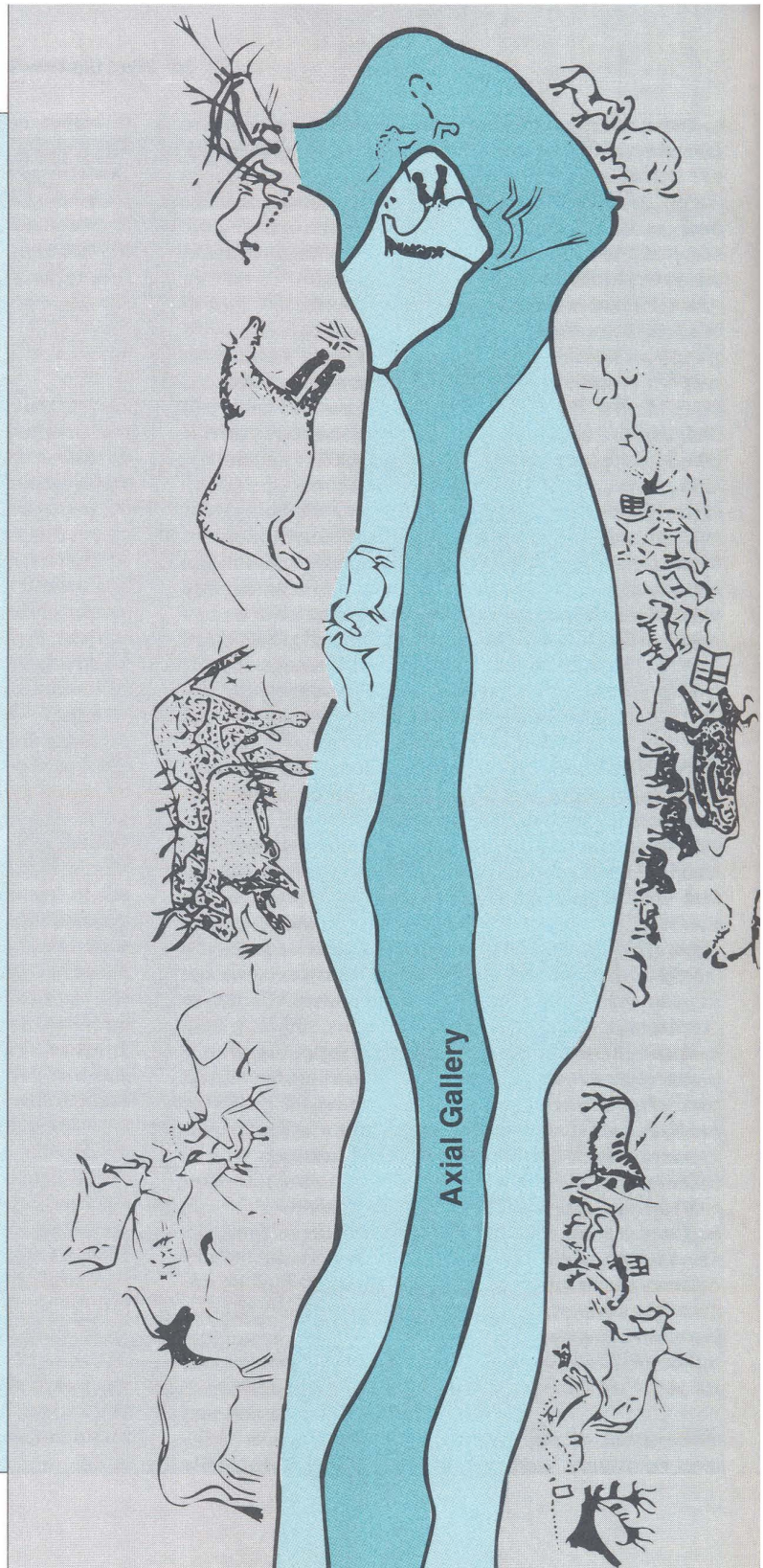
Much has been written about the Ice Age caves of western Europe, decorated with images of animals and with abstract markings. Clustered in specific regions – most notably the Périgord and Pyrenees in southwest France and Cantabria in northern Spain – they span the whole of the Upper Paleolithic, from about 30,000 BC onward. The majority of the art, however, dates to the latter part of the Ice Age, to the Solutrean and especially the Magdalenian period, ending around 10,000 BC.

The cave artists used a great range of techniques, from simple finger tracings and modeling in clay to engravings and bas-relief sculpture, and from hand stencils to paintings using two or three colors. Much of the



***Principal locations** of Paleolithic cave art in western Europe.*

***Position of the** major figures (right) in Lascaux's Axial Gallery: mainly horses, aurochs (wild cattle), deer, ibex, and enigmatic dots and rectangles. About 17,000 years old.*



The spectacular paintings of Chauvet Cave, southern France, discovered in 1994, depict over 440 animals.

art is unintelligible – and therefore classified by scholars as "signs" or abstract marks – but of the figures that can be identified, most are animals. Very few humans and virtually no objects were drawn on cave walls. Figures vary greatly in size, from tiny to over 5 m ($16^1/_2$ ft) in length. Some are easily visible and accessible, while others are carefully hidden in recesses of the caves.

The first systematic approach to the study of cave art ("parietal art") was that of the French archaeologist André Leroi-Gourhan, working in the 1960s. Following the lead of Annette Laming-Emperaire, Leroi-Gourhan argued that the pictures formed compositions. Previously they had been seen as random accumulations of individual images, representing simple "hunting magic" or "fertility magic." Leroi-Gourhan studied the positions and associations of the animal figures in each cave. He established that horse and bison are by far the most commonly depicted animals, accounting for about 60 percent of the total, and that they are concentrated on what seem to be the central panels of caves. Other species (e.g. ibex, mammoth, and deer) are located in more peripheral positions, while less commonly drawn animals (e.g. rhinoceroses, felines, and bears) often cluster in the cave depths. Leroi-Gourhan therefore felt sure he had found the "blueprint" for the way each cave had been decorated.

We now know that this scheme is too generalized. Every cave is different, and some have only one figure whereas others (e.g. Lascaux in southwest France) have hundreds. Nevertheless, Leroi-Gourhan's work established that there is a basic thematic unity – profiles of a limited range of animals – and a clearly intentional layout of figures on the walls. Currently, research is exploring how each cave's decoration was adapted to the shape of its walls, and even to the areas in the cave where the human voice resonates most effectively.

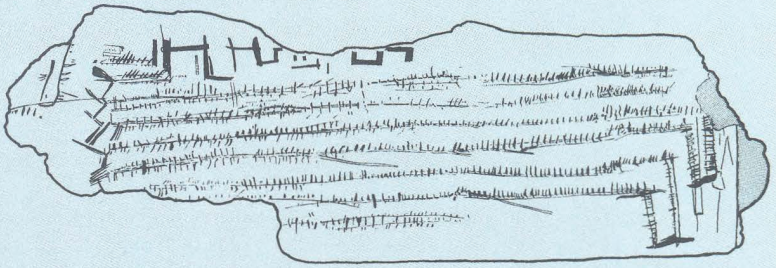
New finds continue to be made – an average of one cave per year, including major discoveries in France, such as Cosquer Cave (1991) near Marseilles, whose Ice Age entrance is now drowned beneath the sea (see p. 73), and the spectacular Chauvet Cave (1994) in the Ardèche, with its unique profusion of depictions of rhinoceroses and big cats.

However, in the 1980s and 1990s a series of discoveries also revealed that "cave art" was produced in the open air. Indeed this was probably the most common form of art production in the Ice Age, but the vast majority of it has succumbed to the weathering of many millennia, leaving us with the heavily skewed sample of figures that survived more readily inside caves. Only six sites are known so far, in Spain, Portugal, and France, but they comprise hundreds of figures, mostly pecked into rocks, which by their style and content are clearly Ice Age in date.

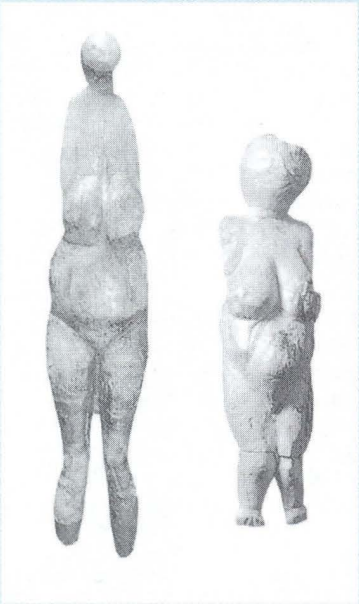
PALEOLITHIC PORTABLE ART

Ice Age portable ("mobiliary") art comprises thousands of engravings and carvings on small objects of stone, bone, antler, and ivory. The great majority of identifiable figures are animals, but perhaps the most famous pieces are the so-called "Venus figurines," such as the limestone Venus of Willendorf, Austria. These depict females of a wide span of ages and types, and are by no means limited to the handful of obese specimens that are often claimed to be characteristic.

Various research methods have been devised by the American scholar Alexander Marshack. By microscopic examination of the engraved markings on some objects, he claims to have distinguished marks made by different tools, and by different hands on different occasions, producing what he terms "time-factored" compositions (made over a period of time rather than as a single operation). However, experiments using replica tools on stone slabs show that a single implement can produce a wide variety of traces. Only now, with the use of the scanning electron microscope, are scholars beginning to produce criteria by which one can reliably recognize marks made by the same tool (which leaves telltale tiny striations next to the purposely made lines).



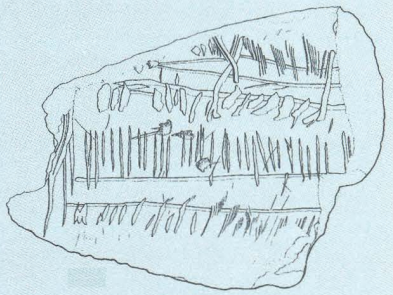
***A plaque** from Taï, France, with a continuous serpentine accumulation of marks.*



***Two "Venus" figurines** found in Russia. (Left) Lanky Venus, from Avdeevo. (Right) Kostenki ivory Venus.*

Marks on Ice Age objects are sometimes incised in groups or lines. Marshack has long argued that some of these markings, such as a winding series of 69 on an early Upper Paleolithic bone from Abri Blanchard, France, are non-arithmetic "notations," used perhaps in observing the phases of the moon and also other astronomical events. The phases of the moon would certainly have been the principal way Paleolithic people could measure the passage of time.

Marshack has also interpreted a highly complex and cumulative set of more than 1000 short incisions on an Upper Paleolithic bone from the Grotte du Taï in eastern France as a notation, possibly a lunar calendar. Although this view is certainly far more plausible than that of simple decoration, some have remained skeptical of Marshack's claims for notation in the Paleolithic. However, Italian researcher Francesco d'Errico's analysis of some parallel lines on a late Upper Paleolithic bone from Tossal de la Roca, Spain, has brought strong support for Marshack's view. D'Errico made incisions on bone with different techniques and tools, and produced firm criteria for recognizing how such marks are produced, and whether with one or several tools. He and his Spanish colleague Carmen Cacho then applied these criteria to the Tossal bone, which has four series of parallel lines on each face, and concluded that each set of incisions was made by a different tool, and there were changes in the technique and direction of tool-use between sets, implying that these markings were accumulated over time and may well be a system of notation.



***One side of** the Tossal de la Roca bone, from Spain, possibly with a system of notation.*

knowledge of a society. Sometimes it is possible to discern the beginnings of this evolved cognitive map in the form of sign systems that do not yet constitute a fully developed writing system – such as the signs found on pottery of the Vinča culture in southeast Europe before 4000 BC. The rongo-rongo script of Easter Island, which survives as markings on 25 pieces of wood, defied analysis until recently when a key to its structure was discovered which suggests that most of the inscriptions are cosmogonies (creation chants).

Societies with Restricted Literacy

Even where a proper writing system has developed, literacy is never shared by all members of a community, and it may be used for very restricted purposes. In Mesopotamia and Mesoamerica, literacy seems to have been restricted to the scribes and perhaps a few of the elite minority. Mesopotamian writing was discussed in Chapter 5.

In Mesoamerica inscriptions appear mainly on stone panels, lintels, stairways, and stelae, all largely intended as public commemorative monuments (see box, pp. 406–07). In addition, there is the store of Maya knowledge preserved in the codices, but only four of these survive. Inscriptions are found on other objects, such as pottery and jades, but these are all elite items and not evidence for any general spread of literacy among the Maya.

Conceptualizing Warfare. In their study of the Maya center at Caracol in Belize, Diane and Arlen Chase have drawn attention to the existence of four major warfare-related hieroglyphs which, they argue, refer to different kinds of warfare events. There are (1) "capture events," perhaps the capture of individuals for sacrifice; (2) "destruction events," involving the accomplishment of specific objectives; (3) "axe events," which have been interpreted as important battles; and (4) "shell-star" or "star war events" in consequence of which one polity may interrupt succession and exert dominion over another, or break free in a war of independence. An example is offered by the epigraphic record of Caracol in the Late Classic era. Beginning the first episode of widespread war at Caracol is an "axe event," probably a battle initiated by Tikal against Caracol in AD 556. Then in AD 562 came a full-blown "star war" against Tikal. It is followed by the marked absence of hieroglyphic history from Tikal for over 120 years and presumably by the subjugation of Tikal. Apart from its interesting insights into Maya political history, this study illustrates how the increasing understanding of Maya glyphs is allowing us to glimpse the manner in which the Maya viewed their own history, and how they distinguished between different categories of warfare perhaps more clearly than we do today.

Maya glyphs identified as referring to warfare (left to right): chuc'ah, *"capture";* ch'ak, *"decapitation", or* batcaba *or* batelba, *"to wield an axe" or "to do battle";* hubi, *"destruction"; and "star-war."*

Widespread Literacy of Classical Greece

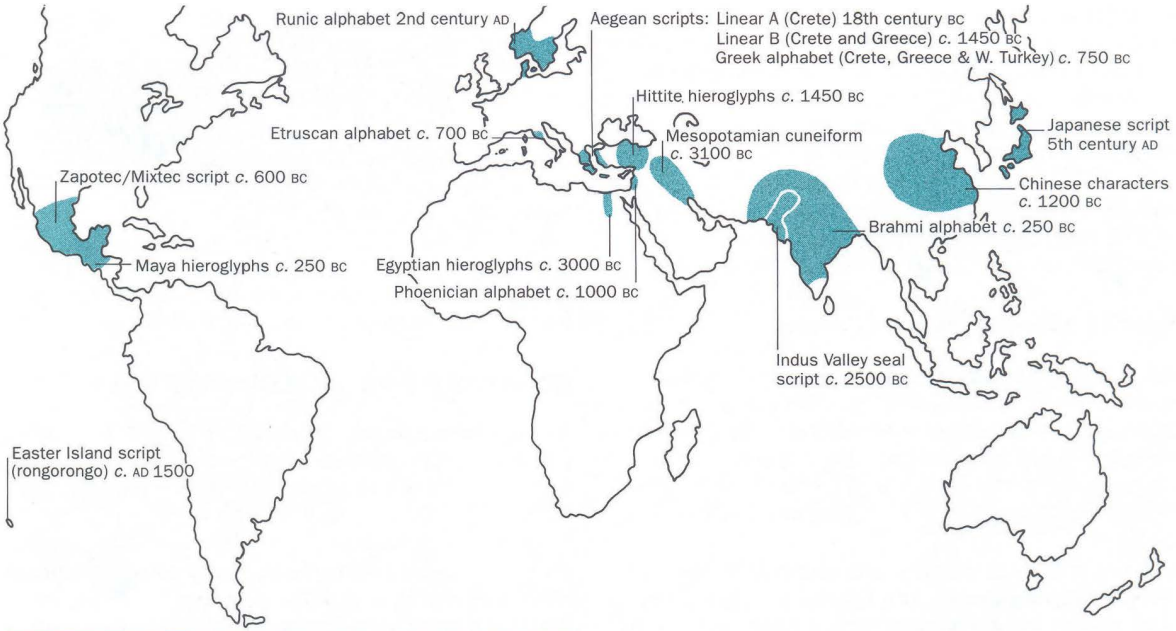
Against these examples of restricted literacy may be set those cases where literacy was widespread, as in Classical Greece. For extended texts, whether works of literature or accounts, the Greeks wrote on papyrus. Examples of such texts have been found at Pompeii (box, pp. 22–23) and in the very dry conditions of the Faiyum depression in Egypt. For public inscriptions, the Greeks used stone or bronze, although notices that were not of permanent interest were put on display on whitened boards (the simple alphabetic script of the Greeks favored such relatively casual use).

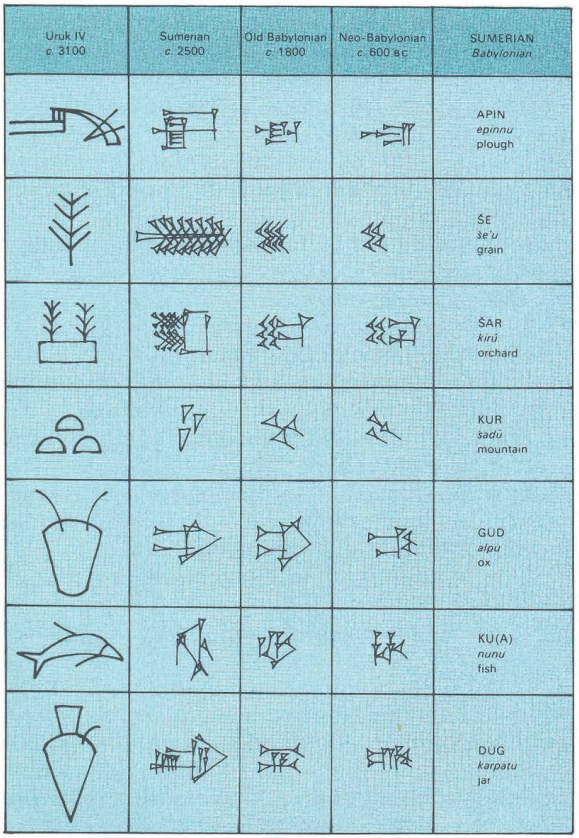
Among the functions of Greek inscriptions carved on stone or bronze were:

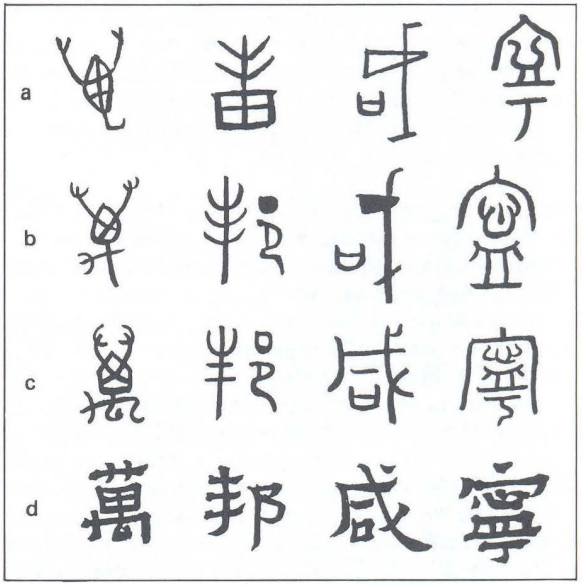
- Public decree by the ruling body (council or assembly)
- Award of honors by the ruling body to an individual or group
- Treaty between states
- Letters from a monarch to a city
- List of taxes imposed on tributary states
- Inventories of property and dedications belonging to a deity
- Rules for divination (understanding omens), e.g. from the flight of birds
- Building accounts, records of specifications, contracts, and payments
- Public notices: e.g. list for military service
- Boundary stones and mortgage stones
- Epitaph
- Curse laid on whoever might disturb a particular tomb.

It is clear from this list what an important role writing had within the democratic government of the Greek states.

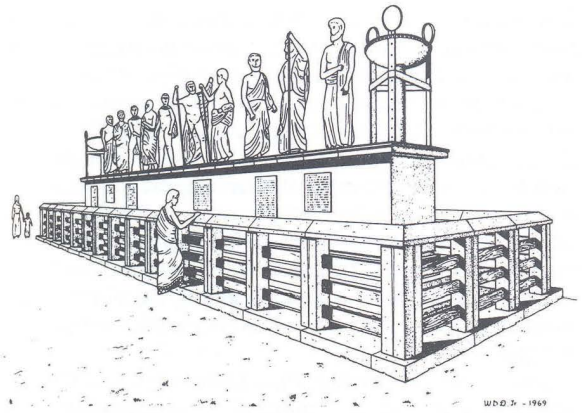
A better index of literacy and of the role of writing in Greek daily life is given by the various objects bearing

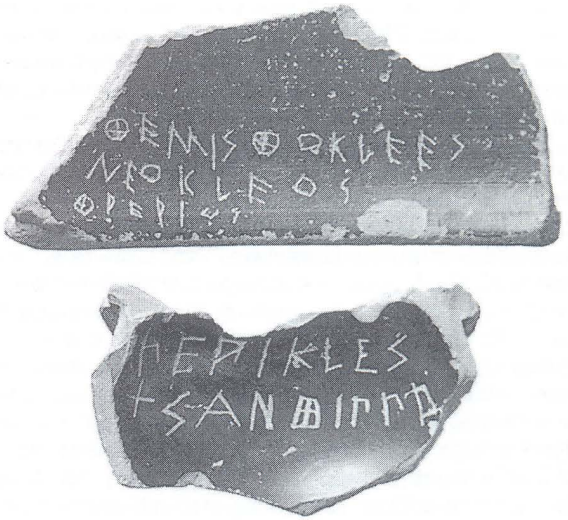






Writing and literacy. (Top) Map to show locations of the world's earliest writing systems. (Left) Evolution of the cuneiform script in Mesopotamia. (Above) Evolution of the Chinese script, using a sentence of classical Chinese composed of four characters "wan pang hsien ming" ("the multitudinous nations have laid down their arms"). First line, oracle bone script; second line, large seal of the Shang dynasty; third line, small seal of the Ch'in dynasty; fourth line, clerical writing of the Han dynasty.





Greek literacy. (Above) In the Agora (marketplace) of Classical Athens, notices were displayed on this public monument. (Right) Potsherds (ostraka) inscribed with two famous Greek names: above, Themistokles; below, Perikles.

inscriptions, and by comments scrawled on walls (graffiti). One type of object, the *ostrakon*, was a voting ticket in the form of a fragment of pottery with the name of the individual – for (or against) whom the vote was being cast – incised on it. Many have been found in Athens where (by the system of "ostracism") public men could, by a vote of the assembly, be driven into exile.

Other Greek uses of writing on a variety of objects were:

- On coins, to show the issuing authority (city)
- To label individuals shown in scenes on wall paintings and painted vases
- To label prizes awarded in competitions
- To label dedications made to a deity
- To indicate the price of goods
- To give the signature of the artist or craftsperson
- To indicate jury membership (on a jury ticket)

Many of these simple inscriptions are very evocative. The British Museum has a black-figure drinking cup of *c.* 530 BC, made in Athens and imported to Taranto, Italy, bearing the inscription: "I am Melousa's prize: she won the maiden's carding contest."

It can be seen from this brief summary that writing touched nearly all aspects of Classical Greek life, private as well as public. The cognitive archaeology of ancient Greece thus inevitably draws to a great extent on the insights provided by such literary evidence – as will become apparent, for example, in our discussion of procedures for identifying supernatural beings in art and individual artists. But we should not imagine that cognitive archaeology is thus *necessarily* dependent on literary sources to generate or test its theories.

Textual evidence is indeed of paramount importance in helping us understand ways of thought among literate societies but, as we saw above for the Paleolithic period and shall shortly see below, there are in addition purely archaeological sources that may be used to create cognitive hypotheses, and purely archaeological criteria to judge their validity. Moreover, as we saw in Chapter 5, literary sources may themselves be biased in ways which need to be fully assessed before any attempt can be made to marry such sources with evidence from the archaeological record.

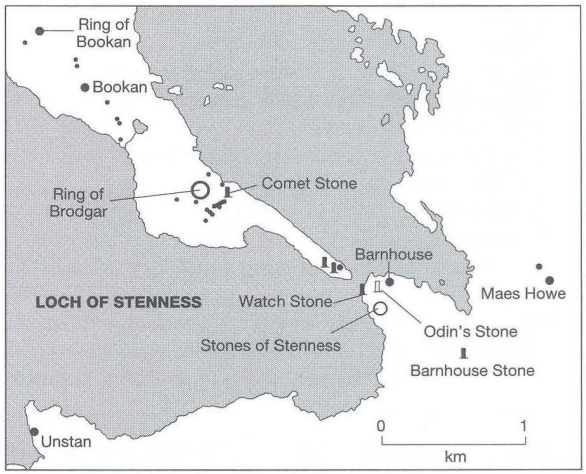
ESTABLISHING PLACE: THE LOCATION OF MEMORY

One of the fundamental aspects of the cognitive map of the individual is the establishment of place, often through the establishment of a center, which in a permanent settlement is likely to be the hearth of one's home, the *domus* to use the term employed by Ian Hodder. For a community another significant place is likely to be the burial place of the ancestral dead, whether within the house or at some collective tomb or shrine. For a larger community, whether sedentary or mobile, there may be some communal meeting place, a sacred center for periodic gatherings. These are matters of deep significance: as Mircea Éliade has

said: "To live in a world one has to establish it.... To install oneself within a territory is equivalent to the foundation of a world." (Éliade 1965, 22) That sacred central place will be the *axis mundi*, the central axis of the world and probably of the cosmos.

These various features, some of them deliberate symbolic constructions, others more functional works which nonetheless are seen to have meaning – the home, the tilled agricultural land, the pasture – together constitute a constructed landscape in which the individual lives. As interpretive archaeologists working in the postprocessual tradition have pointed out, this landscape structures the experience and the world view of that individual. These observations can apply with as much force to small-scale societies as to state societies. As Paul Wheatley pointed out in *The Pivot of the Four Quarters*, many great cities from China to Cambodia and from Sri Lanka to the Maya Lowlands and Peru (see box pp. 410–11) are laid out on cosmological principles, allowing the ruler to ensure harmony between his subjects and the prevailing sacred and supernatural forces. But the sacred center can be important in smaller acephalous societies also, and many of those which appear to have had a corporate structure rather than a powerful central leader, were capable of major public works – the temples of Malta and the megalithic centers of Carnac and of Orkney are good examples, as well as Stonehenge (see box pp. 198–99) and Chaco Canyon (see below and pp. 264–65). Such monuments can also be used to structure time (see Newgrange p. 403) and can operate to facilitate access to the other, sacred world (see below). But these things operate also at a local level, not only at great centers. So the entire countryside becomes a complex of constructed landscapes, with meaning as well as utility – an image well, if poetically, evoked in the case of the Aborigines of Australia by Bruce Chatwin in his book *The Songlines*. The landscape is composed of places bringing memories, and the history of the community is told with reference to its significant places.

Landscape archaeology thus has a cognitive dimension, which takes it far beyond the preoccupation with productive land-use characteristic of a purely materialist approach: the landscape has social and spiritual meaning as well as utility. Building upon earlier traditions of landscape archaeology, these ideas have been well developed in Britain by postprocessual archaeologists of what one may term the "Neo-Wessex school" (Wessex being the area of southern England in which many monuments of the early farming period are situated). Using a variety of approaches, including the phenomenology of Heidegger and the structuration theory of Giddens, they have reconsidered the archaeological approach to the landscape and to the monuments within it, frequently indeed using the



The ceremonial center of Orkney, a ritual landscape in which individuals lived and which in turn shaped their experience and world view. The Ring of Brodgar (left) was one element of a complex and rich sacred landscape (above) which demonstrates that not only large, organized state societies were capable of creating major public works.

monuments of Wessex as their prime example, and this literature (see Bibliography) constitutes the most extensive body of work developed by the postprocessual or interpretive archaeologies of the 1990s (see also The Archaeology of the Individual and of Identity, Chapter 5, p. 215). The landscape and its monuments are seen not simply as reflecting the social structures of society but, by bringing into being new perceptions about the human place in the world, as facilitating the emergence of a new social order. Comparable approaches have been employed in the Classical world: the ancient Greeks sited their earliest temples in ways which structured as well as followed the emergence of the Greek city state.

Even the desert can become a constructed landscape, as the roads around Chaco Canyon in the American Southwest document. Indeed it is very appropriate to see Chaco Canyon (see also pp. 264–65) as a ritual center in what was primarily a symbolic landscape. It has been shown, for example, that the important site of Aztec Ruin lies some 112 km (70 miles) due north, although its heyday came after the decline of Chaco in the 12th century AD. The important site of Casas Grandes, also dating from after the decline of Chaco, lies due south. The Great North Road goes some distance due north from Chaco, although it may not reach as far as Aztec Ruin, and the "roads" (see p. 84), many of which have been rediscovered by aerial photography, are hardly likely to have been constructed for utilitarian purposes: they are processional or ritual ways. Studies have shown that some of the Great Houses at Chaco were aligned to the "standstill" points of the sun and moon. The great circular rooms or *kivas* within them were clearly intended for ceremonial purposes and at Chetro Ketl an impressive range of painted wooden artifacts hints at the decorative and ritual paraphernalia which may have been used, suggesting analogies with the use of the *kivas* in the Pueblo villages of the Southwest which continues to the present.

The lines and figures in the Nazca desert of southern Peru also give us an extraordinary glimpse into the cognitive maps of a vanished people. The archaeological field surveys and the aerial photography of today are directed as much to reinterpreting the experience of the ancient landscape as to reconstructing its practical use.

MEASURING THE WORLD

One aspect of the cognitive map we can readily reconstruct is the way in which it copes with measurement or quantitative description. The development of units was a fundamental cognitive step. In many cases, they can be recovered archaeologically, especially in the case of units of time, length, and weight.

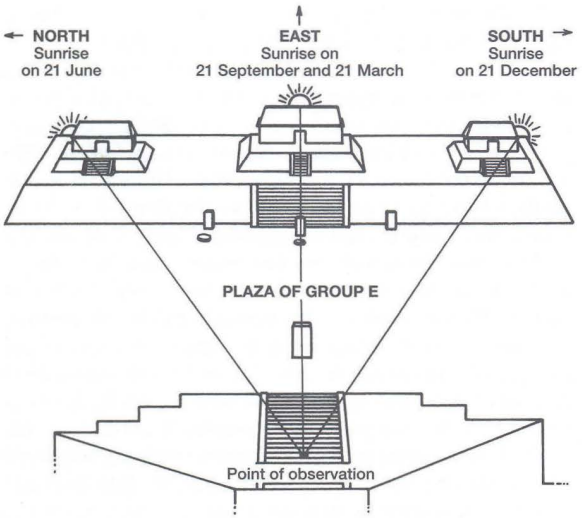
Units of Time

The possibility that time-reckoning developed in the Upper Paleolithic was mentioned in the box on Paleolithic art above. To judge claims for time-reckoning at any period, it is necessary to show either a system of notation with a patterning closely related to that of the movements of heavenly bodies, or clear evidence of astronomical observation. The former is splendidly documented by the calendars of the Mesoamerican civilizations, in the inscriptions on their stelae, and in their codices (see box on the Maya calendar pp. 130–31).

Claims have been made that buildings and monuments in many places were aligned on significant astronomical events such as the rising of the midsummer sun. This was investigated quantitatively by Alexander Thom for the British megalithic circles. Although some of the details of Thom's claims for individual stone circles have been challenged, the cumulative picture argues plausibly for a preoccupation with such calendrical events. In the Americas, the work of the archaeoastronomer Anthony Aveni has done much to demonstrate that the Mesoamerican and Andean civilizations determined the orientation of many of their major buildings in accordance with astronomical alignments. He has shown, for example, that the east–west alignment of the great Teotihuacán street plan (see box, pp. 90–91) is oriented on the heliacal rising of the Pleiades (when these stars first become visible before sunrise), important in Mesoamerican cosmology. The Maya site of Uaxactún provides another example (illus. p. 400), where the arrangement of a suite of three buildings on the east side of the plaza marks the positions of sunrise (as viewed from the west side of the plaza) at midsummer (north), midwinter (south), and the two equinoxes (center) (equinoxes being the midway points of spring and fall).

Units of Length

There are statistical methods for assessing claims that a standard unit of length was used in a particular series of buildings or monuments. The statistical test based on what is known as "Broadbent's criterion" allows



Measuring time: at the Maya site of Uaxactún, Mexico, buildings were positioned so that the rising sun at midsummer, midwinter, and two equinoxes could be recorded.

such a standard to be sought from the data without knowing or guessing in advance what the unit is. It also gives a measure of the probability that a unit of length discovered in this way is not just a product of chance, without any real existence.

"Broadbent's criterion" has been used to assess the claim by Alexander Thom that a "megalithic yard" was used in the construction of the Neolithic stone circles of the British Isles (see box opposite). Comparable claims have been made for units of measure in the construction of the Minoan palaces, for the Maya, and indeed in many early civilizations. In Egypt, measuring rods have actually been found.

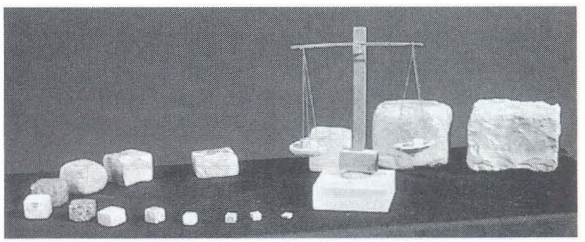
Units of Weight

The existence of measurements of weight can be demonstrated by the discovery of objects of standard form that prove to be multiples of a recurrent quantity (by weight), which we can assume to be a standard unit. Such finds are made in many early civilizations. Sometimes the observations are reinforced by the discovery of markings on the objects themselves, that accurately record how many times the standard the piece in question weighs. Systems of coinage are invariably graded using measurement by weight, as well as by material (gold, silver etc.), although their purpose is to measure differences in value, discussed in a later section. More directly pertinent here are discoveries of actual weights.

An excellent example comes from the site of Mohenjodaro, a major city of the Indus Valley civilization around 2000 BC. Attractive and carefully worked cubes of colored stone were found there. They proved to be multiples of what we may recognize as a constant unit of mass (namely 0.836 g, or 0.03 oz), multiplied by integers such as 1 or 4 or 8 up to 64, then 320 and 1600. One can argue that this simple discovery indicates:

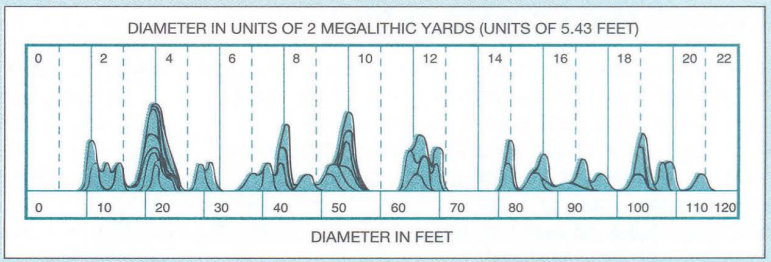
1 that the society in question had developed a concept equivalent to our own notion of weight or mass;
2 that the use of this concept involved the operation of units, and hence the concept of modular measure;
3 that there was a system of numeration, involving hierarchical numerical categories (e.g. tens and units), in this case apparently based on the fixed ratio of 16:1;
4 that the weight system was used for practical purposes (as the finding of scale pans indicates), constituting a measuring device for mapping the world quantitatively as well as qualitatively;
5 that there probably existed a notion of equivalence, on the basis of weight among different materials (unless we postulate the weighing of objects of one material against others of the same material), and hence, it may follow, a ratio of value between them;
6 that this inferred concept of value may have entailed some form of constant rate of exchange between commodities. (This notion of value is further explored in a later section, see below, pp. 404–05)

Items 5 and 6 are more hypothetical than the others. But it seems a good example of the way that superficially simple discoveries can, when subjected to analysis, yield important information about the concepts and procedures of the communities in question.



Units of weight: stone cubes from Mohenjodaro, Pakistan, were produced in multiples of 0.836 g (0.03 oz). Scale pans indicate the practical use to which the cubes were put.

THE MEGALITHIC YARD



***Histogram** (above) of the diameters of 46 megalithic rings (below, the Swinside Stone Circle, northern England), based on Alexander Thom's diagram of 1955. Each peak represents a diameter, measured in feet on the bottom scale. The higher and narrower the peak, the more accurate in Thom's view was the measurement for that diameter. Note how 8 diameters cluster around c.22 ft, 3 diameters around c.44 ft, 5 diameters around c.55 ft etc., suggesting that a standard unit of measure was being employed by the megalith builders. The top scale gives Thom's "best fit" for the unit for the diameters of 5.43 ft. Thom's megalithic yard was half this, i.e. 2.72 ft, since he thought that it would have been the radius of a circle, not its diameter, that was measured out.*

The use of units of measure can be documented for several early literate civilizations. It is only since World War II, however, that formal statistical methods have been applied that allow us to look at the evidence from pre-literate societies (those without written sources). The first such application was to a supposed prehistoric unit of length, the "megalithic yard."

In 1955, the Scottish-born Professor of Engineering at the University of Oxford, Alexander Thom, published an article entitled "A statistical examination of megalithic sites in Britain." In this article, Thom measured the diameters of 46 circles of standing stones (megalithic rings), monuments which are first seen in Britain around 3000 BC and continued to be erected for about 1000 years (see box, Explaining the European Megaliths, pp. 488–89). Thom then recorded these diameters on a frequency plot.

The results suggested to him that a unit of measure had been utilized, for the peaks of the frequency distribution seemed to fall at integral multiples of a unit for the diameters of about 5.435 ft (*c.* 1.657 m). Thom argued that the radius rather than the diameter would have been used in laying out the circles (the circumference perhaps being marked out by a rope fixed to the center of each circle). He therefore proposed that the standard of length in use at the time, the "megalithic yard," was half the diameter, i.e. about 2.72 ft (*c.* 0.829 m). This is an example of the "quantum hypothesis": that is, that basic units of measure were employed.

Initially, there was no obvious way of assessing this interesting claim. But a paper published by the British statistician, S.R. Broadbent, offered several means of testing whether a given body of data involved the use of a quantum of measure, and these were followed up by another British statistician, D.G. Kendall. These tests show that Thom's 1955 data are significant at about the 1 percent level: that is if we had numerous samples of random data and tried to find the best-fitting unit, it would fit as well as Thom's unit in only 1 sample in about 100.

Thom's work has been criticized, but it is possible that a regular unit of length was used by the megalith builders. If the accuracy of the layout of the circles was a little higher, it might support the view that measuring rods, 1 megalithic yard in length, were in use throughout Britain in the 3rd millennium BC. But the alternative suggestion has been put forward that the regularity is no more precise than would be expected from the use of a human dimension such as the pace in the layout of the circles.

The outcome of this discussion is not yet certain. What is clear is that statistical methods now exist to allow evaluation of such hypotheses. In cases where the result is shown to be significant at a very fine level, such as 0.1 percent, we may be confident that a regular unit of measure was used, provided always that the data have been fairly sampled, and that appropriate statistical tests have been applied.

PLANNING: MAPS FOR THE FUTURE

The cognitive map that each one of us carries in the "mind's eye" allows us to conceive of what we are trying to do, to formulate a plan, before we do it. Only rarely does the archaeologist find direct material evidence as to how the planning was carried out. But sometimes the product is so complex or so sophisticated that a plan prepared in advance, or a formalized procedure, can be postulated.

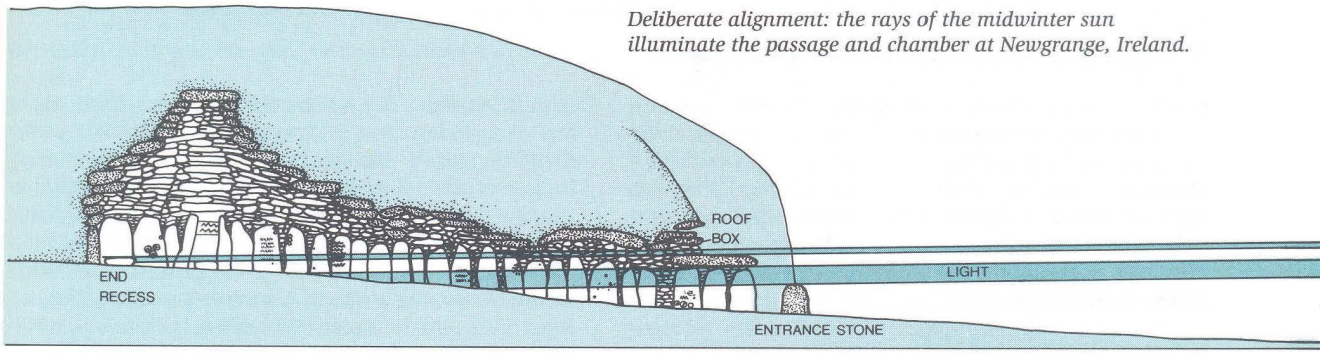
It is, of course, difficult to demonstrate purposive planning, if by that is meant the prior formulation of a conscious plan in the construction of some work. At first sight, a village like Çatalhöyük in Turkey (*c.* 6500 BC), or a sector of an early Sumerian town like Ur (*c.* 2300 BC), suggest prior planning. But when we look at the operation of various natural processes we can see that effects of very high regularity can occur simply by repetition within a well-defined scheme. There is no need to suggest that the polyps in a coral reef, or the worker bees in a beehive, are operating according to a conscious plan: they are simply getting on with the job, according to an innate procedure. The layouts of Çatalhöyük and Ur may be no more sophisticated than that. To demonstrate prior planning it is necessary to have some clear evidence that the scheme of construction was envisaged at the outset. However, such proof is rarely forthcoming. A few actual maps have come down to us from prehistoric or early historic times; but most probably represent depictions or representations of existing features, not the planning of future ones. Just occasionally, however, we find models of buildings that may have been constructed before the building itself. There are five or six models of Neolithic temples on the Mediterranean island of Malta that might represent planning in this way: they certainly show close attention to architectural detail.

The Çatalhöyük village layout (above) may have been no more consciously planned than the cells in a beehive (top).

Such direct projections in symbolic form of the cognitive map of the designer are rare. Sculptor's trial pieces and models, such as have been found in the ancient Egyptian city at Tell el-Amarna, are likewise unusual discoveries.

An alternative strategy is to seek ways of showing that regularities observed in the finished product are such that they could not have come about by accident. That seems to be the case for the passage grave of Newgrange in Ireland, dating from *c.* 3200 BC. At sunrise on midwinter's day the sun shines directly down the passage and into the tomb chamber. There is only a low probability that the alignment would be by chance in the approximate direction of the sun's rising or setting at one of its two major turning points, in terms of azimuth. But it is unlikely also that, in terms of altitude, the passage of such a tomb would be aligned on the horizon at all. In fact, there is a special "roof box" with a slit in it, over the entrance, which seems to have been made to permit the midwinter sun to shine through.

Often, careful planning can be deduced from the methods used in a particular craft process. Any metal objects produced by the lost-wax method (see Chapter 8) undoubtedly represent the result of a complex, controlled, premeditated sequence, where a version of the desired shape was modeled in wax before the clay mold was constructed round it, which then allowed the shape in question to be cast in bronze or gold. Another example is the standardization in many early metal-using communities of the proportions of different metals in objects made of alloyed metal. The constant level of 10 percent tin in the bronze objects of the European Early Bronze Age is not fortuitous: it is evidently the result of carefully controlled procedures that must themselves have been the result of generations of trial and experiment. The use of a unit of length will also document some measure of planning and was discussed in the box on the megalithic yard. Complete regularity in layout, where there is a grid of streets at right angles, evenly spaced, is also a convincing indication of town planning. Traditionally, it is claimed that the Greek architect Hippodamus of Miletus (in the 6th cen-



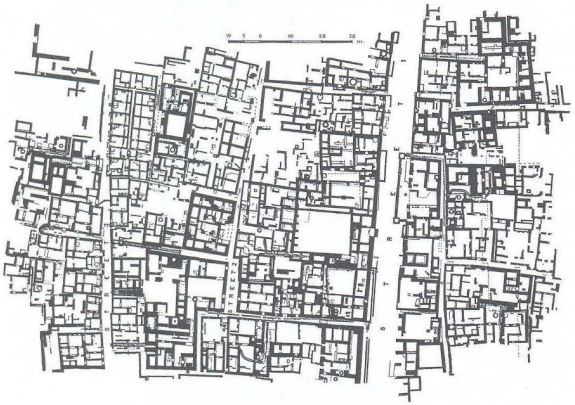
Deliberate alignment: the rays of the midwinter sun illuminate the passage and chamber at Newgrange, Ireland.

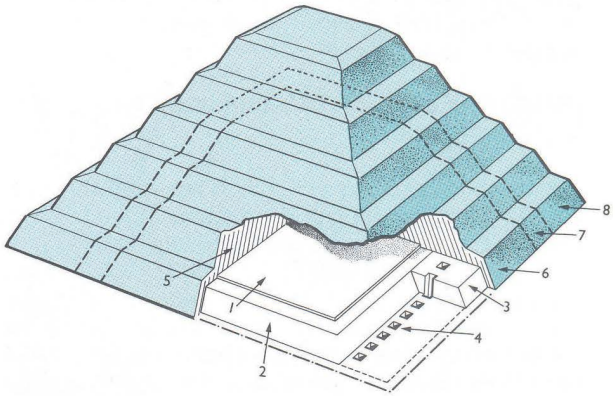
tury BC) was the first town planner. But ancient Egypt furnishes much earlier examples – for instance, in the workmen's village at Tell el-Amarna, which dates from the 15th century BC. And the cities of the Indus Valley civilization around 2000 BC show some very regular features. They are not laid out on an entirely rectilinear grid, but the main thoroughfares certainly intersect approximately at right angles. How much of this was deliberate prior planning, and how much was simply unplanned urban growth are questions that have not yet been systematically investigated.

A stronger case for deliberate town planning can be made when the major axis of a city is aligned on an astronomically significant feature, as discussed in the previous section on Measuring the World and the great Mesoamerican and Andean centers. The geographer Paul Wheatley, in his influential book *The Pivot of the Four Quarters* (1971), has emphasized how the desire to harmonize the urban order with the cosmic order influenced town planning. This seems to be true not just for American civilizations but for Indian, Chinese, and Southeast Asian ones as well. The argument is reinforced when the urban order is supplemented by a rich cosmic iconography, as in such cities as Angkor, capital of the Khmer empire, in modern Cambodia.

So far, no archaeologist has sat down to work out in detail the minimum number of procedural steps that must have been planned in advance in undertaking major building works. Of course, like the master craftsmen responsible for many medieval cathedrals, the builders may have relied also on skill and judgment exercised simply as decisions arose, rather than on elaborate forward planning.

There are also some examples of designs being altered during construction. The great Step Pyramid of King Djoser at Saqqara, the first of the major Egyptian pyramids, was clearly the product of several changes or developments of plan by its legendary creator, Imhotep. (His name is found in written texts, but our knowledge of the stages of construction is derived from the study of the monument itself.)





(Above) The regularity in layout of the Indus Valley city of Mohenjodaro – with main streets approximately at right angles – hints at conscious town planning. An example of a change in plan: the Step Pyramid, Saqqara (right): (1–3) pre-pyramid building stages; (4) shafts to subsidiary tombs; (5) buttress walls; (6) pyramid with four steps; (7–8) pyramid enlarged to six steps.

SYMBOLS OF ORGANIZATION AND POWER

Symbols are used for regulating and organizing people as well as the material world. They may simply convey information from one person to another, as with language or, as in the case of archival records, from one point in time to another. But sometimes they are symbols of power, commanding obedience and conformity, for example the giant statues of rulers found in many civilizations.

Money: Symbols of Value and Organization in Complex Societies

In Chapter 5 we referred briefly to the existence of an accounting system as an important indicator of complex social structure. The symbols used in an accounting system – symbols of value such as standardized quantities of precious materials or coins – are both social and cognitive artifacts, reflecting the way in which the controlled elements of the economy are conceptualized within the society's shared cognitive map.

This is nowhere clearer than in the case of money. Money was briefly referred to as a measuring device in an earlier section, but it is something much more than this: it represents the recognition that we live in a world of commodities, which may be quantified and exchanged against one another, often in a marketplace. It represents also the realization that this is most effectively done using an artificial medium of exchange, in terms of gold or silver or bronze (if the money is in the form of coinage), by means of which the values of other commodities may be expressed. Money – and particularly coinage, where the form of the money is determined by an issuing authority – is a form of communication second in its power only to writing. In more recent times, token money, and now stocks and shares, are developments of comparable significance, indispensable to the workings of a capitalist economy.

Identifying Symbols of Value and Power in Prehistory

The existence of scales of value in non-monetary economies is more difficult to demonstrate, although several archaeological studies have sought to establish such scales. Robert Mainfort has used an ethnographic account from the 18th-century AD North American fur trade to aid such an investigation. The account, a list dated 1761 relating to trade at Miami, Ohio, itemized the values of certain goods in terms of beaver pelts (e.g. 1 musket = 6 beaver pelts). On this basis Mainfort assigned values to grave-goods in burials at the Fletcher Site, a historic and roughly contemporary Indian cemetery in Michigan (see also discussion in Chapter 12). This analogy from the ethnographic record assumes, however, that the values operating at the Fletcher Site were the same as those that were recorded several hundred kilometers south in Miami, Ohio. This may be a reasonable assumption, but it does not help us establish a more general methodology for cases where ethnographic or written records are unavailable.

The Gold of Varna. Archaeological evidence on its own can in fact yield evidence of scales of value, as work by Colin Renfrew on the analysis of finds from the late Neolithic cemetery at Varna in Bulgaria, dating from *c.* 4000 BC, has shown. Numerous golden artifacts were discovered in the cemetery, constituting what is the earliest known major find of gold anywhere in the world. But it cannot simply be assumed that the gold is of high value (its relative abundance in the cemetery might imply the converse).

Deducing scales of value: the great worth of the gold from Varna, Bulgaria, is suggested by, among other things, its use to decorate significant parts of the body.

Three arguments, however, can be used to support the conclusion that the gold here was indeed of great worth:

1 Its use for artifacts with evidently symbolic status: e.g. to decorate the haft of a perforated stone axe which, evidently, through its fine work and friability, was not intended for use.
2 Its use for ornaments at particularly significant parts of the body: e.g. for face decorations, for a penis sheath.
3 Its use in simulation: sheet gold was used to cover a stone axe to give the impression of solid gold; such a procedure normally indicates that the material hidden is less valuable than the covering material.

Indicators of this kind need to be developed if the formulation of such concepts of "intrinsic" value (which is a misnomer because the "value" of precious materials is ascribed rather than inherent) are to be better understood. In Chapter 9 we looked at materials other than gold that had prestige value in different societies (box, pp. 356–57).

The demonstration that gold objects were highly valued by society at this time in ancient Bulgaria also implies that the individuals with whom the gold finds were associated had a high social status. The importance of burials as sources of evidence for social status and ranking was discussed in Chapter 5. Here we are more interested in the use of grave-goods like the Varna gold-covered axes, and other discoveries, as *symbols of authority and power*. The display of such authority is not very pronounced in a society like that excavated at Varna, but it becomes more blatant the more hierarchical and stratified the society becomes.

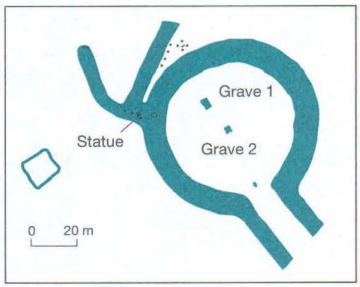
Symbols of Power in Hierarchical Societies

The 6th-century BC chieftain's grave at Hochdorf, western Germany – mentioned in Chapter 5 – was accompanied by a rich array of accoutrements symbolizing his wealth and authority. Near to a comparable princely grave at Glauberg (Frankfurt, Germany) was found a life-size limestone statue of the chief, wearing armrings and neck torque similar to those found in the grave, as well as a sword and shield. Archaeologists today recognize that the grave-goods in a burial are chosen to give a representation or "construction" of the identity of the deceased individual. Here we have a further such construction in the form of a statue, using very similar indicators of rank, perhaps intended to emphasize his heroic status. Even these magnificent burials pale in comparison with some of the treasures buried with the rulers of state societies. It would be difficult, for example, to find a more potent example of royal wealth and power than the tomb of Philip II at Vergina in northern Greece (see box, p. 430), or of Tutankhamun in the Valley of the Kings in Egypt (see box, pp. 62–63).

Indeed, among state societies and empires the symbolism of power goes far beyond merely the burial evidence to suffuse the whole of art and architecture – from the imposing stelae of the Maya (see box overleaf) and the giant statues of Egyptian pharaohs, right up to their later counterparts in Soviet Russia and elsewhere; from the Egyptian pyramids and Mesoamerican temples to the Capitol in Washington.

A study of the art and architecture of the Assyrian palace at Khorsabad, in modern Iraq, provides a good example of symbols designed to impress both native subjects and foreign visitors. At Khorsabad the Assyrian King Sargon II (721–705 BC) built a heavily walled city, with a huge fortified citadel on its northwestern side. Dominating the citadel was Sargon's own palace, its walls decorated with friezes carved in low relief. The subject matter of the reliefs was specifically designed to suit the function of each room. Thus two outer reception rooms – used for receiving visiting delegations – contained scenes of torture and the execution of rebels, whereas inner rooms showed Assyrian military conquests, which reinforced the status and prestige of Assyrian courtiers who used these rooms.

More general questions concerning symbols and art are considered in a later section. Inevitably there is a good deal of overlap between the different categories of symbol isolated for discussion in this chapter. The important point to remember is that these categories are for our convenience as researchers, and do not necessarily indicate any such similar symbolic divisions in the minds of members of the societies that are being studied.



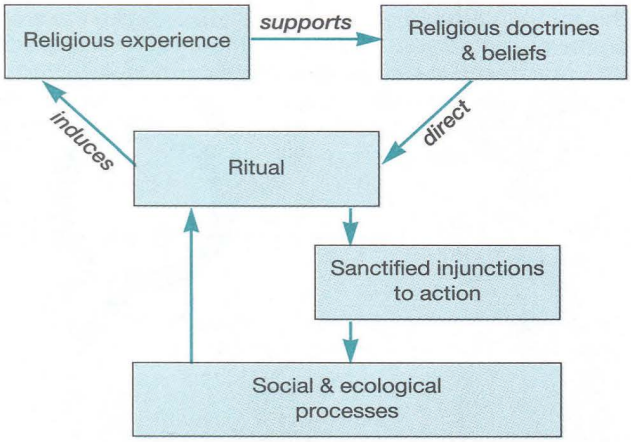
This life-size statue of a chief was found near a 6th-century BC princely grave at Glauberg, Germany. Armrings and a neck torque similar to the ones shown on the statue were found in the grave.

SYMBOLS FOR THE OTHER WORLD: THE ARCHAEOLOGY OF RELIGION

One leading English dictionary defines religion as: "Action or conduct indicating a belief in, or reverence for, and desire to please, a divine ruling power." Religion thus entails a framework of beliefs, and these relate to supernatural or superhuman beings or forces that go beyond or transcend the everyday material world. In other words superhuman beings are conceptualized by humans, and have a place in the shared cognitive map of the world.

But religion is also a social institution, as the French anthropologist Emile Durkheim emphasized in his writings earlier this century. Durkheim pointed out the contribution of religion towards "upholding and reaffirming at regular intervals the collective sentiments and the collective ideas which make its [the social group's] unity and personality." More recently anthropologists such as Roy Rappaport have stressed the same idea, that religion helps regulate the social and economic processes of society. Indeed, more than a century ago Karl Marx argued that the leaders of society can manipulate such belief systems to their own ends.

One problem that archaeologists face is that these belief systems are not always given expression in material culture. And when they are – in what one might term the ***archaeology of cult***, defined as the system of patterned actions in response to religious beliefs – there is the problem that such actions are not



Religion as interpreted by Roy Rappaport: beliefs direct ritual which induces religious experience. Through ritual, religion helps regulate the social and economic processes of society.

MAYA SYMBOLS OF POWER

In the past 30 years our knowledge of the ancient Maya has increased significantly as a result of what has been called "the Last Great Decipherment" of an unknown script. Previously, we knew a good deal about the Maya, not least from their cities and from the stone stelae found there with complicated inscriptions on them.

However, the subject matter of the inscriptions (glyphs) had not been well understood. In 1954, the great Maya scholar Sir Eric Thompson wrote: "so far as is known, the hieroglyphic texts of the Classic period deal entirely with the passage of time and astronomical matters... they do not appear to treat of individuals at all... Apparently no individual of that period is identified by his name glyph." In 1960, however, Tatiana Proskouriakoff (see box, p. 37) of the Carnegie Institution, Washington, published a paper in which she identified rulers of specific Maya dynasties, and from that time, glyphs identifying persons (usually rulers) and places have been increasingly recognized. Indeed, it is possible to reverse Thompson's verdict. *Most* Maya stelae are now seen to commemorate events in the reigns of rulers who are almost invariably identified by name. Moreover, following the insights of the Soviet scholar Yuri Knorosov, we also know that the glyphs have phonetic values: they represent syllables, not concepts (as true ideograms do), and hence, language. Impressive progress is being made.

Maya archaeology has now become fully text-aided archaeology, like Egyptology, or the archaeology of other great civilizations. Previously we had to rely on the documentary evidence of the early Spanish historians in Mexico, such as Diego de Landa. Although writing six centuries after the end of the Classic Maya period, these scholars

were able to draw on much knowledge that had survived into the post-Classic era. But now the decipherment of the stelae inscriptions has given us the benefit of a double literacy: that of the Spanish Conquistadors and that of the Classic Maya themselves.

A formidable amount can today be learned about Maya beliefs from the interpretation of a single monument. We may take as an example one of the masterpieces of Maya art, a lintel from the Classic Maya city of Yaxchilán, removed from there by Alfred Maudslay and given by him to the British Museum. This lintel has been analyzed by Proskouriakoff in some detail. It is also one of the works discussed by the American art historians Linda Schele and Mary Ellen Miller in their remarkable book *The Blood of Kings* (1986).

The standing figure is the ruler of Yaxchilán, named Shield Jaguar. He holds aloft a flaming torch, which suggests that the scene lay within a dark interior space. He has feathers at the rear of his head, and "the shrunken head of a past sacrificial victim is tied at the top of his head by a headband, marking Shield Jaguar's largesse in providing sustenance to the gods." In front of him kneels his wife, the Lady K'abal Xoc. She has begun the bloodletting rite in which he will shortly take part, and is pulling a thorn-lined rope through her mutilated tongue. Her cloak is a remarkable representation of Classic Maya weaving.

The inscription gives the names of the ruler and his wife, and indicates a date in the Maya Long Count calendar (see box, pp. 130–31) of 9.13.17.15.12 5 Eb 15 Mac, which is equivalent to 28 October AD 709.

This monument, and others like it, give us insights into a wide variety of fields: for example, they exemplify the use of Maya writing; they use the remarkably precise Maya calendar; they tell us something of the Maya view of the cosmos; and they provide a series of well-dated royal events as a framework to Maya history. In doing so they make major contributions to Maya political geography (see box on Maya Territories, p. 205).

This and other similar depictions are an impressive instance of what the American scholar Joyce Marcus has appropriately termed "the iconography of power." They also indicate sacred rituals of the Maya, where the rulers had an obligation on specified occasions to shed their blood to give sustenance to the gods.

Now that we can interpret these monuments we can see more clearly than ever that this was one of the great art styles of the world.

Lintel 24 from Yaxchilán *showing Shield Jaguar and his wife, Lady K'abal Xoc, during a bloodletting ritual. The glyphs which frame their images give details of their names, the calendar date, and a description of the rite. Between them is a bowl containing strips of bark paper on which the blood shed during the ritual is collected. To complete the sacrifice the blood-soaked paper is ceremonially burnt to provide sustenance to the gods, so that water will come to nourish the plants of the earth, providing abundance and sustenance.*

always clearly separated from the other actions of everyday life: cult can be embedded within everyday functional activity, and thus difficult to distinguish from it archaeologically.

The first task of the archaeologist is to recognize the evidence of cult for what it is, and not make the old mistake of classifying as religious activity every action in the past that we do not understand.

Recognition of Cult

If we are to distinguish cult from other activities, such as the largely secular ceremonial that may attend a head of state (which can also have very elaborate symbolism), it is important not to lose sight of the transcendent or supernatural object of the cult activity. Religious ritual involves the performance of expressive acts of worship toward the deity or transcendent being. In this there are generally at least four main components (we will see below how these may then help us draw up a list of aspects that are identifiable archaeologically):

– *Focusing of attention* The act of worship both demands and induces a state of heightened awareness or religious excitement in the human celebrant. In communal acts of worship, this invariably requires a range of attention-focusing devices, including the use of a sacred location, architecture (e.g. temples), light, sounds, and smell to ensure that all eyes are directed to the crucial ritual acts.

– *Boundary zone between this world and the next* The focus of ritual activity is the boundary area between this world and the Other World. It is a special and mysterious region with hidden dangers. There are risks of pollution and of failing to comply with the appropriate procedures: ritual washing and cleanliness are therefore emphasized.

– *Presence of the deity* For effective ritual, the deity or transcendent force must in some sense be present, or be induced to be present. It is the divine as well as human attention that needs to be heightened. In most societies, the deity is symbolized by some material form or image: this need be no more than a very simple symbol – for instance, the outline of a sign or container whose contents are not seen – or it may be a three-dimensional cult image.

– *Participation and offering* Worship makes demands on the celebrant. These include not only words and gestures of prayer and respect, but often active participation involving movement, perhaps eating and drinking. Frequently, it involves also the offering of material things to the deity, both by sacrifice and gift.

One of two pits containing caches of statues found at the site of 'Ain Ghazal, in Jordan. This is a clear case of the deliberate burial of cultic objects.

The ritual burial of objects of cult significance is one of the earliest attested indications of cult practice. It occurs as early as the 7th millennium BC in the Levant at sites such as 'Ain Ghazal, where it precedes the appearance of recognizable sanctuaries. Extraordinary statues discovered at this site were made of lime plaster modeled over a reed framework and many were decorated with paint. Buried in a pit under the floor of a house, they may represent mythical ancestors.

From this analysis we can develop the more concrete archaeological indicators of ritual listed below, some of which will usually be found when religious rites have taken place, and by which the occurrence of ritual may therefore be recognized. Clearly, the more indicators that are found in a site or region, the stronger the inference that religion (rather than simple feasting, or dance, or sport) is involved.

Archaeological Indicators of Ritual

Focusing of attention:

1 Ritual may take place in a spot with special, natural associations (e.g. a cave, a grove of trees, a spring, or a mountaintop).
2 Alternatively, ritual may take place in a special building set apart for sacred functions (e.g. a temple or church).

3 The structure and equipment used for the ritual may employ attention-focusing devices, reflected in the architecture, special fixtures (e.g. altars, benches, hearths), and movable equipment (e.g. lamps, gongs and bells, ritual vessels, censers, altar cloths, and all the paraphernalia of ritual).
4 The sacred area is likely to be rich in repeated symbols (this is known as "redundancy").

Boundary zone between this world and the next:
5 Ritual may involve both conspicuous public display (and expenditure), and hidden exclusive mysteries, whose practice will be reflected in the architecture.
6 Concepts of cleanliness and pollution may be reflected in the facilities (e.g. pools or basins of water) and maintenance of the sacred area.

Presence of the deity:
7 The association with a deity or deities may be reflected in the use of a cult image, or a representation of the deity in abstract form (e.g. the Christian Chi-Rho symbol).
8 The ritualistic symbols will often relate iconographically to the deities worshipped and to their associated myth. Animal symbolism (of real or mythical animals) may often be used, with particular animals relating to specific deities or powers.
9 The ritualistic symbols may relate to those seen also in funerary ritual and in other rites of passage.

Participation and offering:
10 Worship will involve prayer and special movements – gestures of adoration – and these may be reflected in the art or iconography of decorations or images.
11 The ritual may employ various devices for inducing religious experience (e.g. dance, music, drugs, and the infliction of pain).
12 The sacrifice of animals or humans may be practiced.
13 Food and drink may be brought and possibly consumed as offerings or burned/poured away.
14 Other material objects may be brought and offered (votives). The act of offering may entail breakage and hiding or discard.
15 Great investment of wealth may be reflected both in the equipment used and in the offerings made.
16 Great investment of wealth and resources may be reflected in the structure itself and its facilities.

In practice, only a few of these criteria will be fulfilled in any single archaeological context. A good example is offered by the Sanctuary at Phylakopi on the Aegean island of Melos dating from about 1400 to about 1120 BC. Two adjacent rooms were found, with platforms that may have served as altars. Within the rooms was a rich symbolic assemblage including some human representations. Several of the criteria listed above were thus fulfilled (e.g. 2, 3, 7, and 14). However, although the assemblage was perfectly consonant with a cult usage, the arguments did not seem completely conclusive. It was necessary to compare Phylakopi with some sites in Crete that shared similar features. The Cretan sites could be recognized as shrines precisely because there were *several* of them. One such occurrence might have been attributable to special factors, but the discovery of several with closely comparable features suggested a repeated pattern for which the explanation of religious ritual seemed the only plausible one.

The case for religious ritual can, of course, be more easily proven when there is an explicit iconography in the symbols used. Representations of human, animal, or mythical or fabulous forms offer much more scope for investigation and analysis (see box overleaf). The recognition of offerings can also be helpful. In general, offerings are material goods, often of high value, ritually donated or "abandoned" by their owners for the benefit and use of the deity. Naturally, the fact of abandonment is much easier to establish than its purpose. Yet collections of special objects, often symbolically rich, are sometimes found in buildings in such a way as to make clear that they are not simply being stored there – for example, objects buried in foundations, like the extraordinary caches of jaguar skeletons, jade balls, ceramics and stone masks deposited in layers within the innermost structure of the Great Temple of Aztec Tenochtitlan (see box, pp. 552–53).

Notable assemblages of goods are also found in outdoor contexts – for example, the Iron Age weapons thrown into the river Thames, England, or the impressive hoards of metalwork deliberately deposited in the bogs of Scandinavia around 1000 BC. Individual objects found in this way may, of course, have been lost, or simply buried for safe-keeping, with the intention of later discovery. Sometimes, however, so many valuable objects are found – in some instances with rich symbolic significance, and in others damaged in a way that appears both deliberate and willful if further use were intended – that their ritual discard seems clear. A famous example is offered by the *cenote* or well at Chichén Itzá, the late Maya site in northern Yucatán, into which enormous quantities of symbolically rich goods had been thrown.

Identifying the Supernatural Powers

If the supernatural powers worshipped or served in the practice of cult are to be recognized and distinguished from each other by us, then there have to be distinctions within the archaeological record for us to recognize. The most obvious of these is a developed iconography (representations, often with a religious or ceremonial significance; from the Greek word *eikon* ("image")), in which individual deities are distinguished, each with a special characteristic, such as corn with the corn god, the sun with the sun goddess.

The study of iconography is, for any well-developed system, a specialist undertaking in itself, and one in which the cognitive archaeologist needs to work hand in hand with epigraphers and art historians (see, for example, the box on Maya Symbols of Power, pp. 406–07). Such work is well established for most of those religions that depicted their divine powers frequently. The iconography of Mesoamerica and Mesopotamia generally falls within this category, as does that of Classical Greece. On a painted Maya or Greek vase, for example, it is common to see scenes from their respective mythologies. In the Greek case particularly, we are dependent on literacy for our interpretation. In the first place, it is certainly convenient (although not always necessary if one knows the mythological repertoire) that one often finds the name of a mythic figure actually written on the vase. But the name itself usually has meaning only because it allows us to place the character within the rich corpus of Greek myths and legends known from Classical literature. Without that it is doubtful whether the scenes would in most cases divulge a great deal.

Where literacy and available literary evidence are less widespread – for instance, in Mesoamerica – more emphasis has to be placed on a painstaking study of the different representations, in the hope of spotting recurrent attributes associated in a definable way with specific individuals. Michael Coe has successfully achieved this in his analysis of Classic Maya ceramics. The so-called Popol Vuh manuscript, discovered among the living Maya of the Guatemalan highlands during the 19th century, preserves a fragment of a great 2000-year-old epic concerning the Maya Underworld. Coe's careful research has demonstrated that there are highly explicit pictorial references to this epic on Classic Maya pottery. For example, one of the three divine rulers of the Underworld, God L, can be identified by the fact that he wears an owl headdress and smokes a cigar. His mythical opponents, the Hero Twins, often appear in ceramic scenes distinguished by, respectively, the black spots of death and patches

RECOGNIZING CULT ACTIVITY AT CHAVIN

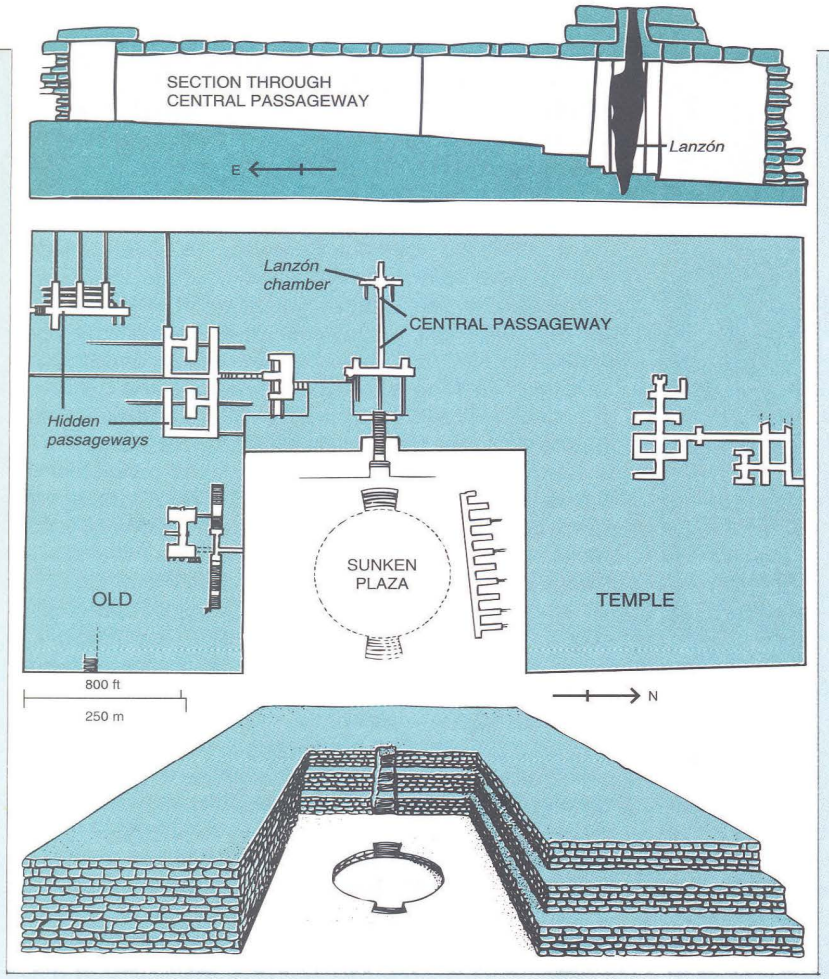
Two views of the Lanzón or Great Image (top, complete image; above, rollout drawing), depicting a fanged anthropomorphic being.

The great site of Chavín de Huantar, high up in the Andes in north-central Peru, flourished in the years 850–200 BC and has given its name to one of the major art styles of ancient South America. Chavín-style art is dominated by animal motifs represented above all in sculpture, but also on pottery, bone, painted textiles, and worked sheets of gold found at this time in different parts of northern Peru.

First discovered in 1919 by the father of Peruvian archaeology, Julio Tello, Chavín de Huantar itself has long been recognized as a ceremonial center, the focus of a religious cult. But on what grounds?

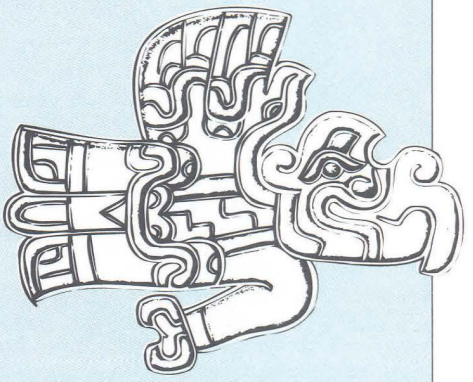
Excavations in recent years by Luis Lumbreras, Richard Burger, and others have indicated the presence of a substantial settled population, and also helped confirm the existence of cult activity. In the main text we listed 16 separate indicators of ritual that can be identified archaeologically, and at Chavín over half of these have now been established with at least some degree of certainty.

The most immediately obvious feature of the site is its imposing architecture, comprising a complex of stone-faced platforms built in the earliest phase on a U-shaped plan and set apart from living areas at the site – thus fulfilling many of the criteria of archaeological indicators **2** and **16** given in the main text. Ritual involving both conspicuous public display and hidden mysteries (**5**) is implied by the presence of an open circular sunken plaza that could hold 300 participants, and hidden underground passageways, the most important of which led to a narrow chamber dominated by a 4.5 m (14 ft 9 in) high granite shaft know as the *Lanzón* (Great Image). The carving on this shaft of a fanged anthropomorphic being, its location in a



***Perspective and plan** views of the early U-shaped platforms at the site, with a section through the central passageway showing the narrow chamber dominated by the Lanzón or Great Image.*

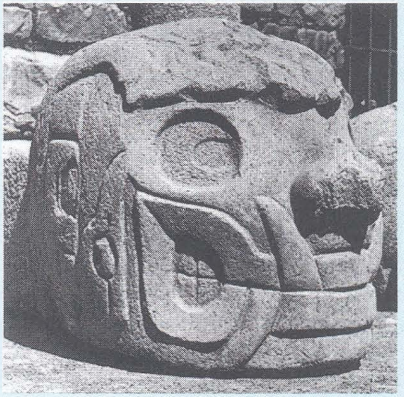
central chamber facing east along the temple's main axis, and its size and workmanship all suggest that this was the principal cult image of the site (7). Moreover, some 200 other finely carved stone sculptures were discovered in and around the temple, the iconography of which was dominated



***Crested eagle** motif from a Chavín ceramic bowl.*

by images of caymans, jaguars, eagles, and snakes (4, 8). A cache of over 500 broken high-quality pots containing food found in an underground gallery may have been offerings (13, 14) (though the excavator, Lumbreras, believes they were used for storage). There is iconographic evidence for drug-induced rituals (11) and the possibility that canals beneath the site were used for ritual cleansing (6) and to create roaring sounds to heighten the impact of ceremonies.

The study of Chavín thus demonstrates that a careful archaeological and art historical analysis of different kinds of evidence can produce sound proof of cult activity – even for a site and society concerning which there are no written records whatsoever.



***Transformation** of a masked shaman (far left) into a jaguar (left). These sculptures were displayed tenoned into the outer wall of the temple, and hint at drug-induced rituals.*

Identifying the Maya gods: this scene on a Late Classic Maya vase, probably from Naranjo, Guatemala, has been interpreted by Michael Coe as showing God L, a divine ruler of the Underworld identified by his cigar and headdress.

of jaguar skin over face and body. Through this work Coe has not only enriched our understanding of Maya art and myth, but also in the process convincingly shown that Maya painted ceramics had a funerary function (from the Underworld imagery, backed up by the repeated discovery of such vessels in tombs).

The archaeology of death and burial is an important aspect of the study of religion, as we now discuss.

The Archaeology of Death

Archaeologists have often used burial evidence as the basis for social interpretations, because material possessions buried with individuals offer information about differences in wealth and status within the community. These points were discussed in Chapter 5. But although the living use funerary rituals to make symbolic statements about the importance of themselves and their deceased relatives and associates, and thus to influence their relationships with others in the society, this is only a part of the symbolic activity. For they are guided also by their beliefs about death and what may follow it.

The deposition of objects with the dead is sometimes assumed to indicate a belief in an afterlife, but this need not follow. In some societies, the deceased's possessions are so firmly associated with him or her that for another to own them would bring ill luck, and there is therefore a need to dispose of them with the dead, rather than for the future use of the dead. On the other hand, when food offerings accompany the deceased, this does more strongly imply the idea of continuing nourishment in the next world. In some burials – for instance, the pharaohs of Egypt or the princes of the Shang and Zhou dynasties in China (and indeed until more recent times) – a whole paraphernalia of equipment accompanied the dead person. As we saw in Chapter 5, in the Shang case, as in the Royal Graves at Ur in Mesopotamia, attendants were slaughtered in order to accompany the deceased in the burial – a practice found in Polynesia too, for example the 40 subjects discovered buried with the 13th-century AD ruler Roy Mata – and here it seems likely that some belief in an afterlife is to be inferred.

In many cultures, special artifacts were made to accompany the dead. The jade suits in which some early Chinese princes were buried, the gold masks in the Mycenaean shaft graves, and the masks of jade and other precious stones accompanying some Mesoamerican burials are artifacts of this kind. Naturally, they had a social significance, but they also carry implications for the way the communities that made them conceived their own mortality, which is an important piece of anybody's cognitive map.

Further inferences can perhaps be drawn from other aspects of funerary rites: cremation as against inhumation or excarnation; collective as against individual burial; the use of major buildings for the purpose, and so on. Again, these are determined in part by the prevailing social system, and the uses to which the living put their ideology. But they are conditioned too by the religious beliefs of the time and the culture involved.

DEPICTION: ART AND REPRESENTATION

We can obtain the greatest insight into the cognitive map of an individual or a community by representation in material form of that map, or at least a part of it. Models and plans are special examples, but a more general case is that of depiction, where the world, or an aspect of it, is represented so that it appears to the seeing eye much as it is conceived in the "mind's eye."

The Work of the Sculptor

To re-create, in symbolic form and in three dimensions, an aspect of the world, is an astonishing cognitive leap. It is a step that we see first taken in the early Upper Paleolithic period, with the portable or "mobiliary" art mentioned in the box (p. 394). Bas reliefs in stone and some clay models of animals are also known from this period. The latter are smaller than life size, but are much larger than miniatures. More common, however, are representations of the female figure. These are usually carved in stone or ivory, but a series of female figurines modeled in clay, and then baked (in itself quite a complex process) have been found at Dolní Věstonice and Pavlov in the Czech Republic.

Although the relevant abilities may have been latent within all members of our subspecies *Homo sapiens sapiens*, it is nonetheless the case that such Upper Paleolithic sculptural work was limited mainly to Eurasia. In the period of early farming, in many parts of the world, terracotta human figurines, using much the same technology as at Dolní Věstonice and Pavlov many thousands of years earlier, are found. They are widespread in the Early Neolithic of the Near East and of southeast (but not central and western) Europe, and in Mesoamerica. Analysis of these small human figures has illuminated certain details of the dress of the period. Some scholars have also seen in them a representation of a near-universal Great Earth Mother or fertility goddess. But arguments hitherto produced in support of that interpretation of these figurines have been effectively dismissed by Peter Ucko – for instance, by showing that most of them are not even clearly female.

The figurines found in southeast Europe were subjected to iconographic study of the kind described in the previous section by Marija Gimbutas, who claimed to see certain recurrent deities among them (see also pp. 218–19). As she pointed out, some of them do indeed appear to be masked figures. However, the more detailed identifications have not won widespread acceptance.

Sculptures approaching life size were produced in prehistoric Malta and in the Cycladic Islands (see box overleaf) – neither of which could be considered urban societies – and life size, or on a truly monumental, larger-than-life scale, in early dynastic Egypt and Sumer, and in many other civilizations. Each had its own sculptural conventions, requiring specialist expertise to be properly understood and interpreted. Conventions of Egyptian art are discussed in the box, pp. 416–17.

Pictorial Relationships

Painting, drawing, or carving on a flat surface in order to represent the world offers much more scope than the representation in three dimensions of a single figure. For it offers the possibility of showing relationships *between* symbols, between objects in the cognitive map. In the first place, this allows us to investigate how the artist conceived of space itself, as well as the way in which events at different times might be shown. It also allows analysis of the manner or *style* in which the artist depicted the animals, humans, and other aspects of the real world. The word "style" is a difficult one (see box, p. 419). It may be defined as the manner in which an act is carried out. Style cannot exist except as an aspect of an activity, often a functional one. And no intentional activity, or more precisely no series of repeated activities, can be carried out without generating a style. Thus the 7000-year-old paintings in rockshelters in east Spain have similarities that lead us to designate them collectively as the Spanish Levantine style. This seems simplified in contrast to the more representational or naturalistic Upper Paleolithic cave paintings of southwest France and north Spain, some 10,000 or 20,000 years earlier (see box, pp. 392–93). Though the nature of what the act of depiction entails from the cognitive viewpoint has yet to be analyzed satisfactorily, the probable purposes of such art are being profitably studied.

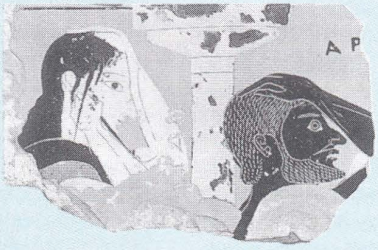
The depictions most successfully analyzed are more complex scenes, for instance in mural paintings. One such is the ship fresco from Akrotiri on Thera, a scene which has been variously interpreted as the homecoming of a victorious fleet, or as a marine celebration or ritual. Another excellent example is offered by some of the Mesoamerican frescoes and sculptural reliefs, where close study has allowed the elucidation of the various pictorial conventions. For instance, Frances R. and Sylvanus G. Morley in 1938 identified a particular class of Maya human representations as captive figures, that is "subsidiary figures, generally though not always bound, in attitudes of degradation ... or of supplication." By a consideration of this convention, Michael Coe and Joyce Marcus have shown convincingly that the enigmatic *danzante* figures, the earliest sculptured reliefs from the site of Monte Albán in the valley of Oaxaca, some 400 km (250 miles) west of the Maya area, are not swimmers or dancers, as had been thought. The distorted limbs, open mouths, and closed eyes indicate that they are corpses, probably chiefs or kings slain by the rulers of Monte Albán (see p. 507).

The rules and conventions for depictions on a flat surface will vary from culture to culture, and require

IDENTIFYING INDIVIDUAL ARTISTS IN ANCIENT GREECE

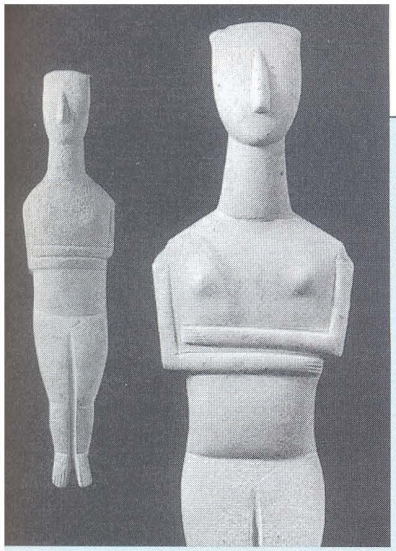
Artists were much valued in ancient Greek society for their skill. In the case of vase painting it was quite common for the painter (and sometimes the potter also) to sign the vessel in paint before it was fired. This means that numerous vessels are known from the hand of a single painter. For the Attic black-figure style (common in Athens in the 6th century BC, where human figures were shown in black on a red ground), twelve painters are known by name. It was the great work of the British scholar, Sir John Beazley, in the middle years of the 20th century to assign three-quarters of the surviving black-figure vases either to individual artists (in many cases without a name known to us) or to other distinct groups.

When talking of "style" (see box), we must separate the style of a culture and period from the (usually) much more closely defined style of an individual worker within that period. We need to show, therefore, how the works that are recognizable in that larger group (e.g. the Attic black-figure style) divide on closer examination into smaller, well-defined groups. Moreover, we need to bear in mind that these smaller subgroupings might relate not to individual artists but to different time periods in the development of the style, or to different subregions (i.e. local substyles). Or they might relate to workshops rather than to single artists. In the Athenian case, Beazley was confident that in the main he was dealing with pots painted in Athens, and he was able to consider the chronological development separately. He was also greatly helped by the small number of signed vases, which confirmed the hypothesis that the grouping he arrived at did indeed represent individual painters.



Exekias, the 6th-century BC Greek vase painter, signed many of the vessels he worked on. Above, part of a funerary plaque by Exekias, with two mourners. Below, Achilles and Ajax – Greek heroes of the Trojan War – depicted by Exekias playing a game.

Beazley used both an overall appraisal of the style and composition of the painted decoration on a pot in relation to other pots, and the comparative study of smaller but characteristic details, such as the rendering of drapery or aspects of anatomy. Where the name of the painter was unknown, he would assign an arbitrary name, often taken from a



Two Early Cycladic, female figurines of the folded-arm type, c. 2500 BC, both identified as being by the so-called Goulandris Master. The larger figurine is 63.4 cm (25 in) tall.

collection in which the most notable work was housed (e.g. the Berlin Painter, the Edinburgh Painter). All this sounds highly subjective, but it was also very systematic and the evidence was thoroughly published. Although scholars argue about the attribution of some pieces, there is general agreement that the main outlines of Beazley's system are correct.

But can one, using this procedure, identify individual artists for earlier periods in Greece? Many of the sculptures of the Early Cycladic period (c. 2500 BC) take the form of a standing woman with arms folded across the stomach. This well-defined series has been subdivided into groups, and the American scholar Patricia Getz-Preziosi has proposed that some of these may be assigned to the hands of individual sculptors or "masters," all of whom are inevitably anonymous in this pre-literate period. This proposal meets the criterion that there should be well-defined subgroups within the broader "cultural" style. There is no reason to suggest that these subgroups are chronologically or regionally distinguished. But in order to identify them with a specific "master" rather than, for example, with a larger workshop, it would certainly help to have the key evidence available to Beazley: a few signatures, or at least personal marks, or the discovery of a workshop. Nonetheless, Getz-Preziosi's assignments to individual sculptors are plausible.

detailed study in each case. But similar approaches to those described above may be applied by the cognitive archaeologist to any past society – from the Bronze Age rock carvings of Sweden (compare box, p. 418) and Val Camonica in northern Italy (see box, p. 492), to the medieval wall paintings of Europe or India.

Decoration

Art is not, of course, restricted to the depiction of scenes or objects. The decoration of pottery and other artifacts (including weaving) with abstract patterns must not be overlooked. Various approaches are being developed, of which one of the most useful is ***symmetry analysis***. Mathematicians have found that patterns can be divided into distinct groups or symmetry classes: 17 classes for patterns that repeat motifs horizontally, and 46 that repeat them horizontally and vertically. Using such symmetry analysis, Dorothy Washburn and Donald Crowe have argued in their book *Symmetries of Culture* (1989) that choice of motif arrangements within a culture is far from random.

Ethnographic evidence suggests that specific cultural groups prefer designs that belong to specific symmetry classes – often as few as one or two classes. For example, the modern-day Yurok, Korok, and Hupa tribes in California speak different languages, but share patterns in two symmetry classes on baskets and hats – a link confirmed by intermarriage between them. With further work, this may prove a fruitful method for analyzing patterns on artifacts, with a view to assessing objectively from material culture how closely connected different societies were in the past. But the interpretation of symmetry is undoubtedly more problematic than the formal analysis, and does not always tell us the meaning or purpose of a design, though it may reveal something of the cognitive structure which underlies it.

Art and Myth

At different times, anthropologists have tried to analyze what is special to the thinking – the logic – of non-western, non-urban communities on a worldwide scale. This approach often has the unfortunate consequence of proceeding as if western, urbanized, "civilized" ways of thinking are the natural and right ones to help comprehend the world, whereas those others might be lumped together as "primitive" or "savage." In reality, there are many equally valid ways of viewing the world. Nevertheless, such broad researches have led to the realization of the significance of myth in many early societies. This was well brought out in

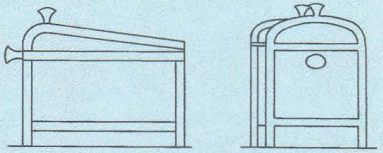
CONVENTIONS OF REPRESENTATION IN EGYPTIAN ART

All art styles employ conventions: indeed in a sense the conventions define the style. Where decorative motifs and abstract forms are concerned, the conventions may be entirely arbitrary. But when the aim of the artist is *depiction* – the representation of objects in the real world and of relationships between them – the conventions are more closely determined.

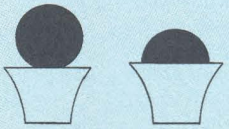
These conventions may be so different from our own that we may have real difficulty in "reading" them. They therefore require careful study. It is useful also to define the range of subjects represented, and to consider those subjects *not* chosen. The conventions of the ancient Egyptians were investigated in this way in 1919 by Heinrich Schäfer in his influential work, *Principles of Egyptian Art*, which can still serve as a model for studies of this kind.

The Egyptians did not organize their wall paintings and reliefs primarily by means of perspective. Rather, each object was shown as it was *known* to be. Thus a chest would be seen, usually, sideways on, and, if there were two, the second would be indicated a little out of line with the first. If it was necessary to show that a jar or a chest contained something, that would be shown protruding or on top of the container. The human body also had its standard conventions. As the Egyptologist Gay Robins puts it: "The human figure was represented by a composite diagram constructed from what was regarded as the typical aspect of each part of the body; yet the whole is immediately recognizable. The head was shown in profile, into which were set at the appropriate place a full-view eye and eyebrow and a half mouth. The shoulders were shown full width from the front, but the boundary

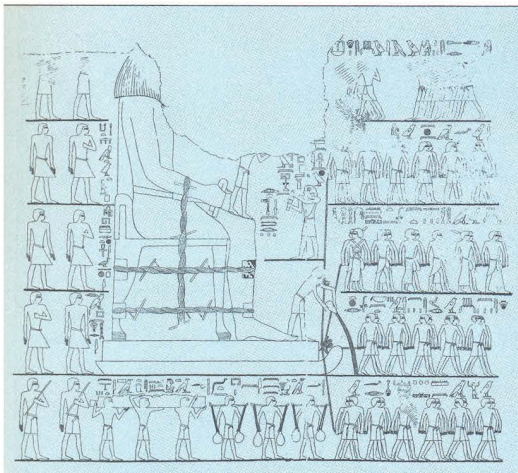
***The human body** was drawn according to a strictly defined canon. Every body part (forehead, nose, navel, knees, feet, etc.) was at a set point on a standard grid, faces were normally in profile, the torso twisted so that it appeared to be facing forward.*

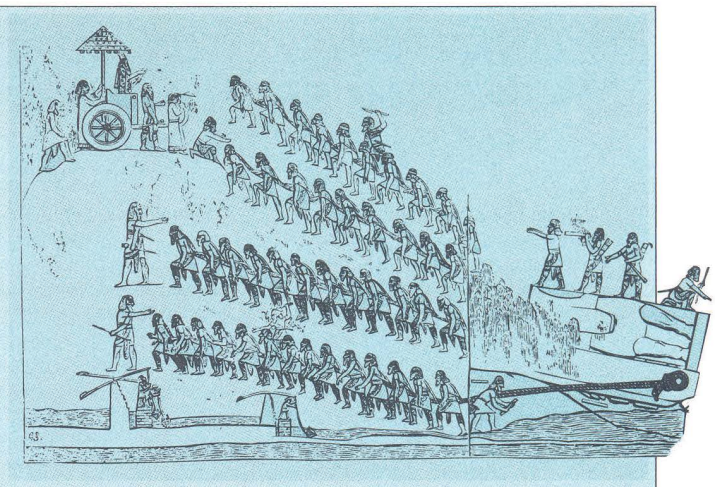


***In Egyptian art** a single chest was always shown from the long side. To indicate more than one, the chests would be represented slightly out of line with each other.*



***To show** that jars (above) contained incense, the artist has depicted the contents as a ball standing proud of the actual jar. On the left it is entirely visible; on the right partially visible.*



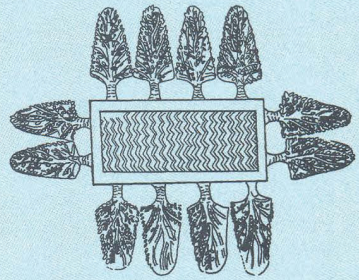


Two pictures of a colossal statue being dragged into position by teams of men – one Egyptian (above left), the other Assyrian (above right). The Egyptian rendering is exact in its detail, but the way of depicting the gangs of workers in horizontal registers creates a stilted, artificial effect. The more painterly Assyrian version appears "scenic" to modern eyes.

line on the forward side of the body from armpit to nipple or, on a woman, the breast, was in profile, as were the waist, elbows, legs and feet. It was traditional to show both feet from the inside with a single toe and an arch. ... It made perfect sense to have one form symbolizing 'foot' which was then used without differentiation for both near and far feet." (Robins 1986, 12–14.)

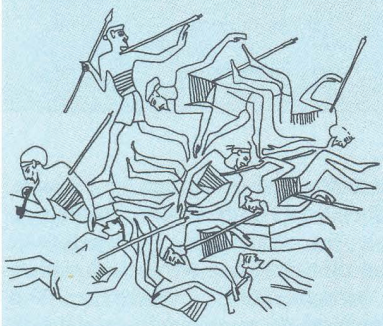
The major figure, whether pharaoh or tomb owner (in a tomb painting), was shown at a larger scale than his or her retainers. These minor figures were organized into horizontal registers placed vertically one above another. This was purely a method of ordering; it was not used to indicate spatial relationships or time sequence. But escape from the use of formal registers developed in desert and battle scenes, where forces associated with chaos rather than the ordered world were depicted.

In accordance with the same principles, scenes were shown as much as they were *known* to be as they were *seen* to be, and often a bird's-eye view principle was followed. These principles are admirably brought out by Schäfer in comparing an Egyptian painting of a colossal statue being dragged with an Assyrian relief of a similar subject (although the latter was carved a millennium later, around 700 BC). The Egyptian picture depicts with meticulous detail what is known. The Assyrian relief, while it follows its own conventions, appears to us as much more "scenic."

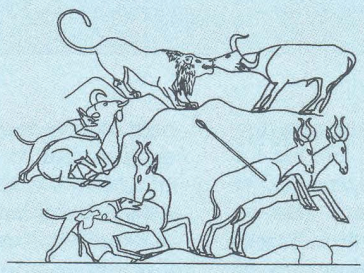


The bird's-eye view principle: the artist has drawn the pool and its surrounding trees as he knew them to be rather than as he actually saw them.

Analysis of this kind is indispensable for a proper understanding of such depictions. Indeed, comparable conventions may be seen in the reliefs, paintings, and codices of Mesoamerica (see, for instance, the box on Maya Symbols of Power pp. 406–07).



In battle scenes, as in nature depictions, the artist could allow the sense of chaos to show in his work.



The Egyptian artist had considerably more freedom when creating scenes of nature, as in this one of desert animal life.

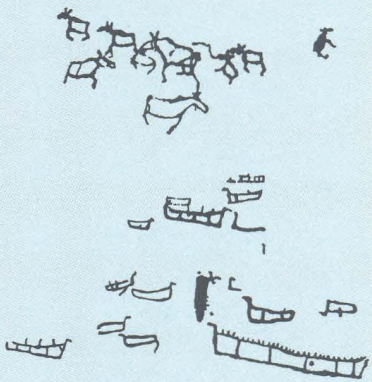
THE INTERPRETATION OF SWEDISH ROCK ART: ARCHAEOLOGY AS TEXT

One of the approaches favored by postprocessual archaeology is to regard the archaeological record as a text composed of meaningful signs, and as Linda Patrik stresses: "all material symbols require a contextual interpretation because their meanings are a function of the specific associations they evoke in a culture and of the actual ways they are combined with other symbols and behavior." One of the most comprehensive attempts to apply this approach to a longstanding and difficult problem, the interpretation of Swedish rock art, has been undertaken by Christopher Tilley. He studied the very rich complex of motifs, generally assigned to the Neolithic and earlier Bronze Age (*c.* 3500–2000 BC), found carved or pecked on the bare glossy rock surfaces overlooking the river rapids at Nämforsen in northern Sweden.

At first sight the carvings represent an extraordinary jumble, with elks and boats as the preponderant motifs, along with humans, shoe soles, tools, and fish, sometimes occurring together in combination. Tilley undertakes a sustained analysis, breaking down the "text" constituted by the assemblages of carvings, investigating the "grammar," and analyzing the design of elk and boat motifs. His first task he regards as "reading a material text" and the second "mediating the text" by considering: (1) a structural logic – where the principles linking elks with boats are investigated, leading to the suggestion of a binary class system; (2) a hermeneutics of meaning, where ethnohistorical perspectives are introduced. This follows an earlier suggestion that there may be a long-term continuity between the rock carvings and the designs found on the membranes of historically documented Saami drums in the 18th century AD. He draws also on the beliefs of the Evenk hunter-fisher-gatherer groups of western Siberia relating to Shamanism and the spirit world. Nämforsen is then interpreted in the light of Evenk cosmology, with the notion of a cosmic river, mediating between the different worlds of the cosmos; and (3) an analytics of power, with considerations of social complexity, of exchange and ethnicity, and of domination and the body.

The reader is left with an open-ended array of possibilities, "riddled with contradictions," and no unified and coherent interpretation – not "a painting of a prehistoric social landscape with the carvings positioned in it, but more a painting of different ways of painting this landscape…the reader is intended to be a participant, not a spectator, however critical, left at the margins."

There is much theoretical discussion, with considerations of assorted thinkers including Saussure, Barthes, Lévi-Strauss, Gadamer, Ricoeur, Marx, and Althusser, and there is no conclusive end-product to the discussion. But Tilley's approach may be described as a strategy of traveling hopefully rather than arriving, and his intellectual journey is rich in unexpected insights – a sustained meditation which offers the reader who possesses the necessary stamina a rich array of concepts and a variety of perspectives.



***A herd of elks** and a "herd" of boats: two of the rock carvings which can interpreted as archaeological "texts."*

Before Philosophy (1946), by Henri Frankfort, one-time Director of the Oriental Institute, Chicago, and his colleagues. They stressed that much of the speculative thought, the philosophy, of many ancient societies took the form of myth. A myth may be described as a narrative of significant past events with such relevance for the present that it needs to be re-told and sometimes re-enacted in dramatic or poetic form.

Mythic thought has its own logic. Most cultures have a story of the creation of the world (and human society), which accounts for many features in a single, simple narrative. The Old Testament story of the Creation is one example; the creation story of the Navajo American Indians is another. Thus we should explore oral traditions and written records – where these survive – to help understand the myths and hence the art of such societies. To understand Aztec art, for example, we need to know something of Quetzalcoatl, the plumed serpent, father and creator who brought humans all knowledge of the arts and sciences and is

A QUESTION OF STYLE

The concept of "style" has provoked much discussion among archaeologists and art historians. It is easy for a number of arguments to confuse the issue, and some clarifications are necessary.

Definition Style is *how you do something*. Most writers distinguish between the functional aspect (*what* you are doing) and the stylistic (*how* you are doing it). According to the art historian Ernst Gombrich: "Style is any distinctive and therefore recognizable way in which an act is performed or an artifact made."

Example If we look at any part of the world, we see artifacts made in a distinctive way. The pottery of Mimbres is different from that of the ancient Greeks. Decoration on early Chinese bronzes is different from that on Viking brooches, although both are highly elaborate.

Individual The word "style" derives from the Latin *stylus* (writing implement), referring initially to different styles of handwriting. This reminds us that the term originally referred to the style of the individual (see box pp. 414–15, Identifying Individual Artists in Ancient Greece). The paleographer, working with ancient manuscripts, readily recognizes the different "hands" of a number of scribes. Different hands have been identified in the archives of clay tablets at Knossos in Crete of 1300 BC and written in the Minoan Linear B script, and in comparable archives in the Near East.

Stylistic Area At the beginning of this century, geographers and anthropologists were preoccupied with the definition of stylistic areas in different parts of the globe. Here one is obviously not talking of individual styles but of shared ways of producing and decorating artifacts. A correlation was established between stylistic area and the area occupied by a given ethnic group. Several archaeologists in recent decades have different views:

James Sackett writes as an archaeologist viewing different assemblages of Paleolithic flint tools. He observes that there are longlasting traditions of style, what he terms "passive style," to be contrasted with active and intentional use.

Stephen Plog, in a study of pottery decoration in the American Southwest, has used a related view, where the degree of similarity in the pottery of neighboring areas is seen to be dependent on the degree of social interaction. Stylistic similarity is here dependent upon interaction.

Polly Wiessner undertook an ethnographic study of variation in projectile points among the San people of the Kalahari Desert. She distinguished between *assertive style*, which is personally based and carries information supporting individual identity, and *emblemic style*, which carries information about group affiliation.

Martin Wobst asserted that "much of what archaeologists label 'stylistic behavior' may be viewed as a strategy for information exchange." Using modern Yugoslavian peasant costume as his example, he showed how variations in dress can convey stylistic messages about status, age, and so forth. Wobst thus firmly links style with the process of information exchange. There is the danger here, however, of confusing the question of style with the whole matter of non-verbal communication effected by visual means. When Wobst speaks in this way, or when Wiessner gives as an example of emblemic style the use of a flag to convey identity, they are losing sight of the original meaning of the word. It is not appropriate to subsume all visual communication under the rubric of "style."

The other distinctions remain valid. It is pertinent to ask whether we are talking of (1) the style of an individual or of the group; or (2) of a consciously adopted mode of decoration (which may well be shared by an ethnic group), or an involuntary similarity brought about by interaction (cf. Plog), or by shared tradition (cf. Sackett).

The analysis by archaeologists of information contained in visual form in artifacts and on representations is still in its infancy. Prehistorians are much less practiced at this kind of study than are art historians and Classical archaeologists. There is much to learn.

represented by the morning and evening stars. Similarly, to understand the funerary art of ancient Egypt we have to comprehend Egyptian views of the underworld and creation myths. It is easy to dismiss myths as improbable stories. Instead, we should see them as embodying the accumulated wisdom of societies, in much the same way that all of us, whatever our beliefs, can respect the Old Testament of the Bible as embodying the wisdom of Israel over many centuries down to the late 1st millennium BC.

Aesthetic Questions

The most difficult theme to treat in the study of early art is in a way the most obvious: why is some of it so beautiful? Or, more correctly: why is some of it so beautiful to us?

We can be reasonably confident that many of the objects of display in imperishable and eye-catching materials, such as gold or jade, were attractive to their makers as they are attractive to us. But when it is not

so much a matter of material as of the way the material is handled, the analysis is less easy. One important criterion seems to be simplicity. Many of the works that we admire convey their impression with great economy of means. A near life-size head from the Cycladic Islands of Greece from around 2500 BC illustrates this point very well.

Another criterion seems to relate to the coherence of the stylistic convention used. The art of the American Northwest Coast is complex, but is susceptible of very coherent analysis, as Franz Boas, Bill Holm, Claude Lévi-Strauss, and others have shown.

Such questions have been extensively discussed, and will continue to be. They remind us in a useful way that in trying to understand the cognitive processes of these earlier craft workers and artists we are, at the same time, embarking on the necessary program of seeking to understand our own.

SUMMARY

In this chapter we have shown how archaeological evidence can be used systematically to provide insights into the way of thinking of cultures and civilizations long dead. Whether it be evidence for measurement, planning, means of organization and power, cult activity, or the whole field of artistic depiction – there are good archaeological procedures for analyzing and testing cognitive hypotheses about the past. An archaeological project may focus on one aspect of the way ancient people thought (for example, in the search for a possible unit of measurement, the megalithic yard), or it may be much broader (for example, the work at Chavín, which we looked at from the point of view of recognizing cult activity, but which in its way also touches on measurement, planning, symbols of power, and artistic depiction). The two fundamental points to remember are that methods of working need to be rigorous, and that while textual evidence may be of crucial importance in supporting or helping to assess cognitive claims – as in Mesoamerica or Mesopotamia – cognitive archaeology does not depend on literary sources for its validity.

FURTHER READING

The following provide an introduction to the study of the attitudes and beliefs of past societies:

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