From the very moment of first discovery of Paleolithic cave art, concern for its significance and the most appropriate techniques for its interpretation have caused great intellectual ruminations on the part of those scholars fascinated by mankind’s prehistoric past. The broad general lines of the principal speculations on the subject have been summarized, and their substance subjected to a critique as hard as it was overdue, by Peter Ucko and Andrée Rosenfeld in their work *Palaeolithic Cave Art* (1967). Possibly due to the rigor of its authors, the publication of this admirable little book brought with it unhappy consequences for cave art studies that they probably did not foresee and certainly could not have intended. For more than a decade after they demonstrated how inadequate, inconclusive, and sometimes even stupid were so many of the ideas of the pioneers in the field, new investigators seemed reluctant to advance into such dark and treacherous terrain. Consequently, the study of cave art seemed in danger of degenerating into a debate focused exclusively on the most concrete and superficial aspects of the material, or of falling into the hands of fantasy-ridden dilettantes.

Fortunately, fresh discoveries and the irrepressible enthusiasm of a few very fine scholars both young and old have now breathed new life into what recently looked like a moribund inquiry.
The degeneration of the field would have been tragic. First, cave art offers us information as unique as it is invaluable about aspects of the evolution of the natural environment, the ecology (in the broadest sense) of communities of the past, and the lifeways of our prehistoric ancestors and relatives, including details of their deepest emotions and beliefs. Comparable information is simply not provided by the study of tools and their attributes, or of contextual materials—sediments, pollen, fauna, etc.—nor by the shapes of buildings, nor by the most scrupulous study of numerical and spatial associations of excavated materials. It is the obligation ofprehistorians to renew their dedication to the extraction of all possible information from this inestimable source, and to elaborate new and sounder interpretive techniques in light of the critique presented by Ucko and Rosenfeld. That is especially urgent now that we know that the very existence of many of the precious monuments of prehistoric art is in imminent peril.

I personally don’t pretend to see the whole form of the new “science of cave art” that must be shaped. But I can see the indistinct edges of some promising tracks that have not yet been sufficiently explored, and I believe that they might lead a certain distance towards our goals. What is more, given the fact that so many old and well-traveled avenues have ended in the foggy nowhere, I don’t think that we can be blamed for exploring beyond the limits of traditional terrain. In trying to find one’s way out of a labyrinth, what is important is to follow a systematic search to its conclusion, no matter what the direction chosen. Naturally, if we see that a track is a blind alley, no matter how wide, attractive, and well-traveled it may be, we should abandon it and set out in a fresh direction.

In this chapter, it would be impossible for me to follow any research avenue to its conclusion. My aim is more modest. For the moment, I am simply going to indicate or re-indicate some directions that have so far not been proven unproductive. Perhaps some of them will lead to new perceptions of the truth about the lives of our prehistoric forebears. The ground to be covered is immense—too large for the small number of explorers now in the field—and I hope that these lines will stimulate my readers to undertake intensive research along some of the lines that I am about to sketch superficially.

### SOME DEFINITIONS

Before we begin our explorations, we need to know what it is that we are investigating. Here are a few (mostly borrowed) definitions and preliminary observations that may guide our quest. First of all, to me the word “art” bears no load of value, and rings no emotional bells. I like Arnheim’s (1971) definition of art (the graphic or plastic kinds) as “visual representation,” and much of what I must now write follows him closely. His definition excludes a great deal, but what it leaves us is nonetheless an immense field, for the phenomenon represented is never simply a part of the external surroundings or “environment”; it is always and at the same time an internal condition of the artist—a condition that is psychological, emotional, and intellectual (Croce tells us that art is “contemplated emotion”)—and always reflects the artist’s
training and position as participant in a cultural system and actor on a social stage. In fact, we might well say that the only reality that can be drawn, engraved, painted, modeled, or sculpted is an internal reality, since perception itself is, in the last analysis, a cerebral phenomenon.

Those comments also imply that no representation ever really replicates its subject. The only real replica of an object would be another exactly identical object. A painting of a horse is obviously not another identical horse, but its representation: the generalized structural equivalent of a horse in another medium. Now since the artist’s perception of the horse is really a brain state or complex of brain states, rather than a bit of external reality, and since a representation can never be a replica, there is no such thing as completely realistic art in any medium—that should be immediately evident from a comparison of a three-dimensional statue, a painting, and a drawing or engraving of the same object. The sculpture is really no more a true replica than the painting, but it is a representation with an added (third) dimension, while paintings, engravings, and drawings (and photographs as well) are two-dimensional, and the most “realistic” of them is much more limited an approach to realistic rendition than is (potentially) a sculpture. In this sense, all art is abstraction.

THE RELEVANCE OF CHILDREN’S ART

Analysts of children’s art have also provided important data bearing on our study. Some interpreters of prehistoric art have held that in art, phylogeny recapitulates ontogeny. They claim to have found in prehistoric art developmental stages that parallel the products of the child slowly learning to draw. Those claims are exaggerated. There are certainly forms and techniques in Paleolithic art with parallels in the products of modern children, but while on the one hand it is quite possible that some Paleolithic figures are the work of children, on the other the noted parallels are “universals” that are also present in the work of modern adults, including trained artists.

The sequence of developmental stages in the child’s acquisition of artistic ability is well summarized by Arnheim (1971). When the child begins to draw, it attempts to reproduce its brain states not just in the medium of pencil, crayon, paint, and paper employed, but also in the movements of its body, some of which seem to us adults totally unrelated to the external object that the child may tell us it is drawing. The first artistic products of children are scribbles. Later, gradually, these seemingly chaotic scribbles begin to take on form. Almost always the first shape produced is a roughly circular outline; the child uses this as a representation of anything whatever—a house, a flower, a person, an animal, etc. What the child apparently attempts to produce is an outline closed on itself that represents the “wholeness” of the object without any specific details, which at this stage of development are still considered unimportant. Thus, we may say that infantile art is “abstract” in the sense that its subjects are not highly differentiated, although as far as the child is concerned, what has been produced is a satisfactory and totally adequate representation of the subject.
As the child continues to develop, its representations become gradually more and more differentiated. One may with some justice claim that in the last analysis, the major difference between the art of a child and that of a Leonardo da Vinci is that the drawings of Leonardo are much better differentiated. On the other hand, it is also certain that any artist may deliberately choose to produce an undifferentiated representation, and may even intentionally reproduce patterns or forms that replicate the Gestalten they produced as young children. This is one direction chosen by artists such as Klee or Miró; though they claim to be influenced by the art of living “primitive” peoples, the child-like element in their work is self-evident. But another important factor in their art is the intentional reduction by the skilled adult artist of complex details, that he is quite capable of rendering, to vastly simpler form. Rhoda Kellogg, a leading authority in the field, suggests that artists of all times have probably drawn on motifs familiar to them from their artistic activities as children (1970: 208–45). What is more, there is reason to believe that certain simple linear or geometric patterns have a species-wide aesthetic appeal that is rooted in common perceptual processes that are not necessarily related to any attempt to produce recognizable depictions of the external world. As a consequence of these observations, any theory of art history that postulates that either abstract or “realistic” representations have inherently greater intrinsic artistic merit, or that the two must represent successive chronological stages in the prehistoric evolution of adult art, must simply be wrong.

These observations lead to a further comment. Some authorities have suggested that the so-called macaroni or superficially chaotic interwoven squiggles, that at times suggest the outlines of an animal figure, represent the most primitive or “infantile” stage in the evolution of art. In reality, these play with visual depiction in a sophisticated and subtle way that is probably far removed from the most rudimentary “original” art, whatever that may prove to be. The artist’s dominance of medium and the sophistication of the resulting visual “puzzles” of suggestive interlaced meanders are well beyond the capacity of the infantile psyche. It is one thing to select from a battery of other techniques that have already been mastered the use of scribbles to produce (and conceal) depictions, and quite another to scribble simply because that is all you know how or are able to do.

## ASPECTS OF ARTISTIC PRODUCTION:
### APPROACHES TO A STUDY

There are several directions from which the study of the documents of prehistoric art might fruitfully be approached. Let me briefly outline a few of them. For present purposes, the process of artistic production may be said to have four fundamental aspects, although the four are by no means always so different as my discussion will suggest, for in reality they are always found mixed and blended. In the first place, an artistic act requires an agent, the artist, whose consciousness in all its individuality inevitably influences his or her product, whether or not the artist was aware of or intended that to happen. In fact, consciousness is the result of the continuously developing activity of the brain in interaction with its environment. It is perfectly
legitimate to study Paleolithic art in this perspective, from the psychological point of view.

Most attempts at a psychological or psychoanalytic analysis of prehistoric art that I know of are unsatisfactory, and even ridiculous, though that need not be the case. They have two fundamental deficiencies. First, they are usually produced by authorities whose firsthand familiarity with the corpus of Paleolithic art is almost nonexistent. Works by specialists of the caliber of a Geidion, who knew many of the more important cave art sites well, are rare exceptions, and though I disagree with many of his interpretations, he was so familiar with the representations that his interpretations are not to be lightly dismissed. I have also found admirable passages in the work of Herbert Read and Anton Ehrenzweig and in that of Jung; though he himself was not a frequent visitor to the painted caves, his knowledge of the world’s art (including Paleolithic depictions) was extensive enough to give him an unparalleled basis for comparative discussion.

The second failing that has characterized such analyses stems from a widespread tendency among psychologists to think of things in strictly ethnocentric terms, and to apply analytical criteria devised to deal with the performance of members of one society across cultural boundaries, as though they were universally valid. Depictions that would suggest particular complexes or psychological problems if produced by a late twentieth-century European or American of European descent might well have no such meaning when produced by a member of a prehistoric hunting and foraging society. Kellogg (1970: 204) found one eight-year-old’s drawing suggestive of the work of a schizophrenic mind (to her credit she refrained from making that diagnosis without further information), and from a young American schoolchild, the imagery and detail in the figure are highly unusual. I suspect, however, that many European or American analysts might think the drawings of a perfectly normal Balinese eight-year-old, full of fierce beasts and threatening supernatural figures, all rendered in minute detail with surprising skill, show the same degree of imbalance. The Pygmies Turnbull studied in the Ituri forest are unused to seeing objects at any great distance. When taken from his native forest to the open savanna of Ishango, his informant Kenge could not believe that animals seen from afar are not really as tiny as they appear to be (Turnbull 1962: 249–60). Members of his society would be likely to confuse scale differences in art intended to show linear perspective with real differences in size. Members of other societies may pay more attention to the white background of a Rorschach card than to the colored blot. If contemporary societies exhibit such differences, and tolerate such widely divergent imagery that what would be normal in one indicates sickness in another, how much more caution is needed in interpreting the products of artists removed from us by an immense temporal gulf, that must coincide with an equally great cultural chasm.

There have been recent efforts to remedy these deficiencies. Dr. Gerard Neuman and his associates have had considerable success in bringing archeologists and experts in Paleolithic art together with authorities on children’s art, art therapists, practicing artists, psychologists, and psychoanalysts in joint working sessions and symposia sponsored by his Institute for Psychodynamics and the Origins of Mind. As I have
mentioned, valuable insights may be gleaned from the published work of the few psychologists and art analysts who managed to acquire a familiarity with the documents of prehistoric art, and were mindful of the effects of cultural difference on artistic performance, choice of media, and subject matter. Though I cannot claim to have the background to follow this track myself, it is to be hoped that others, better prepared, will continue to do so.

If the artist cannot escape his own individuality, no more can he really escape the conventions of his society and the constraints his culture places on symbols he uses in thought, behavior, and communication. We now know that even manifestations of madness are culturally patterned. Art is almost always produced to be “seen” by an audience, whether that audience is alive and tangible or aloof and supernatural. Its success depends on its suitability for and intelligibility to that audience. From a historical and sociological viewpoint, one may try to identify significant symbols, isolate recurrent associations, and trace their temporal development, in hopes that they will lead us to recognize cultural conventions, norms, values, and stylistic traditions in Paleolithic art. The well-known efforts of the Abbé Breuil, Anette Laming, André Leroi-Gourhan, Francisco Jordá, Antonio Beltrán, Herbert Kühn, and Eduardo Ripoll exemplify this direction of research, and as the findings of Alexander Marshack show, it is far from being a blind alley.

Since art is representation, it follows that something is represented, and much of the time its subject matter is drawn from observations of the artist’s surroundings. Consequently, we may legitimately approach the artistic product as a reflection of its subject matter. The study of art as a mirror of the artist’s surroundings is of the greatest interest to anthropologists and natural historians, paleobiologists, and others concerned with the evolution of nature. Through such studies, we have come to know a good deal about the physical appearance and something about the behavior of animal species that became extinct millennia ago.

Finally, the representations are made of some material, using a specific set of tools and techniques. The study of the material and technical aspects of art can also be very enlightening. The careful study of order of execution of drawn and engraved lines and distinct masses of color undertaken by Marshack for some Paleolithic figures is a good example of the utility of this line of investigation. Identifying pigments and tracing them to their sources can inform us about the limits of the territory utilized by a prehistoric population, or about the existence of networks of exchange between areas far removed from one another. The comparison of the pigments used in paintings on the walls of an inhabited site with the characteristics of coloring materials found in the site’s different occupation layers can provide useful information about the relative dating of the paintings and the occupations.

Eventually, it is even conceivable that some non-destructive means can be found to provide absolute dates for Paleolithic representations using the coloring material itself as datable material. The science of chronometry has made considerable progress in such directions in recent years.

In the rest of this chapter, I should like to discuss briefly each one of these four aspects of the study of Paleolithic cave art. The most logical direction for discussion
will be to proceed from the familiar and concrete to the abstract and unfamiliar. We begin by examining the decorations themselves from the standpoint of their techniques of realization and the interrelations between figures. This will be followed by a discussion of the art as a mirror on the outside world—a reflection of environments of the past. These are the aspects of our study with which the majority of readers will have most acquaintance.

**LOOKING IN THE MIRROR OF ANOTHER’S EYES**

But before proceeding, I must anticipate an obvious objection. If, as I have said, cave art shows us reality transformed by the perceptions and emotions of the individual artist and the beliefs of his or her social group, how can I pretend to understand its meaning? Didn’t our early ancestors perceive things much differently from ourselves? Weren’t the mental processes of Paleolithic peoples and their cultures and societies very different from our own? I admit that they were, in fact, different, but I believe that the available evidence indicates a degree of parallelism between the Upper Paleolithic artists and ourselves that justifies our cautious attempt to reconstruct aspects of the meaning of their art along general lines.

It is quite true that it would be dangerous to attempt to understand the art of beings whose perceptual processes were very different from our own. And, it is also true that other animal species cannot perceive the world as we do. Probably no one has made this point better than the pioneer ethologist Jakob von Uexkull did many years ago (1934). His germinal article opened the eyes of the world to the possibilities for interpreting the behavior of animals very different from human beings.

The basic point von Uexkull made is that a single environment is several different “worlds” as it is perceived by animals as different from each other as a fly, a snail, a dog, or a man. To illustrate, let me summarize an extreme example, von Uexkull’s comparison of the perceived environments or Umwelten of a fly and a human. Though it may seem frivolous, its implications are really quite important.

For the human, the inside of a living room offers several surfaces upon which he can walk, sit, or lie, but all are located within a few feet of the floor, all are parallel to the earth’s surface, and almost always all are below his standing eye level. He sees these surfaces and their edges in sharp focus, in three dimensions, and, if they are colored, in a wide range of colors. The floor has a particular significance for the man that is not shared by the walls and ceiling which he cannot walk upon.

To the fly, the same room, even if devoid of furniture, is a completely different world. In the first place, the empty room has six surfaces on which it can walk or rest, not one. In the second place, the fly does not see its surroundings as we do. Its compound eyes permit it to discern what must be less focused, more generalized contrasting blobs or splotches, rather than the sharper forms the human eye distinguishes. The fly’s eye is sensitive to a narrower band of colors than ours, and it does not permit stereoscopic vision. Another significant point is that those aspects of the room which mean one thing to a man. Such as a piece of rotting meat on the ground, have entirely different meaning for the fly. If a fly could paint what it
Meanders on the Byways of paleolithic art

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Naturally, our earlier ancestors, members of other hominid species, were not as different from us as are flies. Nevertheless, their skeletal structure, their cranial capacities, and the shapes of their endocranial casts all strongly suggest that their cerebral development was quite different from our own. There are good reasons to suspect that had they produced cave art it would have been unintelligible to us. This suspicion is strengthened by the observation that chimpanzees, our rather close anthropoid relatives, who can be taught to use fingerpaints and even to communicate with us and with other chimps using rudimentary nonauditory language symbols, have never produced any recognizable artistic depiction, though they do occasionally produce rudimentarily organized and apparently non-representational paintings that we may find aesthetically pleasant.

But, the converse of these observations is also true. Upper Paleolithic people were anatomically identical to living humans. Their anatomy, stature, cranial capacity, and apparently even their cerebral organization (so far as can be judged from endocasts) were just like our own, as far as we can tell. The fact that they produced tools, structures, and burials that we can analyze and understand, and even more important, the very fact that they produced recognizable artistic depictions of animals and other subjects in understandable patterns, indicates as surely as any evidence could that their mental processes and behavior were potentially as complex as those of living humans, and that their processes of perception may be considered for present purposes to be identical to our own. Whatever differences there may be between us are differences of degree, not kind. The very existence of recognizable figures and patterns in Paleolithic art is in itself a guarantee of the legitimacy of our attempt, based on the assumption of a considerable degree of continuity between the perceptual apparatus and mental faculties of the cave artists and ourselves, to analyze that art and seek to find its meanings. Theoretically, at least, major aspects of the meaning of the prehistoric representations and their organization should be accessible to us.

The same cannot be said with such certainty about the products of earlier hominids. We do not in fact know when in the trajectory of hominid evolution our relatives first were able to utilize perceptions and brain states that foreshadowed in complexity those of modern humans. It is entirely possible that some Neandertals, or even earlier hominids, had these capacities and exercised them at least occasionally. But if so, there is precious little evidence (one could say virtually none prior to the Neandertals) of the corresponding behavior in the archeological record. Perhaps our earlier ancestors demonstrated such complexities in the recitation of myths or epic poems, or in song, none of which would have left durable evidence for the archeologist. But for the moment we are best advised to avoid imputing modern motives, emotions, and feelings to Australopithecus and early forms of the genus Homo, relying instead on research techniques analogous to those used by ethologists working with other animals: we should restrict our interpretations to the limited durable evidence for past behavior recovered from early sites by excavation. In those cases, we do not
have the advantage of a corpus of contemporary art as supplementary evidence for behavioral complexity or as an indication that our interpretations might legitimately range further afield.

In contrast, Upper Paleolithic peoples, despite the temporal distance that separates us and the modal gulf that must separate their socio-cultural systems from our own, have revealed themselves, particularly through their art, to be our very close relatives, rivaling us in their capacity for complex cultural behavior. The cave painters have not hidden their world from us. Instead, they have translated the reality of their environments into terms that, in appreciable part, we should be able to understand.

On the other hand, the interpretation of Paleolithic art is by no means easy. The world reflected in the decorations seems strange to us, and penetrating its mysteries, even in their most general outlines, is not a simple task. The careless or untrained observer will have little success in producing adequate reconstructions of past environments from the works of art produced by prehistoric people. The study of Paleolithic art requires caution, scrupulous attention to detail, and thorough preparation.

THE STUDY OF CAVE ART: THE DESCRIPTIVE/CLASSIFICATORY PHASE

The requisite first step of any study is to find the representations themselves and examine them as carefully as possible. It is essential to produce an exact description of each figure, including its measurements and orientation, to describe the different stages involved in its rendition in order and the techniques utilized at each stage, to detect later secondary additions or alterations that may have changed its significance, to determine its precise position in any series of superimpositions, to define its place within any composition and the exact placement of the figure in the topography of its cave or shelter, and finally, to describe its associations with other representations in the site.

The depictions in any decorated site must be studied in their total physical, topographic, and artistic context. This necessarily means that a precise map must be made of the site and all its galleries, and the location of each figure noted in its proper position on the plan. As Leroi-Gourhan (1971: 82) has observed, one of the enormous advantages of the study of cave art is that the depictions are found exactly where they were executed, and where they were intended to remain and be seen; that substantially enhances the potential of studies of the relationships and associations of the figures among themselves, and between them and the rest of their surroundings.

A study of the site itself may prove highly informative. It is essential that the situation, size, relative and absolute elevation, and orientation of the galleries and of the cave mouth, or the direction of exposure of the rock face, in the case of a shelter, all be noted. In the same way, it is necessary to situate the site in the modern topography, and to determine its position in the reconstructed topographic and environmental setting of the period when its decorations were produced. The elevation of
the cave over the floor of the valley in which it is situated may indicate when it was formed and became available for human habitation. The orientation of the shelter or cave mouth with respect to the prevailing winds and the direction of the sun at different times of year may help determine whether or not its occupation is likely to have had a seasonal aspect. Its relationship to the present and prehistoric landscapes may provide indirect data about the reasons for which the site was selected for occupation and about the environmental resources available to its occupants. If the age of the site and its decorations can be determined within acceptable limits, it could prove possible to relate it to other more or less contemporary sites, with or without cave art, in the region. All of these kinds of information will help us reconstruct prehistoric systems of subsistence and settlement, and lead us to a better understanding of the position and function of decorated sites in such systems.

THE PRIMARY EVIDENCE

We now know enough about cave art to recognize that its depictions can be divided into several classes, based on subject matter and on technique of rendition. In the first place, there are those signs that can only be called enigmatic scribbles. Next, there are single lines, small irregular groups of lines, dots, and alignments of dots. There are also more or less regular geometric figures composed of arrangements of lines or dots that are generally unintelligible, though they can be subdivided into types called claviforms, tectiforms, scutiforms, etc. Occasionally, some of these figures can be further interpreted with some probability of success. This is the case, for example, for some of the depictions in the cave of Tito Bustillo in Asturias, that seem to represent vulvas (de Balbín and Moure 1981). It is also the case for signs that seem to represent darts, arrows, or other weapons, noted with some frequency at Castillo, Altamira, and many other decorated sites. Some of these are interpreted as throwing-sticks, analogous to ethnographically known specimens. There is also some similarity between certain linear geometrics from Castillo and “valve traps” recovered from Mesolithic contexts in Northern Europe. Nevertheless, such similarities, while striking, are by no means completely conclusive: there may be alternative interpretations (some “darts” could equally well represent “plants”) that cannot be negated, and for that reason we must admit that we do not know with certainty, and perhaps we shall never know, what kind of material object, if any, they were intended to represent.

Some such figures may allude to real objects from the cultural or natural environment, but others, as I shall explain later, might just as well be sketches of fantastic visual forms that proceed directly from the brain or the eye. Some “signs,” such as the series of red disks that line some of Castillo’s walls, may simply have been intended to mark a trail to be followed through the cave.

Representations of human hands in positive or negative are another well-known class of Paleolithic depictions. The fact that some of them, especially in French sites, appear to be mutilated, has brought them considerable attention. Janssens, for example, dedicated an article (1957) to the medical implications of these apparent mu-
tilations. In other respects, they have received less attention than they should have. These figures must be carefully measured to determine the range and modes of variations in size. This can potentially tell us if the hands represented are the same in size as those of modern adults, or if they may include tracings of the hands of children as well. Bimodality in the size distribution of depictions of adult hands can show that hands of both sexes are represented. A still unpublished master’s thesis taking these factors into account was completed by Christina Peterson in 1984. Her study of the sizes and finger proportions of hand depictions at Castillo suggests that there, while hands of both sexes are represented, women’s hands predominate.

Depictions of humans (“anthropomorphs”) are not common in any Paleolithic art, and when they exist, such figures are stylistically deformed in most cases. Sometimes, as in the case of the recently discovered figures from the Cueva de Hoz, they seem to wear clothing or more unusual accessories, whose study might tell us a great deal about dress and adornment. The distortion of facial features in the majority of cases (perhaps the portable plaques from la Marche are the least distorted examples) makes the anthropomorphs practically useless for studies of physical morphology.

Depictions of other animals are the most frequent representations drawn from the external world. Paleolithic artists were keen observers of nature, and sensitive to details of animal morphology and behavior whose significance often escapes the city-bred archeologists who have had little opportunity and less need to reflect on wild creatures and their ways.

The correct interpretation of animal figures in cave art was probably an easy, almost automatic task to any prehistoric hunter. For a prehistorian raised in an urban setting, attaining the necessary expertise demands much hard work, including a great deal of reading, and, even more important, as much knowledge gleaned by firsthand observation of the species represented as can be acquired. Most prehistorians, even those most interested in cave art, lack that preparation, and consequently their analyses are sometimes surprisingly naïve. I don’t pretend that my own command of such subject matter is perfect—far from it. However, in some cases, even a little learning combined with careful observation and common sense can lead one to see where previous studies are lacking, and how those failures should be remedied in future.

The first and most fundamental problem presented by the study of animal figures is the correct identification of the exact species represented. A biological species is a genetic isolate. Its members cannot, will not, or, in their wild state, would never have the opportunity to interbreed with the members of any other species. For obvious reasons, this definition is not directly useful in studying cave paintings, but fortunately, as a consequence of genetic isolation, each species in a region is distinctive, and has a number of definite discrete morphological characteristics that, in the case of the large mammals of Europe, serve to differentiate it, even when examination is relatively cursory, from any other contemporary species in the same region. However, unless species-specific characteristics are unequivocally indicated in a representation, specific identification of the intended animal is impossible. No
identification that is not based on those characteristics is reliable. Identifications of unusual species that are rarely represented, that are not based on unequivocal morphological characters, are especially suspect.

From time to time, animals that must have been rare in northern Spain, or whose presence in the region is surprising, have been identified from drawings, paintings, or engravings in Cantabrian caves. For example, Gómez Tabanera (1975: 28–29) has claimed that an engraved figure (Fig. 11.1) from San Román de Candamo in Asturias represents a musk ox (*Ovibos moschatus*). Debate about the accuracy of this identification still goes on, but is quite unnecessary. These animals are at present restricted in range to the arctic tundra. A few undeniable depictions of the species have been found in French sites, as have occasional bones of these creatures. No musk ox bones have been reported from any Cantabrian Paleolithic site. Therefore, any representation of a musk ox in Cantabrian cave art would be unexpected. We should insist that the engraving clearly show the species diagnostics of musk oxen before accepting the identification.

According to Van den Brink and Barruel (1971: 172–73, plate 20), the diagnostic characters of *Ovibos moschatus* include a peculiar form of flattened horns that sweep downwards across the forehead toward the eyes, then turn up and to the sides for a short distance, ending in sharp points. The animals’ long, shaggy coats hang to their feet. The carpal region of the forelegs is very thick. Not one of those features is present in the San Román engraving, which shows the typical body build, head and
horn shape, limb structure, and beard of the European bison, a species frequently represented by drawings and skeletal remains in Cantabrian Paleolithic sites. There is no reason for continued debate about the San Román engraving. An identification of the figure as a musk ox cannot be reasonably sustained.

It is important to note that most species undergo characteristic seasonal changes in hair distribution, coat color and thickness, and body weight. Among deer, the males (in reindeer, the females as well) seasonally shed and regrow their antlers. The analyst must recognize these seasonal growth characteristics as such so that they will not be overvalued in classification.

Seasonal changes in coat pattern of *Equus caballus przewalskii* were studied by V. Mazak (1961), who provides a series of drawings that are most useful in analyzing depictions of horses. Similar work should be done for other species. Judging from Mazak’s data, it seems probable that several of the horses from Lascaux, le Portel, Niaux, and las Monedas are shedding their coats. Ignacio Barandiarán gives a useful summary of this and other studies of coat pattern in an article published in *Santander Symposium* (1972).

Some authors have attempted to carry the study of depictions of animals in Paleolithic art still further, proposing subspecific distinctions based on the color and shape of markings on the coat (Blanchard 1964). This is particularly problematic. Since subspecies are only partial genetic isolates, there is always enough intergradation between different subspecies of a single species to make their consistent differentiation impossible among living animals. The only possible approach to the differentiation of subspecies from representations must use significant biometric measurements, although in many sites what are probably stylistic conventions may easily be confused with important similarities and differences of this sort, leading to erroneous conclusions. Madariaga (1963, 1969) and, later, Lión (1971) have applied biometry to Paleolithic art with suggestive results. When specific identifications are attempted, it is even more important that one not confuse stylistic conventions, or depictions of transitory and seasonal changes in pelage, or characteristics that more properly indicate the age, sex, or condition of the animals, with attributes that may have real genetic significance.

There can be no archeology worthy of the name without systematic and exact classification. The same may be said of the study of Paleolithic art. In the absence of correct classification, the study of animal figures in cave art can lead nowhere. The exact identification of the animals represented (to the level of the species wherever possible), and the correct recognition of characteristics that reflect differences in age and sex, are the indispensable prelude to any further study.

### PALEOLITHIC ART AS A REFLECTION OF THE EXTERNAL WORLD: LEVELS OF STUDY

The study of animal figures on cave walls can be pursued with varying degrees of thoroughness. It must be understood that I believe that such studies should always be carried out as thoroughly as possible, within the limits of the time and human
resources available. But some concrete information of value can be obtained even at the more superficial levels. A rapid and provisional pilot study may prove highly informative.

Such studies are those undertaken within the first weeks of the discovery of a decorated cave, as a prelude or accompaniment to a more thorough and detailed investigation. The simplest such study is the identification of all the recognizable animals depicted and the production of a list of all the species represented. It may be possible to get an idea of the approximate age of the depictions from the extinct species that appear on the list. Since different species have different habitat preferences or climatic tolerances, such a list more often provides some information about the general climatic conditions that obtained when the figures were produced. Of course, a list that indiscriminately includes figures produced at different times can easily be misleading, but paradoxical inclusions often betray such mixed assemblages.

The next higher level of analysis is the separation of the animals into different groups, based on their different location in the cave, and the techniques used to realize them. In one gallery, all the engraved animals might be reindeer, and all the painted animals red deer. These two species prefer different habitats. From such information, it should at least sometimes be possible to conclude that the figures produced by one technique or found in one particular part of the cave indicate different environmental conditions than those in another medium or gallery. Where the differences indicate a marked climatic change, it suggests that a long time elapsed between the production of one series and another. When such information can be combined with the study of superimposed figures, it may be possible to derive a relative chronology of groups, techniques, or styles. This sort of study occupied a great part of the time of the Abbé Henri Breuil and other pioneers in the investigation of Paleolithic art.

In some cases, it will be possible to recognize true compositions, made up of several animals. Although it is frequently said that there are no true multifigure compositions in Paleolithic art, that affirmation does not correspond to the facts, as is abundantly proven by the recent work of Moure, Apellániz, and many others including the author. A composition is, after all, only an intentional, systematic arrangement of figures with respect to each other or to some preferential orientation or external feature. As examples of some less familiar kinds of composition, we may cite parallel alignments of figures, their disposition circumferential to or peripheral to the decorated space, and “organic” arrangements in which some particular figure or characteristic of the decoration (for example, the drawing of a river, or canal, or a central figure) is the focal point to which all the other depictions are oriented. A particular arrangement may be repeated several times in a larger composition. The figures may also be placed with reference to natural irregularities on the decorated surface. Although a disposition of this kind is partially constrained by the nature of the surface, there is no doubt that in many cases, such as that of the animals on the ceiling of the Great Hall at Altamira, the figures form a composition in the fullest sense of the word. There are also other more familiar compositions, eminently realistic in character, that reflect scenes taken from observations of the real-life be-
havior of the animals. That is the case, for example, for the well-known line of hinds at Covalanas, all following their leader, who is herself depicted looking backward vigilantly past the file.

Once different compositions have been recognized, the figures in each should be compared in the same way as the figures executed in different techniques, or found in different galleries. In addition to all the information mentioned above, these comparisons may reflect the different kinds of habitats represented in a region, social groupings of animals, and significant interspecific associations. Such associations have been given special attention by A. Leroi-Gourhan (1965, 1971) and A. Laming-Emperaire (1972) among others.

At this point, it is essential for the analyst to know that certain species frequently travel together in the wild. An obvious example is the association of predators and prey. It is quite usual to find a pack of wolves on the outskirts of a herd of bison or reindeer, and their presence does not panic the herd or disturb it in any way (Haines 1960: 24); on the other hand, there are also associations between herbivores. Roe deer and red deer are "companionate" species one often sees in each other's company (Laurent 1974: 29, 47; Sire 1968: 152). Other species are mutually repulsive, each fleeing the presence of the other: examples are bison and aurochs, or chamois and reindeer (Hediger 1964: 152). The coincidence of mutually intolerant species in a composition is probably more a symbolic statement than a reflection of an ordinary real-life situation.

### DRAWING ON EXTERNAL DATA: ETHOLOGY, ECOLOGY, OCCUPATION RESIDUES

As study progresses, more elaborate questions are asked of quantified data. First, from counts of figures, one calculates the proportional abundance of individuals from different species in each locality, medium, style, or composition (or in the site as a whole if there is some guarantee that all its figures were produced at the same time or over a very short period). The results are some indication of the relative importance of the different species in the minds of the artists, though they themselves were under no obligation to reproduce faithfully the real environmental situation in the vicinity of the site. On the other hand, the possibility that the artist might have given a reasonably accurate indication of the representation of species and habitats in the neighborhood of the site is worth investigation. This approach has been taken by González Echegaray in his study of the cave of las Chimeneas (1963, 1974) and by Ripoll in the cave of las Monedas (1972). I personally find these attempts among the most interesting and promising modern studies of Palaeolithic art.

In some cases (perhaps more than one thinks), remains of probably contemporary human occupations have been found in near proximity to representations in a decorated site. That is the case at Altamira, Lascaux, Pair-non-Pair, Marsoulas, Ekain, and Hornos de la Peña, to mention only a few sites. Tito Bustillo, excavated by Moure Romanillo, is another very clear case. The comparison of pooled graphic data from many decorated caves with pooled excavated data from many other Upper
Paleolithic sites suggested to Leroi-Gourhan and others that the animals of most economic importance to prehistoric humans are not the species most frequently depicted. However, his conclusions in this respect are debatable. The samples he used are not comparable (occupation horizons have not been recognized in most painted caves) and the data should not have been pooled, but rather compared on a site-by-site basis, using only those caves with both well-excavated faunal assemblages and animal figures. The studies of excavated data Leroi-Gourhan used are mostly early and unreliable. Where occupation layers were recognized in painted caves, they were sometimes summarily studied, well before prehistorians were aware of the importance of a careful examination of faunal remains. What is more, the art was “dated” stylistically, and one suspects that often occupations that were really contemporary with them were dismissed as irrelevant because they were wrongly considered to be older or younger than the decorations on totally a priori grounds.

A careful comparison of decorations and excavated data from the same sites is always called for. There might be sufficient evidence in contemporary occupation residues to permit a relatively detailed reconstruction of the local environment and to identify the habitats or fauna locally available as resources. To mention just one recent study, our excavations of the Magdalenian level at Altamira already suggest that there may not be much difference between the proportions of different large mammals shown in the depictions and represented by excavated food debris, after all. The comparison of excavated faunas with animal depictions from the same site should indicate whether there is any marked difference in proportions of species represented and those expectable in the neighborhood of the cave; marked discrepancies might indicate that the artists were disproportionately concerned with particular animals, a factor that becomes even more noteworthy when the animals in question are either rare or only found at a great distance.

Such a study might additionally provide an approximate idea of the “mental maps” of those species and habitats that were important in the symbolic domain of artistic thought. While geographers have dedicated a good deal of time to the study of mental maps (Gould and White 1974; Ittelson 1973), as far as I am aware, investigators of prehistoric art have paid them all too little attention to date. Keeping in mind that every species is not equally easy to hunt with the same technological equipment and the same interpersonal organization of the hunters, the disproportionate representation of particular species might also provide important information on hunting methods and the organization of hunting groups. However, this kind of information is more readily obtained at the next stage of analysis.

I mentioned earlier that certain morphological characteristics of animals change over time according to regular and often cyclic patterns. For example, in summer, the pelage of the red deer stag is reddish, with spots over the flanks. In winter, it becomes gray, long, and shaggy. In September and October, the males have a mass of long hair extending from the neck to the chest. Hinds are antlerless, but males have deciduous antlers that begin to grow in spring. By the end of June or early July the antlers are completely developed, but still covered by a layer of very sensitive skin, permeated by a multitude of blood vessels—the so-called velvet. By end of
July or early August, the velvet peels away from the antlers, at first hanging in rags over the face, then finally falling away completely. The antlers themselves are shed in February or March and the cycle begins anew. Naturally, a careful examination of depictions of red deer stags might reveal some of those characteristics, permitting a precise estimate of the season of the year depicted. Analogous changes take place in other species at different times of the year, and for that reason a detailed study of such features for all depicted species can potentially provide a sort of “calendar” of the seasons chosen for representation in a site, gallery, style, or composition. González Echegaray (1974) and Barandiarán have used this kind of information in the study of Paleolithic art.

While the spectrum of movements and postures among humans is very broad and culturally conditioned, that is not the case for other animals. Each other species has a relatively limited range of “instinctive” customary behaviors and body attitudes that indicate the physical and emotional state of the animals. Those postures are absolutely characteristic of a particular species, and are shared by all its normal members. Among the most noticeable of these are the behavior patterns that accompany the breeding season. It seems inevitable that these stereotypical postures must frequently have caught the particular attention of the Paleolithic artists. That is in fact borne out by the depictions. The reasons are not far to seek. In the first place, such careful observers of nature were probably well aware from the behavior of the animals that certain stereotyped behaviors were related to reproductive activity, and it seems likely that they were able to make the connection between breeding and the “regeneration” of hunted resources. In the second place, during the rut, many animals lose their usual shyness and become highly visible in their surroundings. Wherever possible, red deer, for example, normally retire after an early morning feeding to the shade and shelter of heavy brush or dense woods, where they remain resting and inactive (and thus relatively well hidden) during most of the day. Aside from sporadic gentle and unobtrusive calls of hinds or the low bleating of young fawns, deer remain as silent as possible. However, during the September/October rutting season, the males engage in a ceaseless roundup of hinds for their harems. As part of their search, at all hours of the day or night, they emit a jarring and characteristic call (“belling”). Often, a stag lying at rest in the heat of the day will bell repeatedly without getting up. When the animal is up and about, he assumes a characteristic posture as he bells, with neck outstretched, head lifted, and wide open mouth (Laurent 1974: 10–20; Hainard 1949: 132–36).

This characteristic posture can be observed in Paleolithic representations, such as that of a stag from San Román (Fig. 11.2). More often than not, it is erroneously interpreted as a wounded stag bellowing in his death agony. Contrary to widespread opinion, wounded deer are usually silent. While an exhausted deer may pant hoarsely, and in flight may break underbrush audibly, neither I nor any hunters of my acquaintance have ever heard a wounded stag cry out or bellow. When such depictions are seen in Paleolithic art, then, what is represented is an animal in the thrall of passion, not of death. Where, as happens at San Román and elsewhere, the depiction seems to show a spear transfixing the animal, the artist probably intended
to suggest that its belling has attracted a hunter to a careless prey, rather than that the
hunter’s lance has caused an agonized cry.

And that is another reason why the rutting season is a period of particular im-
portance to hunters. In all mammalian species, including our own, males in pur-
suit of females lose whatever reserve and common sense they have, and behave like
idiots in the heat of lust. During the rut, red deer will allow hunters to approach
them much more closely than at other times, and that makes them far easier to kill
(Hainard 1949: 134; Laurent 1974: 13). Many other mammals also lose their fear of
natural enemies during the breeding season.

The information derived from a study of the condition and attitudes of animal
figures can thus tell us a great deal about the season of the year that the artist wished
to depict. Obviously, that need not have been the season during which the site was
occupied and painted, since the painter could have worked from memory. But, if all
the animal representations in a site are indicative of the same season of the year, the
hypothesis that the paintings were produced during that season naturally suggests
itself as a plausible explanation. However, other evidence, such as the nature and lo-
cation of the site (whether on the coast or in high mountains, etc.), or the nature of

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure112.png}
\caption{Belling stag from San Román (after Hernández Pacheco 1919)}
\end{figure}
sediments, flora, and fauna from contemporary levels of human occupation debris in the site, is needed before the hypothesis may be evaluated.

In the next chapters, I shall show how a careful reexamination of the polychrome figures on the great ceiling at Altamira, along the lines indicated above, revealed aspects of their meaning that had not previously been suspected—that in fact almost all the figures depict a herd of bison during the rutting season. This theme is pervasive at Altamira, recurring in figures executed in different styles and techniques, and occurring in other galleries. Its repetition suggests that seasonality and reproduction were a focal concern of the artists, and that in turn leads us to consider the possibility that the human occupation of Altamira may have been seasonal, or even that Altamira might have been the scene of seasonal and cyclic rites related to the reproduction of primary natural resources that would have taken place at the end of the summer.

To strengthen such an interpretation would require as a first step that new data bearing on environmental conditions during the utilization of the site be gathered from the occupation layers. While excavated data might tend to make the interpretation more plausible, I cannot pretend that it would “test” a hypothesis about site function and seasonality. Even if the excavated environmental data gave a perfect indication that the site was inhabited at another season, or the whole year round, it would be possible to argue that the decorations were only produced during the late summer. Nonetheless, when it became possible to excavate the Altamira Magdalenian level in the early 1980s, we were especially attentive to the potentially informative relationship of “environmental” data from the midden to the decorations in the cave. At the moment, some of the evidence from the excavation has been analyzed, and tends to make the inference that the decorations depict the principal period of accumulation of the Magdalenian occupation debris somewhat more credible.

This brief resume and the studies to follow will, I hope, persuade the reader of the importance of a careful and minute study of decorated sites and the depictions preserved in them. From the study of art as a mirror of the external world, it is possible to gather information that is absolutely fundamental to any attempt to reconstruct the lifeways of our prehistoric forebears, and their adaptations to the environments in which they played out their lives. My choice of Altamira as an exemplary site for restudy was not fortuitous, though I did not foresee that I would actually be invited to participate so intensively in that restudy when it took place. Altamira quickly became the major thrust of my own research in Paleolithic art for three reasons: first, I believe that it is still in immediate danger of destruction; second, it was the first decorated Paleolithic cave recognized as such, and for that reason as well as the intrinsic quality of its art it is still one of the most famous Paleolithic caves, so that news of a demonstration of valuable new approaches to the study of its art would spread quickly to the profession and the concerned public; third, familiarity with parts of the site already indicated that there was a great deal that could still be learned. It made an ideal setting for the demonstration of just how much remains to be understood about even the most famous, best known, and most “completely” studied Paleolithic decorated caves. The fact that an Altamira, which has already
been subjected to detailed investigation by generations of the finest and most expert minds in the field, can still yield so much when approached with open eyes and new questions, means that almost everything about Paleolithic art is still to be learned. We have discovered a previously obscured avenue to the study of the lifeways of the past, and found it to be wide and promising.

ART AS A REFLECTION OF AN INTERNAL REALITY

Nevertheless, this is not the only avenue that we must explore. Studied simply as a mirror on the artist’s surroundings, Paleolithic art could only provide a distorted glimpse of the past. It is also important that we examine the art as a reflection of the “interior” world of the artist’s own psyche, and that we try to find in art’s mirror glimpses of the society to which the artist belonged.

I must begin that examination with some brief remarks about the nature of the organization of the human brain, and the psychological processes involved in perception, as far as I am able to understand them (and I must admit that my knowledge in these fields is neither profound nor original). As prehistorians, we are most familiar with the concrete evidence for past human behavior that has survived in archeological deposits, or in the form of the depictions on the walls of caves and shelters. We are more than a little uneasy when faced with the speculations of those psychologists who deal with less tangible phenomena. We feel, with some justification, that any valid interpretation of Paleolithic art must always be based on solid empirical evidence of the artistic process: the paintings, engravings, reliefs, and sculptures realized by prehistoric artists. Those are the only primary documents available to us, and we cannot permit ourselves to engage in speculations that stray far from them. Nevertheless, it is clear that there are other relevant data at our disposition, proceeding from the study of the human psyche, and we are not only well advised but obliged to take these data into consideration to the degree possible and consonant with our aims and responsibilities as scientists.

It might seem at first glance that the human conscious is a nebulous, almost mystical field whose study is uncertain and has little direct bearing on the understanding of Paleolithic art. But that is not entirely true. Aspects of this study are as empirically solid and trustworthy as the cave paintings themselves. In fact, the findings of psychology actually set certain limits to our interpretation of the figures, and restrain the uncontrolled flights of pure fantasy that at times have characterized the work of some interpreters of Paleolithic art. Psychological data derived from living people and other animals illuminate subjects as different as the relationship between art and language, the origins of abstract art (as we have already observed), and many other dimensions of the meaning of cave art.

In agreement with other paleoanthropologists, I think that the authors of practically all cave art belonged as we do to the biological subspecies Homo sapiens sapiens. This is the subspecies to which all of the fossil humans of the latest Pleistocene should be referred, although they have commonly been assigned to different “races,” with names such as Cro-Magnon, Chancelade, Combe-Capelle, Grimaldi, etc. There is no
reason to believe that the nervous systems and cerebral organization of these humans were significantly different from our own (see, for example, the work of Kochetkova [1978 and elsewhere]). Consequently, any attempt to understand Paleolithic art from a psychological viewpoint may and should use data obtained from the study of modern humans.

THE PROCESS OF PERCEPTION AND GEOMETRIC FORMS IN ART

There are many excellent studies of visual perception among vertebrates. The retina of the primate (including human) eye contains very large numbers of light-sensitive cells, whose function is the reception and "classification" of visual data. It seems that this retinal classification is quite simple, inasmuch as different groups of cells only respond to differences of light intensity oriented in specific ways or contrasts that move in particular directions across the visual field. Some cells only discharge their electrical impulses when presented with a vertical contrast, others are sensitive to horizontal gradations of light intensity, others to moving contrasts that form right angles, and so on. While a particular kind of contrast stimulates one group of receptors, at the same time it inhibits the activity of other groups. The total number of different kinds of photoreceptors seems to be relatively limited (Gregory 1966; Rose 1976).

The information organized by the retinal photoreceptors is transmitted to specific zones in the cerebral cortex, where cells responsible for the processing of information from determined parts of the retina are all situated in columns perpendicular to the cortical surface. It seems to be the case that within any column, there are vertically arranged sets of cells all of which are responsible for the analysis of data of the same kind, with neighboring sets processing different kinds of data. So, stimulating adjacent groups of columns by whatever means produces the visual impression of patches of flashing spots, sometimes arranged in a geometric network, sometimes in movement, situated in a particular part of the visual field. Even without the intervention of the eyes, these effects will be produced. This is the explanation of visual patterns, called "phosphenes," produced during attacks of migraine, or fever, or by overindulgence in alcohol, ingestion of drugs, or blows to the head. Pressure on the eyeball may also produce apparent "visions" of spots and patterns of light (Fischer 1975; Harner 1973; Horowitz 1975; Klüver 1966).

Since the retinal photoreceptors lie at the back of the eye, the light that stimulated them must first travel the distance that separates the crystalline from the receptors. In this intervening space, there is an important network of blood vessels, and the intraocular space is also filled with fluid that often contains local concentrations of material of greater density than the surrounding medium. The outer surface of the eyeball is constantly bombarded with tiny dust particles while the eyes are open, and must be continually bathed by lachrymal fluid to prevent dust buildup and irritation. Normally, we are not aware of the existence of dust particles, "floaters," or the network of blood vessels in the eye, but under certain light conditions they may become visible and bothersome or frightening.
These observations have considerable relevance to the study of art. I have previously said that art is representation, and that sometimes what is represented is the external environment—the world outside the artist. Sometimes, however, what is represented is inside the artist.

Some authors have claimed that such geometric forms as “tectiforms,” “scutiforms,” and “claviforms,” that appear with some frequency in Paleolithic representations, have no counterpart in nature. For that reason (they go on) such depictions must necessarily represent artifacts made by prehistoric people, such as traps, huts, boats, or other built objects. It seems to me that we need not necessarily seek models for these representations outside the eye and brain of the biological organism that produced them. Complex and regular geometric forms do exist in nature, and can appear to us in our dreams, or even when we are wide awake, sometimes in striking fashion, provoked by stimuli that are always with us. I don’t mean to suggest that all geometric figures in cave art need necessarily have this origin—such a suggestion would be an abuse of the evidence—but I do insist that the a priori opinion of some authors that all such images are modeled on real artificial structures familiar to the artist is just as dubious, and is especially dangerous if it leads to analyses of postulated “cultural features” or if it comes associated with the idea that geometric art represents a developmental stage later than “realistic” representations of animals.

[Box: Lateralization, Art, and Language]

Another fundamental question concerns the relationship between Paleolithic art and language. Some specialists have always tended to see the two as related. Marshack (1976) is one of the authors who has dwelt on such an interpretation, suggesting that certain kinds of depictions reflect the beginnings of articulate speech. If that were so, it would be extremely important, since there is no other direct evidence of spoken language before true writing appears. Other authorities have proposed that Paleolithic art might be the root of written language, and consequently suggest that the designation “proto-writing” be given to some Paleolithic signs. Of course, one has to admit that the Paleolithic figures are graphic symbols that were almost certainly intended to convey some message, and in that sense they are a fruitful field for the student of semiotics and communication, but not all graphic symbols that convey a message are linguistic, and not all are properly called writing. Silent films, cartoon strips, or animated drawings may “tell” a story in an understandable way even without legends or titles, by imitating actions or figures that are more or less recognizable, but that doesn’t qualify them to be called “language” in any but an analogical, figurative sense. Not all communication is language.

Surprisingly, evidence from the field of psychology can be brought to bear on this question. As far as we know today, all higher mental functions are under cerebral control (Luria 1966). Complex human thought processes are related to the cerebral cortex. The cerebrum is composed of two semi-independent hemispheres that communicate by means of the corpus callosum. As the very small child learns to think and to speak, one of the hemispheres gradually comes to dominate its rational
processes and complex body movements. In normal right-handed people, it is the left hemisphere that becomes the more dominant, while in normal left-handed people, the reverse occurs. If the dominant hemisphere receives some damage, as long as the child is still very young, the damage may be compensated for by a transference of function to the other hemisphere, but if this occurs at a more advanced stage of development, the transference of function does not take place. If the corpus callosum is divided, communication between the two cerebral hemispheres cannot take place directly, though the individual may continue to behave in many other respects in a normal way, speaking, reasoning logically, and following a relatively ordinary way of life. Observations made of such “split-brained” individuals, of patients with lesions in one hemisphere, and some experimental data from normal subjects show that, in the immense majority of people, the dominant hemisphere is the locus of verbal communication; of analytic, logical, and grammatical functions; of mathematical ability; and of phoneme comprehension. This hemisphere analyzes discrete input sequentially, processing it in linear fashion (Ornstein 1972).

Apparently, rational, sequential processes function in a framework of binary digital logic, based on all-or-none signals along neuronal chains. Binary digital logic is that used in digital computers, and seems to underlie all language and mathematical calculation (Fisher 1975). All our conscious mental processes governing intentional actions are under the domination of the system of verbal communication and the dominant hemisphere, that may be called our “conscious, logical” brain.

The other, non-dominant hemisphere, normally the right in right-handed people, is our “unconscious, analogical” brain. It evidently plays little part in the organization of logico-grammatical structures and processes, but it is capable of a diffuse differentiation of some words and a general appreciation of their sense. Its functional organization is less differentiated. It is specialized for holistic, synchronous mentation, for the simultaneous processing of visual and relational data appreciated all at once, and for information about the state and orientation of the body in space (Luria 1973: 160–68). It recognizes familiar faces or objects, and their characteristics, but not their names. It is precisely in the non-dominant hemisphere that artistic production is localized. Musical, artistic, and craft ability can be lost if it is damaged severely, although the incapacitated individual can still speak and reason if the dominant hemisphere remains intact (Ornstein 1972). The non-dominant hemisphere discriminates tones and rhythms, but does not “hear” phonemes (Luria 1966). It is concerned with nonverbal information processing, with visuospatial Gestalten and fields, with multivalent metaphor, with what the Freidians call primary process, and with intuition (Fischer 1975; Dimond and Beaumont 1974; Geschwind 1974).

Split-brain individuals who are right-handed can draw, copy spatial constructions and complex two-dimensional geometric figures, using color to make pleasing and regular patterns, but only with their left hands. They are incapable of performing the same tasks using their right hands. However, they maintain their ability to write with their right hands (Ornstein 1972).

Similarly interesting observations could be multiplied, but there is no reason to go on. The point is already sufficiently clear. Visual, pictorial representation is
the function of one hemisphere, while logic, grammar, speech, connected narrative, and serially structured information such as is required for the production of history or myth are the function of the other. These observations have the profoundest implications for the interpretation of Paleolithic art. They imply, first of all, that we cannot expect the study of Paleolithic art to provide direct evidence of the origins and development of spoken language. On the other hand, that study does provide indirect evidence as valuable as it was unforeseen.

It is now known that mutual interference between the two cerebral hemispheres is as marked a hindrance to artistic ability as it is to the acquisition and reproduction of language. It is therefore almost inconceivable that works of art as masterful and well defined as are some of the animal figures in even the earliest Paleolithic art could have been produced before cerebral lateralization had developed to a state where separation of function of the two hemispheres had become as marked as it is among living humans. When the first art was produced in the caves, cerebral lateralization must already have been so advanced as to permit the use of spoken languages as complex as those that exist in our day.

ART AND WRITING: EVIDENCE FROM LINGUISTICS

Of course, the fact that Paleolithic art cannot be taken as evidence of a primitive stage in the evolution of spoken language does not necessarily mean that it could not provide evidence about the origins of writing. In at least some of the earliest writing systems, representational signs were certainly used (although popular ideas about the evolution of specific alphabetic signs from pictographs of particular objects are as often based on misinformed a posteriori rationalizations as on chains of reliable historical evidence). Alonso del Real (1974) is among those who have referred to some enigmatic signs as though they were “proto-writing.” If this appellation is ever justified, it is only in a very few special cases (possibly, for example, the small groups of points and lines that are found repeated in association with some of the animal figures at Lascaux; they do seem very like some individual “i.d.’s” or personal insignias known from ethnography). But even in these cases, it is doubtful that we should call the marks “proto-writing.”

What I have just called “personal insignias” are certainly signs, and might have served as a stimulus for the idea of using graphic signs to represent words. However, identity markers of this sort are a peculiar category of linguistic signs, without much relationship to the signs used in normal text. If, as seems possible, the Lascaux signs are personal expressions of the identity of the artists, attached, perhaps with some pride, to their aesthetic productions, there is more “affect” than “logic” in the semiological load they bear (Guiraud 1975), and that sets them apart from other forms of writing, just as the great affective load of family nicknames or pet names sets them off from other words in speech. With the sole possible exception of these signs that may be personal insignias, where the great majority of Paleolithic depictions is concerned—for the animal figures, tectiforms, and other geometrics, etc.—the interpretation of Alonso del Real is probably without justification.
Linguistic theory has something to say on this subject. Writing properly so
called—that is, language writing—is a secondary graphic means of communication
derivative from and modeled on already well-developed systems of articulate speech.
Since its organization and structure are based on systems of articulate speech that
are already completely evolved, the term “proto”-writing cannot properly be em-
ployed. While written language may take many forms, as different as syllabic writ-
ing, or alphabetic, or ideographic writing, and despite the fact that any particular
written language changes through time, none of these manifestations can in any
sense be called proto-writing. Language writing either exists full-blown or it doesn’t
exist at all.

All linguistic writing systems share certain characteristics. In the first place, ev-
ery script consists of a limited (though sometimes large) set of ultimate, discrete,
and clearly patterned components. Second, those components are systematically ar-
ranged into recurring hierarchical structures, in compulsory patterns, so that in any
specified context, certain signs must always precede or follow others. In art, on the
other hand, as Roman Jakobson has pointed out (1964), there are no ultimate dis-
crete components, and even where hierarchical structure occurs in an artist’s work,
it is neither compulsory for the rest of that artist’s contemporaries nor is it neces-
sarily systematic. With the exception of the pieces called “tally-marked” objects,
where evidence of patterned notation (counting) does exist (even though Marshack
is certainly wrong in identifying so many of them as lunar calendars), Paleolithic
signs do not satisfy this criterion. There is no systematic, compulsory arrangement
of small, indivisible, and easily recognizable units into larger, recurrent, hierarchical
wholes. Consequently, for the moment it seems that the overwhelming majority of
Paleolithic signs must be regarded as art, not writing.

The late Annette Laming-Emperaire proposed another interpretation of art
as narrative (1972). She postulated that individual figures may be mnemonic de-
vices recalling elements of the mythic history of the group. Some such narrative
significance, at least in embryonic form, is virtually implicit in Laming’s and Leroi-
Gourhan’s earlier treatment of painted caves as sanctuaries containing associations
of symbols whose meanings are in complementary opposition. But in that case, the
“message” was always thought to be so short that it was possible to represent it
integ rally on a single panel, in contradistinction to the more extensive narratives
Laming’s newer theory implies.

I find that the suggestion that the corpus of decorations in a cave might repre-
sent long narratives on the order of Kwakiutl myths or medieval romances is still
unconvincing. It is impossible to deny that in some caves, that might be the case, and
no one familiar with certain sites like Altamira can escape the impression that they
are indeed sanctuaries that would have been appropriate settings for the recitation
of myths of cyclic death and resurrection, or the performance of initiatory rites.
Nevertheless, the methodology of Leroi-Gourhan and Laming is ultimately subjec-
tive and impressionistic, and the proof of such assertions, even in those cases that
seem subjectively to be most suggestive, must derive from much more consistent,
rigorous, and systematic methods than have ever yet been applied.
I admit that in some caves, such as Altamira, one can demonstrate a pervasive theme that unifies different figures, panels, or galleries. But the revised hypothesis of Laming, postulating that all the decorations in a cave may represent the detailed exposition of an extensive mythic cycle, seems especially weak to me. Where unifying themes have apparently been detected, they are manifest as redundant and forceful figurations of simpler notions of symbolic equivalence or contrast, and the complexity that one would expect from an involved narrative is simply lacking.

There is another, equally important obstacle to Laming’s theory. In the case of written language, elementary symbols are apparently mentally converted to speech sounds and then processed by the dominant hemisphere. In similar contexts, the same phonemes are always represented by the same set of elementary signs. Though there is some variation between one representation of a sign and the next, enough similarity must be present so that identical sounds or concepts can be recognized when they occur. The signs have to be remembered until the message makes sense. Simplicity and replicability make it possible for a reader to keep a string of elementary language signs in memory long enough so that whatever meaningful patterns it contains can be decoded. Long written texts look very different from long pictures on this account. Students of Paleolithic art are not the only scholars who have failed to recognize this fact. The number of early abortive attempts to decipher unknown scripts, such as Egyptian hieroglyphics, that failed in part because would-be translators tried to read the pictures on monuments as well as their inscriptions, is absolutely amazing.

When a non-linguistic visual depiction is examined, its “meaning” is derived from the relatively simultaneous perception of the visual field. For the meaning of a composition to be evident to the viewer or producer, its elements must be relatively close to one another in space, and perceptible from a single viewpoint. Many of the associations discussed by Leroi-Gourhan and Laming do not conform to this requirement. That makes it unlikely that any viewer could have grasped the significance of the complementary oppositions portrayed.

There is, of course, a way to make sure that a spectator receives a unified impression from a set of discrete, spatially separate compositions. That is to link the symbols in sequence by a verbalized logical structure that has previously been committed to memory, or that is recorded in writing elsewhere. That is the technique employed, for example, with the stations of the Via Crucis in a Roman Catholic church. The “Way of the Cross” is a sequence of conventional graphic symbols linked to a mnemonic structure by means of the repetition of one or more of the symbols in recognizable form in several of the different panels that make up the whole. (Usually the panels or stations are also numbered in sequence, and they may have short written legends as well.) The repeated focal symbols are individualized by means of a well-defined and obvious conventional complex of invariable primary attributes that remain recognizable despite changes in position, attitude, and other secondary characteristics. Christ’s beard and nimbus, the crown of thorns in the latter part of the series, and the shape of the cross are just a few of the primary characteristics found repeated in different stations.
I know of no series of figures from Paleolithic art that conforms to this description. The Paleolithic figures that would play the role of mythic symbols in Laming’s interpretation look so very dissimilar that any conventions for their individualization would have had to be completely anarchic—key figures whose repeated presence could serve as reference points for the thread of narrative would have had no “recognizability”—a manifest contradiction in terms. That may be the most telling objection to Laming’s thesis.

OTHER INTERIOR REALITIES, INDIVIDUAL AND SHARED

Until now, aside from this digression into the byways of linguistic theory, my discussion has only dealt with the characteristics of the universal, genetically inherited perceptual apparatus, and not with other, learned, aspects of conscious mental activity. Now I must enter less solid ground. Several clinical psychologists and psychiatrists have made important observations that apparently indicate a certain psychic unity in the development of individual thought processes, and these observations are in agreement with data from other fields. In fact, unless there were certain natural similarities in the mental processes of all peoples, there would be no basis for the structuralist position that Lévi-Strauss, Piaget, Leroi-Gourhan, and Laming represent, and despite my specific reservations, there is no doubt that their approach has led to more profound insights in the social sciences and in the study of Paleolithic art.

One of the greatest contributions that clinical psychology has made to our understanding of the human condition is the recognition that people see the world as they want it to be, not as it “really” is. Many philosophers before Freud, and some at present, have taken the stand that there is a real, external environment, whose characteristics may be objectively and correctly appreciated by our senses: they are unalterable truths that are always with us. For those philosophers, it is imagination that is plastic, not our surroundings or our perceptions of them. It was Freud who showed convincingly that stimuli from the external world can be ignored, avoided, or altered according to the internal demands of the unconscious. That means that our perception of the external world around us is not an immutable given, but instead is always shaped and modified by internal processes such as projection. Recognition of that truth has altered the course of scientific investigation in a myriad of ways.

One need not be a strict Freudian to appreciate the truth of this fundamental observation. The dichotomy between the external universe and the inner psyche is never complete, and in studying Paleolithic art, we must constantly remind ourselves that a naïve belief in that dichotomy would be an error. In fact, our perception of reality is the result of a complex interaction of individual conscious and unconscious frames of reference with the “real” environment. Einstein commented that in physics it is always the theory that decides what we can observe (Heisenberg 1971). Ethnographers are now aware of the extent to which the values of their own societies usually intrude, distorting their analyses of other cultures and societies (Sturtevant 1964). Historians tell us that the biases of the present affect our understanding of the past, producing what Fischer (1970: 135–144) calls the fallacies of
“Presentism” and “Tunnel History.” But these are only special cases of what Freud showed us to be a more general condition of all understanding, the basis of all intellectual endeavor. While we may and in fact must minimize these distortions in our understanding by making ourselves aware of their nature, extent, and causes, we can never eliminate them entirely.

From the foregoing, we may say with some justification that there are several distinct kinds of reality, each of which is of interest to us. First, there is the reality of physical objects, although we are never able to grasp them exactly as they are. Second, there is the shared reality of perception capacitated by our biological inheritance, which we have discussed. Every normal individual of our species perceives reality by means of a mechanism common to us all, determined by the structure of the human eye and brain, and subject to the same set of basic illusions. Third, there is the reality which has been filtered, modified, and structured by the emotions and feelings of the individual. Fourth and last, there is the reality that is interpreted and structured according to shared, learned frames of reference, such as language, myth, and religion. This kind of reality is the exclusive domain of the human species.

Only the first kind of reality is truly unstructured; there is no human observer in the equation. The moment a human observer is introduced, structure becomes essential. Without the imposition of some structure, no matter how arbitrary, by the spectator, it would be completely impossible for us to understand our surroundings, to grasp “reality” at all. Nature is not copied in the mind by perception and thought; it is instead sorted out and interpreted according to schemata, some of which are shared, while others are peculiar to the individual. It is clear that Paleolithic art is a material reflection of part of this process of structuring and sorting out of reality, and that presents us with the fascinating likelihood that the study of Paleolithic art can tell us something about those individual and group differences in reality structuring that obtained among peoples of the prehistoric past. This presentation does not provide sufficient space for me to more than allude to the potential of such studies in the most general terms.

ART AND TRANSITIONAL MODES OF BEHAVIOR

As is well-known, there are several theories about the purpose and function of Paleolithic art, such as that the figures were used in hunting magic, that they represent myths, that they were produced solely for the aesthetic pleasure they yielded, that they are somehow related to rites of initiation, and so on. The variety and superficial incompatibility of these suggestions prompted Peter Ucko and André Rosenfeld to comment (very sensibly, in my opinion) that there is no single reason why the art was produced; there may be as many motives for its production as there were artists or decorated sites. In fact, if we were to accept the reservations of Ucko and Rosenfeld as the last word on the subject, we would have to admit that the search for the motivation of most Paleolithic art is a fruitless and futile venture.

Although I believe that their conclusions are generally correct, I also believe that the external diversity of possible motivations for artistic production may overlie
and obscure a deeper, more basic uniformity. That uniformity has apparently been detected by certain ego-psychologists who have studied the processes by which children develop to become functioning individuals and members of society. In particular, the work of Winnicott (1971 and elsewhere) and Modell (1968) is both relevant and fundamental to our inquiry.

Their observations may be summarized as follows. At birth, the individual is immersed in his environment. Despite the fact that we have learned that infants may respond at some level to stimuli while they are still in the womb, there is no convincing proof that the newborn child is aware of its distinctness from its mother. On the other hand, this immersion of the individual in the environment would be an unthinkable situation for a rational, functioning adult, and as a consequence, there must be a gradual differentiation of the self from its surroundings. For some time after birth, whatever the child needs is ordinarily provided as soon as the need is noticed, by an adequate mother. As the baby becomes gradually less helpless, more competent, and more conscious, its demands on its mother are increasingly ignored—we think of a mother who responds too readily to its whims as “spoiling” the child, and in fact there is a real danger that being overly solicitous will hinder normal development. Through this process, the child learns that it is someone other than the mother, an individual separate from an environment that it is not omnipotent to command. It is essential that the child undergo this differentiation or individuation process successfully. Eventually, the moment must come when the child cannot be protected from the environment by its parents, so it has to learn to deal with that environment independently in rational fashion.

As soon as the beloved and satisfying object—the mother—begins to withdraw her attention with some frequency from the subject, and as the child becomes more aware of the inevitable shortcomings of any parental treatment, no matter how good, feelings of rage and retaliatory destructiveness are provoked in the child. The guilt that those sensations produce causes anxiety—fear that there could come a time when mother might never respond, no matter how insistently she is called.

The anxiety that the environment might someday cease to gratify the subject, or even depart never to return, leads the child to create a private inner world more consonant with its wishes. As this happens, a part of the affect normally associated with the parents is almost always projected on a so-called transitional object. The transitional object is something real, such as a piece of cloth or a doll, but at the same time it is invested with certain qualities that come from the child’s inner world, and thus, paradoxically, it is simultaneously part of the external world and part of the child’s imagination. It gives the illusion of protecting the child from the dangers of the environment and it may be carried about so that it is always there and always gratifying. (Linus’s security blanket in Schultz’s Peanuts comic strip has long since become the most famous example.) In some degree it substitutes for the parents, and thus counteracts the effects of physical separation of the child from the real, gratifying, but imperfect environment. As long as the child is in possession of the transitional object, it is easier for it to tolerate an increasing separation from the parents.
As the child continues to develop, the old transitional object is eventually abandoned, but the transitional mode of relating to the outside world persists as play. In play, which may be either a solitary or a socially shared experience, children create a magical world, neither entirely within themselves nor entirely outside, where they can symbolically work through the continuing problems of psychic development. Play and creativity persist among adults, where they continue to have similar functions, but now the activities tend mostly to be shared, and the symbols employed are not developed by each individual, but are instead defined by the society.

The psychic tensions and anxieties which inevitably arise from the vicissitudes of social interaction or the unpredictability of nature are allayed to some degree by dreams, daydreams, and fantasies, and to an even greater extent by art, music, dance, literature, myth, and religion. They, too, substitute a created proximate world for a distant real environment, and in the process provide at least the illusion of participation and control as well as some amount of gratification, whether real (for the participant or performer) or substitute (for the observer), or both. Additionally, they permit the psyche to consider the world from several different perspectives, working through the consequences of alternative behavior, before initiating any real action.

It seems to me that these observations have some real, fundamental explanatory validity for the study of art of all times and places. The production or viewing of Paleolithic art would have served an important educational function, as it helped prepare individuals for action in their real environment. The representation of possible, immediate, or frequently recurring situations must have helped hunters deal with those situations as the need arose. The act of producing or viewing the representations in itself provided a degree of intrinsic satisfaction, and so helped relieve the tensions produced by a concern for the possible failure of the hunt, or by the fear that the game might fortuitously disappear. In response to anxiety that the hunt would not be successful, or that there might be too few prey to permit group survival, humans created a symbolic environment where the spatial separation between the hunters and their prey was denied. The representation of desirable but unlikely or impossible situations would have provided some gratification withheld by the real environment or only obtainable at rare intervals, or after long and arduous exertions. By this reasoning, the production and stabbing or other mutilation of animal figures (well documented at Altamira as elsewhere) would have had a measurable influence on the outcome of the hunt and the well-being of the human group, not because of any magical effect on the real prey or external environment, but because of their real ultimate effect on the hunters and their neighbors and kin. A basic function of Paleolithic art, we may say, was the reestablishment of the balance of psychic forces in the artist and the viewer.

It is also important to note that whenever groups of people made or viewed cave art together on ceremonial occasions, or as part of other rituals, the effect produced by the representations would have been heightened, while at the same time the act would have helped to strengthen the social bonds holding the group together. As group solidarity was augmented, individual anxieties allayed, and the self-confidence of hunters strengthened, Paleolithic art would have helped hunters in a reasonably
benign environment to greater success in their daily endeavor. It is because of their efficacy, not on the world of animals, but on the world of men, that such practices are self-perpetuating. The fact that art is a transitional mode of behavior provides an adequate and convincing explanation of some of its most important functions among hunting and gathering peoples. It is a more generalized explanation for the production of Paleolithic art than the specific motives examined and rejected by Ucko and Rosenfeld, but its very generality lends it strength.

**ART AND SYMBOLICALLY STRUCTURED SPACE**

Nevertheless, that is not the only valid explanation for the production of Paleolithic art. Paleolithic art undeniably had an important and far-reaching effect on the real world outside the artists and their audiences in another way. It served to organize and domesticate the cave environment.

At all times, caves have held a strange fascination for human beings, while at the same time they have filled them with unease and fear. Caves themselves are liminal zones: they are the passageways between our surface world and the abysses of the terrestrial womb. On the one hand, they offer us the benevolent protection of mother earth: in their interiors, we are sheltered from the inclemencies of weather and the fickleness of the seasons. Interior cave environments are not subject to the marked changes of temperature and precipitation that affect the surface world. They remain relatively warm at the height of the winter’s cold, and cool on the hottest summer days, and their respiration fills them with gentle breezes. They may conceal enchanting formations that when lit sparkle like jewels, or glow with soft colors. They often contain crystalline pools or rivers of clearest water. I have never felt more secure and protected than I have often felt in caves. In many respects the inside of a cave is the ideal home.

But their nature has at the same time a threatening, terrifying aspect. I have never felt more helpless, alone, and unprotected than I have sometimes felt in caves. The darkness of their depths is impenetrable, indescribable, unimaginable. A cavern may be filled with hidden dangers—bottomless holes and fatal precipices. Their bowels were frequently the lairs of fierce carnivores, the lion and bear, sworn enemies of hunting groups from memoryless time, and the treacherous hyena, who robs by stealth but will turn and kill when he has the advantage. The descent into an unexplored cavern is a completely unnatural act for humans, beings from the sunlit surface. Once we have emerged into the light at birth, to enter a cave is symbolically to submit to reabsorption. As psychologists of the Jungian school hasten to remind us, caves are the grave in the mother’s belly (Jung 1965: 125–38; 1964: 56; Neumann 1972: 45); they are wombs that seek to devour us.

But that grave is also the gateway between the world of the light of the conscious and the unknown underworld of darkness. To enter it is symbolically equivalent to a descent to the lowest depths of the subconscious, to explore the intimate secrets of our own individuality, to search for new syntheses of our personalities, always with the possibility that we may be reborn illuminated and triumphant. In that
subconscious allegory resides the attraction of caverns for the majority of people of all times and places.

The interior of a cave seems intolerably strange and disorganized to the human surface dweller. On entering an unfamiliar cave, we find ourselves at first wholly disoriented. Its galleries seem unbelievably twisted, and broken by completely irregular rock formations—columns, fissures, cascades, stalagmites, and stalactites—that when seen from different directions take on totally dissimilar aspects. Consequently, the impression produced is one of absolute chaos—a situation so far removed from the culturally ordered world of our everyday lives that we find it almost unimaginable; we feel thoroughly lost in it.

Ordinary humans cannot long endure such disorganized space. Before it can be put to human use, we must first make it orderly, and give it "sense." Paleolithic people accomplished this with their art. Representations of animals, geometric figures, hands, splotches of color, and engraving on the walls and ceilings miraculously transformed the chaotic natural environment into symbolically structured space—a cultural environment or "symbol-milieu" that to a much more comfortable degree domesticated and humanized the cave interior.

The principles of organization of the new cultural environment would have reflected the ideology of the group, its beliefs about its place in the natural and supernatural worlds, and the conscious and unconscious concerns of its members. In places that served as sanctuaries, the symbolic load would have been even more concentrated and better differentiated than in mere domestic space, but both would necessarily have reflected the same basic principles (Eliade 1957).

SOCIAL DIMENSIONS OF SYMBOL CONSTRUCTION

If, as I have said, Paleolithic art reflects the cultural beliefs and values of the societies that produced the artists, we may hope to find there a reflection of some of the broad outlines of the classificatory principles and patterns of symbolic structure they conventionally employed. Since no two societies use exactly the same range of structural principles in identical ways, artists from different groups must have patterned their symbolic representations in ways that can betray their group affiliation. When we are able to identify the underlying principles of symbol construction in a corpus of parietal art, and couple their analysis with a search for constellations of co-occurring principles and an examination of the spatial distributions of such constellations, we will have another important tool for the detection and delineation of distinct territories occupied by different contemporaneous social groups in the prehistoric past. This is another important motivation for the intensive study of the art on the cave walls.

CONCLUDING OBSERVATIONS

In this chapter, I have tried to show how multifaceted is the study of Paleolithic wall art, and how an examination of some of its aspects that have previously been
little appreciated by most experts can lead us to a deeper understanding of the motivations, beliefs, and behavior of our prehistoric relatives, and of the relations that obtained between them and their natural, non-human surroundings. It is my belief that the study of Paleolithic art must be a two-stage operation. First, we must obtain a complete and scrupulously exact description or redescription and classification of each and every depiction, composition, panel, or assemblage, paying due attention to the positions and attitudes of the figures, the relations among them, and the relationships between the figures and their physical surroundings. Once this stage of the study is complete, one may proceed to the second, or analytical, stage, bringing to bear as wide a range of relevant observations as possible from ethology, aesthetics, psychology, and ethnology, and examining the figures and artistic compositions in light of those external data. Naturally, it is essential that the comparisons undertaken in this process be meticulously controlled, to avoid baseless or fantastic interpretations. Elsewhere I have shown how these principles may be applied to the study of art from the Paleolithic and Medieval periods; the reader will judge whether or not their promise is justified by the results.

I am quite aware that the exploration begun in this chapter has only given an imprecise sketch of the lay of the land and the approximate position of some of the pathways that lead to its interior. Nevertheless, our journey to this point has given us glimpses of an unknown landscape with breadth and texture, not the well-mapped, even boring topography we might have expected. Too long dominated by armchair speculation and dilettantish fantasy, the study of Paleolithic art invites the attention of the serious, objective scholar willing to immerse him- or herself in its firsthand study. The task of understanding Paleolithic art is as demanding of systematic application and analytic rigor as any aspect of prehistory. Approached correctly, it will be found just as informative and rewarding.

**NOTE**

This chapter is in essence the combined text of two lectures presented during a short course on “The Present State of Paleolithic Art” at the Menéndez Pelayo International University, on June 12 and 13, 1976. The original manuscript, in Spanish, was lost while the article was in press, and so it never appeared. Several years later, it was rediscovered and returned to the author. The English translation is new. Since 1976, much praiseworthy work has been done, and many published studies have examined some of the themes touched on here in greater detail. The one that has had most impact is certainly the restudy of Lascaux by Glory, Leroi-Gourhan, and others (Arl. Leroi-Gourhan, Allain et al. 1979: *Lascaux Inconnu*). Nevertheless, I believe that publication of this paper in essentially its original form is still useful. I have not changed any of the substance of the text, but have added a few newer references where they make points better than the citations available to me in 1976.

The reference section also incorporates a number of sources that are not cited in the text. I consulted them extensively in preparing the course, and they were suggested reading for the students. I believe that today’s readers will still find them
useful. My Spanish colleagues, engaged in the firsthand study of Cantabrian wall art, insist that the existence of Paleolithic compositions is an established fact, that should not now need to be stressed as strongly as I did in the 1970s. I see, however, that the horse is not dead at all (Halverson 1987: 67); one more beating will do it good.

I did not specifically discuss the origins of art as such in the short course. Fascinating as I find the current debate concerning the origins of representation (see, for example, Davis 1986), I am not sure that it leads to any resolution, and in any case I believe that the subject stands quite apart from the issues I have addressed.

The most important modification of this text that recent research might have called for is the recognition—certainly very satisfying from my point of view—that French and Spanish investigators, many of them representing a younger generation, have already carried empirical studies of cave art in Paleolithic sites to considerably greater depths than those attained before this chapter was written. Their work is in refreshing contrast to a troubling resurgence of armchair speculation on this side of the Atlantic.

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