

# **Introducing the World Archives of Rock Art (WARA): 50.000 years of visual arts**

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## **Abstract**

This paper illustrates the motivations and the aims for undertaking a large-scale project on a world inventory of prehistoric and tribal art. Art is a world wide phenomenon, which is part of the behavioural system of *Homo sapiens*. The study in this field was so far focused on descriptions of local patterns. The proposed world data base project will allow an understanding of the universal patterns of prehistoric art and the significance of local or ethnic patterns. It will provide an international resource to reconstruct the history of mankind of the last 50.000 years. From the preliminary work carried on so far several important paradigms emerge already on behaviour, cultural trends and cognitive processes. They allow us to predict the output and the possible uses of the project.

## **Riassunto**

Questa comunicazione illustra le motivazioni per un inventario mondiale dell'arte preistorica e tribale. L'arte è un fenomeno globale che riflette il sistema comportamentale dell'*Homo sapiens*. Gli studi del settore erano finora interessati principalmente alla definizione di modelli locali. La banca dati mondiale del progetto WARA permetterà di esaminare e comprendere i modelli universali dell'arte preistorica e tribale ed il significato di caratteristiche locali o etniche. Questa banca dati costituirà una risorsa internazionale per ricostruire la storia dell'uomo e delle avventure del suo intelletto negli ultimi 50.000 anni. Dal lavoro preliminare già svolto emergono alcuni importanti paradigmi sul comportamento, le tendenze culturali ed i processi cognitivi riflessi dall'arte visuale. Da ciò si può valutare le prospettive ed i possibili usi del progetto.

## **Introduction**

How can we explain the production of art? For at least 50,000 years, humans have sought and struggled to find effective means of visual communication. Most of that time period, which predates «modern» pictographic or alphabetic writing, is considered prehistory. Visual art and writing, that made «history» possible, can be traced back to their origins through the signs and figures left by preliterate peoples. These creative manifestations, painted and engraved on rock surfaces and in caves throughout the world, have left a legacy of humankind's conceptual journey.

Man marked the territory with the expressions of his mind, soul and heart. Prehistoric art, as a visual narrative of culture, demonstrates the common heritage of all humanity. From early hunters and gatherers, to evolved hunters, to farmers, metal workers, and proto-literate populations, preoccupations of daily life were depicted in rock paintings and engravings. They reveal individual and social needs, as well as conceptual and communicative motivations at

different stages of development. Insight into aspects of humanity such as knowledge, art, imagination, and religion can be sought and gained through the study of rock art. Why did humans feel the need to mark such record of their thoughts and emotion?

The works of art left behind by man may be on portable objects and on non portable supports such as rock surfaces. Out of the prehistoric works of art recorded thus far, there are more than 100,000 objects: figurines, plaquettes, engraved bones, decorated horns and other items. These artefacts are preserved all over the world in museums, galleries, and collections. But the world's major «art gallery» is rock art, which remains *in situ* in many regions across the globe. About 70,000 sites of rock paintings and engravings are known throughout the world, with an estimated 45 million images and signs on record. Nearly one tenth of this patrimony is in Europe. The major areas of concentration are in the Southern Hemisphere, in Southern Africa and in Australia. The Americas, Asia and the Pacific are also extremely rich in rock art sites. Considering potential discovery in unexplored areas, the total number of rock art images that still survive in the world may well be much higher.

Major rock art sites are found in over 160 countries and constitute an immense patrimony, which is far from being fully recorded and thoroughly inventoried. Only a fraction of the world's rock art has been adequately studied. It is imperative that this essential source of information is preserved and understood. Research, documentation, and conservation should progress with a global scope; knowledge of the value and significance of this heritage should be made accessible at large. What can we learn out of this immense archive of our past?

Rock art constitutes the bulk of evidence of the cultural and intellectual history of humankind before the advent of written communication, the early playing ground of our mind. For the use of administrations, governments, and international organisations, and certainly for general and historical awareness, a discovery of primordial messages and themes is essential. For recognising the common way of thinking of mankind – an increasingly urgent task – this project has to be carried out world wide.

The immense heritage of prehistoric art is vulnerable to natural processes of wear, obliteration and destruction, which are further accelerated by human acts. Every day bits and pieces of rock surfaces are falling apart. Development projects, road construction, home building, and agriculture can hardly be stopped, but measures need to be taken to document and record rock art in its current state to assure that its testimony will remain for future generations.

Taking steps toward the accumulation of information, a database has been established for rock art and related research. The project of *World Archives of Rock Art* (WARA) has indeed started. It consists of a compilation of resources at the *Centro Camuno di Studi Preistorici* in Capo di Ponte (Brescia, Italy) with over 200,000 slides, numerous photographs, tracings, recordings, reports, and surveys of rock art sites in five continents. Intended to serve as a source for research, documentation, conservation, comparative and analytical studies, education, and cultural programs, the WARA project is currently aiming at computerising the archives.

When we speak of prehistoric art we usually refer to visual art, though we know that music, dance, poetry, and other products of artistic creativity must have existed as well, like diverse forms of art coexist today among all the peoples on Earth. Even the remains of visual art which have lasted until our time must be only a fraction of what made up the original production. Visual art sometimes provides visual information on the other arts as well.

As absurd as it may first seem, the prime material used in the Stone Age all over the globe, except the Arctic regions, was wood. Apart from the objects in stone, horn, bone, or ivory, which were fashioned out of material that has withstood the ages, how many objects in wood, organic fibres, tree bark, animal skin, or other perishable materials once existed that now have perished forever?

## **Visual art and writing**

## *Behavioural patterns of Homo sapiens*

After a period of gestation in Africa and possibly also in the Near East, early ancestors of contemporary man spread across the planet, while acquiring an increasingly complex system of vocalisations and sound symbols we call speech. All modern humans have issued from these first *Homo sapiens*. Early vocal, gestural, and other momentary expressions were by their very nature not preserved through time, but some of the graphic messages of early *Homo sapiens* have reached us. While art objects have been unearthed in archaeological sites, the bulk of prehistoric creative expressions are preserved in the form of rock art. Its study and evaluation provides unique insight into man's intellectual life during the last 50,000 years, and reveals his imagination, his cognitive perceptions and conceptual journey.

The human beings with full *sapiens* physical features may well have developed around 100.000 years ago but, so far, there is no evidence of a full scale use of visual art until 50.000 years ago. The consistency throughout the world of the same basic repertory of symbols and images exhibited in the early phases of rock art testifies to the common origin of *Homo sapiens* and of his uniquely human intellect. The common essence of humankind is becoming of paramount importance in these times when diversity is used to justify violence. Ironically, rock art may turn out to hold the key of a critical understanding of early expressions of antagonism, violence and war.

The production of art, rock art included, seems to be a basic attribute of *Homo sapiens*. Our common direct ancestor is believed to have its roots in a «primary homeland» in Africa – some say in Asia, or both – from which all present-day mankind has branched; in Europe, America, and Oceania no evidence exists for the presence of previous hominids from whom *Homo sapiens* may have emerged. During a gradual trend of migrations and diffusions, early groups of *Homo sapiens* carried to nearly every continent their ability to produce tools, their traditions of food collecting (hunting and gathering), their social and conceptual patterns, their primordial language(s), and their ability to produce art. According to modern research, the great age of migrations is likely to have taken place between 70,000 and 30,000 years ago, by which time *Homo sapiens* had largely acquired its modern characteristics. The world distribution of rock art is likely to coincide with the world distribution of *Homo sapiens*; traces of early man's art and imagination can be found along his paths all over the earth.

Early prehistoric men already operated within a framework of mental mechanisms of association, symbolism, and abstraction, which still today are defining characteristics of our species. In comparison to the preceding hominids, using these cognitive skills was not only an evolution, but also a true revolution: a leap forward that once taken has made us forever a very different Primate. The formation of our identity as *Homo sapiens* implies the acquisition of a complex package of specific and specialised attributes, such as the universal human ability of seeing, feeling, talking and listening with awareness and cognition, in a manner exclusive to *sapiens*. It also implies the adoption of a specific set of cerebral processes, which we define as «logic». The occurrence of so many coincidences in the course of an uneven and fast-paced biocultural evolution could have occurred but once in the course of the natural history of social mammals. We are now confronted with the theory of a single place of origin, where *Homo sapiens* had his formative age and whence he spread over the rest of the world. The early patterns, styles, and themes of rock art would help us solving this issue.

The emergence of our cultural roots from primordial artistic expressions has a dramatic impact on society and modern man. In rock art we recognise elements that are acutely relevant today. The visual language of the archaic hunters was and is a universal language, one which possesses not only representational systems and stylistic patterns that are startlingly similar in various parts of the world, but also presents figurative and symbolic associations derived from a common logic. Fundamental artistic consistencies bear witness to parallel modes of thinking and expression among peoples around the earth, though they adapted to different environments and culturally exploited different resources.

Man is likely to have learned from nature his first graphic approach. What were man's first encounters with marks? The footprints of another man or animal in the sand, the scratches left by a bear's claws on the walls of a cave, the small mound of earth piled outside the burrow of a hare, the black smudges of ash which indicate the remains of a fire, the sparse clues which mark the location of an abandoned camp, the carcass of an animal which is a sign of action by man or another predatory animal, or a hundred other signs, held and still hold a precise significance for peoples living in and with their environment. We would say today that these are symbols that man learned to read, provided him with information and inspired his artistic creativity.

For Palaeolithic man, however, the idea of «symbol» or any term describing such a phenomenon probably held no meaning. This word is unknown even in the languages of most contemporary hunter-gatherers. A footprint was a footprint, containing its own reality; it was the track of someone or something that passed by. By its form and its freshness, the hunter could guess immediately who passed by and how long ago the print was made. If the mark was the means by which one came to know a certain reality, then it also became a reality that could then be communicated. Thus his own footprints, as well as those of others, served to relay information, just as would his hand prints and other signs.

There are at least two phases to be discerned in this process: the first involves that passage from understanding the significance of a footprint or sign as the evidence of some event, to the action of consciously making a footprint or the sign in order to transmit a message. The second phase involves the further step of using a mark shaped by nature, such as a footprint, to reproduce the same mark on a rock, which then becomes an imitation of nature, an invented sign, and a means of communication. Analogous phases can also be imagined for other forms of artistic creation, such as dance and music, from following nature to imitating nature.

To understand the dynamics of these phases and the forces that fuelled them would open the way for us to understand the origins of art. We would then see how arbitrary are the distinctions often made between various styles, for example between naturalistic and abstract art. They simply define our own ability, or disability, to read the message. Most likely the concept of «abstract» did not exist for prehistoric man. On the other hand, even the most naturalistic art is a form of abstraction since it constitutes the transfiguration of a reality by depicting only a part of a whole, whether that be visual or audible, symbolic or conceptual. That which we define as «abstract» is often the result of synthesis, the reading of which depends on our receptive and associative capacity.

We know that humans of the Old Stone Age left imprints and made marks in the mud and sand as many populations still do today. Traces of such practices have been discovered in deep caves. In the open these works were quickly destroyed by rain, snow, or wind. Men and women of many contemporary cultures paint their bodies and decorate the walls of their huts; because of the temporal nature of this art, very little evidence of these practices remains from prehistory. Modern understanding of prehistoric art activities depends therefore on limited sources of information.

The ethnological comparisons between prehistoric hunting peoples and present day hunting tribes can show us a range of possible explanations, but since there is not a verifiable pattern of behaviour in the context of artistic creativity between the two groups, we cannot make exact analogies. In fact, contemporary groups show the rich variety of lifestyles and artistic manifestations of hunting and gathering groups, but they are not carbon copies of prehistoric clans.

### *Acquiring a world view*

Human culture spread and developed in different environments; the contexts in which artistic expression took place were correspondingly diverse. It is perhaps surprising, then, to recognise the striking similarities that can be found in rock art around the globe. In ancient times as today, the artist did not represent everything he saw or knew, but instead made specific

choices. Although subject matter varies considerably from one age to another, it is always rather circumscribed within each age or cultural pattern. Thus the frequency and assemblage of subjects allow us to construct a rudimentary hierarchy of the artist's values. The gamut of subject matter is always well-defined and consistent within specific cultural and tribal patterns. Specific impulses to paint, draw, or engrave in a certain way have always existed, and both subject matter and style are reflections of deeply-rooted motivations that are specific not only to a time or a place, but to humanity.

Local circumscribed inventories of special areas of prehistoric art cannot provide a world view on patterns and paradigms. A global view on art can be achieved only by the resource of a global data base. It is surprising that such a fundamental cultural and scientific project had never been attempted before.

The elements that contributed to the shaping of conceptual and linguistic differentiation are the same that directed artistic expressions: climate, diet, natural resources, landscape, unpredictable events and life experience. It may be hypothesised that diverse systems of mental development, dictated by variations in context, became part of culturally transmitted traditions and contributed to the differentiation of the human mind. At the base of conceptual processes a common matrix continues to function today, though it persisted on a much broader scale until that time – relatively recent in the history of humankind – when man made his first attempts at cultivating and producing food. Just as substantial differences are not evident in the first visual language, it is presumable that they were not crucial in the spoken language. The first *Homo sapiens* groups in Africa or the Near East, and those that made the first migrations elsewhere are likely to have spoken the same language, the «mother tongue» that was shared by the earliest ancestors of present day humankind. Like the development of trends and styles in the visual art, language may have developed dialects that gradually became languages and further evolved dialects that became languages and so forth.

Not only in the use of repetitive signs and symbols, but also in the choice of sites for rock art, and in the choice of surface, colours, and themes, numerous similarities make us realise that all these preferences stem from a universal language. A world archive of prehistoric art is the channel to further elaborate and specify this issue. Logic and artistic expressions would have conformed to universal patterns, and the spoken language would have been part of a common human way of relating to one another and to nature.

Results from joint research of anthropologists and geneticists suggest that other issues may have followed the same trend as in the case of the «mother tongue,» from which all languages spoken by modern man developed. The same can also be hypothesised for other aspects of art creativity such as music. Sounds, like graphic forms, create immediate, primal, and intense associations that have the power to restore and reaffirm a hidden memory; certain sequences or associations of sounds would have formed a basic musical language. As we see, the scope of a world data base on visual art goes far beyond specific concerns for aesthetic and graphics.

The «language» of man's first music must have had universal paradigms, which remain basically intact today, though transformed by accumulation. It suffices to think of the global diffusion of certain musical instruments such as the churinga, the megaphone, the flute, the drum, the castanets, or the musical bow, for us to recognise that in the realm of music, like in that of visual art, *Homo sapiens* was the custodian of specific mental solutions and sets of traditions. Considering the human music – different from that of birds or wolves – in which the double games of rhythm and melody intertwine, we acknowledge that these universal canons lead us back to a common matrix, a kind of neurological imperative for language and music.

The Tower of Babel in which we live today, with different languages and mentalities, with such diversified expressions of visual art, music, and dance, seems to be a relatively recent phenomenon. It probably developed with the cultural and artistic differentiation that took place in the Late Pleistocene, between 15 and 30 thousand years ago, when regionalised cultural characteristics were formed, coinciding with the time in which human groups specialised and diversified their systems of hunting, fishing, gathering, and food production.

The world archives of rock art will help in defining if there are world trends in such patterns of culture. When assemblages can be identified chronologically, each one represents a different stage in the cultural sequence; hence, through subject matter and associations, rock art can reveal many aspects of human life. The depiction of the species of animal hunted and of the food gathered tells us much about the ecosystem in which man lived. The depiction of tools, weapons, and other objects reveal his technical abilities. The illustration of myths and beliefs outlines essential aspects of our intellectual roots and displays the existential relationship between Man, Nature, and the Supernatural.

The technical aspects of culture seem to progress in a more or less coherent evolution. New inventions and innovations result from experiences, which motivate subsequent progress and constitute the base of each step in the evolutionary sequence. It is questionable, however, whether such logical evolution occurs in the artistic expression as well. Current cultural standards influence the evaluation and appreciation of art and creativity. Aesthetics change from culture to culture and from person to person according to fluctuations in style and taste.

Because it falls well before the advent of writing, rock art constitutes a major testimony of early man's expression of himself and of his worldview. While even the most ancient script is just over 5,000 years old, rock art provides a record of the way man deliberately expressed himself many thousands of years earlier. Despite its value as a source of cultural, social and historical information, in most regions of the world this expression of human creativity has been sorely neglected. Moreover, for one reason or another much of the knowledge of regional scholars does not become available to the rest of the world.

In order to establish a more co-operative and receptive forum for thought, it is vital that researchers share their knowledge on the state of art studies and be better informed on the progress of research in other areas. The initial operations of a world archive have revealed that one of the most effective functions of such an institution is to provide a physical and conceptual venue for comparative studies, which suddenly help solve local problems as well as those concerning universal trends and patterns.

To look for the origins of art means searching for ourselves: who we are and where we come from. Forms, colours, rhythms, sounds, and movements are all messages we seek to decipher in order to understand ourselves. They are the raw material of our psychic heritage. The search is our lifeblood, for without it we would not be what we are. Before man, nature in all its guises has produced forms, colours, sounds, and movements, without which the senses of man would not function as they do today. The search for origins is therefore not just an intellectual game. Rather it is a necessity, and has stood as such for thousands of years, from the time we gained, rightly or wrongly, the appellation of *sapiens*.

## **Searching for roots**

### *The environmental setting of art*

Human beings are unique among the Primates in that they are the only species to produce art. Humans possess a universal pattern for emotions and needs beyond the three elementary, fundamental needs. Food, sex, and territory motivate a significant proportion of modern human activity, and the same three needs are the major preoccupations revealed by visual art from millennia past. However, we may question whether the very act of creating art, is in strict relation to these needs. Aesthetics, ethics, and human relations do not directly provide for the three main necessities, but they have always been essential ingredients of *Homo sapiens'* way of life.

Alertness to the surrounding world, as well as internal necessities, involves both recognition and integration of sensitivity, sensibility, and sensuality. One of the major difficulties of research in prehistoric and tribal art is that of recording such essential aspects and defining their

paradigms. To be aware of art is to navigate into the human intellect, to sense the functions of its mechanisms, to penetrate the spirit of our species and find out its logic.

By producing art, man is questing after the completion of nature. Visual art is a search to delve more deeply into the external world. All expressions of art in all periods are in some way interpretations of humans and their environment. But why is understanding nature such a dominant preoccupation? Humans are part of nature and inescapably intertwined with the entirety of it. Art, among other things, is the testimony of man's earliest attempts toward understanding or interpreting, completing or imitating nature.

Many areas the world over appear to have been revered spaces where people went for artistic rituals, or social activities, of which little evidence remains today except rock art. By painting and engraving on stone, human societies left their marks on the territory, shaped spaces, and moulded the landscape. Apparently the use of rock surfaces for producing art is itself an archetype, which was performed wherever *Homo sapiens* was present. Many places around the world where rock art is still practised are considered sacred, and some are also secret, accessible only to the initiated. Many prehistoric rock art sites were created in distant places for some social or spiritual reason.

For example, Har Karkom in the Negev Desert (Israel), a holy place and a sacred mountain in the Bronze Age, with shrines and altars, displays the richest concentration of rock art in the entire Sinai Peninsula. Here we know that Neolithic and Bronze Age rock art was produced in a place already sacred, since the mountain has remains of what appears to be a sanctuary of the Palaeolithic Age. Other examples can be found in the highlands of Malawi, where the Nyau society produces rock art in sacred caves in which ancestral spirits are said to live. Palaeolithic sanctuary caves of Western Europe are likely to have been both sacred and secret, and the same is true for many Australian Stone Age art sites, which have been used by Aborigines until historic times.

The evidence from many other cases of sacred sites suggests that the environmental setting of rock art seems to fit the «revelation pattern.» A common denominator to many faiths seems to confirm the Biblical concept that «the prophet comes from the desert,» which is expressed differently in various environments. Medicine men in parts of Africa retreat for long periods in sacred caves; shamans in Siberia choose to remain isolated for months at a time in the icy tundra. In many cultures, the preparation for initiation into adulthood demands isolation away from the clan and from populated areas. Christian hermits deliberately choose lonely places for their devotional activities. Buddha went to the mountain to meditate. Repeatedly the revelations of myth and scripture are described as occurring in deserts. Islam was born in a desert oasis; Judaism was born on a desert mountain. Most of the major rock art sites in the world are located in far away, isolated deserts, mountains, and bush area, where living resources are scanty and the density of population has always been sparse.

Comparative studies on a world range seem to reveal unexpected patterns that concern various aspects of the intellectual life of man and its links with the environment. The interpretation of rock art related to individual regions would allow us to understand local trends, but it is necessary to explore beyond the hills for capturing those common trends that unify humankind.

### *Geography and ecosystem*

The dimension of the documentation is growing constantly. To undertake experimental and phenomenological studies it is useful to select a number of major rock art sites from different parts of the world.

A large percentage of the 150 major known areas with rock art are in what are now deserts or semi-desert areas. In the present environmental situation, these areas may be defined as peripheral or isolated zones. Around the world rock art appears in places distant from heavily populated areas, from centres of «civilisation». This seems to be a recurring pattern in «major sites», from the Dahthami Wells in Central Arabia to Tromso in Arctic Norway; from the Acacus in the Libyan Sahara to Ayers Rock in Central Australia; from the Kalahari Desert in southern Africa to San Ignazio in Baja California, Mexico; from Valcamonica in the Italian Alps to the Middle Yenisei River in Siberia; from Rio Pinturas in Argentinean Patagonia to Har Karkom in the Israeli Negev Desert. Most of the major concentrations of rock art turn out to be located in poorly populated regions with poor resources. This fact should have an explanation. One reason, but not the principal one, may be that rock art could not be preserved in heavily populated areas. The question is not solved by such assumption. The «revelation pattern» apparently requests isolation and silence.

In contrast, current data indicate that in areas covered by large tropical forests, rock art is scarce. We have little evidence of such images in the Brazilian Amazonian forest, in the Congo River basin and other west-central African countries, or in south-eastern Asia. The examples of rock art known in these tropical forest regions are usually relatively recent. It is likely that people dedicated to producing art on wood or other vegetal support tend to produce mobile art rather than more durable rock art. This however does not explain the preference of desert areas for the major sites of rock art.

As the product of pre-literate societies, rock art is generally discontinued when communities acquire a «written» form of communication. The cultures from which these artistic expressions emerged were largely fixed in hunting and gathering as means of subsistence, and today hunting and gathering populations are nearing extinction. They are confined to the most inhospitable parts of the world, such as the deserts and bush lands of Australia and Southern Africa, the Congo basin, Southeast Asia, or the Arctic tundra of Lapland, Kamchatka, Alaska, and the great Canadian North. They occupy territories that constitute more than 20% of the Earth's land surface, yet they make up less than 1% of its population.

Only 500 years ago, at the time when America was reached by Columbus, 70% of the earth's surface was populated by hunting and gathering people, who then accounted for more than 20% of the world population. 14,000 years ago, at the end of the Pleistocene, the entire population of the Earth pursued these means of subsistence, which were then gradually replaced by economies based on food production. Only in the last 14,000 years, of the 100,000 years of their existence, humans have used other ways of survival and were not dependent on hunting and gathering.

Tribal societies' output of visual art from all of these ages is recorded around the world in millions of figures, in thousands of zones, on all inhabited continents. Major concentrations of rock art are found more or less evenly distributed on the inhabited land. According to present reports, however, the Southern Hemisphere, Australia, South Africa and South America have the greatest concentrations of rock art in the world. It is noteworthy that the Southern Hemisphere, which is today considered poor and backward, displays a prehistoric artistic creativity far higher than that of the affluent Northern Hemisphere. Should we consider new definitions for culture?

From the data available today, over 75% of all known rock art was produced by hunting and gathering societies while less than 25% is the work of pastoralists and agriculturalists. Being by far the major remaining evidence of communication and creativity among early *Homo sapiens*, rock art is an invaluable source for the study of cognitive development. Within the range of time since the emergence of *Homo sapiens*, it is the main archive of mankind. It is somehow surprising that this immense cultural and historical resource did not receive as yet the consideration it deserves.

### *Chronology*

The information available today is not yet definitive, as shown by the data themselves. The wish to know *when* is a major human curiosity and further studies are needed on a world basis to understand the cultural meaning of the beginning of art in various parts of the world. Is it *always* related to the arrival of *Homo sapiens*?

Some technical data may contribute to a general framework, although, as we know, new discoveries may modify them, as it currently happens.

Recent research seems to indicate that the beginning of rock art on every continent goes back farther in time than was believed just a few years ago. In Africa, major concentrations of the earliest art horizons come from Tanzania and Namibia, both in mountainous, rather marginal areas of late Pleistocene human movements. Among the oldest art dated so far is that of the Apollo 11 cave in Namibia, where painted, sometimes polychrome, animal figures on stone slabs were found at archaeological levels defined by W.E. Wendt as «Middle Stone Age,» dated by three C-14 tests (not calibrated) to 28,400, 26,700 and 26,300 BP (Wendt, 1976). This indicates a real age of over 30,000 years. In Tanzania, the earliest rock art in the Kondoa and Singida districts may be older. In one of the painted rock shelters, colouring materials with marks of utilisation were found in archaeological levels dated by C-14 to over 40,000 years BP. A sequence of different styles of Early Hunters' rock paintings are likely to have started earlier than any other rock art dated so far in Africa and may be well over 40,000 years old (cf. *BCSP*, vol. 21, 1984).

In northern Africa, the earliest dates to which rock art is presently attributed are much later than in southern Africa. Early Hunters' art from the Acacus range in Libya, according to F. Mori, are dated back to the late Pleistocene, before 12,000 BP (Mori, 1970; 1991). Similar stylistic assemblages are known from the Tassili n'Ajjer in Algeria and from the Ennedi in Chad. A climatic explanation is usually suggested for this late arrival of art-making people in northern Africa. A dry age appears to have characterised the final Pleistocene, from around 24.000 to 14.000 BP. This may have retarded the arrival of *Homo sapiens* groups.

A stimulating aspect of the comparative study of rock art is the determination of which man-made marks in the environment are identifiable as deliberate attempts at communication. Some graphic markings found in Europe have been attributed to the Mousterian period and are considered a «pre-figurative» stage attributed to Neanderthal Man. This hypothesis is much debated, but should it prove to be correct, the earliest graphic markings in Europe would turn out to be older than 40,000 BP. So far, no figurative images have been demonstrated to exist at that stage in the area. Other early graphic signs are found in contexts that are dated between 40,000 and 35,000 years BP and seem to coincide with the first presence of *Homo sapiens* on the continent.

The beautiful polychrome paintings from the caves of Altamira and Lascaux were produced much later, in the Magdalenian period, after 20.000 BP. True to the trend of creating art in remote places, the major concentrations of Palaeolithic cave art in Europe are located in the «dead end» area that faces the Atlantic Ocean. In the Franco-Cantabrian region, in fact, man is likely to have moved about much less than in Eastern Europe, the Balkans, or the Mediterranean, where people reached Europe from Asia and where civilisations later flourished.

The Caucasus remains an open question. Several rock art sites in Georgia, Armenia and Azerbaijan are related to pastoral and early agricultural group but only one major site is known at present of Early Hunters and Gatherers, that is Gobustan in Azerbaijan. A large number of rock shelters and small caves display a consistent sequence of styles of rock engravings. There are periods when the subject matter were animals, and others when the theme was the human figure, with preferred male or female subjects in different phases. Most of this sequence was sealed, in one cave, by archaeological layers over 11.000 years old. Early figurines of steatopigic females appear to belong to one of the earliest phases and are likely to go back to the early phases of the Upper Palaeolithic. The beginning of the Gobustan rock art is tentatively attributed to around 30.000 BP but it might be earlier (Gobustan, 2001)

In the Near East several attempts have been made to attribute art creativity to *pre-sapiens* beings. Two small objects used by hominids but not necessarily having artistic intents, have awakened some interest in the professional literature. An analogous question arises about the so-called Palaeolithic Sanctuary at Har Karkom in the Negev Desert. A group of flint boulders having vague anthropomorphic natural shapes have been brought together by human beings; one may ask if the choice of natural forms, which were organised in a kind of instalment, may be defined as art or not. The flint implements that are found in this site belong to the Karkomian culture, which is characterised by a flint industry showing Lervalloisian traditions of the late Middle Palaeolithic, along with blades which are currently considered as belonging to an early phase of the Upper Palaeolithic. It is believed to be a rather unique transitional phase and is tentatively dated between 40.000 and 30.000 years ago.

All that we know about rock art in the Middle East is considered to be much later. The large animal outlines in a style typical of the Early Hunters are known from the site of Kilwa, near the border between Jordan and Saudi Arabia, from Har Karkom in the Southern Negev, from one site in the Central Negev and from the site of Dahthami Wells in Central Arabia. In all these sites the kind of rock art is believed to belong to the end of the Pleistocene or to the very beginning of the Holocene.

In the Near East the earliest clues for dating are from Central Arabia (Dahthami Wells) and are likely to belong to the end of the Pleistocene, between 14,000 and 10,000 BC (Anati, 1970).

In Central Asia and the Far East, chronological data so far are more limited than elsewhere. Mobiliary art from Malta (Siberia) and other sites in the Baikal region of Central Siberia has been dated by C-14 (not calibrated) to ca. 34.800 BP (Abramova, BCSP 25-26 1990, p. 81). Using this element as a comparative support, A. P. Okladnikov has proposed a Pleistocene date for ancient rock art sites of similar styles in various parts of central Siberia. These datings are controversial, but Early Hunters' rock engravings are widespread in Siberia and some of them may well go back to the Pleistocene.

In India, in Madhya Pradesh, at Bhimbetka, and elsewhere, V. S. Wakankar detected a series of rock paintings from the Stone Age that he attributed to the Pleistocene. Decorated ostrich eggshells from the same region have been dated by C-14 to 25.000 BP. Several sites of Early Hunters' rock paintings are likely to belong to the Pleistocene. Much earlier dates recently proposed need to be verified. It is however unlikely that India, or any other region of the world, may have visual art before the arrival of *Homo sapiens*. Some attempts to demonstrate the contrary did not provide convincing results.

In Australia the concepts of distance and isolation are confirmed. Although man must have arrived to the continent from the north and populated that area before expanding southward, some of the earliest known rock art is found in the most far-flung regions of the south and west. In a dead end facing the Indian Ocean at Koonalda Cave, graphic markings have been dated by indirect C-14 to ca. 20,000 BP. Recent considerations propose dates older than 50,000 years for Northern Australian engravings by relying upon C-14 dating. Such dates are not impossible but remain controversial and need to be verified.

In the Americas, the earliest art dated so far comes from the southern continent where in the Piauí State, Brazil, anthropic layers, connected with rock art and including fragments of painted rock surfaces, have been dated by C-14 to ca. 17,000 BP. Recently much earlier dates have been proposed for rock art in Brazil, but so far they do not seem to be reliable. In the far south of Argentina, at Rio Pinturas in the province of Santa Cruz, C-14 dating have again enabled researchers to locate early representational assemblages as far back as 12,000 BP. Nothing as early has been dated so far in northern and central America, although stylistically the Early Hunters' rock art assemblages in Baja California, Mexico, and in the western States of the United States, may well turn out to be of a comparable early date or earlier.

This brief summary of the earliest dates of rock art postulated so far in different continents indicates that the earliest known art may go back to dates between 40,000 and 50,000 BP in Africa, Asia, and Australia. In Europe the earliest dates fall between 35,000 and 40,000 years

BP. In the Americas, the earliest available dates are about 17,000 BP, but we may consider it likely that art should have been introduced by early waves of human migration through the Bering straight as early as 33,000 years BP.

The recurrent ecological and social environments for early rock art, in desert or mountain regions and on the peripheries of densely populated areas, still demand an explanation. There is no doubt, however, that man arrived to these areas with the intellectual capacities for producing art, and developed his artistic vocation being these settings particularly suitable for artistic creation.

Early man apparently viewed art as an integral and essential part of his daily life. On every inhabited continent human groups painted and engraved rock art; indeed, in every part of the world, rock appears to have been among the most ancient and most enduring «canvases» used by man. The ephemeral arts of sand drawings and body paintings faded off quickly, collections of stones and assemblages of organic materials disappeared, and only shadows of these creations remain for us to imagine, from references to them in rock art itself or from distantly related artistic activities of the present. Visual art, and possibly music and dance, may have been invented by humans earlier than the inception of rock art. Indirect traces of music and dance in rock art depictions and remains of musical instruments leave tantalising suggestions as to the first material forms of artistic creativity.

Through the first attempts at expression and communication, the human mind demonstrated both its diversity and its consistency. Rock art constitutes by far the most important record we possess of human history before the invention of writing. It provides invaluable material for the study of human beings' cognitive development, as it represents a largely overlooked wealth of information about the origins of human expression. The diverse array of images, symbols, and marks that make up rock art are precious remains from humanity's early endeavours in communication. The continuing comparative study of prehistoric rock art will contribute to the understanding of the logical processes that underlie the genesis of art, writing, and modern communication.

## **Looking for logic**

### *Universal factors*

Our ancestor early *sapiens* was characterised by the neurological capacity of creating an ideology, whose basic matrix is still present at the core of modern man's conceptual cognition. This framework included a capacity for synthesis and abstraction which, among other things, led man to produce art and abstract thought, and to develop an articulate and complex language.

The hunting way of life provided subsistence for hominids for over two million years and left profound marks on the subsequent intellectual evolution of *Homo sapiens*. The fundamental human capacity of establishing mental associations and «logic» relations evolved throughout the ages in which the human species acquired its unique neurological make-up and parallel social concomitants. In fact, these millennia were characterised by hunting bands that shared activities and refined communication. This way of life reached a high level efficiency in the last 100,000 years with the diffusion of our direct forefather, *Homo sapiens*. He developed a high technological level and quite refined mental abilities and was capable of producing efficient implements.

In many cases, precise technical methods appear to have been used for painting, engraving, pecking, graffiti, or relief work. Certain rock art techniques are broadly repeated throughout the world, which do not seem to reflect processes of acculturation or diffusion. In some cases it seems to be simply the result of a given technological level or way of thinking or both. A few basic colours are used in rock paintings all over the world, red being by far the most common in all continents.

A thorough analysis of the essential elements of rock art on a world level is necessary to determine the universal factors and distinguish them from local factors. The adopted criteria must be globally accessible and therefore suitably simple. Five elements have been taken into consideration: subject matter; types of associations, compositions, and scenes; stylistic trends; technical patterns; patterns of location.

Certain elements of style and content have been shown to be constant world wide, and five main categories of rock art with universal characteristics have been defined.

A. *Archaic Hunters*: The art of hunting populations who do not use the bow and arrow. Figures and signs are associated, but true descriptive scenes are practically absent. Animals are the main figurative subjects. These are often depicted in a realistic or naturalistic style. Anthropomorphic images are rare and usually have some zoomorphic feature.

B. *Early Gatherers*: The art of populations who rely primarily on a food collecting economy. They tend to represent vegetal food sources. Anthropomorphic images are common and often form surrealistic scenes or sequence of figures. Edible animal figures are much less frequent than in the art of hunters.

C. *Evolved Hunters*: The art of hunting populations who use the bow and arrow includes descriptive and anecdotal scenes, mainly describing hunting and social events.

D. *Pastoralists/Animal Breeders*: The art of populations whose main economic activity is rearing of livestock tends to focus on domestic animals and descriptions of daily life.

E. *Complex Economy*: The art of populations with diversified economies, including farming activities, is characterised by mythological scenes, representation of human-like divinities or spirits, and repetitive schematic groupings of signs.

These subdivisions are necessarily schematic. Transitional phases and groups with mixed characteristics do exist; within each category there are considerable variations. Nevertheless at the present state of research, and given the immensity of the material so far recorded, it is becoming necessary to create general lines of analysis on thematic and style that go beyond the limits of regional analyses. The methodology requires further elaboration, but even now it is producing results: a preliminary order has been established for several of the larger geographical groups. These groups include rich concentrations in Central Tanzania, Madhya Pradesh in India, Central Arabia, Valcamonica and the Alpine Area, the Negev and Sinai deserts, Seminole Canyon in Texas, and the Kimberley in Australia.

Widely-based criteria of thematic and typology have led to the identification of recurrent elements. These include the nature of associations and the presence of scenes; figurative, schematic and abstract styles; importance given to some wild or domestic animals; and the presence or absence of certain symbols that act as «fossil guides.» This has brought forth the hypothesis that universal reflections conditioned by way of life influence behaviour, thought, ideology, associative processes, and, consequently, artistic manifestations.

### *Grammar and syntax of art*

For nearly all rock art there is a limited typological range of subjects. Constant throughout the five categories of rock art, three types of signs, grammatically different from each other, can be identified. These three types recur not only in rock art but also in mobiliary art. We have called them pictograms, ideograms, and psychograms:

*Pictograms* (and their variations of mythograms) are figures in which we may identify forms of real or imaginary objects, animal and human images. Four main themes cover most pictograms: anthropomorphic; zoomorphic; topographic and tectiforms; implements and weapons. Only rarely and only in specific contexts do other themes, such as vegetation, landscapes, or realistic portraits, occur.

*Ideograms* are synthetic signs and symbols such as tree-shapes, phallic and vulvar signs, discs, crosses, stars, or groups of dots and lines. Their repetitiveness in similar associations seems to have been understandable and symbolic of conventional con

that convey ideas in ancient writings and in many groups of rock paintings from painter to viewer, or from writer to reader. We have recognised three main types of ideograms: anatomic (such as vulvar signs, phallic signs, hand prints or footprints); conceptual (such as cross or disk); numerical (such as groups of dots, series of lines). These terms are invented and used for the benefit of present day research and communication needs; they do not necessarily imply the original significance of ideograms.

*Psychogram* is the third grammatical type of sign. It is not recognisable as, and does not seem to represent, either an object or a symbol. Sometimes they would seem to reflect a sudden flow of adrenaline. Psychograms can be strokes or violent outputs of energy that perhaps express sensations, exclamations, concerns, wishes, or even more subtle mental states. Psychograms are more abstract than symbolic ideograms; in fact they function like certain archetypal signs that our conscious memory is no longer able to define but which release associative and cognitive processes. Their meanings lies more in subconscious resonance than in intellectual definitions, and as a result psychograms are most remarkable for their immediacy.

Preliminary studies in quantitative analysis shows drastic relative differences between numbers of pictograms, ideograms, and psychograms in different periods, world areas and cultural groups. In the Early Hunters' assemblages, an even balance between the three types of graphemes is more or less constant around the world, with almost equal proportions between pictograms and ideograms and the sporadic presence of psychograms. When *scenes* become the main type of syntactic association, psychograms tend to disappear. In the Evolved Hunters and in the Pastoral groups, there is usually a predominance of pictograms. In the Gatherers' groups, ideograms usually prevail, while in groups with complex economies, the possible variations have a larger range, from assemblages with a high majority of pictograms to assemblages with a high majority of ideograms. Throughout the range one can distinguish assemblages with or without psychograms.

Associated ideograms are often found next to or involved with pictograms. The figures and their associations have been studied and discussed by several scholars, and various theories have been suggested for their meanings (H. Breuil, 1952; A. Leroi-Gourhan, 1982; A. Lommel, 1970; G. G. Luquet, 1926; A. Marshack, 1972). Some general agreement exists on the fact that while pictograms are the subject, ideograms give sense to the message, like verbs or attributes. But the language of rock art, and more generally of prehistoric art, quite often is metaphoric, as is true of art and ideology in all times. Common patterns, types of association, repetition of subject matter, and use of similar ideograms reveal common denominators in the conceptual background of the early intellectual phases of *Homo sapiens*. This universal trend indicates the presence of a basic need for expression and for a common framework of typology and sequences.

The study of patterns in the grammar and syntax of prehistoric art needs a broad and well planned world documentation. It is particularly important that the documentation shows complete assemblages. Single figures like single words do not allow the interpretation of cognitive process.

Examples from historical paintings can demonstrate the differences and relationships between pictograms and ideograms. In the Annunciation scene by Renaissance painter Frà Angelico, it is not enough to say that a dove is depicted near a lady with a sort of halo around her head. With the knowledge of Christian symbolism and the cultural background of the artist, the dove takes on a metaphoric meaning. In order to understand that it represents the Holy Ghost, as the viewers were expected to do, awareness of Christian catechism is assumed. Similarly, the dove of Picasso is not merely a dove, but a pictogram combined with the ideogram, the olive branch, that we recognise as a symbol for peace only because we are initiated to the meaning of the image. In most religions, deities have their own ideograms, like the cross for the Christian religion. The meaning of the cross is acquired as a consequence of culture. Its Christian meaning could not be understood by a Batwa Pygmy, who knows nothing about Christianity.

Other examples could be cited, such as the eagle in Roman times. In a few thousand years *Homo supersapiens* may recognise the eagle even if it will be an extinct animal and may say:

«Yes, the bird represented does seem to be an eagle» But what does this eagle mean? Sometimes, when the pictogram is accompanied by four ideograms that modern viewers read as SPQR, an idea of the figure's conceptual content may emerge as a sort of symbol of the Senate and the People of Rome.

Thus, the pictograms of the hunters frequently accompanied by their ideograms must have been clearly legible to anyone familiar with their conceptual content. Today there has been a breach in the direct tradition of depicting and deciphering. Because contemporary viewers are no longer able to make the immediate connection between ancient ideograms and their meanings, we rely on archaeologists to assemble the components and enable us to understand the content.

Most of the ideograms used for millennia by prehistoric groups are later found as characters in the first writings in various parts of the world: in China, the Near East and Central America. In the cases in which the meanings of the ideogram can be traced back to a single common core, a universal pattern is established. The world comparative analysis may lead research toward broader horizons. For the time being a few signs have been identified as having the same meaning in more than three different areas of the world. The rectangle, or square, means land, site or territory in most early scripts as well as in many examples of rock art. Similarly, two or more wavy lines mean water or liquid; they may mean also fertility or plenty. The rayed disk means sun, light, or day; the non-rayed disk, in several cases, means sky or air. In some early ideographic scripts from different continents, and in rock art from mixed economy groups, the triangle with a point turned downward signifies the pubic triangle: female, sex, fertility, or birth. Many examples show that in the rock art of human groups with complex economies of Europe, the Near East, and North Africa, the dot near an anthropomorphic being is a verb of action, like «to do.» If it is near the foot of a person it may mean «to go» or «to walk;» near the penis or the vulva, «to have intercourse;» near a bow and arrow, «to shoot;» near the head, «to think.» A similar significance of the «accompanying dot» seems to emerge from the rock engravings of the Helan Shan in northern China.

In the rock art of the Plain Indians, in New Mexico and Arizona, a line near the foot of a human figure is read as the direction of a trail. Similar lines appear to have the same significance in the rock engravings of later periods in the Near East. The problem presented to researchers now is to determine whether these symbols can be traced back to a common archetype. Even more tantalising is the idea that many more such simple signs, spread over pre-literate rock art around the world, may turn out to have similar meanings and to be the core of a pre-literate ideographic proto-writing. In fact the beginning of writing may be much earlier than believed so far.

### *Paradigms and sequences*

In each one of categories of rock art mentioned above, comparative studies seem to demonstrate that paradigms exist that are repeated world wide. One of them is the choice of location – cave, shelter, or open air rock surface – and another one is the preferred degree of inclination of the surface. Every assemblage of rock art appears to reflect choices of the maker concerning the place, the inclination of support and the selection of the surface to decorate, according to recurring criteria. Usually one type of choice is prevailing over the others. It is therefore useful to establish a standard definition of typology that allows comparative studies.

The chosen surfaces have preferential characteristics of colour and form that seem to mean that the «support» (or background) has been taken into account by the artist.

Subjects represented in rock art indicate the range of interests expressed throughout the ages. It is significant that the quantitative proportion of the four main themes of pictograms mentioned above varies from period to period: anthropomorphic, zoomorphic, objects, and

structures. In some contexts, the anthropomorphic beings are the overwhelming majority, while elsewhere they may be practically absent. The same is true of zoomorphic figures, topographic images, and representations of implements. In the rich sequence of Valcamonica (Italy), the relative percentage of the four themes varies drastically from period to period. The same is true for the sequence of the Seminole Canyon in Texas, for the Yenisei sequence in Siberia and for the Tassili sequence in Algerian Sahara. These differences in subject matter appear to have recurring rules world wide.

Sequences with certain constant features have emerged in the Sahara, Tanzania, the Nile Valley, the Near East, Madhya Pradesh in India, Russian Central Asia and elsewhere. The five categories already mentioned - Archaic Hunters, Early Gatherers, Evolved Hunters, Animal Breeders and Complex Economy groups - are usually present in the same chronological order. In Australia, however, no Pastoralist/Animal Breeders rock art has been found. The Australian sequence is mainly composed of the Archaic Hunters and of Early Gatherers, and in sporadic areas in the north, of Evolved Hunters. The Complex Economy category is represented in only a few recent cases, as a post-contact phenomenon. Northern Australia is one of the areas where remarkable typological differences exist, and have frequently been ignored, between art of hunting people mainly relying on animal proteins and art of food gatherers.

In South Africa the main rock art zones comprise a sequence with little evidence of Archaic Hunters; they appear farther north in Namibia, Zimbabwe and Tanzania. A few schematic incisions dated over 70,000 years at Blombos Cave are at the moment an isolated and problematic case. The greatest artistic activity of this zone, probably the richest in rock art thus far known in the world, is classified at present as the work of the Evolved Hunters starting from about 13,000 years ago. They maintained the same visual language with only minor modifications until the present century. Pastoralists/Animal Breeders and Complex Economy groups are also present. Rock art shows the existence of these Pastoralist and Early Farming populations while in most of the territory the Evolved Hunters' way of life persisted (J.D. Lewis-Williams, 1983).

In the rock art of all continents, landscapes and images of plants are extremely rare: either completely absent or indicative of some particular characteristic. The Tanzanian rock art sequence spans over 40,000 years and is considered one of the longest continuous sequence in the world, yet all the images representing the vegetal world are concentrated in one phase, tentatively dated to the end of the Pleistocene and the beginning of the Holocene (ca. 12,000-8,000 BC). During this period of «Archaic Hunters», we come upon a short parenthesis of a vegetarian culture whose economy was based on the gathering of fruits and berries. A wealth of vegetal representations are concentrated in this phase, while they are practically absent in all other periods. Zoomorphic and anthropomorphic images are depicted as monsters; humans have zoomorphic features and animals have anthropomorphic features. From the data at our disposal this appears to be a phase of gathering populations rather than hunting, in the midst of a Hunting and Gathering period (E. Anati, 1986).

Analogous creative episodes occur elsewhere. In the Central Sahara the same type of rock art seems to reflect a population whose lifestyle depended largely on gathering and who quite probably made extensive usage of drugs. A similar phenomenon is recognised along the Pecos River and in the Seminole Canyon in Texas. In both cases this phase is chronologically located between the Archaic and the Evolved Hunters, although the absolute dating varies from one area to the other.

In Near Eastern deserts, rock art shows sporadic examples related to a Complex Economy, that is to say of Food Producers and Agriculturalists, most surprisingly evidenced by pictures of plough in the Negev Desert. This was a brief episode some 1750 years ago, during the Roman period when colonizers were subsidised by a central government. The stratigraphy of overlapping and superimposition shows that the artists both before and after were Pastoralists. In itself, the existence of a few drawings indicating a complex economy does not conclusively mean the beginning of a new era. Rock art indeed provides segments of history, although history

is certainly not always as simple and linear as we would like it to be. The proposed WARA data base will help us in reconstructing human cultural adventures in different parts of the world. But in order to detect patterns, the basic data must be memorised and elaborated with criteria that will allow this kind of research.

## **Visual language**

### *Patterns of the cognitive system*

The use of a world data base for comparative analysis would provide far reaching results for the understanding of early human history. Some basic concepts about the functions of the cognitive system are already emerging. An overview of available data indicates the presence of world trends in the choice of the visual language. We have evidence that, in the absence of any possible cultural transfer between the populations in question, similar artistic outputs and visual patterns were produced. These commonalities cannot, therefore, have been the result of external influence or acculturation in all cases. We may thus hypothesise that a certain convergence exists in the creative expressions of humans. These paradigms bring us into contact with our own cognitive system and open the way to a fresh understanding of elementary associative processes.

The art of ancient *Homo sapiens* is the mirror of mind and spirit, and constitutes a precious record of man's conceptual and psychological matrix. In this art we are face-to-face with archetypes and paradigms that are typical of our species and that have been present deep within us for ages. Good quality information about rock art should become available and be understandable, comparable and debatable. It may become a resource for comparative culture, research and knowledge for everybody.

From an analysis of the typology of figures and signs, patterns emerge which constitute the «grammar» of rock art, as if the images were words in sentences. Isolated marks are extremely rare, as isolated words are rare in written texts. In rock art groups of images reflect systems of associations that we might refer to as syntax. They are sentences composed of groupings or sequences of graphemes, like in today's spoken and written languages. The constant associations go even beyond the limits of linguistics. Essentially, through rock art we may come to recognise some of the fundamental elements of man's cognitive dynamics. It seems that there are no isolated figures and that a fundamental aspect of the documentation consists in defining the context and outline logic associations. The base for the analysis is the assemblage of graphemes that were made together.

A comprehensive viewing of rock art is not always an easy task because superimposition, composite associations and cognitive accumulation have come about in the course of time. Sometimes the process is extremely complex and the accumulation processes require professional analysis. Looking at a panel we may find that there were only three figures originally, two animals, one in front of the other, and an accompanying ideogram; after some generations another figure was added; then two thousand years later another four marks were made. The primordial association should be singled out, the repetitive elements verified, and analogies and comparisons studied in order to evaluate whether the superimposition is fortuitous or intentional. Usually the artist was conscious of the previous figures he was overlapping.

In many instances accumulations of marks appear to be intentional even if they were executed in different periods. Others appear not to be intentional or at least are unrecognisable to us as such. In both cases, however, we frequently discover that a kind of language is expressed by these signs. Sometimes previous graphemes may have been considered as part of the support, like the natural shapes of the rock. These may have been used or not in the association of graphemes of the superimposed depictions. In various contexts around the world and in different types of social and economic setting, the accumulation of graphemes appears to be connected to the mental process of associations.

Artists—hunters, gatherers, or otherwise—made precise choices in terms of the themes they chose to represent. In Europe, Asia, Africa, the Americas, and Australia a similar range of figures may be found represented in rock art, while certain aspects of the environment, economy and social life consistently do not enter into the artist's thematic range.

In various parts of the world, extremely schematic groups of paintings and engravings may initially seem to have no representational meaning. Upon closer study, however, marks with numerical value, repetitive associations of dots and lines, and network motifs actually show that they follow conceptual rules. In Europe, various groups of Mesolithic art, the La Cocina type in Spain, Azilian art in France, Magelmoisian art in Germany and Scandinavia, and the Romanellian art in Italy, are very close to assemblages encountered in Turkey and the Near East, North Africa, Malawi and Zambia in Southern Africa, along the Murray river in Southern Australia, and in various Polynesian Islands. The dating of these similar graphic expressions may be thousands of years apart from each other.

These groups produced either mobiliary art or rock art, or both. Many of these groups have two main recurrent features: specific associations of lines and dots that are repeated using similar associative syntaxes in various parts of the world, and constant proximity to *escargotières* or shell mounds. Thanks to comparative analysis, it was possible to determine a common denominator in similar graphic assemblages from different parts of the world at different periods. These are sites where human groups camped and where heaps of shells and other molluscs remains are found, revealing an economy based on the collection of river or marsh food.

Thus, significantly, it appears that a specific graphic style reflects a way of life with more or less uniform consistency, at different ages in various parts of the world. We tend to find this type of art by rivers, lakes, marshes, and the seashore. It would appear to reflect a gathering mentality rather than a hunting mentality, centred on gathering molluscs as a means of survival. Such activity seems to have aroused a particular interest in arithmetic and a tendency to schematise, in contrast to the spirit of observing large animals in great detail that appears in most Archaic Hunting populations.

Another example of themes of preference can be found in the art of hunting populations, to which life-size or larger representations of animals are almost exclusive. Among pastoralists, large size animal images are found only in certain zones that are now deserts, especially in Arabia and the Sahara where breeders practised hunting as well. Large animal representations are extremely rare in the rock art of Early Collectors and of Complex Economy populations. On the other hand, in other phases of both Archaic and Evolved Hunters' art, medium-sized or even miniature animal representations are found. An interesting phenomenon has been noted both in Africa and in Australia: when large animals are prevalent, human figures are rare, and when the animals are smaller the percentage of anthropomorphic figures is usually higher.

In all complexes primary and secondary subjects are usually found: an initial dominant choice and minor, complementary themes. There are repetitive elements, ideograms and pictograms, which appear to accompany the dominant figures. It is frequently stated that the animal is the most commonly represented figure in European Palaeolithic art and that throughout the world animals are the main feature of Archaic Hunters' art. Contrary to what is normally believed, however, isolated animal figures practically do not exist; animals are almost always accompanied by ideograms. Frequently animals occupy the largest space on the painted surface simply due to their size, but ideograms vary in number and usually exceed the number of animal figures with which they are associated.

Animals, like other figures in both prehistoric and tribal art, often appear to have a totemic meaning as a metaphoric representation of tribal groups or of individuals. They also may represent qualities or attributes. A group of American Indians made image-based references to their chief Black Bison by depicting with charcoal black the animal of his name rather than his profile; others used to indicate a liar by representing a snake with a forked tongue. In modern language qualities and attributes are represented by animals: a man may be referred to as a pig,

shark, monkey, snake, or chicken, or a woman might be identified as a gazelle, cat, bird, bitch, or rat.

Myths all over the world have always included animals: the deer as messenger from the underworld and the dove as messenger from the sky, the scorpion as source of evil and the snake as a tempter have been represented in Europe for centuries. The frog as a symbol of courage in China, or the elk as a symbol of plenty in Siberia, are symbols likely to go back to prehistoric origins. Such metaphors are used by people from different regions, diverse cultures and varying languages all over the world. They likely represent primordial trends of associative processes.

As was already brought to evidence by A. Laming (1962) and A. Leroi-Gourhan (1965), in the Upper Palaeolithic cave art of Western Europe animal figures of different species are often associated with each other. Two animal species, the bison and the horse, are represented together, usually one in front of the other, as a main theme much more frequently than groupings of other wild animals. The repetition of this pattern would seem to imply something quite specific in the language of visual associations. In the Gobustan area of Azerbaijan, the rock engravings of Archaic Hunters display the horse and the ox facing each other in the same way.

In Tanzania, Archaic Hunters' art contains representations of the elephant and the giraffe that play roles similar to those of the horse and the bison in Western Europe, and the horse and the ox in Azerbaijan, in terms of associations and frequency of representation compared to other animals. That is, they are frequently associated with each other and are by far the most commonly represented animals (E. Anati 1986). Quite probably they played the same role within the conceptuality of the Tanzanian Archaic Hunters, as the horse and the bison did in the Franco-Cantabrian mentality in western Europe and the horse and ox did in Azerbaijan. Comparative analysis provides here the premises for yet another paradigm: in the art of hunters the presence of paired dominant animal species shows significant dialectic relationships.

With regard to the meaning of such associations A. Laming and A. Leroi-Gourhan proposed a possible connection between the concept of male-female interplay, with one of the animals representing the man or male attributes and the other, the woman or female attributes. Another hypothesis interpreted the animal figures as totemic images representing clans or tribes. Their associations might have assumed, in such case, the role of commemoration of pacts of agreement or of expressions of antagonism. While other theories have been proposed, no final conclusions have been reached. It is not unlikely that the pairings reflect metaphors of binary relations. Whatever the specific significance, there can be little doubt that the European association of horse/bison shows grammatical and syntactic parallels to the African association of elephant/giraffe, and therefore it is possible that they also reflect conceptual analogies.

From these examples we may gather the idea of how a world archive can help in comparative analysis. Such paradigms seem to reveal the existence of «logic constants,» a detailed analysis of which on a world scale could lead to advanced research in cognitive patterns. It is particularly relevant to develop a systematic analysis that defines the type of relationship between one grapheme and another - associations, compositions and scenes - in any given context in order to provide indications on the way of thinking and conceptual dynamics reflected by the associations.

In the art of the Evolved Hunters, scenes showing hunting, dancing, other social events, or warfare are common. In the art of the Archaic Hunters, on the other hand, real descriptive scenes do not seem to appear, either in Europe or elsewhere. Associations in sequence do exist in Archaic Hunters' art, however, and they may represent «metaphoric scenes.» Their conceptual structure is, in any case, the mirror of a mental process, which was modified with the development of technological abilities. The art of hunters using the bow and arrow usually has a different syntactical structure than that of hunters that do not use the bow and arrow. This intriguing psychological phenomenon holds true for rock art on all continents.

## **Conclusions**

Through the ancient expressions of the human mind, recorded on rock surface, a wide range of submerged memories come back to consciousness, reviving stored chapters of our intellectual heritage. The historical relevance of rock art is monumental; as a sort of pictographic writing, it constitutes humanity's largest and most significant archive of a 50,000 year-old history, up until the advent of conventional modern writing. Almost daily new discoveries keep adding to the prehistoric record.

Food, sex and territory appear to have been, in all contexts at all times, the main concerns of the human species and the concerns most frequently expressed in rock art (E. Anati, 1992). A series of elements in the comparative study of rock art is being set out.

The clearest evidence for the presence of universal paradigms lies in the ideograms, which are found as constants throughout the world. Vulvar, phallic, cruciform, stick-like, eye-like ideograms, cup and ring marks, hand prints, foot prints and animal tracks are being found in the rock art of all continents.

The art of the Archaic Hunters appears to have broad universal characteristics in terms of the subject matter, associations, and stylistic trends. The art of gatherers is mainly found in some limited areas and in specific time-range around the world, and reflects universal patterns. The art of the Evolved Hunters has many more local features and local stylistic characters. The real Babel Tower comes into being when the hunting and gathering way of life is replaced by that of food production. As we know, this happened at various dates around the world and in different cultures. In parts of the Near East, domestication of nature and complex economies developed 10,000 years ago, and in some corners of the world this same innovation is occurring as late as this century.

Art, like most other aspects of culture, became increasingly provincial and more conditioned by surrounding influences with the development of sedentary societies. On the whole, however, many common denominators persisted. The most obvious commonality is the very fact of producing rock art. Beyond that, as we have seen, are analogous typologies, subject choices, types of associations, constant uses of certain colours, and repeated preference for certain kinds of rock surfaces. In addition to these basic elements, details, embellishments, and the different stylistic approaches are used by varying local traditions.

Hominids had been evolving for 4 million years, but art only appeared with *Homo sapiens* and proved to be an exquisitely human expression. The «creation» of art was a revolution. The emergence of our identity as *Homo sapiens* presupposes the acquisition of a set of specialised functions and particular attributes, of being able to see, hear, and feel with a lucidity quite specific to the species *sapiens*. Such abilities imply the same capacities of synthesis and abstraction, which led to graphic communication, which eventually emerged as writing.

The visual language of early hunters is a universal language since, quite apart from systems of representation and styles that are often very similar in different parts of the world, it also displays combinations of figures and symbols that derive from the same logic, suggesting a similar way of thinking and of self-expression on a world scale. The careful study of this art, and the global phenomenon of rock art as a whole, reveal the early conceptual processes of the human mind. The ancient imagery of rock art shares with modern humanity the visions of our ancestors.

Why did humans have the need to record their own thoughts and emotive stimulation? No doubt this is part of the nature of *Homo sapiens*, like socialisation, the sense of aesthetic, love, ambition, and solidarity. Was early man conscious of the fact that by so doing he was preserving an immense heritage for future generation? Was he aware of his enormous bequest to the story of mankind? Probably not.

A world inventory of rock art will be a major contribution to world cultural heritage, and may become a major source of research for scholars of many disciplines, from sociologists to psychologist, from art historians to philosophers. It would also become a source of inspiration for aesthetics, graphics, fashion and many other fields. But beyond all that it would be a major resource for a comprehensive, evidence-based, reliable and inspiring history of mankind.

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