

Time, Space, and Image Making: Rock Art from the Dhar Tichitt (Mauritania)

Augustin F. C. Holl¹

Prehistoric images are particularly versatile and difficult to grasp. In a few cases of historical continuity, local cultural glosses provide researchers with a rich corpus of data and help in the interpretation of the imagery. Such approaches contribute to the interpretation of the material in a “frozen time” perspective. Their impact on the development of archaeological methodologies enabling researchers to deal with strictly prehistoric image making traditions without any known descendant communities remains to be felt. This paper is an attempt to develop a subtle and robust archaeological methodology for the study of prehistoric images. The suggested approaches are replicable, and conclusions are falsifiable.

Les images préhistoriques sont particulièrement versatiles, et leur sens difficile à cerner en raison de leur polysémie. Dans une poignée de cas, là où il y a continuité historique, les chercheurs ont réussi à constituer une riche documentation sur les pratiques culturelles liées à l'utilisation des images. Ils/elles parviennent ainsi à des niveaux d'interprétation très détaillée, dans une conception paradoxalement réifiée des sociétés en question, conservant des pratiques culturelles inchangées pendant des millénaires. L'impact de telles approches sur l'élaboration de bonnes méthodes archéologique est négligeable. Dans la plupart des cas, les images et les vestiges matériels sont les uniques témoins des sociétés préhistoriques étudiées. Cet article s'efforce de développer des méthodes, à la fois subtiles et robustes, permettant une analyse systématique des images préhistoriques. Les méthodes proposées sont répliquables, et les conclusions réfutables.

KEY WORDS: rock art; modus operandi; iconographic language; Dhar Thichitt; West Africa.

¹The University of Michigan, Museum of Anthropology, Center for Afroamerican and African Studies, University Museums Building, Ann Arbor, Michigan 48109-1079.

IMAGE MAKING: THE CHALLENGING DIVERSITY

The fundamental thesis of the paper is that almost the same range of basic motivations that incline anyone to draw pictures today also existed in the past (for *Homo sapiens sapiens*). Image making involves human minds, techniques, timing, scheduling, and location. According to Fauconnier (1997, p. 189), the cognitive operations that play a central role in the construction of everyday meaning are the same operations that apply to reasoning, thinking, and understanding generally. In this perspective, there is no need to rely on ad hoc and peculiar features—like entoptic phenomenon and/or trance—to devise a systematic investigation of rock art. Cognition is the key parameter holding all the other variables together. As argued by D’Andrade (1995, p. xiv):

Human knowledge is much too precious a thing to be carelessly discarded each generation with the hope that it will be rediscovered in the next. Human knowledge is carefully preserved and passed from one generation to another. Most of what any human ever thinks has been thought before, and most of what any human ever thinks has been learned from other humans. Or to put it another way, most of what anyone knows is cultural knowledge . . . , knowledge which is imbedded in words, in stories, and artifacts [one may add, and images], and which is learned from and shared with other human[s].

Studies on how salient cognitive features operate are part of an emerging research frontier (Cognitive Sciences) with significant impacts in anthropology (D’Andrade, 1995), linguistics (Fauconnier, 1997), and archaeology (Renfrew and Zubrow, 1994), and cannot be addressed satisfactorily here. Suffice to say that human conceptual networks are intricately structured by analogical and metaphorical mappings. Mappings between distinct domains are the heart of the unique human cognitive faculty of producing, transferring, and processing meaning. They play key roles in the synchronic construction of meaning and its diachronic evolution (Fauconnier, 1997, p. 18). The idea of mapping as a process of transfer from one domain to another is critical for a systematic investigation of rock art as a cultural phenomenon. “Mapping, in the most general mathematical sense, is a correspondence between two sets that assigns to each element in the first a counterpart in the second” (Fauconnier, 1997, p. 1, note 1). Rock art is clearly the result of a transfer on a medium—the rock surface—of icons, signs, and symbols transiting through each artist’s mental space and framed in an iconographic language. The artists, depending on their level of expertise, may have mastered a certain range of pictorial techniques and knowledge on the suitable and reliable rock surfaces to work on. The selection of items, motifs, and scenes to be represented is the product of a persistent interaction between the artists’ cultural heritage and his creativity. Depending on circumstances, the cultural heritage may predominate, setting the standards for the representation of sensitive social issues; or the creative side may take over, thus initiating news forms of expression, new associations of themes and motifs, and even new meanings. The challenge for researchers is to devise theories and methods robust enough to encompass the broader range of possible situations

and at the same time subtle enough to allow for the discovery of “individual” or local particularities.

RESEARCH PERSPECTIVES

Saharan rock art research includes diverse theoretical and methodological orientations that will not be discussed in detail here. Rock images have been used to monitor past climatic changes (Esperandieu, 1952; Le Quellec, 1999), patterns of cultural evolution (Lhote, 1975; Monod, 1938; Mori, 1965, 1998), regional distribution and chronological succession of rock art styles or schools (Aumassip, 1993; Dupuy, 1998; Le Quellec, 1987, 1993, 1999; Lhote and Thomasson, 1967; Muzzolini, 1986, 1995; Muzzolini and Boccazzi, 1991; Striedter, 1983), as well as more recent developments ranging from cognitive to hermeneutic approaches (Calegari, 1993; Davis, 1984, 1990; Hassan, 1993; Lewis-Williams, 1983; Lewis-Williams and Loubser, 1986; Smith, 1993).

There is a general assumption crosscutting all the schools of thought outlined above. All the images dealt with in rock art research are considered to be “finished products,” as the artists intended them to be. There is no place for drafting mistakes, crude sketches, unfinished motifs, or abandoned attempts. As far as rock art is concerned, past image makers appear to have been perfect; they were always able to implement their projects from the beginning to the end. That this was certainly not the case cannot be merely assumed but argued with archaeological evidence. It is one of the topics to be addressed in this paper. This is done through a detailed and as precise as possible analysis of how individual images were made. The analysis is based on the *chaîne opératoire* rationale that involves the reconstruction of the scheduling and succession of technical gestures, as well as how they were adjusted to produce images, scenes, and panels. As suggested by Gombrich (Gombrich and Eribon, 1991, p. 68), the analysis of art techniques is one of the fundamental aspects of art history:

There is a technological aspect in art history: one has to learn how to create and make a beautiful painting. Such paintings could never have been painted if the necessary technology was unavailable. Perspective is an excellent example. There are many others. In this perspective the history of art is similar to many other technological developments like metallurgy.

The research orientation spelled out above clearly deals with time dimension, techniques, and know-how. Another aspect equally crucial for a balanced analysis of rock artworks and an integral part of the process of image making is locational, and revolves around space issues. The spatial distribution of rock art stations recorded today is without any doubt a result of many distinct locational decisions, ranging from ludic and casual on the one hand to purposeful and thoughtful on the other (Bradley, 1994; Coles, 1999; Eogan, 1999; Hartley and Vawser, 1998; Holl, 1994; Holl and Dueppen, 1999; Ouzman, 1998). Let us suppose rock surfaces

adequate for image making to be evenly distributed in a specific area, and archaeological surveys revealing the effective distribution of rock art stations to be uneven, spatially skewed in favor of some places. At first glance, the question that one is pressed to ask is where are rock art stations located? Are they within or outside of the inhabited space associated with dwelling features, or are they found in peculiar parts of the landscape? And in either case, what are the observed distribution patterns? And why?

The rock art from the Dhar Tichitt region, which happens to be intertwined with dwelling features, provides an excellent test case for the research perspective outlined above. This is not the case for most Saharan rock art traditions; in which artworks were generally located in areas with ambiguous or no habitation features, as seen in the Tassili, the Air, the Atlas, the Adrar-n-Ifogha, with however the notable exception of the Tadrart Acacus—Uan Afuda, Uan Telocoat, Uan Muhuggiag, Ti-n-Hanakaten (di Lernia, 1999; Mori, 1965, 1998; Muzzolini, 1995).

THE DHAR TICHITT: CONTEXT AND CORPUS OF ROCK IMAGES

The Dhar Tichitt region is a 44 km long and 15 km wide portion of the sandstone cliff formation located in south-central Mauritania, in the southwestern part of the Saharan desert. The area was settled by Late Stone Age (LSA) agropastoral communities from ca. 2000 to 500 BC. They raised cattle and sheep/goats, cultivated bulrush millet, and also relied on hunting, fishing, and the gathering of wild grains (Holl, 1985, 1986; Munson, 1971). The settlement system(s) developed all along the LSA agropastoral occupation consisted of main villages with dwelling features built in stone based on drystone masonry techniques, and intermittent sites of dry-season camps with surface scatters of cultural remains. The main villages were generally located on the cliff, overlooking the sandy lowlands that included small lakes and freshwater ponds. Depending on their size and the number of compounds, the sites are partitioned into hamlets, small villages, and large villages (Fig. 1). The region appears to have been abandoned from the middle of the first millennium BC onwards, probably because of the onset of particularly arid climatic conditions. The details of the process are still poorly investigated (MacDonald, 1998) and it has been suggested that Proto-Berbers (or Libyco-Berbers) later expanded into the area. This inference is based exclusively on rock art evidence and suggests the existence of a cultural universe focused on a high degree of mobility as well as a hunting and warrior ethos. These groups seem to have developed an opportunistic use of earlier settlements' features without initiating a building style of their own. Much later, during the so-called Medieval Period, the Dhar Tichitt was crossed by merchants' caravans linking North African trade towns to places like Tegdaoust (Awdoghost), Kumbi-Saley, Walata, etc. in the western part of the Bilad es Sudan (the Land of the Blacks). The probability of some of the later images having been made by the members of the different

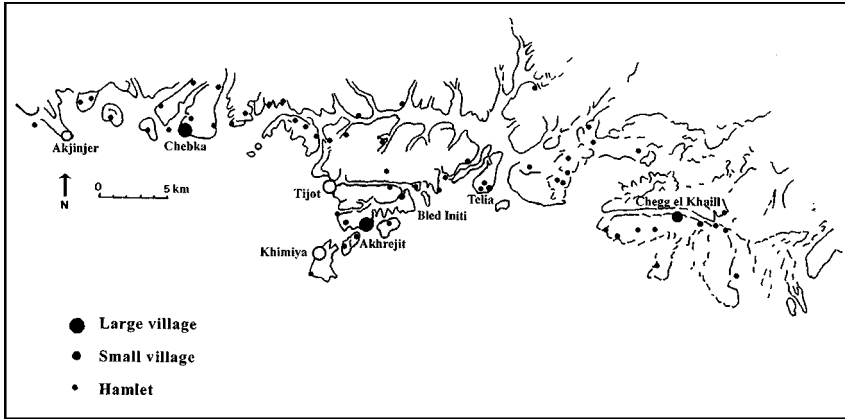


Fig. 1. Distribution of sites with rock art mentioned in the text.

caravans is high, but can hardly be supported by direct archaeological data; few clues can nonetheless be suggested here and there.

The corpus of rock images from the Dhar Tichitt available today has been recorded during the last three decades. In 1968, P. Munson (Munson and Munson, 1969, 1971) recorded a series of images in the vicinity of Akhrejit, at a hamlet called Bled Initi (Fig. 1). These images include ox carts supposed to date from 650 to 380 BC (Munson and Munson, 1971, p. 354) and representations of several specimens of large wild fauna. A regional survey project carried out in 1980 by the *Mission Préhistorique du Dhar Tichitt*, directed by Professor Henri-Jean Hugot, has recorded hundreds of rock art stations distributed all over the landscape, with main concentrations in some sites. They include two cases of paintings (Holl, 1986), but consist predominantly of engravings representing humans, isolated or clustered domestic as well as wild animals, walled compounds, and nonfigurative or abstract motifs (Beyries and Boeda, 1981). Finally, in 1981, more intensive mapping and recording of rock art was implemented within a single site at Akhrejit, resulting in additional findings (Amblard *et al.*, 1981/1982; Amblard and Vernet, 1984). The available database is heterogeneous but not desperately so. Some sites have been thoroughly investigated, many others simply sampled. Munson and Munson (1969, 1971) attempted to arrange their finds along the chronological guidelines devised by Mauny (1954), Monod (1938), and Lhote (1975), a scheme shown to be inappropriate in this paper.

MODUS OPERANDI AND IMAGE MAKING

The use of the concept of *chaîne opératoire* (modus operandi) involving the scheduling and sequencing of any technical set of actions is but the logical

consequence of the implementation of a processual (study of a process) analysis of rock art. Images are made, using a range of more or less elaborate tools, techniques, and knowledge. The focus is narrowly on the process of making an image, on what gesture is made, and how it is articulated to the preceding one. Following this rationale, and keeping techniques constant, the length of the operational sequence is in first approximation a function of the time invested in the production of the image. In the perspective outlined above, one can arrange the rock images found in a panel and then in a site according to the length of time required for their completion. Each of the recurrent sequences' series is then considered to be a *modus operandi*, a more or less common way of making rock images. The issue of variability at both intra- and intersite levels is then considered, hypotheses formulated, evaluated with the data at hand, and suggestions are made for further investigations.

All engravings recorded in the Dhar Tichitt belong to two families: the earlier consisting of images with dark patina (DP), and the later comprising representations with light patina (LP). Images from both families, with a certain amount of variation, are made with pecking techniques. There are two kinds of pecking techniques: one with and the other without the use of hammerstones. In the first, the tool has to fit in the hand of the artist and at the same time be heavy and hard enough to impact the chosen rock surfaces. In the second, a hammer is used in tandem with an intermediate tool, a flake, a blade, or a piece of metal, to impact the selected surface. As all the recorded images are two-dimensional, one can rely on simple principles of Euclidean geometry. Pecking can generate patterns of distinct dots, lines, and surfaces and diverse combinations of some or all of the mentioned pictorial elements. There is a slight methodological difficulty at this juncture: what is the most relevant yardstick to use in order to decipher the *modus operandi* implemented? Ideally, the obvious elementary analytical unit is a dot made by a single blow of a pecking tool. In practice however, it is far from easy to figure out the number of individual dots involved in the drafting of a well-made line; consequently, the yardstick to be used here consists of a more or less straight line to be found between major changes in direction. Any major change in orientation, depending on its angle with the previous line, requires a repositioning of the tools and readjustment of the hands, arms, and ultimately the whole body of the artist. Thus a straight line will be used as the proxy unit equivalent to a technical sequence. The methods will now be implemented on the corpus of rock images from different sites, ranging from seasonal camp to hamlet, small village, and, finally, large central villages (Fig. 1; Table I), and arrayed according to a criteria whereby the predominant represented animal species is the key parameter.

Bled Initi Wild Fauna

Images of the so-called Ethiopian Megafauna, representing giraffes, rhinoceros, and an undetermined specimen, have been recorded at a single locality

Table I. Major Parameters of the Studied Settlements

Locality	Nature	Dwelling features	No. of compounds	No. of panels	No. of images
Bled Initi	Hamlet	Compound	?	?	?
Akhrejtit	Large village	Compound	200	119	119
Chebka	Large village	Compound	120	?	?
Chegg el Khaill	Small village	Compound	40	41	113
Telia I	Hamlet	Compound	8	8	27
Telia II	Hamlet	Compound/Hut	12	10	22
Telia III	Camp	Hut	?	4	16

in the Dhar Tichitt, at the hamlet of Bled Initi (Fig. 1). They are all DP images and do not seem to belong to any larger or coherent composition, an issue better left pending as their spatial distribution has not been published. According to Munson and Munson (1971, p. 342) however, some of the images are found within the hamlet, with the majority scattered at a short distance around. All the published images belong to a single modus operandi, with a maximum of seven major steps represented (Fig. 2).

Step 1 is represented by the outline of a giraffe made after four sequences: head–neck and back–tail–front leg (Fig. 2.1). Step 2 is shown by two images, a giraffe and an undetermined specimen, both created in seven technical sequences: (1) the head; (2) the back–tail; (3) the left front leg; (4) the belly; (5) the right front leg; (6) one rear leg; (7) the other rear leg (Fig. 2.2). Step 3 (Fig. 2.3) has been created in ten sequences: (1–2) the triangular head; (3–4) both horns; (5) the neck–back–tail; (6) one left leg; (7) the other left leg; (8) the belly; (9) one right leg; (10) the other right leg. Step 4, made in 13 sequences, represents a rhinoceros (Fig. 2.4) with a few restricted pecked areas, and a giraffe with a checkered coat (Fig. 2.5). Step 5 consists of a giraffe drawn in 20 sequences, with a regularly checkered coat and well-delineated horns (Fig. 2.7). Step 6, implemented with 22 sequences, is attested by a giraffe with an elliptic body (Fig. 2.6). Finally, step 7 is demonstrated by a giraffe with the coat entirely pecked, probably the most elaborate wild fauna image found in the Dhar Tichitt to date (Fig. 2.8).

The modus operandi that can be reconstructed from the series of wild animal images of Bled Initi appears to start with the pecking of the animal's cervico-vertebral line and two legs. Straight lines depicting the ventral outline and the remaining two legs are then added to the basic module. Two options emerge at step 4: one with a more extensive use of curved lines combined with restricted densely pecked areas; and the other, also with curved lines, with a variable pattern of checkered grid for the animal's coat. The most elaborate of the studied images (Fig. 2.8) is made of a combination of straight and curved lines, the animal's coat being portrayed by an extensive and densely pecked surface. The image set dealt with in this case seems to be built with varied combinations of simple geometric shapes: triangle (steps 1–2), rectangle (steps 3, 5, and 7), and hemisphere and ellipse (steps 2, 4,

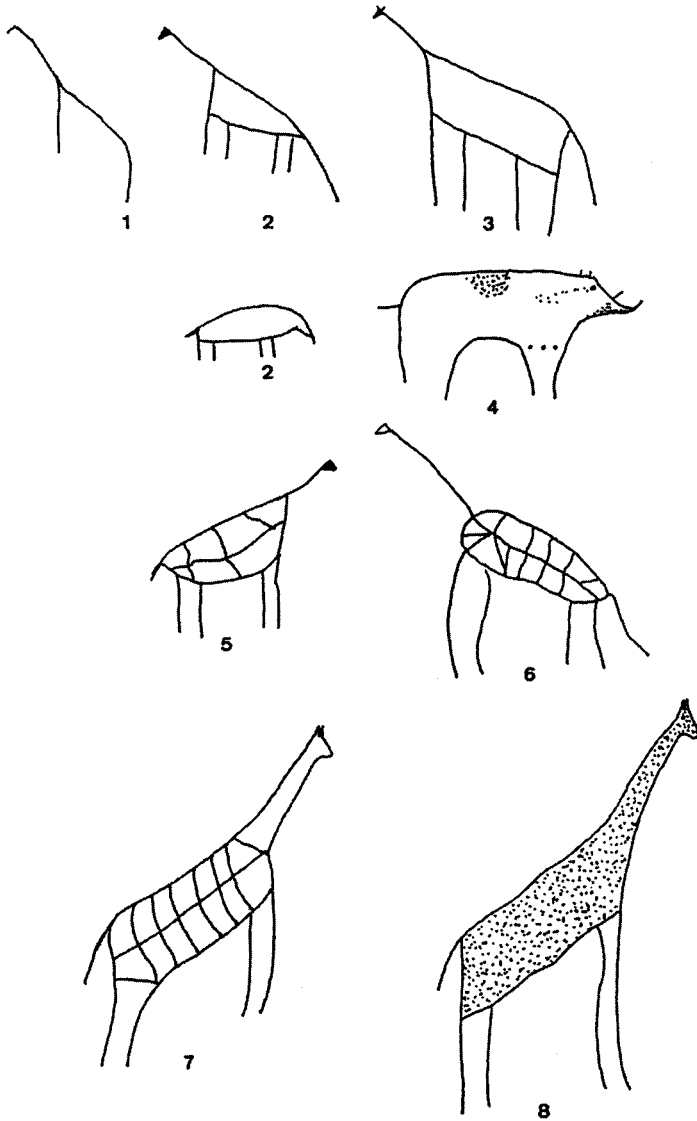


Fig. 2. Bled Initi; reconstructed sequences of the making of wild animal images.

and 6). One may wonder if all the images presented above were “finished” artworks; some of them may have been initial sketches left unfinished, or exercises made by a single individual or different individuals at different times. There is no strong enough set of material evidence in the archaeological record at hand to allow for a thorough evaluation of the set of issues raised here. It is nonetheless clear

that the time and energy invested in image making is proportional to its drafting complexity, deciphered here with the number of technical sequences.

The idea that the so-called Ethiopian Megafauna represents an earlier Late Stone Age period, during which hunting and gathering was the unique subsistence system, has been used to devise a chronology of the Dhar Tichitt rock art (Munson and Munson, 1971, p. 343). Additional evidence collected since then show this not to be the case; a hippopotamus bone collected from the food refuse of a small seasonal camp has been dated to 2290 ± 110 bp (Gif-4112). A few bones of white rhinoceros were recorded in the faunal sample from Akhrejit (Holl, 1985, 1986), a site inhabited from ca. 4000 to 2400 bp. Large wild mammals were still present in the Dhar Tichitt region during the Late Stone Age agropastoral occupation. The Bled Initi images thus belong to the same broad image making tradition, as will be argued later.

The Images From a Large Village: Akhrejit

Akhrejit is a large site measuring 12 ha in extent and located on the top of the cliff next to the escarpment in the central part of the study area (Fig. 1; Table I). The settlement is surrounded by a 1.5–2 m high dry stone wall along its northern side, with its long axis oriented east–west. The site consists of 200 compounds delimited by dry stone walls, organized into clusters separated by alleys and open places. Akhrejit has been the focus of relatively intensive archaeological research initiated in the 1960s by Hugot (1979). A broad range of evidence has been collected since then and published by different researchers (Amblard, 1984; Amblard and Vernet, 1984; Amblard *et al.*, 1981/1982; Holl, 1985, 1986; Munson, 1971). The corpus of rock images available so far consists of 119 representations divided into two families. The DP family is represented by 65 artworks and the LP one by 54.

Artworks from the DP family were created with six distinct *modi operandi*. The first comprises four steps. Step 1 consists of four technical sequences with curved lines: (1) the head and the cervico-dorsal axis; (2) the horns; (3) the mouth–lower neck–front leg; and finally (4) the ventral line (Fig. 3.1(A)). Step 2 involves 16 technical sequences, resulting in a cattle image with a restricted pecked area on the head and a coat represented by eight more or less curved lines (Fig. 3.1(B)). In step 3, curved and straight lines are combined in a 23-sequence cattle image (Fig. 3.1(C)). Finally, in step 4, a bull with neat anatomic details has been created in 32 technical sequences (Fig. 3.1(D)).

The second *modus operandi* includes three steps. Step 1 is represented by a cattle image made in 9 sequences based predominantly on the use of straight lines. Vertical straight lines representing the legs are used to partition the image into four parts, and hooves are singled out for one of the legs (Fig. 3.2(A)). Step 2 involves two options, one being the redundancy of the other (Fig. 3.2(B) and (C)). In the first option, a cattle is represented with thicker outlines and densely pecked head and horns. In the second, the redundancy is obtained by combining two animals in

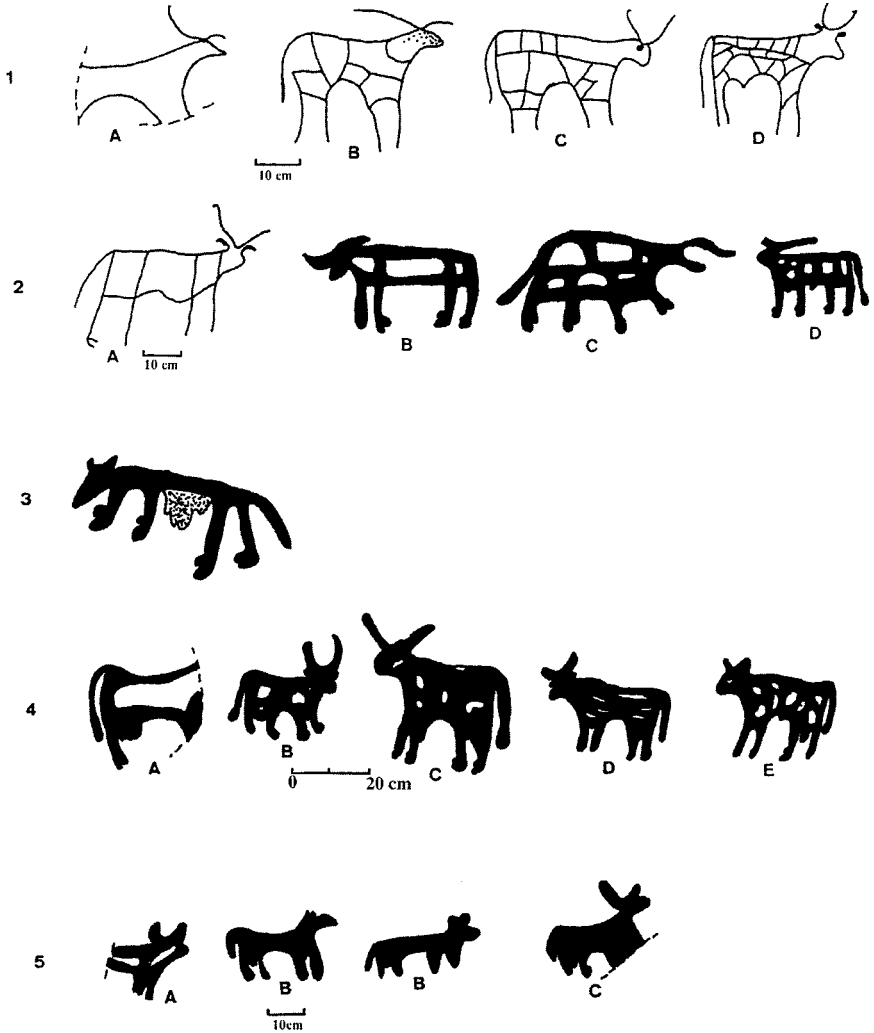


Fig. 3. Reconstructed sequences in the making of dark patina (DP) images from the large village of Akhrejtit.

a sideview with forward-oriented horns. The increased thickness of lines as well as the broader extent of densely pecked surfaces make the determination of the number of technical sequences less and less precise. With at least the doubling of the number of involved technical sequences, the amount of time invested in the creation of rock images certainly increases. Step 3 is attested by a bull with a checkered coat (Fig. 3.2(D)) made with eleven straight lines.

The third modus operandi is represented by a single image, that of a mammal with pecked udders (Fig. 3.3); it is not clear if it is a slightly stylized cow or a dog. It has been drawn with broad, densely pecked lines. For the fourth modus operandi five steps have been documented, with the persistent extension of the pecked surfaces as main technical characteristics. The first is represented by the image of a truncated cow with udders (Fig. 3.4(A)); the outlines are broadened and the central area left plain. In the remaining four steps (2–5), the details of the coats are more and more elaborate: two plain spots in step 2 (Fig. 3.4(B)); five in step 3 (Fig. 3.4(C)); six short horizontal plain bands in step 4 (Fig. 3.4(D)); and finally, eight plain spots in step 5 (Fig. 3.4(E)), with one used to represent the eye.

The fifth and last modus operandi with small-sized images includes two main steps. In the first the plain area is small in size and confined to the central part of the body of the animal being represented (Fig. 3.5(A)). In the second, the whole image is pecked (Fig. 3.5(B) and (C)). The art pieces drawn in this case are elongated, with a significant disproportion between the body and legs. The sixth modus operandi is manifest in a single elaborate representation of a “Monumental Bull” that will be dealt with later.

The 54 images from the LP family have been created following the same unique modus operandi, the seventh documented at Akhrejtit. The images are small in size (Fig. 4), represent dromedaries, camel riders, and horse riders, some of them

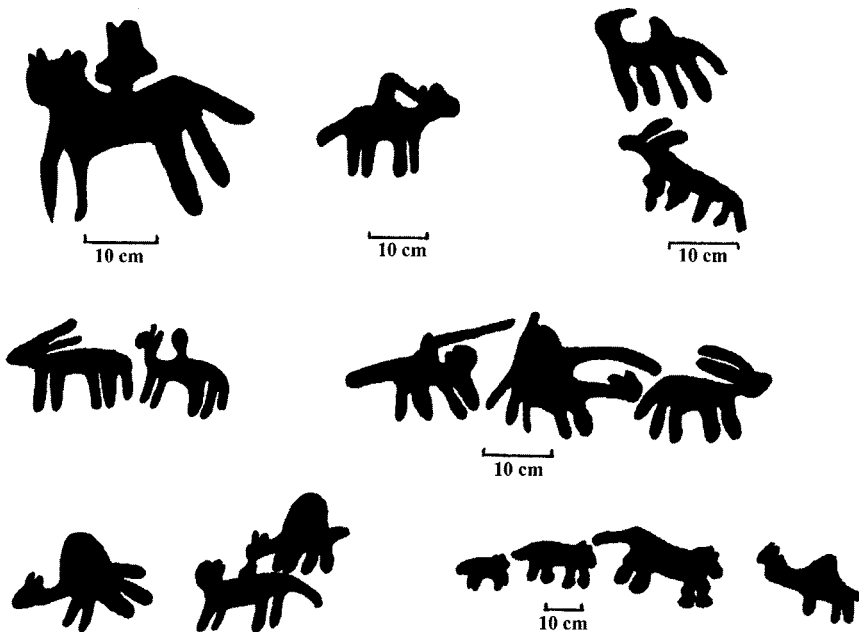


Fig. 4. Samples of light patina (LP) images from the large village of Akhrejtit.

with spears. They are made through extensive and dense pecking of the whole shape of the motifs to be represented. Some of them are arranged in more or less elaborate compositions. Because of their size, images from the LP family seem to have been less time consuming than those from the DP family.

The Images From a Small Village: Chegg el Khaill

One hundred and thirteen images have been recorded from the small village of Chegg el Khaill (Fig. 1; Table I). They are distributed into 42 panels belonging to four clusters or stations. The documented images have been made using six distinct *modi operandi*, five with DP representations and one with LP (Fig. 5; Table II). The first two are found exclusively in cattle representations, the third, fourth, and fifth comprise combinations of cattle and sheep/goat images, and the sixth, with LP images, comprises horse riders, camel riders, dromedaries, wild bovids, and ostriches, as well as humans.

Modus operandi 1 has been implemented in five steps (Fig. 5.1). Step 1 is completed after eight sequences, and the image looks like a sketch and seems to be unfinished (Fig. 5.1(A)). Step 2 is also represented by an unfinished headless sketch, but with thicker outlines (Fig. 5.1(B)). In step 3, the outline of the represented cattle is almost completed, with the sideview of the head still unfinished (Fig. 5.1(C)). In step 4, the outline of the represented cattle is completed, with the front part, from the front legs to the head, densely pecked, and a plain elongated

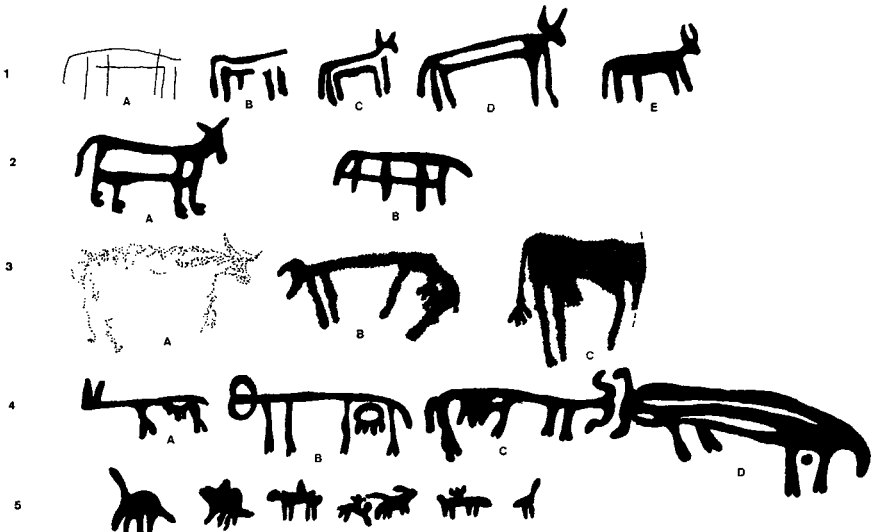


Fig. 5. Reconstructed sequences in the making of images from the small village of Chegg el Khaill.

Table II. Aspects of Image Making Systems: Distribution of the Reconstructed Operational Sequences

Relative time scale	Bled Initi (hamlet)	Akhrejit (l. village)	Chegg el Khaill (s. village)	Telia I (hamlet)	Telia II (hamlet)	Telia III (camp)	Frequency
1	—	—	—	LP0	—	—	1
2	—	LP1	LP1	LP1	LP1	LP1	5
3	—	—	—	—	—	LP2	1
4	—	DP0	DP0	—	—	—	2
5	DP1	DP1	—	—	—	—	2
6	—	DP2	DP2	—	—	—	2
7	—	—	DP3	—	—	—	1
8	—	—	DP4	—	DP4	—	2
9	—	—	—	—	DP5	—	1
10	DP6	DP6	—	DP6	DP6	—	4
11	—	—	DP7	—	—	—	1
12	—	DP8	—	—	—	DP8	2
13	—	DP9	—	—	—	—	1
Total	2	7	6	3	4	3	25

area left in the middle of the body (Fig. 5.1(D)). Finally, in step 6, the whole represented specimen is densely pecked (Fig. 5.1(E)). The images discussed in this paragraph seem to have been part of a drafting exercise, with corrections of mistakes, or attempts to express an idea, a concept. This suggestion will be discussed in detail later.

Modus operandi 2 comprises two steps. Step 1 is characterized by thick outlines, with extensive pecking of the head, complemented by two unequal plain areas on the animal's body (Fig. 5.2(A)). Step 2 is represented by an unfinished or sketchy image of crisscrossed thick lines dividing the animal specimen into four parts (Fig. 5.2(B)).

The third modus operandi comprises three steps based exclusively on the intensive use of pecking techniques without complementary line drawing (Fig. 5.3). In step 1, a cattle shadow is suggested by differential density (Fig. 5.3(A)). Step 2 is characterized by a more focused pecking with more or less diffuse outlines, and represents a cow with udders (Fig. 5.3(B)). Finally, in step 3, the same pecking technique with more or less fuzzy outlines is carried on to represent a cow with udders and a special fingered tail. The front part of the animal, including one leg, the neck, and the head, was not represented (Fig. 5.3(C)). The rock surface does not show any sign of natural flaking (Beyries and Boeda, 1981, p. 16), suggesting the image was found as originally drafted. The artist may have had a specific idea in mind, or have been unable to complete his work for unknowable reasons.

Modus operandi 4 consists of four steps in which bovids with udders are represented, with a significant trend toward stylization and schematism (Fig. 5.4). A female goat is represented in step 1 (Fig. 5.4(A)); an elongated cow with a circular horn shape in step 2 (Fig. 5.4(B)); a cow with udders with a top-view of the head in step 3 (Fig. 5.4(C)); and finally, a cattle of undetermined sex drawn in

a semi-side- and semi-top-view (Fig. 5.4(D)). The fifth modus operandi includes small-sized wholly pecked images of three bovids and two ostriches different from those of modus operandi 6. The latter includes LP small-sized images of dromedaries (Fig. 5.5), camels riders, horse riders, and ostriches, as well as a hunting scene.

Ten of the 18 rock image panels documented at Chegg el Khaill include cattle representations. Of the 21 images of cattle, 15 represent cows with udders. The concentration of these images within a relatively restricted area in the immediate vicinity of the site may suggest a link with cow-milking activities that may have been performed in the cattle enclosures located in the outskirts of the village.

Images From Hamlets and Camps: Telia I, II, and III

The cluster of Telia sites (Fig. 1; Table I) consists of three small settlements, two of which, Telia I and II, are hamlets, and the third, Telia III, is a seasonal camp. A total of 65 images have been recorded, 27 of which are distributed into eight panels at Telia I, 22 into ten panels at Telia II, and 16 into four panels at Telia III.

Three modi operandi have been documented at Telia I (Fig. 6). The first is shown by a DP representation of a cow with udders (Fig. 6.1). The portrayal is elongated, on short legs, with the body divided into four more or less equal rectangular plain surfaces. The remaining 26 images are LP representations made following two modi operandi. One, found on comparatively large images, was obtained by extensive pecking or hammering, leaving small plain surfaces (Fig. 6.2), representing horse riders. The other, consisting of total pecking of the motifs' shadows, is documented in small images of horse riders, dromedaries, camels, and wild bovids (Fig. 6.3). The interesting panel recorded at Telia I includes 17 images: 8 horse riders, 4 dromedaries, 2 ostriches, one wild bovid, and 2 undetermined motifs, and appears to represent hunting scenes that will be studied in detail later.

Four modi operandi have been documented from the corpus of 22 images at Telia II, three for DP representations and one for the LP ones (Fig. 7; Table II). Modus operandi 1 consists of two steps: in the first the animal outline is drawn with two nested but disjointed thick pecked lines (Fig. 7.1(A)); in the second, both previously disjointed nested lines are connected by a link between the ventral segment and the other front leg (Fig. 7.1(B)). Modus operandi 2 includes four steps. Step 1 is manifest in an unfinished cattle image (Fig. 7.2). The coat is represented by plain surfaces separated by thick, straight pecked lines. In steps 2 and 3 coats' details are more and more elaborate (Fig. 7.3(A) and (B)), ending with a totally pecked specimen with long upward horns (Fig. 7.3(C) in step 4. Modus operandi 3 includes two documented steps. The images are schematic in both cases. In the first, the size of the head and horns is exaggerated, with the front legs constituting the vertical symmetry axis of the representation (Fig. 7.4(A)). In the second, the body is particularly elongated and the size of the horns is also exaggerated, but the

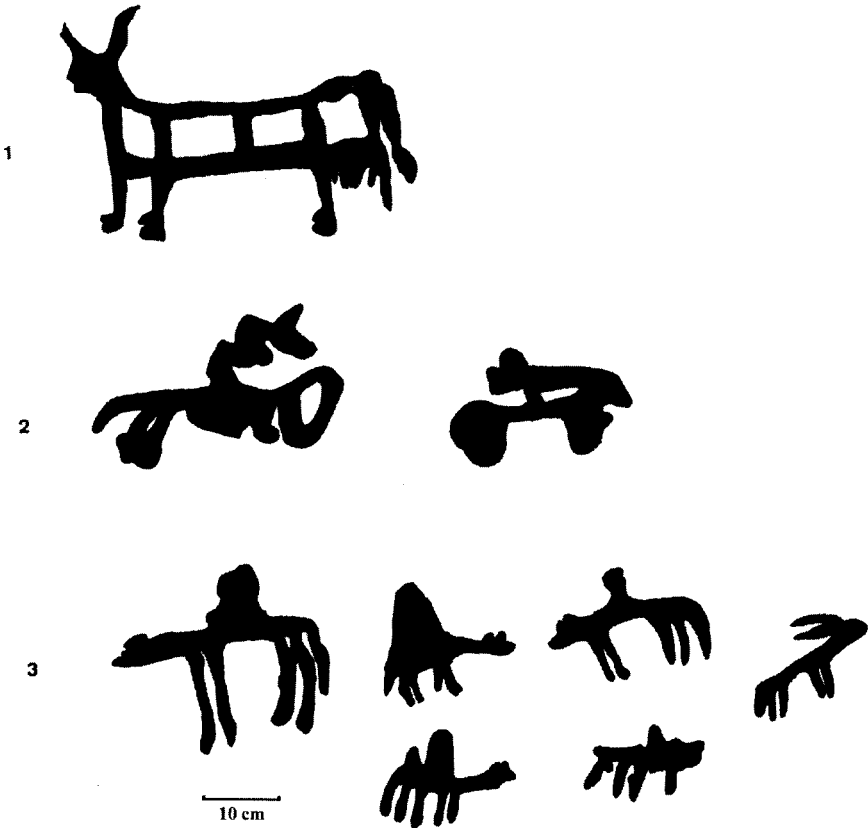


Fig. 6. Reconstructed sequences in the making of images from Telia I station.

whole image is relatively more balanced (Fig. 7.4(B)). Finally, *modus operandi* 4, with small LP images representing horse riders and dromedaries involved the pecking or hammering of the whole motif's silhouette (Fig. 7.5).

The 16 images of Telia III are distributed into four panels documenting three *modi operandi*. The first is found in a single representation of a small-sized bovid made of two nested, thick pecked outlines (Fig. 8.1). The second includes four steps along the increased elaboration of cows with detailed coats and udders (Fig. 8.2(A)–(C)), ending with an integrally pecked *Bos taurus* (Fig. 8.2(D)). Finally, the third, with LP images, includes small horse riders, camel riders, and ostriches (Fig. 8.3).

Cases of images representing walled compounds have been recorded in all the surveyed sites (Fig. 9). They are all DP representations with thick pecked lines, and as such an integral component of the Dhar Tichitt Early Iconographic Tradition outlined so far. Two ox-carts have been documented from the immediate

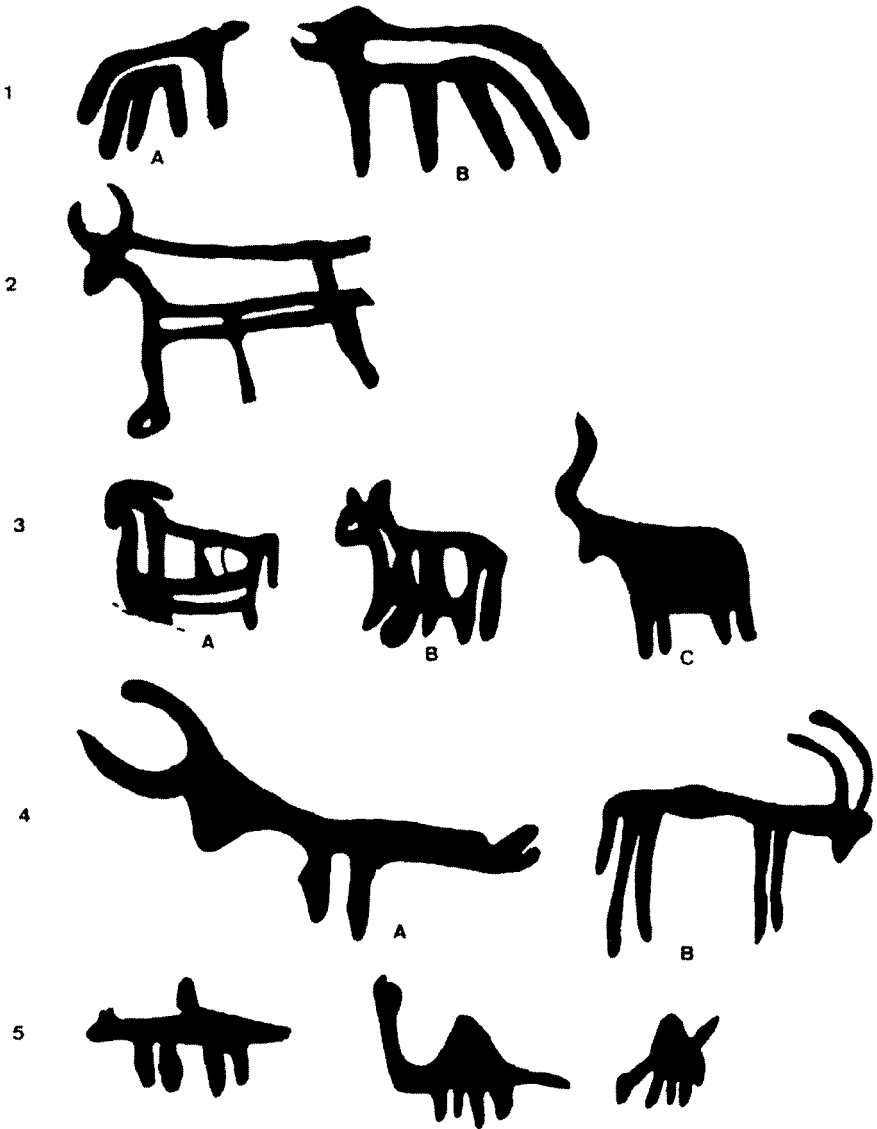


Fig. 7. Reconstructed sequences in the making of images from Telia II station.

vicinity of Bled Initi. One (Fig. 10.1), with a human representation, lacks some elements and may be considered unfinished. The other (Fig. 10.2), appearing completed at first glance, seems to have been drawn by an unskilled artist (or more probably a beginner) unable to master the perspective. In both cases however, the

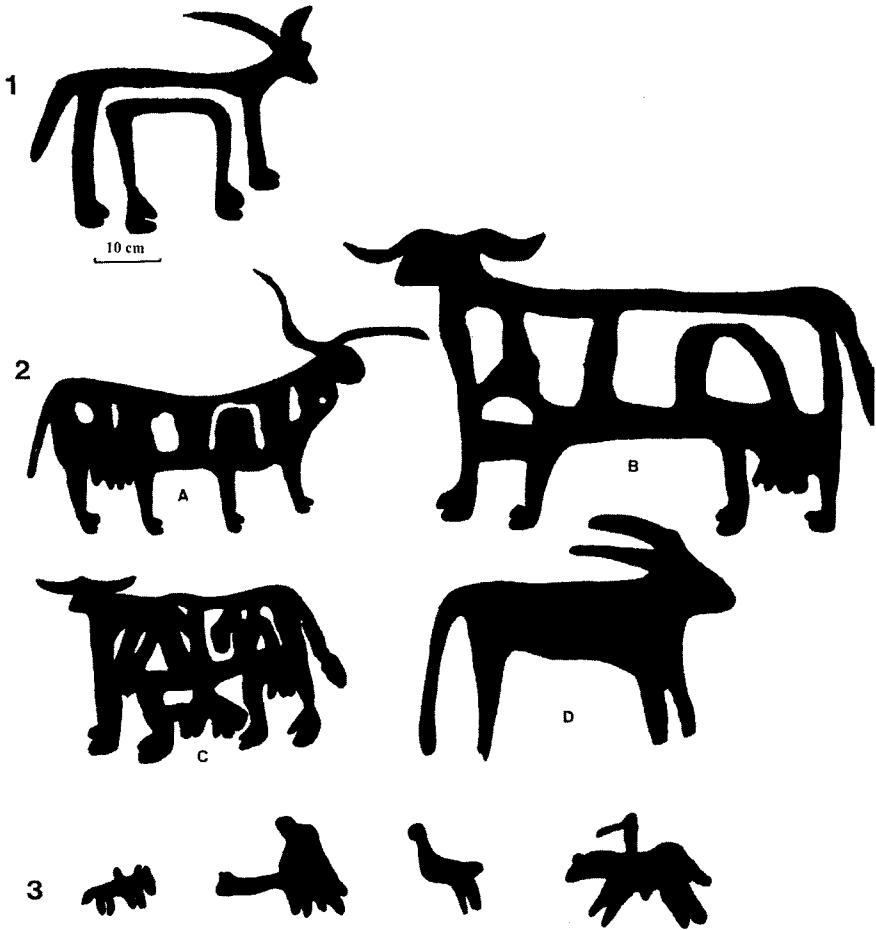


Fig. 8. Reconstructed sequences in the making of images from Telia III station.

modus operandi implemented is similar to that documented at Akhrejit, as shown in Fig. 3.2(A)–(D). In other words, despite their exotic motifs (carts), both representations adhere to the regional Early Iconographic Tradition. But what precisely are the documented iconographic traditions?

**THE DHAR TICHITT ICONOGRAPHIC TRADITIONS:
A GENERATIVE MODEL**

The analysis of the techniques involved in the Dhar Tichitt image making carried out so far is strongly dependent on the precision and quality of the

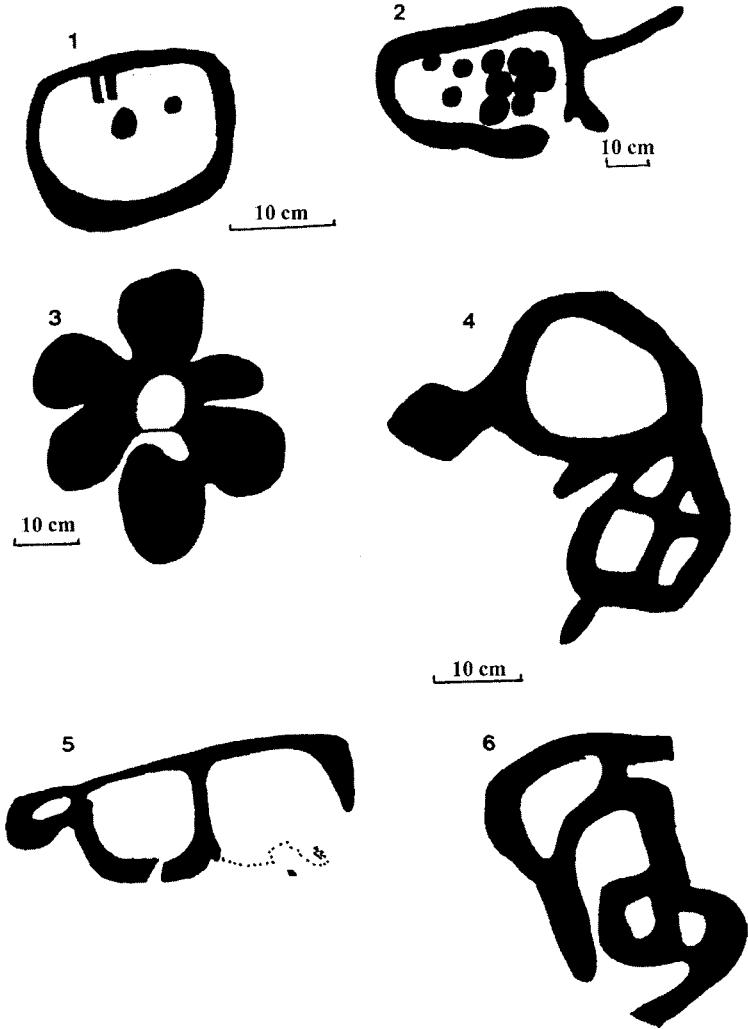


Fig. 9. Images representing walled compounds.

published record, which is at best variable. Despite this difficulty, the reconstitution of the range of modi operandi implemented in the creation of the Dhar Tichitt rock images highlights the specificity of each of the studied sites (Table II). Fourteen modi operandi have been reconstructed. From a combination of techniques, represented motifs, and the nature of the patina, the recorded modi operandi can be divided into two major categories. One category includes small, strongly homogenous images representing isolated or clustered horse riders,

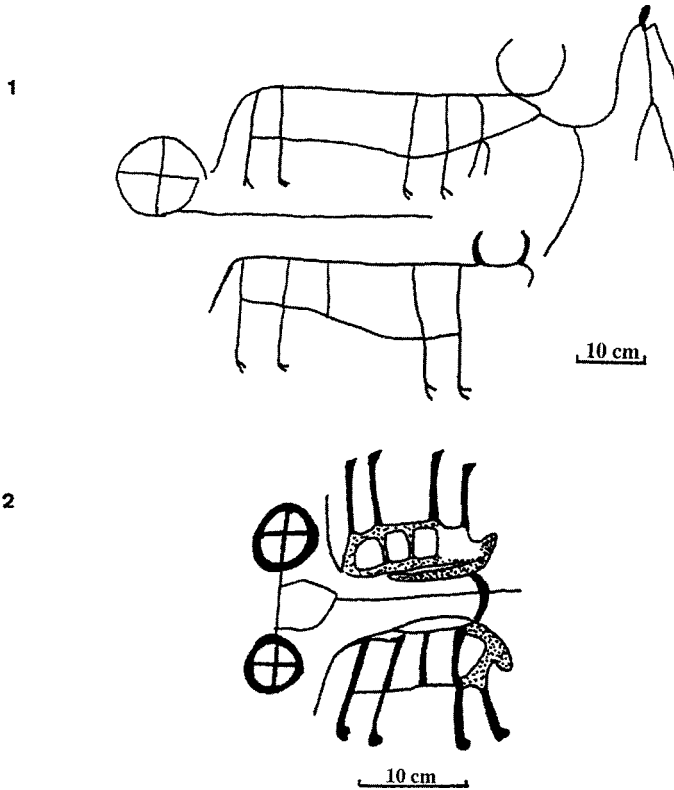


Fig. 10. Oxcarts from Bled Initi.

camel riders, dromedaries, wild bovids, and ostriches. The images, made through pecking/hammering, have a light patina (LP), and are partitioned into three classes: LP0, LP1, and LP2 (Fig. 11). The other category is more diversified and consists of dark patina (DP) images of different sizes, with cattle as the predominant representation. This category is partitioned into at least 11 classes, from DP0 to DP10 (Fig. 11).

If the recorded *modi operandi* are arranged according to their length—a proxy for the time required for the creation of an image—LP images appear to have required much less time to complete (Fig. 11). They are found in all the sites studied, with the exception of Bled Initi. This absence may be due to the selective description of the area’s archaeological record (Munson, 1971).

DP0 images are small in size and as such are comparable to LP ones. They differ, however, in the motifs represented and their dark patina. They are confined to two localities: two ostriches recorded next to Chegg el Khaill, and a few cattle images at Akhrejit and Chegg el Khaill.

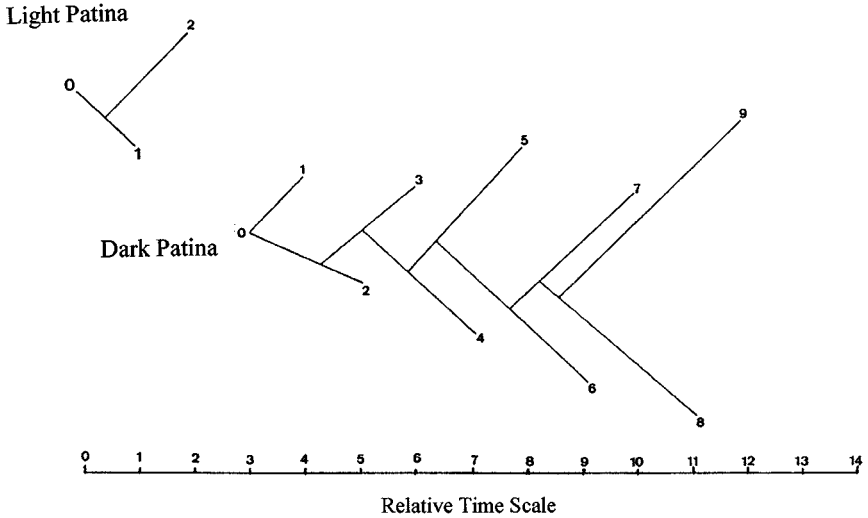


Fig. 11. Chart of the reconstructed image making systems of the Dhar Tichitt, showing the relative time taken to complete each class of light patina (LP) and dark patina (DP) image.

DP1 images are created with single pecked lines, the animal coat represented by pecked lines combined with, in some cases, pecked surfaces. Animal limbs are more or less straight vertical pecked lines, without any representation of hooves. DP1 images have been recorded at two sites: Bled Initi and Akhrejtit (Fig. 11; Table II).

DP2 images have been recorded at Chegg el Khaill Station B and Akhrejtit (Table II). They are made of thick lines obtained by the progressive broadening of pecked outlines. Limbs are still represented as straight vertical lines, without hooves. On a strictly technical level, DP2 is clearly an extension of DP1, as will be shown later in the discussion of the Chegg el Khaill “Cattle Fresco.”

DP3 images are found exclusively in the Chegg el Khaill cluster. They are made of thick pecked lines, with additional, more precise anatomic details such as hooves and cows’ udders. The majority of cattle images are represented from a top–bottom perspective.

DP4 images are found at Chegg el Khaill and Telia II (Table II; Fig. 11). They consist of entirely pecked images, the animal’s body being elongated, with head and horns of disproportionate sizes.

DP5 images have been uncovered exclusively at Telia II (Table II; Fig. 11). They are made with broad pecked lines, limbs represented without hooves. The front limbs are drawn perpendicular to the ventral line, and the rear ones are oblique, with disjointed tail.

DP6 images are widespread (Table II). They were recorded from four settlements: three hamlets, Bled Initi, Telia I, and Telia II; and a large village, Akhrejtit. In general, the represented animal specimens are more elaborate. Hooves are represented and coats are simulated by rectangular plain surfaces.

DP7 images have been recorded at Chegg el Khaill (Table II). They are characterized by fuzzy outlines and differential pecking density, suggesting shadows. Anatomic details such as cows' udders are represented.

DP8 images were found at Akhrejtit and Telia III, the latter probably a seasonal camp (Table II). The recorded images consist exclusively of representations of cattle, drawn with a wealth of anatomic details and elaborate coat patterns.

DP9 images are represented by the unique case of the "Monumental Bull" found at Akhrejtit (Fig. 11; Table II). It is extended over a vertical rock surface of some 8 sq m, and is clearly an impressive artwork executed through the combination of several *modi operandi*, as will be discussed later.

As far as the time dimension involved in creation of rock images is concerned, the corpus from the Dhar Tichitt at hand has been partitioned into 14 *modi operandi*, arranged into a tree diagram with two major branches (Fig. 11; Table II). Each branch represents an iconographic tradition, with a neat selection of motifs and drafting techniques. Nine of the reconstructed *modi operandi* (LP0-2, DP0-5) can be set at the lower end of the scale of time requirements. Three (DP6-8) required more time and as such can be set at the middle of the scale. Finally, one (DP9), which indicates an incomparably longer time and effort invested in the making of an image, is clearly at the upper end. Some images probably range from relaxed ludic activities to more symbolically charged ones. In order to access the plausible "meaning" of a portion of the Dhar Tichitt rock imagery, a handful of more or less elaborate compositions will be considered in detail.

ADJUSTING THE IMAGES: LEARNING FROM LARGE COMPOSITIONS

Up to this point, the paper has been focused on the investigation of the technical processes involved in the making of images. This may easily fall within the category of empiricism, as extensively discussed by Lewis-Williams and Loubser (1986, pp. 253–262). They raised one of the fundamental problems faced by any student of prehistoric art, "How, in the absence of any knowledge of the culture under consideration, can merely facetious correlations be distinguished from the significant ones?" (Lewis-Williams and Loubser, 1986, pp. 259–260), and addressed it with a surprising pirouette, suggesting that "there seems to be no way of making such a distinction" (Lewis-Williams and Loubser, 1986, p. 260). The case studies that follow are based on replicable methodologies; the suggested "meanings" can be refuted and alternatives worked out.

The Red Ochre Paintings From Chebka

The red ochre line paintings found in a rock shelter from the large village of Chebka are unique in the Dhar Tichitt archaeological record (Mission de Recherche Préhistorique du Dhar Tichitt (MRPT), 1980, pp. 70–71; Holl, 1986, pp. 146, 150). The panel consists of three images: one large bovid and two humans, one holding a sickle-like tool (Fig. 12). They are red in color, and consist of outlines painted with a brush. Unfortunately, the precise location of the images relative to each other was not recorded. It is nonetheless clear that all three images were painted on the same rock shelter wall. For these reasons, components A and B of the painting (Fig. 12) will be dealt with separately. At first glance, both representations seem to have been mere sketches of a more ambitious “unfinished” composition. It can be argued that the painter may have planned to complete the work later by drafting the heads. Was this the case? A detailed analysis of the paintings is carried out to clarify this issue.

Painting A measures 2.8 sq m, 2 m in length and 1.4 m in width. It comprises two large images representing headless creatures, a human on the one hand, and a large bovid on the other (Fig. 12(A)). The headless human measures 1.12 sq m, 1.4 m in height and 0.8 m in width. Its legs are 0.7 m long and 0.1 m wide, and its arms are 0.65 m long, with width ranging from 0.12 to 0.07 m (Table III). Remarkably, the limbs of the right (for the reader) half are completed, with the hand and the foot, while those from the left are left as sketches (Fig. 12(A)). The

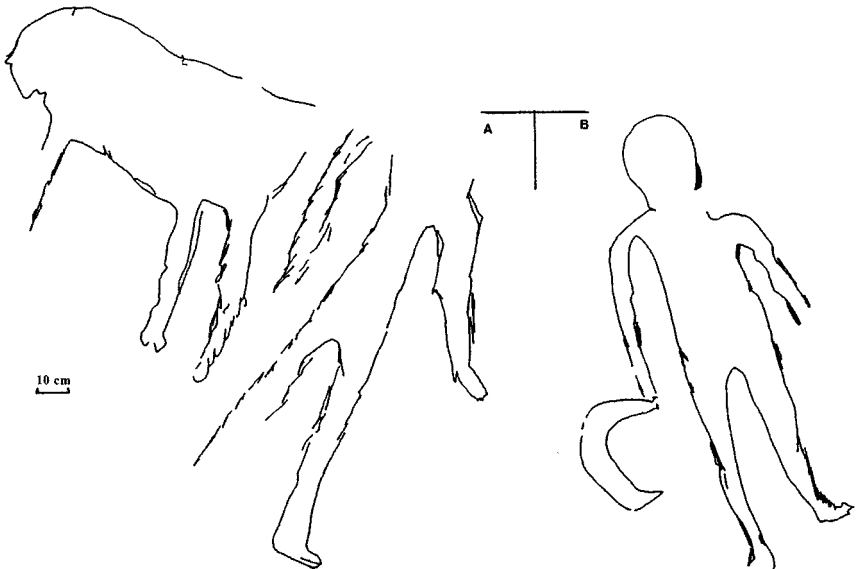


Fig. 12. Red ochre line paintings found in a rock shelter of the large village of Chebka.

Table III. Components of the Chebka Rock Shelter Paintings

Components	Painting A			Painting B			
	Length (m)	Width (m)	Surface (m ²)	Length (m)	Width (m)	Surface (m ²)	
Panel	2.00	1.40	2.80	1.55	0.90	1.40	
Human	1.40	0.80	1.12	1.55	0.65	1.99	
Leg	0.70	—	—	0.70	—	—	
Left	0.60	0.10	0.06	0.70	0.10	0.07	
Right	0.70	0.10	0.06	0.60	0.11	0.06	
Arm	0.65	—	—	0.58	—	—	
Left	0.60	0.07	—	0.58	—	—	
Right	0.65	0.12	—	0.45	0.08	—	
Torso	0.70	0.20	0.14	0.60	0.30	0.18	
Head	—	—	—	0.25	0.24	0.06	
Animal	1.00	1.00	1.00	Tool	0.40	0.10	0.04
Body	1.00	0.50	0.50	—	—	—	
Legs	0.50	0.10	—	—	—	—	

large headless bovid measures 1 sq m (1 m × 1 m). Its limbs measure 0.5 m in height and 0.1 m in width, and the body is 1 m long and 0.5 m wide. In this case too, the front limbs (on the right) are well drafted while the rear ones (on the left) are sketched, or suggested (Fig. 12(A)).

Painting B measures 1.4 sq m, 1.55 m in length and 0.9 m in width (Fig. 12(B), Table III). The represented individual measures 1.55 m in height and 0.65 m in maximum width. Leg length varies from 0.7 to 0.6 m, with width ranging from 0.1 to 0.11 m. Arms are 0.58 and 0.45 m long and 0.07–0.08 m wide. The torso measures 0.6 m in length and 0.3 m in maximum width, and finally the head is 0.25 m height and 0.24 m in maximum width. The sickle-like tool is 0.4 m long and 0.1 m wide.

Together both paintings measure 4.2 sq m in extent. Human images are found over 2.12 sq m, and the large-sized bovid and the sickle-like tool represent 1.04 sq m of the composition's space. A closer look at the proportionality of the different elements of the composition reveals a quasi-algorithmic nested hierarchy: 0.24–0.38 of the space for the tool and the animal, 0.5 for humans, and finally, 0.75 for the painted composition relative to its "frame," the shelter's wall (Table IV).

The study can be carried further into details at a finer level. Here, the paper will focus on the fundamental graphic structures of the paintings as measured by several ratios of the represented body parts. As can be seen in Table IV, the ratios of legs to total height (Leg/TH), arms to total height (Arm/TH), and torso to total height (Torso/TH) present similar variations in both human paintings. The rigor and balance of the human representations are achieved through the implementation of a strict proportionality between the length of the legs and that of the torso, within the magnitude of 1.00 ± 0.16 . A similar pattern is clear for the bovid representation with a limb/body ratio of 1.00.

Table IV. Structure of the Chebka Paintings: Relative Proportions of the Recorded Components

Parameters	Global	Painting A	Painting B	Difference
Panel				
Composition	0.75	—	—	—
Human	0.50	0.43	0.71	0.28
Animal	0.38	—	—	—
Human and tool	0.24	—	—	—
Human				
Leg/TH	—	0.50/0.42	0.45/0.38	0.05–0.04
Torso/TH	—	0.50	0.55	0.05
Leg/torso	—	1.00/0.85	1.16/1.00	0.16–0.15
Arm/TH	—	0.46/0.42	0.51/0.29	0.05–0.13
Arm/torso	—	0.92/0.85	0.96/0.75	0.04–0.20
Arm/leg	—	0.92/1.00	0.82/0.75	0.10–0.25
Arm L/R	—	0.92	1.28	0.36
Leg L/R	—	0.85	1.16	0.31
Head/TH	—	—	0.16	—
Animal				
Leg/height	—	0.50	—	—
Body/height	—	0.50	—	—
Leg/body	—	1.00	—	—

Note. TH: total height.

The red ochre paintings from Chebka village rock shelter appear to have resulted from the implementation of tight compositional rules. In this perspective, the absence of the head in painting A is more likely the result of a purposeful decision. The themes dealt with in this composition are connected to two fundamental components of the Dhar Tichitt Late Stone Age agropastoral economies. One may venture here in a plausible but nonetheless speculative assessment that the large bovid, probably a *Bos taurus*, stands for livestock husbandry. The tool, ambiguous as it is, can stand for grain agriculture. The location of the paintings in a rock shelter, that may have been taboo to “unauthorized” individuals, suggests the possibility of a connection with ritual practices, maybe a rite of passage for children. In such circumstances, images may have been very effective indeed, “to the extent that they have the potential to affect even (or perhaps especially) the youngest viewers, and affect them not just emotionally, but in ways that have long-term behavioral consequences” (Freedberg, 1989, p. 5).

The “Monumental Bull” From Akhrejtit

The “Monumental Bull” measures 4.6 m in length and 2 m in height. It is located at the southeastern end of Akhrejtit, above a dry and deep valley, and on the wall of a narrow natural corridor oriented east–west and measuring 10 m in length and 3 m in maximum width. According to Amblard *et al.* (1981/1982, p. 127), there is the possibility that another large-sized representation of a *Bos taurus* existed

nearby, unfortunately too worn out to be properly recorded. It is presumably the image recorded and published by Munson and Munson (1971, p. 348), and assigned to the Bovidian group without further precision on its location or even site.

The analysis of grooved line intersections as they can be seen in the photograph (Amblard *et al.*, 1981/1982, p. 127) shows that the vertical lines were carved after the horizontal ones. This allows for the reconstruction of most of the sequences involved in the carving of the “Monumental Bull.” The lines were first pecked, then carved, and finally smoothed into shallow U-shaped grooves. The location of the representation high from the ground of the corridor indicates the use of a scaffold. In other words, each of the recorded bull’s elements required far more labor than simple pecked lines, and accordingly more time. The Monumental Bull appears to have been created in six main “work segments.” These work segments are different from “steps,” the elementary components of a modus operandi, the term used so far in this paper. They consist of a number of pooled technical steps; and this number may vary considerably from one “work segment” to another.

- (1) The first work segment resulted in the creation of the bull’s outline. It was implemented in 34 technical steps, with the image divided into two almost equal and symmetric parts by a series of pecked dots arranged into vertical lines (Fig. 13.1). The bipartition of the bull image may have resulted from a broad range of intention; two will be suggested here. On

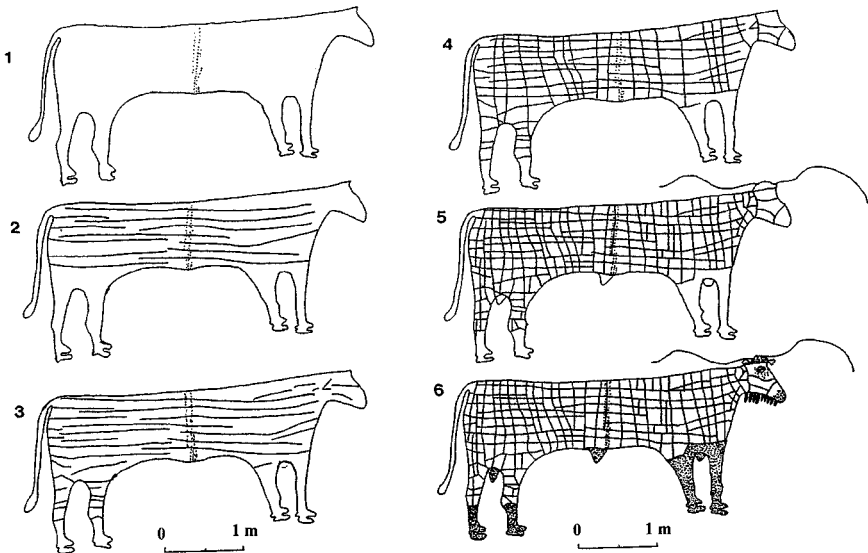


Fig. 13. Reconstructed sequences in the making of Akhrejtit “Monumental Bull”: steps 1–6.

the one hand, if the artwork was drafted by a single artist using a scaffold, the dotted lines may have been used as a technical device to ensure the balance of the composition. On the other, if two artists were involved, the vertical dotted lines may have acted as the area of overlap of both drafting zones.

- (2) The second work segment was completed in 48 technical steps, resulting in the creation of horizontal grooved lines on the bull's body (Fig. 13.2). The longest lines are found in the upper part of the representation. They are arranged in a pattern of decreasing length from top to bottom. In general, lines starting from the front are longer than those originating from the rear. The lack of connection between front–rear and rear–front lines is surprising. In the one-artist hypothesis, it could have resulted from the difficulty of carving long horizontal lines on hard stone on a four square meters surface. In the two-artists one, poor coordination may have resulted in the mismatch. Or, finally, the mismatch could have been part of the design of the drafter(s).
- (3) The third work segment was completed in 72 technical sequences (Fig. 13.3), and consisted of short horizontal lines on the rear and the front parts of the representation.
- (4) The fourth work segment was carried out with a cumulative amount of 91 technical sequences (Fig. 13.4). The bull's coat is now a pattern of intersecting horizontal and vertical lines. The carved series of vertical lines is divided into two parts by the vertical dotted lines. The front part includes ten lines arranged into three discrete sets of three equidistant and more or less parallel lines each: one set of short lines is found on the head and neck (Fig. 13.4); another is found just above one front limb; and the last set is on the upper abdomen. The tenth line is the longest; it connects the other front limb to the back of the bull (Fig. 13.4) and appears to have partitioned the front half into two equal zones. The rear part has nine vertical lines arranged into one set of three and two sets of two lines (Fig. 13.4).
- (5) The fifth work segment, completed after 123 cumulative technical steps, results in an elaborate checkerboard coat pattern and the addition of further anatomic details. It is at this time that the horns, the top of the cranium, the genitalia, and the skin pending between the front limbs were added.
- (6) The sixth work segment, obtained after a cumulative 150 technical steps, is that of finishing. The limbs, the genitalia, and the pending skin were densely and carefully pecked, as well as the bull's mouth, and the cranium top. The eyes, ears, and beard were added to the representation.

It is difficult to escape from an aesthetic judgment. It is in the eye of the beholder and will not be dealt with here. However, the artistic taste, the techniques,

the equipment, and the amount of labor invested in the creation of this gigantic composition set it apart in the Dhar Tichitt archaeological record. Without supporting evidence, interpretation can loom large. If the Late Stone Age agropastoral way of life is taken into account, the magnification of a bull as the generator of the ultimate type of wealth is a genuine possibility. Ritual and even religious considerations do not have to be excluded *a priori*, but they are better left pending while awaiting additional research on the topic.

The “Cattle Fresco” From Chegg el Khaill Station B

The composition dubbed the “Cattle Fresco” is located at Chegg el Khaill Station B (Beyries and Boeda, 1981, pp. 12–13), at approximately 1 km from the nearest dwelling site. The fresco is found on the wall of a natural cirque measuring 100 m in maximum diameter, open in the west. That opening was closed by a 0.5 m high and 1 m wide wall made of rock blocks, thus creating a livestock enclosure. A grindstone was found in the enclosure and the place was probably used as a dry-season camping station.

The “Cattle Fresco” measures 2.2 m in length and 0.5 m in width (Fig. 14). It includes seven images organized into two superimposed lines, six in the upper and one in the lower line. The recorded fresco was created using a *modus operandi* involving seven steps, and can be analyzed after different rationales.

If the successive steps involved in the implementation of the *modus operandi* used in this case are taken into consideration, the “Cattle Fresco” can be read as a drafting exercise, with each forward step correcting the mistakes of the previous one. Following this rationale, the step 1 image heading the fresco (Fig. 14.1) can be considered as a sketch that failed to indicate what the artist intended to express. The drafter seems to have intended to represent two animals side by side, as suggested by the two head sketches and an additional limb. The drafted head of the larger specimen is comparatively too low relative to the vertebral axis. Furthermore, the additional limb crosses the body of the larger specimen. The images of steps 2 and 3 are relatively close to each other (Fig. 14.2 and 3). The former has six limbs and a tail similar to that of the step 1 image; it can be argued that in this case too, the drafter tried to represent two animals but failed. The latter is smaller in size



Fig. 14. Steps in the composition of Chegg el Khaill Station B “Cattle Fresco.”

Table V. The “Cattle Fresco” From Chegg el Khaill Station B: Size of the Components

Component no.	Length (m)	Height (m)	Width, torso (m)	Height, legs (m)	Height, horn (m)	Head (m)
1	0.40	0.13	0.07	0.06	0.07	—
2	0.47	0.20	0.07	0.13	—	—
3	0.20	0.12	0.04	0.08	—	—
4	0.20	0.17	0.07	0.10	0.03	0.07
5	0.38	0.30	0.07	0.12	0.10	0.15
6	0.40	0.27	0.08	0.13	0.05	0.07
7	0.27	0.17	0.07	0.08	0.05	0.09

and headless; it may have been intended to be the companion calf of the former after the failure of the attempt to draft them side by side. The step 4 image is another attempt to draft two animals side by side (Fig. 14.4). Four limbs of the second specimen were drafted but there was no sufficient room for the body. In step 5, a complete, relatively large, *Bos taurus* with large lyre-shaped horns is drafted—with, however, two ventral lines (Fig. 14.5). The calf is drawn in front of the larger adult specimen in step 6 without the jaw outline; and another one, completely pecked this time, is drafted on the side or below, creating a group of walking cattle. According to this reading of the material, the “Cattle Fresco” seems to represent an ordinary scene of pastoral life, drafted step by step. All in all, the failed attempts fit together in a composition that gives the impression of a “moving herd.”

The fresco can be read from another perspective aiming to discover the underlying principles and structures of the composition. This approach is implemented with a handful of quantitative data (Fig. 14; Table V). The length of individual images varies from 20 to 47 cm; the height ranges from 12 to 30 cm; torso width from 4 to 8 cm; limb length from 6 to 13 cm; head length from 7 to 15 cm; and finally, horn height from 3 to 10 cm. The range of variation is maximum for image length (20 cm), relatively high for height (18 cm), minimum for torso width (4 cm), and fluctuating between 8 and 7 cm for limb and head length, and horn height. In general, images that appear to have been simply sketched (images 1 to 3) present the broadest range of variation. Images 4–7 (two calves, a bull, and a cow), found in the central part of the fresco, differ because they display age and sexual dimorphism. The distance between neighboring images varies from 12 cm between images 2 and 3 to 8 cm for the rest of the fresco.

A more precise analysis of the relative proportions of each of the images, as implemented with length/total height ratios (L:TH), supports the specificity of the sketches, whether the rationale is the modus operandi (Fig. 15(A)) or the position in the fresco (Fig. 15(B)). That specificity vanishes when torso width/total height (W:TH), and limb height/total height (LH:TH) ratios are considered (Table VI). The W:LH ratio suggests the existence of two image subsets articulated on image 4, irrespective of whether the rationale of the succession in the

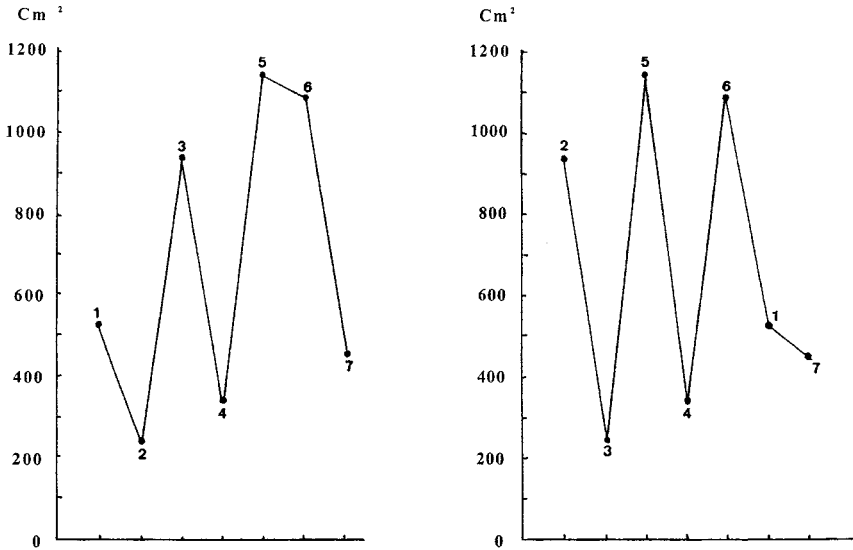


Fig. 15. Variation in the surface extent of images 1-7 of the "Cattle Fresco": (A) according to the sequence in the composition; (B) according to their position in the "Cattle Fresco."

modus operandi (Fig. 15(A)) or the position in the fresco (Fig. 15(B)) is being used. According to the modus operandi, one subset includes the sketches, images 1-3, and the other one consists of images 4-7. In the fresco arrangement, there is one subset of images 2-5, and another one of images 6, 7, and 1.

How long it took to draw the "Cattle Fresco" will remain unknown. But it can be suggested that it may have been the product of a herder's "meditations" on pastoral life during the long idle hours spent with the herd in a dry-season camp cattle enclosure, at Chegg el Khaill Station B.

Table VI. Relative Proportions of the Different Components of Chegg el Khaill Station B "Cattle Fresco"

Component no.	1	2	3	4	5	6	7
Surface (cm ²)	520	940	240	340	1140	1080	460
L:TH	3.07	2.35	1.66	1.17	1.26	1.48	1.58
TL:TH	0.53	0.35	0.33	0.41	0.23	0.29	0.41
LH:TH	0.46	0.65	0.66	0.58	0.40	0.48	0.47
TL:LH	1.16	0.53	0.50	0.70	0.58	0.61	0.87
HH:TH	—	—	—	0.41	0.50	0.25	0.52
HH:TL	—	—	—	1.00	2.14	0.87	1.28
HH:LH	—	—	—	0.70	1.25	0.53	1.12

Note. L: length; TH: total height; LH: leg height; TL: total length; HH: head height.

The Hunting Scenes From Telia I

Eight rock art panels have been recorded at Telia I. The rock art station is found in the vicinity of a hamlet of six compounds situated in a small dry *talweg* (Beyries and Boeda, 1981, p. 42). One of the panels, dubbed Panel 5, will be considered in more detail here. The LP images were drafted on a horizontal rock surface and seem to be the most elaborate of the whole set. Unfortunately, its location relative to all the other panels is not specified. The panel measures 6800 sq cm. It consists of 17 images distributed into two subsets representing distinct hunting tactics.

Subset 1 measures 2450 sq cm, 70 cm in length and 35 cm in width. It comprises six images representing four motifs (Fig. 16.1; Table VII). Three of the images are horse riders, one a camel rider, and one ostrich. The motif at the

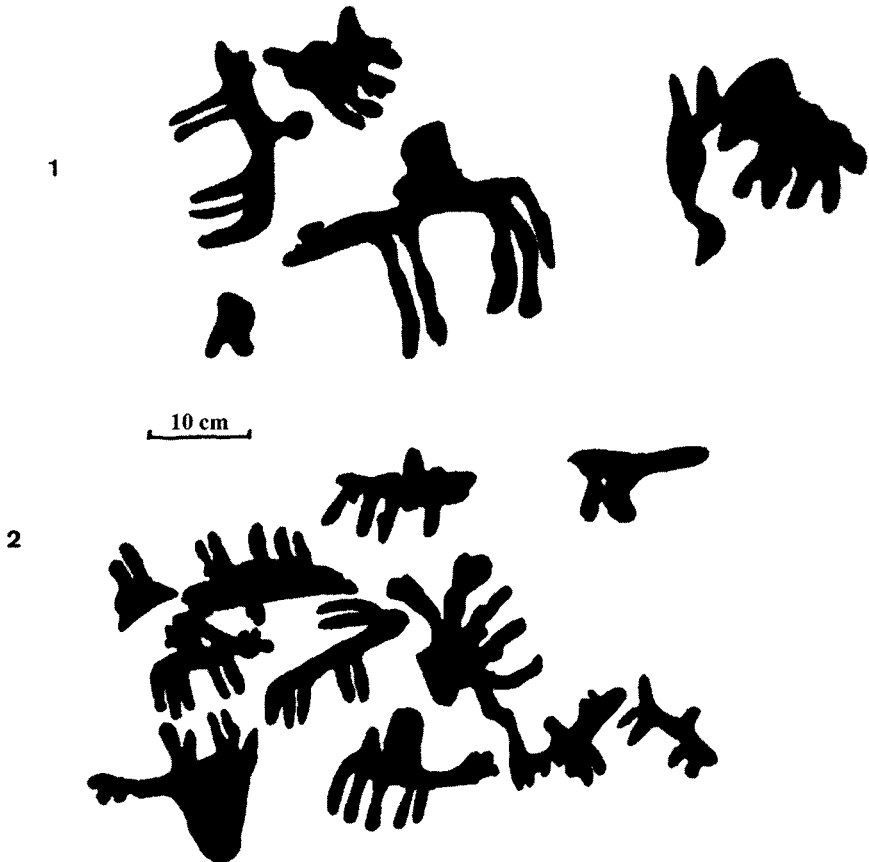


Fig. 16. Telia I station hunting scenes.

Table VII. Telia Hunting Scenes

Components	Scene 1	Scene 2	Total
Panel			
Length (cm)	70	80	85
Width (cm)	35	40	80
Surface (cm ²)	2450	3200	6800
Number of images	6	11	17
Image diversity	4	4	5
Motifs			
Horse-rider	3	5	8
Dromedary	1	3	4
Ostrich	1	1	2
Gazelle	—	1	1
Undetermined	1	1	2

bottom left of the composition is undetermined. The scene probably represents a specific ostrich-hunting tactic. The ostrich appears to have been caught by the horse rider in the right of what looks like a loose circular arrangement, with a camel rider at the bottom and two additional horse riders. One is located at the top of the composition and the other on the left (Fig. 16.1). The scenery can also be submitted to a different reading, as a palimpsest of independent and discrete events. In this perspective, there is an ostrich hunter riding a horse on the right, a camel rider chasing an undetermined item in the bottom, and, finally, two horse riders in the top left.

Subset 2 measures 3200 sq cm (80 cm in length and 40 cm in width) and includes 11 images represented with five motifs (Fig. 16.2, Table VII). Five of the images are horse riders, three are dromedaries, one is a type of gazelle, another an ostrich, and one undetermined representation. The central scene represents a hunting episode. The type of gazelle at the center is surrounded by two dromedaries, one camel, and two horse riders. The undetermined motif in the top left and two horse riders in the bottom right are set on the periphery of the circle. Finally, a horse rider seems to chase an ostrich in the upper part of the composition (Fig. 16.2).

The panel under consideration represents three distinct hunting tactics: interception in the composition from subset 1; encircling in the main scene from subset 2; and finally, chasing in the remaining part of subset 2. All the hunting tactics outlined were observed and described by Gabus (1979). The Nemadi, an extinct cultural group of the southwestern Sahara, were nomadic camel-riding hunters chasing addax and gazelles in the Djouf desert in Mauritania. These LP images do not require a long time to complete. They could have been made during hunters' bivouacs in any of the abandoned Late Stone Age settlements of the Dhar Tichitt. They could have been drawn during forced immobilization caused by sandstorms, and may have helped alleviate boredom. The LP representation of camels riders and horse riders, some armed with spears, have been used to suggest massive so-called Libyco-Berber invasions. This may have been the case

elsewhere. The presence of the LP graphic tradition is without doubt linked to the expansion of Proto–Berbers in the southern Sahara and part of the Sahel. This expansion was much more complex than a D-Day invasion, and the LP images found in the Dhar Tichitt archaeological record refer, for the most part, to mundane subsistence activities.

WHAT IS WHERE: IMAGES IN THE INHABITED SPACE

The Dhar Tichitt has peculiarities of its own compared with other Saharan rock art provinces: a fair amount of images are embedded in the inhabited space. The distribution of image panels in the socialized space is the focus of this part of the discussion. The issue addressed can be formulated in a simple question: What is represented where? The analysis is based on image sets recorded from each settlement variant: hamlet (Telia), small village (Chegg el Khaill), and finally, large village (Akhrejit).

The Chegg el Khaill Sets

Chegg el Khaill is a small village located in the eastern part of the study area along a west–east valley (Fig. 1). It comprises about 40 compounds distributed into two groups separated by a wadi (Fig. 17). The southern group is larger and includes what seems to be a very large livestock enclosure. The northern one consists of three clusters of compounds set in a landscape with extensive areas of boulders. Rock images have been recorded in the northern half of the settlement as well as in three stations (A, B, and C, Fig. 17) at slightly more than 1 km NW.

Eighteen image panels have been recorded at Chegg el Khaill. The frequency of images per panel varies from one (in nine occurrences) to a maximum of eight (Table VIII). The number of motifs represented varies from one to four. A sequence of action in what may be termed a scenery has been found in a single case; that of panel 17, representing a horse rider chasing a gazelle. Panel 18 includes an inscription in Arabic. In general, the images appear to have been drafted without any set of action in mind; the most frequent representations being those of cows with udders. All the rock image panels from Chegg el Khaill north are confined to the western boulders' area (Fig. 17), dotted with numerous rock shelters. That part of the settlement may have been a fantastic playground for children. It can be hypothesized that many of the DP images recorded in this corpus could have been drafted within the context of playful activities. There is no superimposition of LP on DP images and no preferential location for any motifs (Table VIII).

Station A is located at the head of a dry valley at approximately 1 km from the cliff escarpment, on top of a small sandstone hill. Nine image panels have been recorded (Table IX). All the images belong to the LP graphic tradition, with frequency varying from one (in five occurrences) to seven. As far as number of

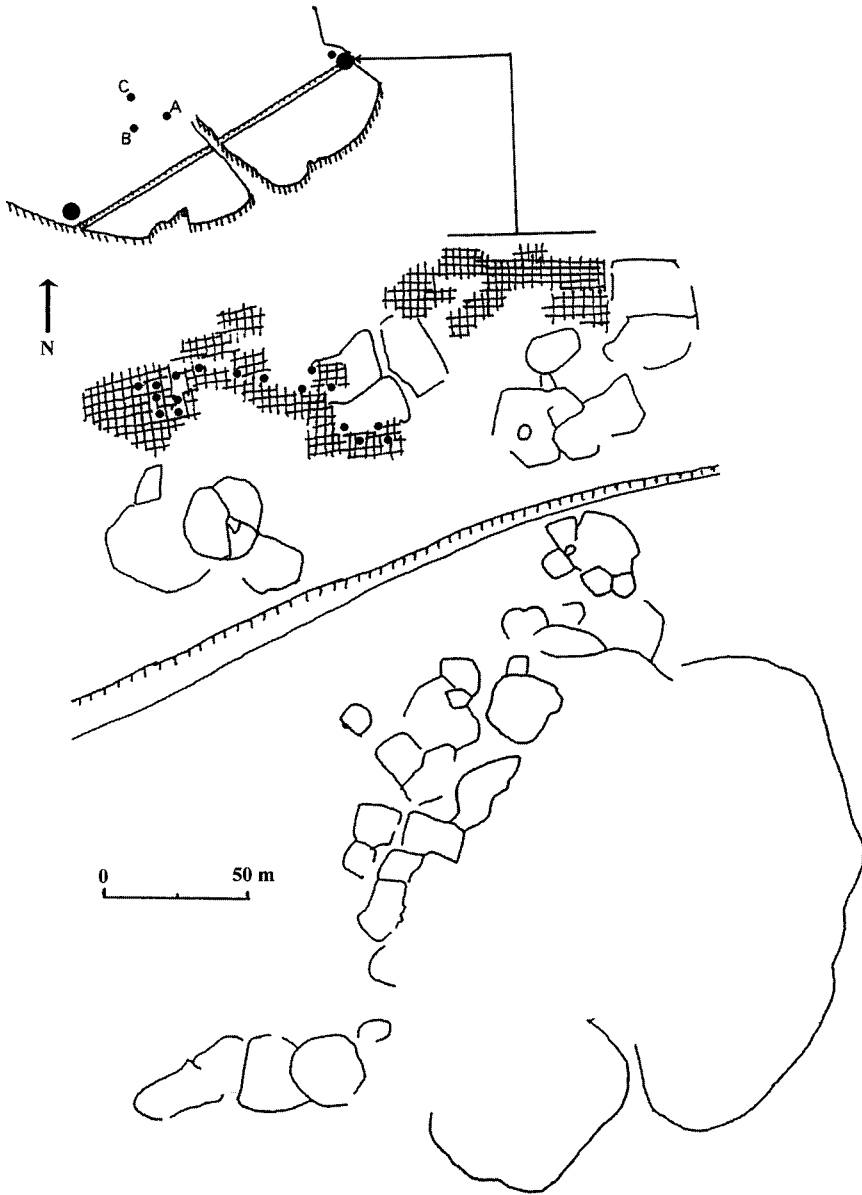


Fig. 17. Location of rock art stations in the Chegg el Khaill cluster and spatial distribution in image panels in the small village of Chegg el Khaill.

Table VIII. Variation in the Rock Art Representations of the Small Village of Chegg el Khaill

Panel no.	No. of images	Motif diversity	No. of operational sequences	Position	Location
1	4	2	2 (LP.DP2)	Vertical	Open air
2	1	1	1 (DP7)	Horizontal	Rock shelter
3	1	1	1 (DP7)	Horizontal	Open air
4	1	1	1 (DP4)	Horizontal	Rock shelter
5	4	3	2 (LP.DP4)	Horizontal	Rock shelter
6	1	1	1 (DP7)	Horizontal	Open air
7	2	1	1 (DP2)	Horizontal	Open air
8	8	4	2 (LP.DP2)	Vertical	Rock shelter
9	1	1	1 (DP0)	Horizontal	Open air
10	4	2	2 (LP.DP0)	Vertical	Rock shelter
11	3	2	1 (LP)	Horizontal	Open air
12	1	1	1 (LP)	Horizontal	Open air
13	6	4	1 (LP)	Portable	Open air
14	1	1	1 (LP)	Vertical	Rock shelter
15	1	1	1 (DP3)	Vertical	Open air
16	3	2	2 (DP0.DP2)	?	Open air
17	3	1	1 (LP)	Vertical	Open air
18	1	1	— (LP)	Vertical	Open air

Note. LP: light patina; DP: dark patina.

motifs are concerned, they vary from one to four (Table IX). Four of the recorded panels are located on vertical surfaces in rock shelters and the remaining five are found in open air, on horizontal surfaces with the notable exception of the vertical panel 7. The image corpus from Station A consists of many representations of horse riders with seven documented cases; one each in panels 1, 4, 5, 7, and 8 and two in panel 6. Panels 2 and 3 include three undetermined signs for the former and a suboval motif in grey paint for the latter. Three panels represent what can be considered a sequence of action: a horse rider and an ostrich in panel 5; two horse riders, two wild bovids, an ostrich, and an undetermined sign in panel 6; a

Table IX. Variation in the Rock Art Representations of Chegg el Khaill Station A

Panel no.	No. of images	Motif diversity	No. of operational sequences	Position	Location
1	1	1	1 (LP)	Vertical	Rock shelter
2	3	3	1 (LP)	Vertical	Rock shelter
3	1	1	Painting	Vertical	Rock shelter
4	1	1	1 (LP)	Horizontal	Open air
5	2	2	1 (LP)	Horizontal	Open air
6	7	4	1 (LP)	Vertical	Rock shelter
7	1	1	1 (LP)	Vertical	Open air
8	1	1	1 (LP)	Horizontal	Open air
9	3	3	1 (LP)	Portable	Open air

Table X. Variation in the Rock Art Representations of Chegg el Khaill Station C

Panel no.	No. of images	Motif diversity	No. of operational sequences	Position	Location
1	3	3	1 (LP)	Vertical	Rock shelter
2	1	1	1 (LP)	Vertical	Open air
3	3	2	1 (LP)	Oblique	Rock shelter
4	1	1	1 (LP)	Vertical	Open air
5	2	2	1 (LP)	Vertical	Open air
6	1	1	1 (LP)	Vertical	Open air
7	1	1	1 (LP)	Vertical	Open air
8	2	2	1 (LP)	Vertical	Open air
9	7	5	1 (LP)	Vertical	Open air
10	1	1	1 (LP)	Vertical	Open air
11	1	1	1 (DP2)	Vertical	Rock shelter
12	1	1	1 (DP2)	Vertical	Open air
13	2	1	1 (DP0)	Horizontal	Rock shelter

dromedary, an undetermined four-legged animal, and a circle in panel 9. The action of hunting *sensu stricto* is not specified anywhere in the panels, but ostriches, wild bovids, and horse riders are fundamental elements of the “Hunter Ethos” conveyed in the LP graphic tradition. In this regard and because of its location on a higher spot, Station A may have been a lookout position used more or less frequently by groups of mounted nomadic hunters. The drawings were probably part of a broader range of playful activities during what may have been long watching hours.

Station C is found few hundred meters northwest of Station A (Fig. 17). Thirteen rock image panels have been recorded. Four of them are located in rock shelters and the remaining nine are in open air situations exclusively on vertical surfaces (Table X). In fact, Station C is situated in a natural corridor approximately 200 m long, with images spread on the walls. Some of the rock shelters have additional archaeological features, for example low drystone walling and artifacts such as grindstones. The frequency of images per panel varies from one (in seven occurrences) to seven. Three of the recorded panels belong to the DP graphic tradition. They were drafted following modi operandi DP0 and DP2 and feature two large-sized ostriches (panel 13), a calf (panel 11), and finally, an unfinished *Bos* (panel 12). The remaining nine panels belong to the LP graphic tradition. Single image panels represent an undetermined sign (panel 4), a horse rider (panel 2), an undetermined four-legged animal (panel 6), and a dromedary (panels 7 and 10). Panel 5, with two images, features a horse rider chasing an ostrich. Panels with three images present different motif combinations, all of them variations around the hunting theme: an undetermined sign, a four-legged animal, and a horse rider in panel 1; two horse riders chasing a wild bovid in panel 3; and finally, a dromedary, an undetermined sign, and an ostrich in panel 8. Panel 9, with seven images, is divided into two subsets: one includes three horse riders, and the other two ostriches and two wild bovids.

The Chegg el Khaill set consists of four rock image stations. Station B, already dealt with, is the “Cattle Fresco” site. The documented image repertoire was drafted following the implementation of six modi operandi. The simplest, from the LP graphic tradition, absent from Station B, have been documented at three sites. They are largely predominant at Station C, found on 10 panels out of a total of 18. In distributional terms, the frequency of DP pastoral themes is inversely proportional to LP hunting ones. They are found at Station B at the exclusion of anything else. At Chegg el Khaill village, pastoral themes are featured on 11 panels compared with 3 for hunting ones. At Station C, there are two pastoral-themed panels for five hunting ones. And finally, at Station A, with exclusively LP images, there is no evidence for a pastoral theme.

The Telia Sets

The cluster of Telia sites is found at the southern end of a sandstone promontory in the central-eastern part of the study area (Fig. 1). It consists of three hamlets and one camp located at 1–3 km from each other (Fig. 18). Three of the recorded settlements are associated with rock images: Telia I, a hamlet with 8 compounds; Telia II, another hamlet with 12 compounds, scattered round hut bases, and a few intermittently used rock shelters; and finally, Telia III, a 60 sq m site located in a small rocky cirque with evidence for round huts. The round-hut bases of the latter site measure on average 1.5 m in diameter. Additional cultural remains were found associated with the huts, including a fairly large amount of potsherds, ground axes, and scrapers made from quartz and quartzite (MRPT, 1980, p. 37).

Eight image panels have been recorded at Telia I (Table XI). They are all found in open air locations on horizontal surfaces, with a single exception. The number of images per panel varies from 1 to 17. The represented motifs range from

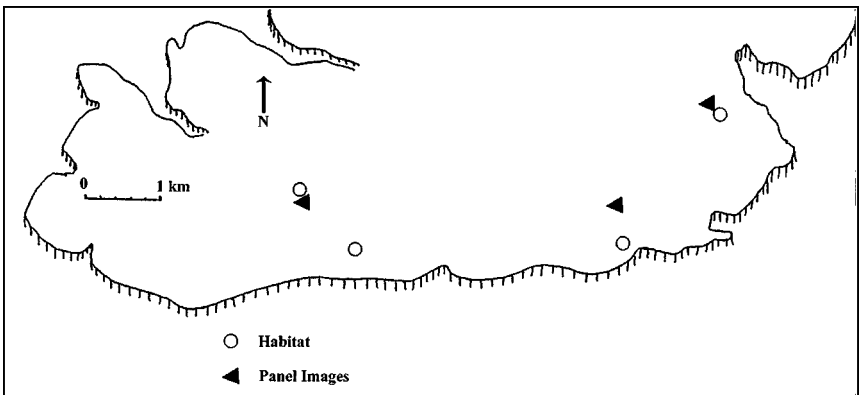


Fig. 18. Location of rock art stations in the Telia cluster.

Table XI. Variation in the Rock Art Representations of Telia I Hamlet

Panel no.	No. of images	Motif diversity	No. of operational sequences	Position	Location
1	1	1	1 (DP7)	Oblique	Open air
2	1	1	1 (DP0)	Horizontal	Open air
3	1	1	1 (DP0)	Horizontal	Open air
4	1	1	1 (LP0)	Horizontal	Open air
5	17	9	1 (LP1)	Horizontal	Open air
6	2	2	1 (LP1)	Horizontal	Open air
7	1	1	1 (DP2)	Horizontal	Open air
8	3	2	1 (LP0.LP1)	Horizontal	Open air

one to two, excluding the previously described panel 5. Two of the panels (4 and 7) feature what is considered to represent compounds; two others (panels 5 and 8) represent hunting themes; and one, panel 1, contains a pastoral theme. With the exception of panel 1 (DP7), short modi operandi appear to have been predominant in the making of the Telia images, with an equal representation of DP and LP graphic traditions (Table XI).

Telia II has 10 image panels. They are all found in open air locations, eight on horizontal surfaces and two on vertical ones (Table XII). The image frequency varies from one to five. The represented motifs vary from one to three. Six modi operandi from both the LP and DP graphic traditions have been used to make the images at hand. Two of the panels utilize three modi operandi each. DP images are found on 8 of the 10 documented panels, and LP ones on 4. Pastoral themes are found on seven panels (panels 1–5, 7, and 10) while hunting is represented in a single composition (panel 9). In this last case a camel rider is chasing a wild bovid. Six horse riders have been recorded, four in panel 6 and two in panels 2 and 10.

Telia III has four image panels, two on vertical surfaces in open air, and two on horizontal surfaces in rock shelters (Table XIII). Image frequency varies from one

Table XII. Variation in the Rock Art Representations of Telia II Hamlet

Panel no.	No. of images	Motif diversity	No. of operational sequences	Position	Location
1	3	3	1 (DP7)	Vertical	Open air
2	3	3	3 (LP1.DP4.DP5)	Horizontal	Open air
3	1	1	1 (DP6)	Vertical	Open air
4	1	1	1 (DP6)	Horizontal	Open air
5	1	1	1 (DP6)	Horizontal	Open air
6	4	1	1 (LP1)	Horizontal	Open air
7	1	1	1 (DP5)	Horizontal	Open air
8	2	2	1 (MP5)	Horizontal	Open air
9	5	3	1 (LP1)	Horizontal	Open air
10	3	3	3 (LP1.DP5.DP8)	Horizontal	Open air

Table XIII. Variation in the Rock Art Representations of Telia III Camp

Panel no.	No. of images	Motif diversity	No. of operational sequences	Position	Location
1	3	2	2 (LP1.DP8)	Vertical	Open air
2	1	1	1 (DP8)	Vertical	Open air
3	5	4	2 (LP1.DP8)	Horizontal	Rock shelter
4	7	5	3 (LP1.LP2.DP8)	Horizontal	Rock shelter

to seven, and that of motifs from one to five. Both DP and LP graphic traditions are represented by two modi operandi each; DP6 and DP8 for the former, and LP1 and LP2 for the latter. Three of the four documented panels have DP and LP images, without superimposition. It appears that LP horse riders, dromedaries, and ostriches were added later on the panels with DP images with almost exclusive representation of cows with udders. Themes of pastoral life are largely predominant in the imagery of Telia III. The place was probably used as a camping spot by small groups of Late Stone Age agropastoralists.

As can be read from the corpus of available images, Telia I, II, and III present an overwhelming “pastoral atmosphere,” with a persistent emphasis on cows with udders.

The Case of a Large Village: Akhrejtit

The spatial distribution of rock images from Akhrejtit was published by Amblard and Vernet (1984). A closer look at the published distribution (Fig. 19)

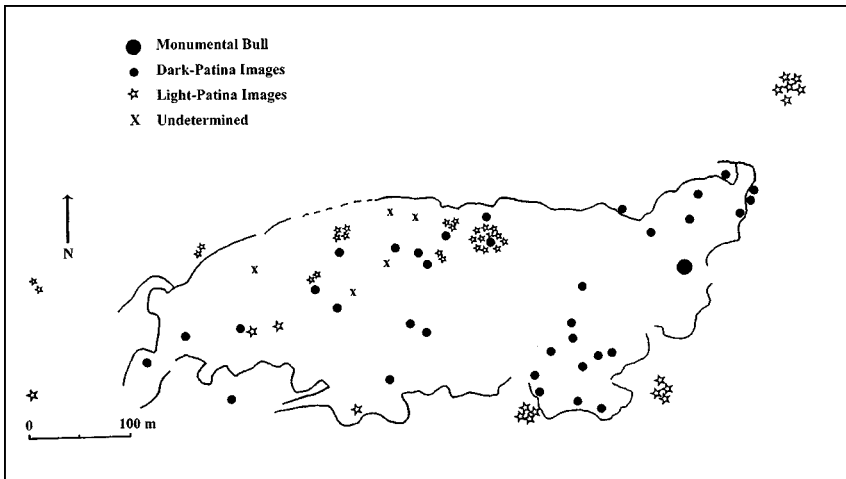


Fig. 19. General distribution of image panels in the large village of Akhrejtit.

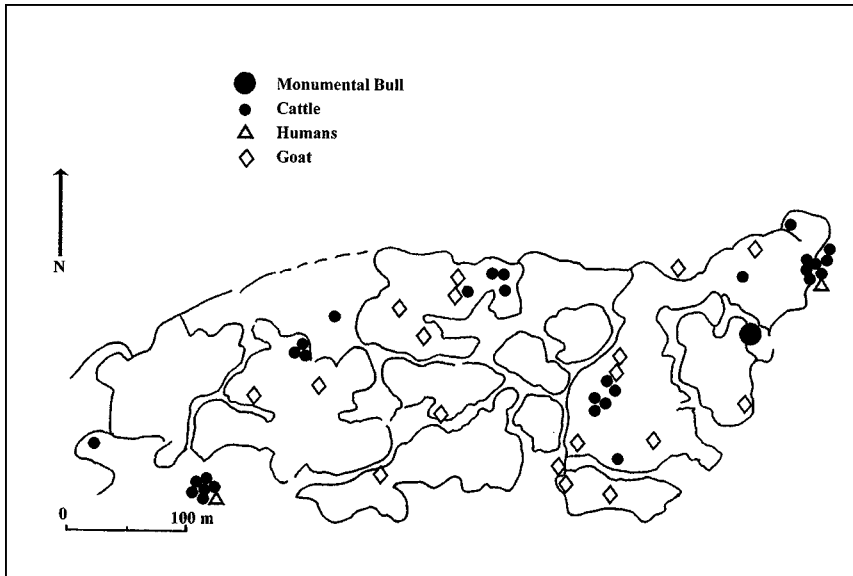


Fig. 20. Distribution of motifs and panels of dark patina (DP) variant in different subcomponents of Akhrejtit.

suggests a few cases of preferential clustering and a subtler patterning in the spatial arrangement of both DP and LP images. At first glance, DP images seem to be more widely distributed within the village built space, in a broad east–west partition. LP images are preferentially clustered in the central-north of the village with a significant proportion found in the outer periphery (Fig. 19). DP images made following the implementation of six modi operandi (DP0, DP1, DP2, DP6, DP8, and DP9) represent cattle, goats, and compounds. They are inserted in the socialized space with a higher concentration in the eastern part of the settlement. In a more detailed village map, with its constituent series of connected compounds, the distribution of livestock images is even more tightly patterned, found in only 3 compound clusters in a total of 11 (Fig. 20; Table XIV). The “Monumental Bull” is located in

Table XIV. Distribution of Motifs in Dark Patina (DP) Among the Rock Art Panels of the Large Village of Akhrejtit

Group	1	2	3	4	5	6	7	8	Isolated	Total
Cattle	2	2	3	3	1	1	4	6	4	26
Goat	—	—	—	—	—	1	—	—	1	2
Bovids	—	—	—	—	—	—	1	—	1	2
Human	—	—	—	—	—	1	1	1	—	3
Nonfigurative	—	—	—	—	2	1	—	—	15	18
No. of images	2	2	3	3	3	4	6	7	21	51
Motif diversity	1	1	1	1	2	4	3	2	5	6

the east and seems to have generated a specific spatial distribution of the rest of the eastern DP images (Fig. 20) into northeastern and southwestern sets. The number of images per panel was not published consistently. Despite that limitation, there are 25 singles among the 65 recorded panels with DP images. Twenty two of the 26 cattle are found in groups of two to seven images (Table XIV). The thematic diversity of the recorded DP images groups varies from one to four. Two important image groups have been recorded in the SW and the NE (Figs. 20 and 21). Both cases feature a cattle herd followed by a human, probably a herder. There are no clear details about the frequency distribution of goats, and humans seem to have been rarely represented.

LP images representing horse riders, camel riders, dromedaries, ostriches, wild bovids, and Proto-Berber letters, the Tifinagh, are distributed into groups of

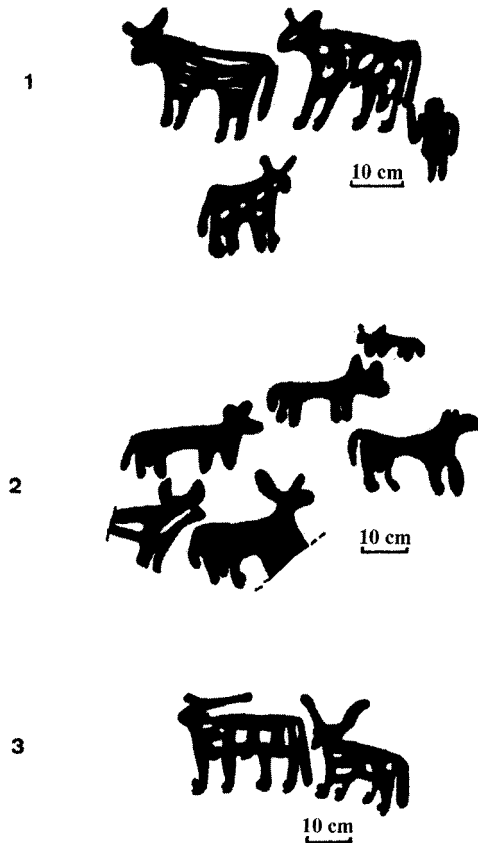


Fig. 21. Sample of themes represented in dark patina (DP) compositions from Akhrejtit.

Table XV. Distribution of Motifs in Light Patina (LP) Among the Rock Art Panels of the Large Village of Akhrejtit

Group	1	2	3	4	5	6	7	8	9	10	11	12	Isolated	Total
Horse rider	1	1	1	—	—	—	1	1	3	3	2	7	1	21
Camel rider	—	—	—	1	—	—	1	1	—	—	1	5	—	9
Ostrich	1	1	—	—	1	—	—	1	—	—	1	3	—	8
Antelope	—	—	1	—	—	—	1	1	1	1	1	2	—	8
Tifinagh	—	—	—	—	—	1	—	—	—	—	2	1	—	4
Others	—	—	—	1	1	1	—	—	—	—	—	—	1	4
No. of images	2	2	2	2	2	2	3	4	4	4	7	18	2	54
Motif diversity	2	2	2	2	2	2	3	4	2	2	5	5	2	7

2–18. (Table XV; Fig. 22). Four out of a total of 12 recorded images groups are found in the north-central part of the village, a small sandstone hill with a shallow rock shelter. The documented motifs’ association indicates that all the featured actions revolved around hunting. That spot could have been used as a hunters’ lookout, or a shelter, or both. The remaining groups are, for the most part, located in the periphery. The distribution of LP images indicates strongly enough that their makers were not, in any case, inhabitants of the Dhar Tichitt drystone masonry villages.

CONCLUDING REMARKS

This paper is another step in an ongoing research program (Holl, 1994; Holl and Dueppen, 1999). The issues being addressed revolve around the search for a

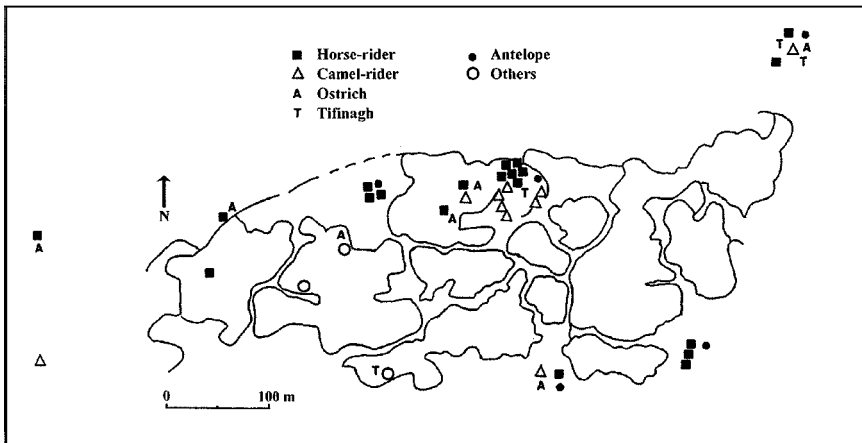


Fig. 22. Distribution of light patina (LP) motifs found at Akhrejtit.

better understanding of African prehistory. However, the understanding advocated here is based on a replicable methodology, with falsifiable results. Image making is a particularly versatile activity. However, when the diversity of the selected theme is reduced to a handful of signs and icons, the graphic systems drift toward more autonomy and generate patterns of behavior that could not have been predicted. It can be suggested that, in the long run, the distribution of LP images in the Saharan landscape may have been used as “road maps” by those able to decipher and process the information. DP images on the other hand are clearly linked to an agropastoral way of life and are confined to the Late Stone Age settlements. Finally, motivation for image making ranges broadly, from ludic and playful activities to deeper and obscure symbolic and/or religious purposes.

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