

THE SOUTH BEUNE VALLEY (PERIGORD, FRANCE):
A SPATIAL ANALYSIS OF MAGDALENIAN
ENGRAVED AND PAINTED CAVES

BY

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ELIZABETH MALOTT PENTON. The South Beune Valley (Périgord, France): A Spatial Analysis of Magdalenian Engraved and Painted Caves. (under the direction of NORRIS BROCK JOHNSON).

ABSTRACT

Upper Paleolithic cave painting and engraving in France and Spain have been the subject of intensive study over the past hundred years. While methods of analysis have been refined and interpretations broadened, the questions posed about the decorated caves continue to emphasize the presumed importance to Magdalenian people of the images, rather than that of the cave itself. The present research contributes a regional examination of caves toward the end of denoting relationships between images and cave architectonics during the Magdalenian period. As suggested by the caves themselves, it is my thesis that the location and spatial nature of the caves chosen for decoration by Magdalenian people was as important as the decorated galleries in the caves.

The South Beune Valley (Périgord, France) was selected as the site for the project for several reasons. The area hosts a concentration of image-rich cave sites in a defined geographic area with neighboring caves devoid of images. All of the image sites date tentatively to the middle Magdalenian period. The valley is geographically close to various Magdalenian habitation sites.

The approach employed here is spatial and phenomenological, presenting a human-scale experience of both the landscape and the inner-cave context as content. The term 'phenomenology' is here defined as the descriptive analysis of a set of phenomena (elements of the cave setting) with respect to perception through the senses.

Detailed topographic maps of a section of the South Beune Valley are generated, and the relationship of topography to significant habitation and image sites is discussed. Each cave in the study area is located, mapped in three dimensions, and described. Spatial features of caves both with images and caves without images are compared with respect to experiential qualities both architectonic and kinetic. Patterns in the selection of types of spaces by Magdalenians for activities entailing image-making are discussed. Relationships between the images and the cave are suggested.

The analysis extends to nearby cave sites in the Beune Valleys. Through carbon 14 dating, faunal, climatic, and lithic analysis, and a comparison of image style and theme, a time-frame is postulated for the use of these caves in a specific culture sequence.

This study redresses the overemphasis on images in the traditional literature. It presents a dimensional method of mapping caves and a model for the interpretation of cultural use of underground places based on spatial and phenomenological data.

PREFACE

Journal Entry

April 1, 1988

Hughes had disappeared. We had been standing in the mouth of a cave called Cournazac where he was going to show me several prehistoric drawings. I turned around and he was gone. I looked down into the cave, past the wintering geraniums and the light of day into the darkness. There was no sign of him. Then, I heard some movement and looked down by my side to see only the soles of his boots sticking out of the ground and a muffled voice from behind the wall said, "Are you coming?". I got down on my knees and peered into a tiny dark crack at the base of the wall that I had not noticed before. Hughes was literally wriggling away into the earth. I stuck my head into the crack, and then my shoulders, straining to see anything in the darkness, and followed him. I squirmed along on my stomach in a space in the earth only 15" from floor to ceiling with mud on the bottom and tiny stalactites grabbing my hair from above - my face slid over the mud and rock floor - I did not know where I was going or even physically how. My back was arched unnaturally to conform to the passage and I had the strange sensation that I was almost upside down. At the time, I could not imagine what I was doing. After several meters of shuffling along we came to a small chamber about the size of the interior of a car. Hughes looked at me, saw that my eyes were wide and asked if I was alright. I had certainly not expected this. Then he disappeared again. We moved along like gophers following each other in small dark twisted passages, pushing the rope and wire ladder and camera bag, squirming along where it was so tight that one could not force one's knees back or forward and it was dark and mud got in one's ear and big rocks got in the way. After a time (there is no way to calculate time in a cave) we came to a passage tall enough to walk in upright with stalagmites and rock formations. We then moved carefully down the steep incline of an accumulation of fallen rocks for 8 to 10 meters. It was much like mountain climbing underground. We went further along in narrow passages, somehow climbed up a vertical wall and sat on a shelf of dripping limestone that reached out across the formless corridor like a lion's claw.

I wondered why we had crawled up onto this ledge. All I could see was the solid rock wall that I was clinging to and the darkness of the crevice we were tediously perched above. Then Hughes said, "You will have to take off your coat because it might get bunched up and you will get

stuck. I will go through first and then turn around and you pass the equipment". We were in the middle of nowhere - of tons of rock - deep inside the ground in a darkness that dissolved the imagination. The entire experience was disorienting. The only point of reference was the area lit by the carbon lamp, and there was no way to anticipate what was ahead. I was to learn later that this was the only point of articulation between the series of passages the prehistoric people had known and the one we had entered.

Hughes had the light. He turned around and began crawling into what seemed like the solid rock wall. I was stunned. I had not seen the tight, vertically-oriented, undulating crack-like tunnel behind him which he fit his body into like a key in a keyhole. His boots thudded as they hit the sides of the wall. He was shimmying away like a snake that is not slick, his nylon suit kept rubbing against the rock, with quick material-burn sounds. Forcing the ropes and wire ladder in front of him, he inched forward on his side, impossibly defying gravity to keep himself in the upper part of the crack so as not to become wedged in the lower, more narrow part. All the commotion made my adrenaline flow, especially as I couldn't see well and didn't know exactly what to expect. Suddenly, Hughes began slapping his hand against the carbon container on his belt. This was attached by a hose to the open flame on the front of his helmet. An enormous blaze seemed to race through the crevice, with Hughes in it. I was shocked - he seemed to be on fire, head-first and stuck in the crack. Light poured out of the opening like a horrible dragon. Then it died down and he was shuffling again. I was dizzy with this ordeal, clinging to the shelf of limestone poised several meters over empty space, not wanting to slip off into the abyss which I no longer could see, not daring to turn around into the void of darkness behind me except to take a few cool damp breaths and call again on my reserves of composure.

I was concentrating hard on the tiny passage. Hughes was through. I took to the task and pulled myself through in a panicked rush on my side with my elbow. The tunnel seemed twice as long as I had calculated. My green wool sweater kept catching its fibers in the muddied rock wall on both sides at one time. "I must not let my hips fall in the narrow part or I will be stuck...". The stiff boots, that did not move as one's foot would naturally, worried me greatly. I thought of the man who had wedged his foot in a cave in

Kentucky and, despite the efforts of all his companions, had died there. I could not believe how much finesse and strength it took to manage my body through this undulating shoot.

On the other side of the tunnel (or cat-hole, as spelunkers call such spaces) were a series of passages large enough to stand in - parallel to each other and with holes like windows poking through. There, was the only drawing in the cave - the brief black outline of a mammoth, now covered with calcite like a sheet of smoky glass. It seemed that we had not only passed through space, but also through time to get here and look at this image that someone drew 13,000 years ago. Caves harbor a sense of timelessness.

I took the camera out of my speleological camera bag which had been brand new but at this point was bruised and covered with 1/2" sticky brown mud. The journey was documented by pictures of the mammoth image and the passage and Hughes looking at the mammoth.

We then went further down the passage and walked across a rope hanging over a crevice and came to the edge of a tremendous hole in the earth. It was vast and bottomless. I did not know that it went only 12 meters down. Hughes asked me if I was up to the descent. After the cat-hole, I felt invincible. We dropped the ladder down. The wire ladder was 8" wide and qualified as professional equipment. Even so, it bowed and swayed with every move. With mud in my ear, I started down the ladder, with Hughes rappelling me, not knowing where I was going or how deep it was or if Dante was down there somewhere. I was doing fine until I got to a tangle in the ladder, and, not having a light, I didn't know how much further it was to the bottom, and could only feel around to orient myself against a wall as I swayed like a puppet dangling in space. Fortunately, the shaft at this point was narrow, so I put my back to one side and my feet across to the other and Hughes came down and told me that the ladder was "enchevetrée". We made it to the bottom, where an entire new network of passages formed a lower level of the cave.

Here in the lower muddy passage, traces of 13,000 year old finger tips were found beside vertical lines made with flint tools, and 'tectiforms' (geometric engraved shapes which are found in several paleolithic caves) incised in mud on one wall. I kept slipping while wading through the dense, sticky mud on the floor. Somebody, long ago, had placed a handful of this mud on the

wall, smoothed it out and drawn on it. The marks are still there.

I felt honored to see the well hidden evidence of a Paleolithic excursion deep into this cave. Hughes pointed out another, recently made entrance at the end of the passage. It opened at the top of a steep incline of rubble about 25 meters from the mud traces. Hughes had discovered the passage which we had used to access the cave from the upper level in 1978. I then found out we could not exit through the now sealed near entrance. We had to go all the way back, climbing up the vertical shaft, as the paleolithic image-maker had been inclined to do when he or she made the mammoth image, if they had, as specialists believe, accessed the cave from the lower level (except we had a ladder).

When we finally emerged from the crack where Hughes had initially disappeared, I stumbled out into the night air on the side of the hill overlooking the valley. I lay down, almost involuntarily, and stretched out in the dewy grass, my body recovering from tortuous twists and bruises, covered with mud-stiff layers of clothes and looked up through the trees at the stars. They were never as clear as at that moment. The freshest air I've ever breathed pumped life into my veins and I felt a rejuvenation beyond words.

Magdalenian imagery is often placed in underground settings similar to that of Cournazac. The personal account of spelunking suggests that the experience of passing through the cave is a necessary element in understanding the imagery. The relationship of the person to the physical aspect of the cave itself is integral to the nature of the activities which took place there. This study is experimental. It explores the feelings of individuals today in the spatial contexts of caves, and suggests that they are close to the experience the prehistoric image-makers may have had while negotiating the same inner-cave areas. The work is premised on two facts. First, we know that many of

the caves have not changed noticeably from the Paleolithic, and in many cases we can reconstruct the geological history of ones which have. Secondly, we know that the morphology of Western European populations during the Magdalenian were comparable to fully modern humans in both physical stature and, more importantly, in the structure of the brain (Billy, 1976). It follows that the Upper Paleolithic cave-goer's basic response to spatial contexts to some extent parallels our own.

The idea of the cave as an entity in and of itself -- not only as a container of material culture -- is central to the study. Data are generated by taking measurements of the caves and in making observations of a person's passage through the cave. The data are derived from descriptive accounts of being in the cave setting, where phenomena are understood relative to the person. Multi-dimensional mapping is an important part of the method. The maps allow for a documentation of types of caves and cave spaces which can be useful in comparative studies.

Several problems are raised in using descriptive material. Inherent cultural (Western) presuppositions may influence the investigator, as may personal impressions. The attempt to explore a 'pre-cultural' response to space is difficult, at best. The subjective nature of the data also undermines the project's replicability and accuracy. The author is aware of the limitations of the study. Many anthropological analyses tend, however, to ignore personal

experience because there is no systematic method for recording it. Such studies greatly reduce behavior in cases where subjective human responses are central to meaning. The present work suggests that the import of the cave setting is a vital component in the interpretation of the Upper Paleolithic image-making tradition.

Despite our objective techniques of analysis, we can never know what the Magdalenians thought, but we can assume several things about their cultural practice of drawing in caves. The placement of images deep in caves indicates that the experience of the cave itself was important. One of the few ways of putting ourselves in the 'shoes' of the Magdalenians is to follow in their footsteps. To a large extent, we can know where they went in caves, we can know about the spatial dynamics of the places they drew in, and the efforts they made to get there. In the cave, the modern investigator may be as close as one will ever get to the archaeological event.

This approach is necessary because it provides a means of analyzing Magdalenian behavior based on the common experience of space. It is a method for looking at caves. Information about the caves themselves, when combined with analyses of archaeological material, contribute to a more complete picture of the Magdalenian practice of drawing in caves. This dissertation documents a comparative, spatial study of the caves in one valley in the Périgord region of France.

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for Georgie

The greatest distance between
people is not space but culture.

- Jamake Highwater

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I. UPPER PALEOLITHIC IMAGERY IN CAVES

The black outline of a horse appears in the flickering light, gracefully lifting a foreleg, its mane and the shadow of the hairline around its belly are briefly suggested. Other animals and traces of brilliant red ochre are scattered on the wall. The alcove is smaller than the size of a compact car, one half of a kilometer underground.

The figures, scrawled by fingertips in the hardened mud, resemble dancing pregnant women and are surrounded by parts of animals and stray marks. They are on the ceiling, 12 meters above the floor in a vast chamber in a cave. To reach them requires scaling huge fallen blocks.

After passing under the flooded vault and following the underground stream as it twists past pools and stalactite banks, a corridor branches off to the right. Clay models of a bear and perhaps a feline are found deep in this muddy chamber.

On the dark wall emerge the sketchy outline of a great wounded bison, the caricature of a man beside it, and a rhinoceros, all in black silhouette. On all sides the walls reach 7 vertical meters to the main passage, itself far underground.

The figures described above are found in Portel, Pech-Merle, Montespan and Lascaux. They are the product of

Magdalenian image-making in caves. Drawing began in the Upper Paleolithic era, when individuals and cultural groups painted, drew and engraved on bones, rock slabs, exposed rock walls, and to a great extent, in caves. A vitality is present in many of the figures which derives from the exceptional quality of rendition - an economy and delicacy of line, from the brilliant use of natural features of the wall or bone as a suggestive medium, and, for the figures found underground, from the powerful context of being in a cave.

The emphasis of this project is on the caves themselves; with incidental mention of the images found there. The images are seen as indications of the use of certain spaces by Magdalenians. The purpose of the project is to understand image-making as an integral part of a broader activity which is repeatedly expressed in caves. The task is to examine the underground spaces and delineate a pattern in their use. This project is unique in looking at a local group of caves and comparing them in terms of their spatial features.

CAVE ARCHITECTONICS AS MATERIAL CULTURE

The rationale for this study embraces several issues. A micro-regional focus allows for discerning relationships among spatial features of neighboring caves. There is the possibility of a more precise identification of a cultural time frame, especially as most cave image sites date to the

Magdalenian, the final phase of the Upper Paleolithic. The Upper Paleolithic era spans 22,000 years and the Magdalenian period itself, 7,000. These great lengths of time are problematical in interpreting a culture-specific activity like image-making. Archaeological work does provide data related to the images, making a more precise cultural definition possible.

Spatial-phenomenological patterns inform the anthropologist about the human experience of space, and its use. Yi-Fu Tuan (1977 p.114) elaborates:

Architectural space reveals and instructs. How does it instruct? In the Middle Ages a great cathedral instructs on several levels. There is the direct appeal to the senses, to feeling and the subconscious mind. The building's centrality and commanding presence are immediately registered. Here is mass - the weight of stone and of authority - and yet the towers soar. These are not self-conscious and retrospective interpretations; they are the response of the body.

Similarly, caves contain natural architectonics, including inner and outer divisions, up and down orientations, right and left sides, spaces opening above, spaces closing in - spaces that we, like the image-makers, can experience and to which we respond.

The present paper takes a spatial-phenomenological approach to the settings of underground images. It elucidates previously ignored elements of the cave environment and discerns patterns in the use of cave

architectonics - patterns which in turn yield insight into the behaviors that involved image-making in such settings. The term 'phenomenology' is here defined as the descriptive analysis of a set of phenomena (elements of the cave setting) with respect to perception through the senses.

THE ROLE OF THE CAVE IN CURRENT LITERATURE

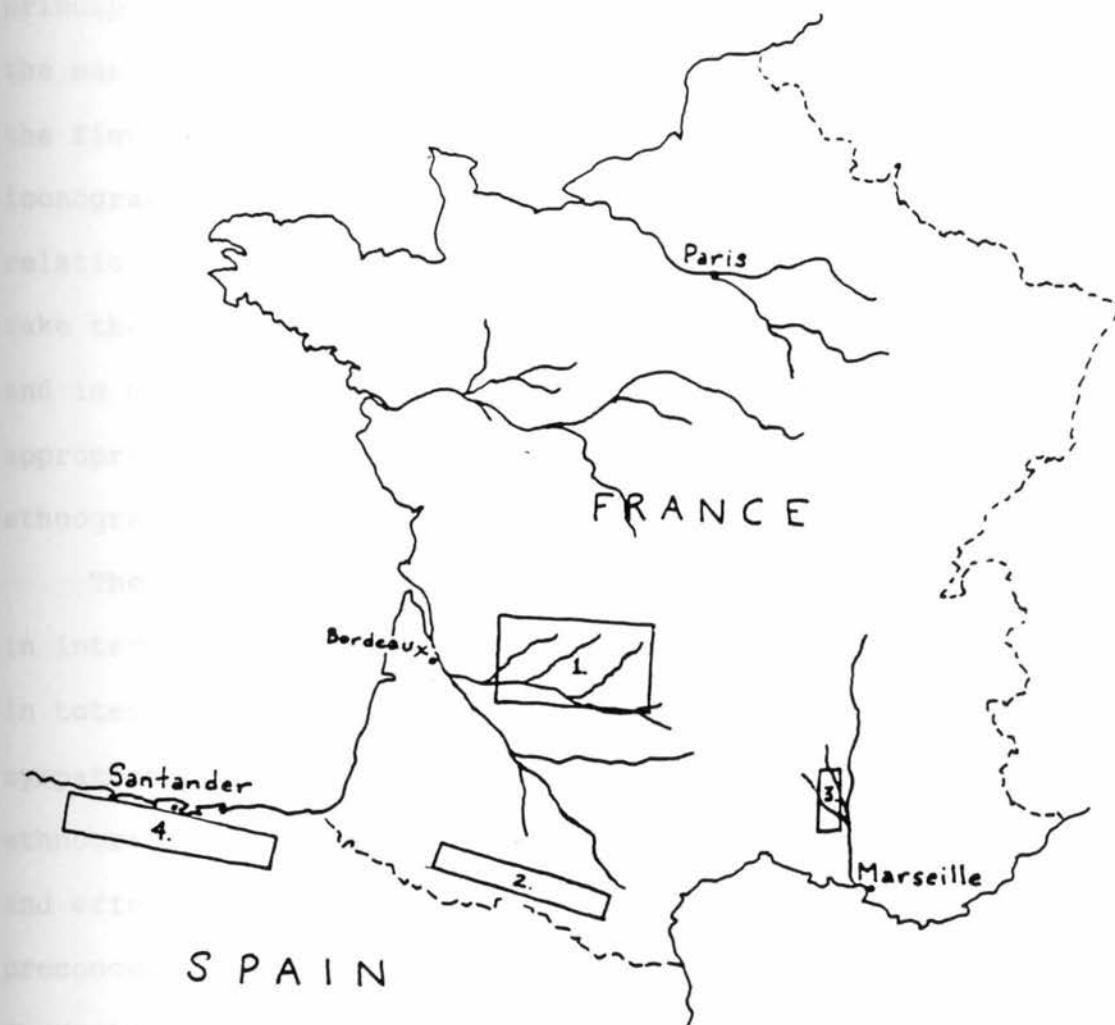
For more than a century, Franco-Cantabrian cave painting, drawing and engraving have been a subject of great interest to archaeologists, art historians and cultural anthropologists (see Map 1). Interpretations of the cave imagery generally fall into three categories and illustrate a shift in the modern view of Upper Paleolithic culture.

These are:

- 1) the Art for Art's Sake theory, generated by the surprise of the quality of depiction and the aesthetically developed sense of Upper Paleolithic people (Lartet and Christy 1864; Graziosi 1960)
- 2) the hunting and fertility magic hypothesis which was influenced by exposure to concurrent ethnographic data on African and Australian groups who create images on rock walls with religio-magic functions (Reinach 1903a; Capitan 1925; Bégouën 1929) and
- 3) structural interpretations, based on the number and type of figure represented (Stevens 1982), their relationship to other figures, and the indication of a general principle of organization in the image-maker's world view, symbolized by

1. Périgordian River Valleys
2. Pyrénées Mountains

3. Ardèche Valley
4. North Coast of Spain



MAP 1. Four major geographical areas of Franco-Cantabrian image caves.

the juxtaposition of male and female aspects (Laming 1959, 1962; Leroi-Gourhan 1967, 1982).

A chronology of distinct periods of Upper Paleolithic imagery has been developed on the basis of aesthetic principles such as the quality of rendition, realism, and the mastery and complexity of technique. Formal analysis of the figure itself (the definition of style, technique and iconography) is useful in determining an image's relationship to other images. However, the Art for Art's Sake theory focuses on the formal quality of the image alone and is derived from Classic Western values which are not appropriate for interpreting the complex usage of images in ethnographic and prehistoric traditions.

The hunting and fertility magic hypothesis is implicit in interpretations which suggest that the images functioned in totemistic and initiation rituals. The use of image in sympathetic and contagious magic is documented in ethnographic literature. This hypothesis assumes a cause and effect relationship, wherein the figure had a specific, preconceived purpose. Reinach (1903a) and Bégouën (1929), suggested that the cave setting was important to the magic hypothesis. They argued that the placement of images deep in inaccessible areas reflected their use in ritual context. H. Breuil, author of the comprehensive publication 400 Siècles d'Art Pariétal (1952), also saw the cave as a sanctuary where initiation rituals were held.

Structural interpretations imply that the images are part of a complex metaphysical system based on male and female symbolism within defined parts of the cave. The structuralist approach is abstract. It relies on predetermined patterns generated outside of the culture tradition of which the images are a part, and applies those patterns to the data. Leroi-Gourhan's Préhistoire de l'Art Occidental (1971) is the most comprehensive and systematic work in the structuralist vein.

Leroi-Gourhan places image caves into broad categories of "topographical character." Two main divisions, caves of easy access and caves of difficult access, are each further divided into medium and great depth. There is no description of what constitutes easy or difficult access. Considering the great variety of underground features, these divisions overlook complexities in three-dimensional space that may be significant. Leroi-Gourhan is also concerned with the placement of images in caves. He charts the presence of specific image subjects in central or peripheral areas, in entrances, passages or ends of caves. Concentrating on the images, the type of animal depicted and its proximal relationship to other figures, Leroi-Gourhan discerns patterns in grouping species together in certain parts of the cave. He does not, however, describe or address cave settings in any depth, except to differentiate cave recesses reached by the light of day from those lost "dans l'obscurité." Finally, he suggests an overall plan

implemented by the image-makers for decorating caves in each region, in which certain animals and signs in general areas of the cave have symbolical-structural significance. In Leroi-Gourhan's analysis, the cave functions only as a container of the images and not as an integral part of the process of image-making.

One of the most useful and provocative overviews of literature on European Upper Paleolithic cave painting and drawing is a critical work by Ucko and Rosenfeld (1967), Paleolithic Cave Art. The authors discuss the use of ethnographic parallels and argue that they are most useful in a general sense only. In this case, ethnographic studies serve their best purpose in acknowledging the great variety of behavior accompanying image-making in groups around the world. Exposure to ethnography allows the Western scholar to consider other perspectives on image traditions and to critique biases implicit in a Western approach to the 'art' of other cultures.

Ucko and Rosenfeld's most cogent argument is that we are lacking in knowledge of Magdalenian culture. They imply that, along with analyses of Magdalenian material remains, we need to know more about what Magdalenians were specifically doing in caves.

More recent literature on the subject includes L'Art des Cavernes, published in 1984 by the French Ministry of Culture. This large volume represents all of the known sites of Upper Paleolithic parietal images and includes a

map of each cave. Other current research is in the form of monographs on specific caves (Lorblanchet 1981, Roussot 1976, Simmonet 1981). The literature presents two extremes: earlier, encompassing collections of data, and more recent detailed examinations of one cave or rock shelter. In almost all cases, the images themselves are central to the study. Several exceptions include the publications of Conkey (1980), Aujoulat (1987), Rouzaud (1978), and Vialou (1986).

Conkey's work contributes to the identification of larger, gallery-like, decorated caves which may have been sites of seasonal aggregation. Altamira and Lascaux are two examples. These caves host a large central chamber where many individuals could gather. Her approach was to discern basic styles of engravings on bone and antler from Magdalenian sites. She then tabulated the pieces of engraved material and the number of patterns represented at particular sites. Caves containing bone or antler with a high percentage of different patterns suggested that they were aggregation sites. Conkey's analysis does not, however, address in detail the spatial nature of caves other than their relative size and the density of occupation.

Aujoulat (1987) is developing a method of dimensionally mapping cave interiors by the use of stereophotography and photogrammetry. His method arose in part as a solution to the problems of photographing imagery in difficult light conditions, and in the past decade was employed in making an

exact replica of the Lascaux cave for tourists. Aujoulat is applying the method to other caves for the purpose of generating computer maps of cave interiors. Rouzaud (1978) documents the variety of types of underground spaces that Magdalenians visited in the Pyrénées. These publications point to a growing interest in the cave setting itself as a clearly significant factor for the interpretation of Magdalenian image-making in caves.

One of the first regional studies of caves and cave imagery was carried out by Denis Vialou, who published his results in the 1987 book, L'Art des Grottes en Ariège Magdalenienne. This very thorough work is noteworthy because it addresses an area whose caves date to one time period - Magdalenian IV - and thus the interpretation may be framed by culture-specific insights. Vialou cites two aspects as central to the study: 1) thematic associations and symbolic constructions apparent in the representations themselves (in the tradition of Leroi-Gourhan), and 2) common elements that may be distinguished in parietal (images on stationary rock wall) systems, including any technical or stylistic bearing the location or configuration of the cave may have on themes and associations.

Vialou is interested in spatial elements. He refers to the continuity or discontinuity of the cave, and to images marking the cave in places; but his analysis is always with respect to the images themselves. The bulk of L'Art des Grottes en Ariège Magdalenienne presupposes a cultural

imposition of order onto each cave. Vialou (1986 p.391) allows that "... Magdalenian space is the result of a cultural elaboration founded on a 'dispositif pariétal' (pattern of the cave walls), original in each cave." He suggests that the idea of the cave as a sanctuary is inappropriate, and that the divisions between Magdalenian daily life and spiritual life are not clear. He then asks, if the expression of the culture is put forth in imagery and in its placement, what are the types of places where the imagery is found? Can we make some distinctions in the types of spaces selected and their effect? What is the experience of being underground for us? What is it like being in a church, even if one is ignorant of the doctrine?

In the conclusion of L'Art des Grottes en Ariége Magdalénienne, Vialou (1986 p.391) expresses these ideas which might stand as a preface to the present work:

The fundamental nature of parietal art derives from its location and distribution in a setting naturally defined by the access and journey exercised within particular [physical] constraints.

The approach to parietal works necessitates, therefore, a preliminary study of the underground setting, considered as an architectural body chosen and constructed by the Paleolithics. A topographic and morphologic study of the cavities, and the examination of entrances and conditions of movement have called for a notion of a space in which all material remains and all traces of activity are left in their original position. (my translation).

Vialou stresses that archaeologists should "... strive... to seize the human elements, to spell out diverse activities which took place in ... the spatial limitation [of the cave]" (Vialou 1986 p.391).

The caves themselves are material culture. They provide explicit information through their physical features. The spatial dynamics of interior cave settings are the primary focus of the present study. Cave morphology and the sensory effects of types of spaces are addressed in relation to the placement of imagery. Secondly, the location of the caves in the landscape and their relationship to habitation sites and other image sites are considered.

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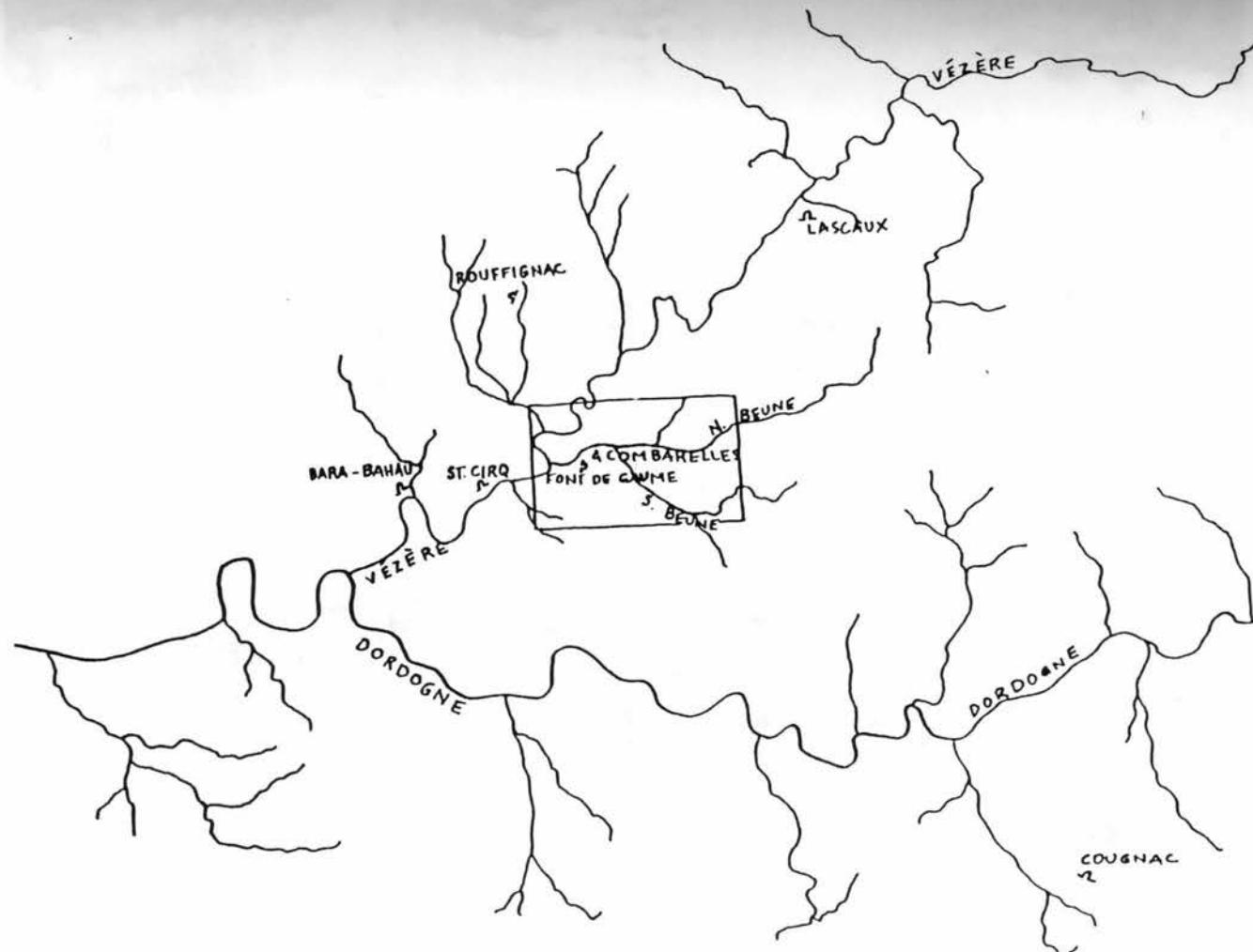
II. THE BEUNE VALLEYS (PERIGORD, FRANCE)

Several major image cave sites are in the Dordogne Valley and related river systems (see Map 2), as are Magdalenian habitation sites yielding imagery engraved on bone and rock surfaces (See Map 3). An area of 10 square kilometers surrounding the juncture of the Vézère and Beune valleys was selected for study. This region is well known for its rock shelters and caves in the steep limestone escarpments on each side of the valley (see Photo 1). The Beune and Vézère confluence is the location of several significant Magdalenian mobiliery and parietal image sites (see Map 4). The region is appropriate for the study because of the exceptional density of cave sites, many corresponding to a similar time frame, the amount of reliable archaeological work based on carbon 14 dating, lithic, faunal, and climatic analyses.

There are a number of caves in the South Beune Valley. The valley presents an ideal area for studying the selection and use of caves for image-making by Magdalenian culture.

SOURCES OF INFORMATION

Local spelunking clubs have prospected the valleys at different times during this century. Summaries of brief surveillance and of specific caves visited are found in



MAP 2. Major image caves in the Dordogne and Vézère River Valleys.



PHOTO 1. Limestone rock escarpment on the north bank of the Vézère River at the Beune Valley confluence. The town of Les Eyzies nestles underneath.

various issues of the Périgord Spéléo-Club journals. These visits were especially popular around the time of important cave-art discoveries in the area. Several Beune caves were thought to contain partial Paleolithic negative red hand prints which have since been recognized as a naturally occurring coloration of the rock. Many of the caves were explored for sport and did not receive much attention because of their insignificant size or challenge to the spelunkers, and because no imagery was ever located.

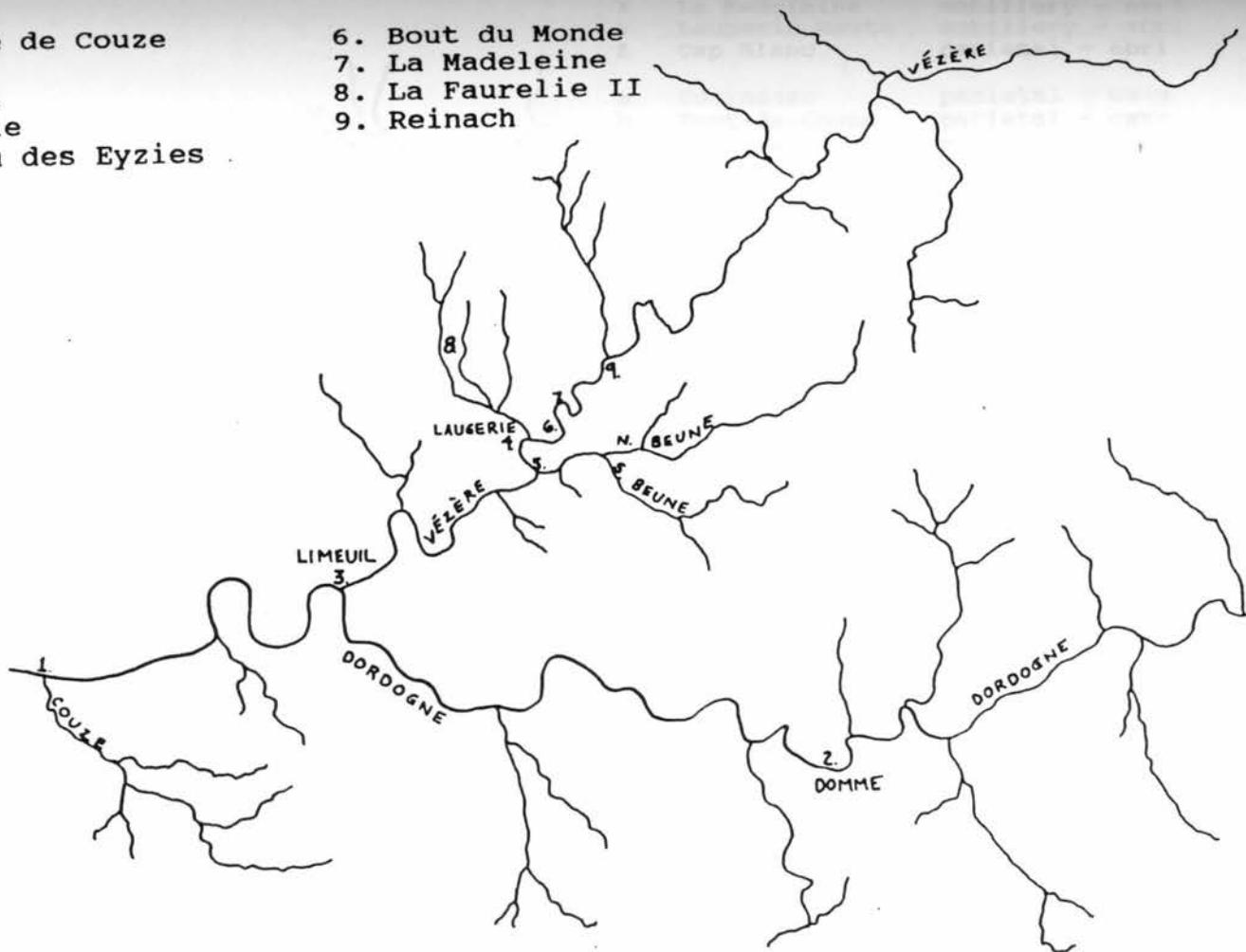
Another source of information comes from two individuals who had lived since birth in the valley and played as children in the cliff sides and surrounding hills. Christian Archambeau, whose parents and two brothers lived in the now 'old' mill house adjacent to the stream in the study area, was helpful in remembering cave locations, especially those just to the east of the sector. Hughes Nielson, an active spelunker, served as an informant and guide to several caves in the area. Local proprietors also frequent caves for sport, and in the hope of discovering a rare Upper Paleolithic engraving.

Nowhere, however, was there a map of the valley which included the locations of caves in relationship to each other, or acknowledged the presence of all of the caves in the area. Nor did any one person, even the proprietor, have knowledge of all of the caves in a given area.

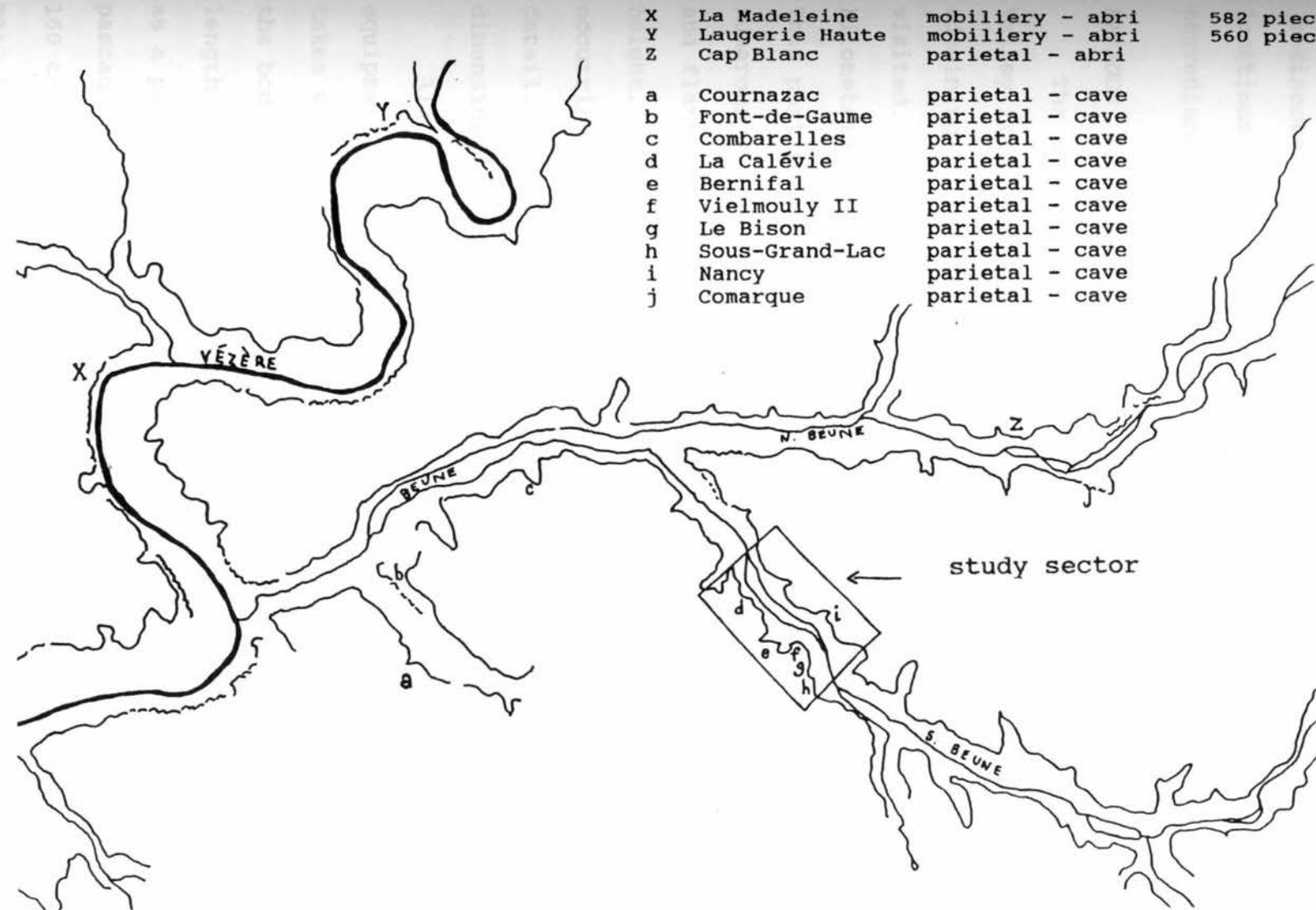
Certain caves are known to people in the region and are used or discussed; over time some are forgotten, others

1. La Gare de Couze
2. Domme
3. Limeuil
4. Laugerie
5. Chateau des Eyzies

6. Bout du Monde
7. La Madeleine
8. La Faurelie II
9. Reinach



MAP 3. Major Magdalenian habitation sites containing
mobilier or parietal imagery.



MAP 4. Mobilier and parietal imagery sites in the Beune and Vézère River Valleys.

rediscovered. Thus, for locals, working knowledge of cave locations is practical, is influenced by need or convenience, and it changes over generations.

METHODS

The author surveyed 6 kilometers of the South Beune Valley from the vale at Cazelle southeastward to the first adjoining tributary at Paradoux. More than 50 caves were visited. The focal area of the study comprises 1.5 kilometers of the South Beune, an area containing 18 caves. This portion of the valley features a clear running stream, numerous springs, a floor approximately 200 meters in width and flanked by limestone cliffs reaching 30 meters in height. The boundaries of the study section are naturally-occurring vales. This sector was surveyed and mapped in detail. Each cave was explored and mapped in multi-dimensions, as well.

All surveying was made without the use of rock climbing equipment such as ropes and ladders. Some measurements were taken with a tape measure, but more often were a function of the body's experience of cave spaces. Examples include 'the length of a body', 'a hand's reach overhead', and 'as wide as a person's arms spread out'. Factors such as ease of passage and negotiability were noted. The investigator is 160 centimeters tall and weighs 120 pounds. Magdalenian mean height studies suggest that the average Magdalenian

adult's stature falls between 171 and 177 centimeters (Billy 1976).

In discussing the size of cave passages, I have tried to be objective in relating the manner in which a person of average adult height and ability can negotiate spaces. Many people are claustrophobic, and would perceive a small passage as tiny and suffocating. To others, the same sized space is comfortable and inviting. Some individuals are apprehensive of closed in spaces, others are uneasy in large open spaces. Growing up in or around caves and cave entrances does not necessitate a love of the dark, or an innate desire to explore small passageways.

Other elements influence one's experience of space. A very emotional period may encourage a person to seek out smaller spaces, just as fear, illness, or a trauma like the onset of childbirth may influence attitudes toward types of spaces. Ritual activities also engender special feelings about types of spaces.

Although I had been in several caves before, I had not frequented inner cave areas before the project. My impressions were those of a novice. I am not claustrophobic and am not afraid of heights. In relating the experiences of cave spaces, my attitude reflects a balance between having minimal fear of strange places, and yet little desire to cram my body into a dark muddy crack or to feel the solidity of a ceiling of rock pressing on my back as I struggle flat on my stomach through a crevice only hoping

there is a larger opening beyond. These are all examples of places that we know Magdalenians visited. Their reasons are the subject of our pursuit.

GENERAL DESCRIPTIONS OF SPELUNKING

Spelunking is the practice of exploring caves. It is distinct from using cave entrances for shelter. Signs of habitation in cave entrances rarely exist beyond the penetration of daylight. The following passages are descriptions of spelunking. They illuminate the physical experience of encountering a cave, the feelings involved, and consequent relationship of the spelunkers to each other, and of the spelunker to the cave.

Initial Entrance

Entering a cave is an exercise in ambivalence. One is drawn inside almost against one's will. The surface of consciousness constantly reminds one that the cave is unfamiliar. It is the unknown. The initial entrance is a constant argument of self.

It is not a question of pragmatics, "Will I fall?, Will I get lost?, Will my light die?". It is the thrill of passage, the feeling of violating a sanctuary, a place which is unknown. To know the unknown, for the spelunker, is the impetus to breathe. It is on this edge of conflict, and of participating (not of discovering because everything in a cave is already known to the self) that I entered the cave.

These feelings stem from socialization. "I will be scolded for physically endangering myself", translates into, "I will be shunned for entering a forbidden place", which translates, "In the face of my own social and cosmic consciousness, I am participating in the sacred". It is an act that will be accomplished time and time again, an act that creation myths hinge on: a disruption of the sacred state of the universe.

I am at the entrance to a cave. I am alone. The anticipation of finding the cave changes into

the dread of going inside. I feel afraid. Am I afraid of being outside and not going in or am I afraid of the inside? I am at once afraid to stay and afraid to enter. The fear grips me inside my body. I look inside the cave. The same thing that keeps me out draws me in.

The first shadows are the effect of daylight. I see at once the entire floor and the walls. Nothing is there. I smell the odor of earth and see the place where daylight melts into darkness. The hardest step is into the darkness. I feel a tightening. I look around desperately. Is there a bear, a fox, a spider? Is there a mad man there? My light scans the walls and the floor. Nothing is there. I go further inside, searching for whatever I fear. I move further. In movement there is safety. I cover the entire passage until at the end I realize the only mad man is myself. It is then that an overwhelming sense of security floods over me. I am in a cave, alone, in the most peaceful space I have ever known.

I crouch over and begin to listen and to breathe deeply. While focusing on the one patch of light that my flashlight creates, I try not to rely only on vision. In this way I gradually become a part of the cave. I relax and concentrate on the form and the darkness of the cave around me. Cave walls sweat and glisten.

Entering a cave is a difficult step. It is also the most difficult to describe. Entrance marks a transition from the familiar, sensory world into another, different realm. Illusory shadows on the rock walls and the pervasive darkness require a reorganization of the senses. The aspect of being physically enclosed also influences one's attitude. The initial feelings of ambivalence, followed by fear, and finally security, were reflected in the above passage.

Negotiating Space

Many caves in the Beune are dead end resurgences. They have the shape of a tube which gets progressively smaller. These caves are boring to spelunkers but foxes and other animals like them. They give one the sensation of climbing into a sequence of Chinese boxes, until at the end, one has to wriggle out backwards on

one's belly. It is frustrating for a spelunker to run out of space.

Spelunkers always search for the end of a cave. Not only the end of a passage but the end of the cave system. It is a process that may take years. Spelunkers are obsessed with going the ultimate yard, with knowing the entire boundaries of the cave. They seem to think that all caves are endless. They knock out stalagmite walls and dig into mud choked ends in hopes of breaking through to a new series of unexplored passages.

Interestingly, very many paleolithic image caves, some quite deep, have marks of human presence at the end, often in the form of dots of red ochre. The arrival at the end is marked.

How does one negotiate space? Spelunking is the continual process of selecting posture, hand and foot holds, and making decisions en route. A spelunker who sees a crack which he may or may not fit through will likely give it a try. Self knowledge is fundamental in these situations. One must know one's body, its dimensions and capabilities. Misjudgment can be very serious. Physical abilities, however, are only as advantageous as an equivalent mental constitution. The body can do many things as long as the mind is clear and in control.

The sport of spelunking depends above all things on discipline and self-control. There are techniques of moving through tunnels such as keeping one arm forward and, the other arm down by the body. This posture is useful when the carbon lamp's hose catches on a jutting rock. One can reach it and not be stuck in a situation where if one can't help one's self, no one else can either. A veteran spelunker advises, "Never go anywhere feet first. You do not have eyes on the bottom of your feet". Other rules are to move on your stomach and never go alone. People do die in caves.

I asked Hughes how he remembers his way around caves. Knowing that he has grown up in this area and visited some caves often and others only infrequently, I wondered how he has generated cognitive maps which he remembers over many years.

At first Hughes is puzzled by the question. I wanted to known how he remembers to go right or left at a fork, or when to look for a tiny hidden crack that will lead to another series of passages. In all of the thousands of twists and turns, how is this possible?

It occurred to him that he remembers with his body. I have experienced enough caves to understand how this is so. Every time he tackles

a climb or a descent or crawl through a space he remembers it in the way his body conformed to the walls, to the hand holds, and to the action. He remembers vaguely how he had to move to put his foot in place. He remembers the actions as they happen, not the specifics one at a time. This is the same technique Phil Ford and Michael Jordan practice in making impossible moves to the basket, around and through defensive players. They don't know what they are doing until they do it. It is not conscious in that sense. They don't plan the movements, they make them.

Many people wonder how it is possible to trust such a method. Indeed, post classical Western thought has sabotaged our confidence in intuiting information. Essentially one intuits with the body and the mind at once. Contrary to popular rational thought processes, intuition is based on information, albeit another kind of information.

The act of spelunking is defined by movement. The adventure requires the continual challenge of new obstacles and the discovery of new places. Constant movement allows for participation with the setting wherein the body explores its potential and its limitations. Physical danger is always a part of spelunking, a constant reminder of the seriousness of the sport.

A Visit to Boyer Cave, South Beune Valley (see map 7)

We found the entrance to Boyer high in the hillside. The first chamber had a low ceiling but was spacious at 3-4 meters across. At the back of the small chamber, a tight opening about the size of a manhole led under a ledge and straight down a shaft for 3 meters which fell into a level round passageway. We moved further into the cave, past deep crevices and over ledges up into different passageways.

Cracks in the earth (which is what caves are) are surprisingly uniform. The ceiling was more than a foot over my head. I could barely touch each wall beside me with outstretched arms. The wall was brown-clay-mud limestone and smelled faintly like wet earth. Further down, the walls

moved in at waist height, and the passage took on the shape of an hour glass. We maneuvered like G.I.'s with our weight on our bent arms, our hips sliding through the narrowed joint and our legs dangling in the space of the lower tunnel. At the end of this configuration, the tunnel bottomed out into a declining chamber of rubble going down too steep to negotiate without a good possibility of falling. The configuration of the cave was changing constantly.

It was dark. I leaned against the wall. My legs and arms were weak from the ordeal of pulling and swinging and scrambling along. I turned out my light. Hughes had gone to explore a new passage. There was a stillness and blankness that must be like death. But I was there, alive. I sighed. My heart rate slowed from the exercise. I vaguely heard moving rocks somewhere. It was so quiet and I was so far down inside the passages and cracks that twist and turn that... . I thought about what it would be like if my flashlight burned out. I thought the worst because it was fun to approach the edge of terror. I checked my light. How long had I been there? I wanted to dissolve into the darkness. The humidity was high but the air was not stale. This was a living cave. There was a solitude there that was astounding. I wanted to get closer to it. Hughes came back too soon.

He said that he may be able to break through the stalactite wall at the end down there and will bring Pierre back and try to push through in a few days. The other passages were more difficult and there was not much to see. We make it to the head of a steep drop which bottomed out in a room, but that was the end. We decided not to go down but to turn around.

I told Hughes that I had followed him initially when he went into the new passage. He had asked if I wanted to come saying it was difficult. I had said I would wait, knowing that 'difficult' was a word not to be translated without any loss of meaning.

Hughes had disappeared like some kind of salamander winding down a pipe into folds of rock and clay. Where was he going? I had asked that question before. He was quick and moved with marked determination and finesse. The glow of the carbon lamp on his head was swallowed up by the earth. Its last shadows were interrupted by the wriggling legs and heavy boots as he disappeared head first. I peered after him, looking over and down between two angular walls of rock that formed a sort of irregular tub; its near wall up to my

armpit. Inside the tub and off to the left, there was a tiny opening, like a hole poked in the toe of a sock. It looked easy to get stuck in as best as I could tell. My flashlight was feeble compared to the carbon lamp. Well, I didn't want to miss out on anything. I hoisted myself over and into the well, twisting in unnatural positions to get set for the sock hole. It was always a hassle holding the flashlight and moving with all four limbs at one time. My head, covered with mud, stuck sideways through the window. It became a small, irregular shaped, child-sized tunnel. All of my weight was on my shoulder with my neck bent sideways. My spine was bent to breaking and my legs stuck straight back up in the well. What was I doing? "I'm going to get stuck", I thought. I went a little further, wriggling. Everything turned into wet mud. I resented the loose-fit of my overalls and the big rubber boots that made movement even more awkward. I went forward in this body-sized tunnel. Then I smelled fresh air.

The tunnel opened out into a room, only the opening was a good 12 feet from the floor. Had I gone any further, I would have deposited myself on the floor on my head. From such a position, one can never tell if there is a floor at all or if there are gapping trenches below. I was not feeling too comfortable in this situation. The logic flowed through my mind. If I do drop down or work my way down I might become unstable and may fall. When you fall in a cave you don't know where you are falling to. If I get down alright how am I going to get back up? That was it. I decided to go back. I do not remember if I managed like Houdini to turn around in the tunnel, or if I backed out with my legs scrambling against unyielding rock and my arms forcing the weight of my body out and up the tunnel backwards through the window and twisting out the well. I was reaching the end of my mental rope. I do remember a considerable amount of mud in the face and a sizable shoulder bruise.

Despite all the aches and pains from the body twisting, the scrapes and bruises, and the incessant knocking of head against unseen stalactite, spelunkers believe that caves have an enigmatic and comforting atmosphere. Knowing a cave is like knowing a secret.

The Stalactite Sheet Room

At one point during the journey into Boyer, we crawled off into an hole .3 meters wide in a solid sheet of stalactite to enter a tiny,

intimate chamber where pools of clear water sit under Greek-drapery-like stalactites. Getting my head through the opening with a big carbon light and helmet was the hardest part. Actually, it was a question of the shoulders. Unlike cats and rats, our shoulders are not collapsible. Does one put one's arms above the head and shrug shoulders, or keep one's arms against the body to pass through the narrow opening? Most spelunkers have one going each way, one to move or explore things in front, the other to unhook or loosen a tangled carbon hose.

Lying on my side, I stuck my head through the hole. Every time we came to a new event such as this I got a feeling that is was not possible to move through it. The shield of stalagmite was hard. It scraped the back of my neck and hurt. Tiny stalagmitic formations and broken pieces of the thin wall pinched me. I shuffled on my side, like a dying animal, forcing my awkward way through the crack. My overalls scraped against the smooth limestone floor and my boots made scuffling noises. My hand reached out into darkness and landed in thick mud. My torso inside, I came face to face with a wall, which I had to bend around to get inside. On my hands and knees (these were sore knees - I had bruises everywhere) I came out into a box-like room. It was enchanted.

I collapsed on the floor. My eyes caught eerie translucent forms of light, flickering around through the calcium formations. It looked as if the room was caught in a frozen water fall. Flows and billows of yellow-pale calcite drapery were lit by the carbon lamp. I was sitting in the shallowest pool of water in a room where other pools reflected the walls and light. It was a fantasy world. As the lamp moved around, all the forms changed.

I was revived and in wonder. Hughes was tired and leaned, sitting up against a shower of timeless rock-drapes. The light was bright, reflecting off white and yellow walls in this small chamber. I wanted to sit here forever. I started tapping the different thicknesses of stalactites to make percussive rhythms. The thick ones were the bass. The room reverberated. It was engulfed by the sound. Strong sounds were mixed with little 'tink-tink' sounds. I thought about mammoths. I thought about earth-bowel rhythms. I was the maker of the sounds. I was making a story with the sounds, there inside the earth where mammoths were born. It was not a

story with a plot, it was a story with raw, changing energies, a play of sounds.

I felt that I was not just underground. I was contained deep in the earth. My senses were at once charged and relaxed here. I thought about the Paleolithic. All of the barriers between our time and our cultures were becoming vague. I heard mammoths in the sound waves. I saw rituals that hinged on drama. All things basic and primitive and ever new were becoming real.

Hughes was smiling. We were just in a cave.

Small, hidden chambers, long narrow passageways, steep declines and tiny chutes connecting one area to another have been described for the reader. The act of negotiating these spaces generates feelings as the spelunker responds to spaces and to objects. In Boyer, the author experienced being alone in the cave setting, described the quality of the darkness, the sense of timelessness, the process of logic in a physical predicament, and the unleashing of the imagination as the result of a spatial transition.

Spelunkers

"Could you find your way out if I was hurt?", Hughes asked. My stomach landed at my feet. This is essentially the issue at the base of the bond between spelunkers. The mental constitution to deal with accidents, with pain, with being lost, or simply calming someone in the face of their own fear, especially if they are stuck, is an important part of the character of the spelunker. One trusts one's companion to take care of himself, so as not to endanger you both. Spelunkers must rely on each other in a manner not readily experienced in daily tasks and in ordinary environments. Spelunking is a bonding activity. For paleolithic culture it could have had some value as such in ritual fashion. It creates situations where being familiar with the abilities, reactions and limitations of one's peers and one's self could mean success or death in dangerous but necessary activities like hunting. Social negotiations and dependencies are brought to the fore in caving excursions.

Hughes' question called on my memory, my decision-making ability, and my physical state all at once and without preparation. The bottom line is not whether one has the nerve to try or not, but how one approaches a situation in which success is a requirement for survival. Although it is a sport, the game of spelunking sometimes gets stripped away. It is a bonding experience, translating into social information, sorting and defining the limitations and leadership abilities of individuals.

Social information is exchanged between individuals who explore caves together. A person becomes aware of his or her own physical abilities and mental constitution, just as he or she becomes aware of another's. The bonding between spelunkers is a natural extension of social relationships. Humans are dependent on each other for survival. In inner-cave settings, this relationship can be reduced to bare essentials.

Descriptions of spelunking are instructive. It is apparent that the experience of cave spaces generates movements, attitudes, and relationships. Entering the cave is a transition requiring a reorganization of the senses whereby the person becomes transformed. For some individuals, the cave presents itself as an entity to be explored. It provides an arena for social and personal development. Magdalenian images found inside caves indicate that the image-makers made use of the cave setting itself in some fashion. Understanding more about the caves in which images are found will help the modern scholar interpret the role of the cave in Magdalenian culture.

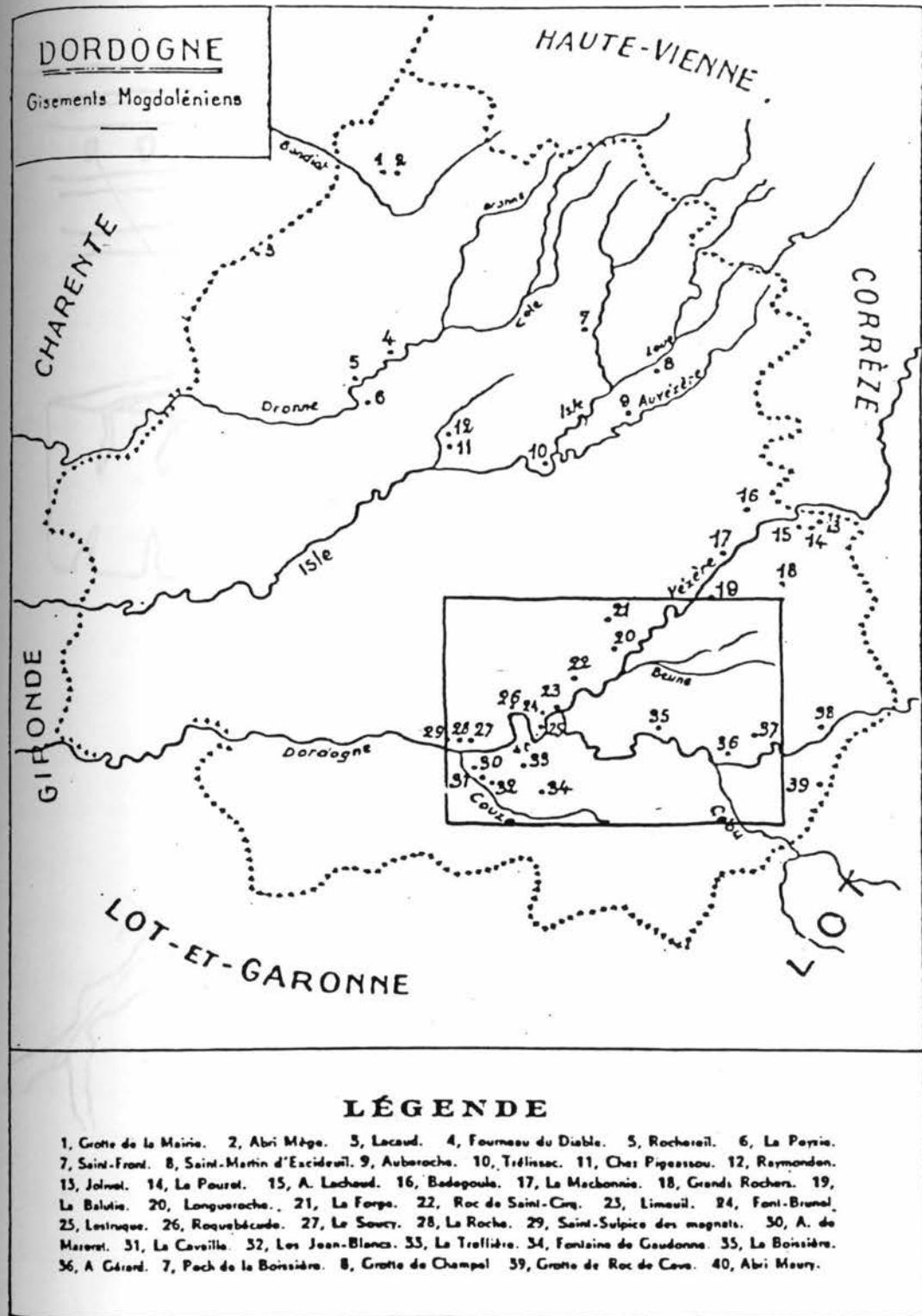
III. THE GEOLOGY OF THE PERIGORD

The Périgord is an historically rich area for Paleolithic sites. The density of occurrences in the river valleys of the Dordogne is unparalleled in France and the rest of Europe. Understanding the regional setting of the Périgord begins with the geology of the area (see Map 5).

LIMESTONE PLATEAUS AND FAULTING

The Périgord is characterized by a series of limestone plateaus formed during a sedimentary cycle of the Cretaceous Period. Senonian deposits during the upper Cretaceous consist of alternating sandstone and clay; these are dense and uniform because of the calm conditions at the time. Limestone deposits of the Coniacien, oldest of the Senonian substages, are rather chalky and often contain silex (flint). The Coniacien limestone plateaus of the area provided a substrata conducive to the flow of water underground and thus are honeycombed with fissures and cave systems (see Figure 1). Coniacien deposits also weather in a manner which forms the unique overhanging cliffs of the area, which have attracted human populations seeking natural shelters throughout history.

The limestone plateaus of the Quercy and the Périgord Regions are known as karst systems. These are fossil



MAP 5. Dordogne, Isle, and Dronne River systems in the Périgord. (from D. Peyrony 1949).

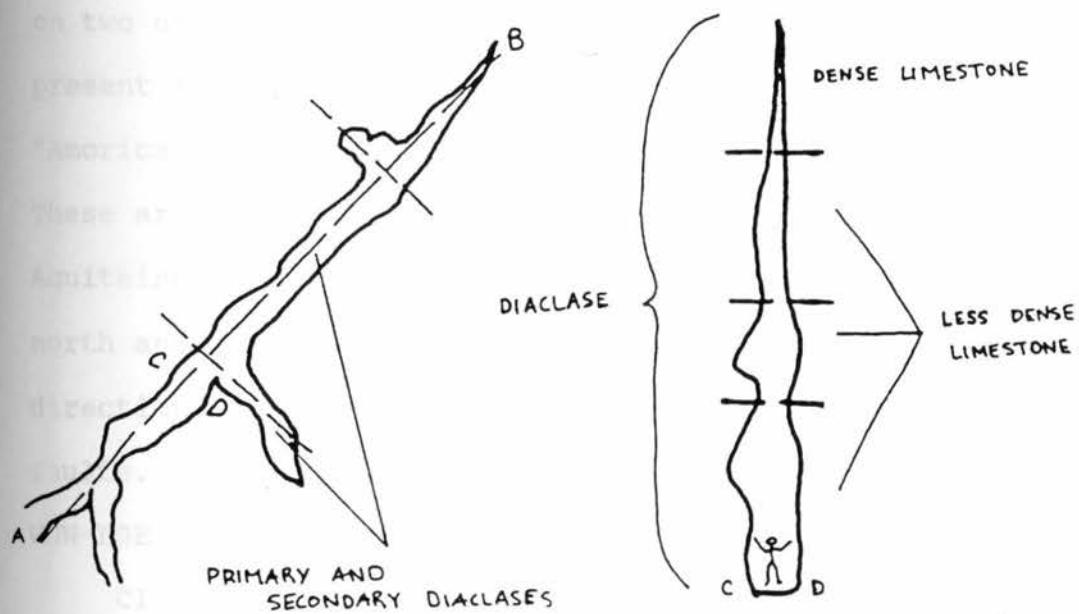
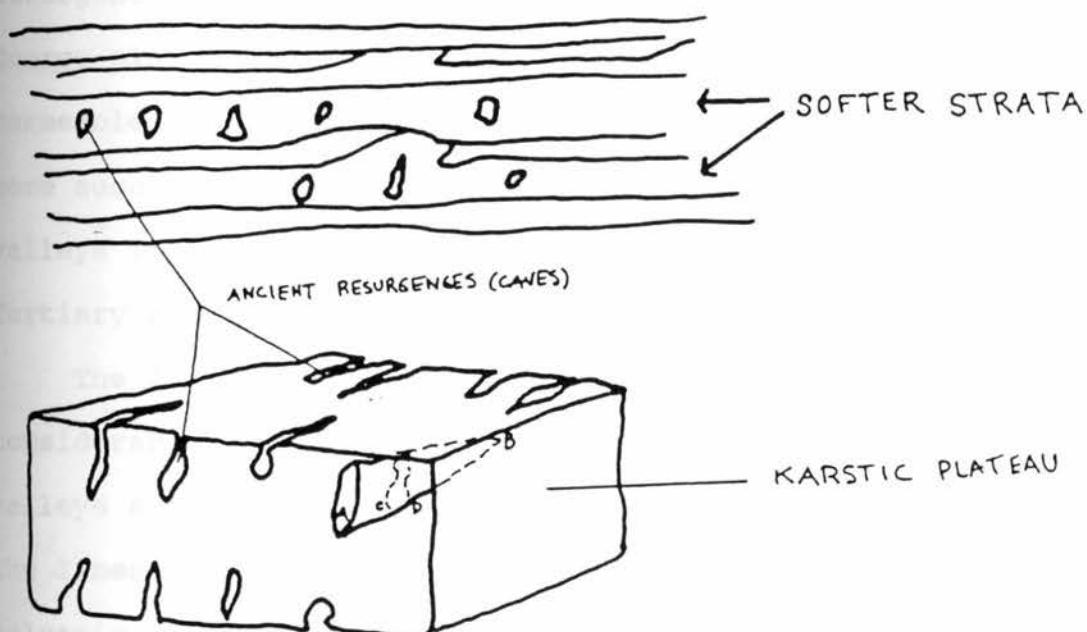


FIGURE 1. Geomorphology of a karstic plateau and a typical fissure or diaclase (cave).

resurgence networks, many of which are dry today. The Quercy plateau is Jurassic, a denser limestone which is less permeable; the Périgordian limestone is late Cretaceous and more susceptible by the effects of water. Numerous dry valleys in the area attest to the action of water during the Tertiary period.

The formation of mountains in Western Europe is of considerable importance in grasping the geomorphology of valleys and caves in the Périgord. As the Pyrénées formed, the limestone plateaus, already stressed from the east by volcanic activity of the Massif Central, were folded upward on two sides, thereby generating the regular fault pattern present in the area. Faults running NW-SE and NNW-SSE (the "Amoricaine" direction) dominate regions north of the Lot. These are the very long anticlinal faults in the northern Aquitaine, and constitute a zone of flexures separating the north and south Aquitaine basins (See Figure 2). A second direction, SSW-NNE, is followed by the "Villefranche" faults. And more than 25 "Pyrénéenne" faults run W-E and WNW-ESE.

Closest to the heart of the Périgord is the St. Cyprien fault, crossing in the direction NW-SE, perpendicular to the Vézère. The Vézère itself represents an "anticlinal" fault, a result of pressure absorbed from the St. Cyprien fault. This geomorphological action is repeated in the formation of the Beune Valleys, perpendicular to the Vézère, and in the creation of caves which generally run at a 90° angle to the

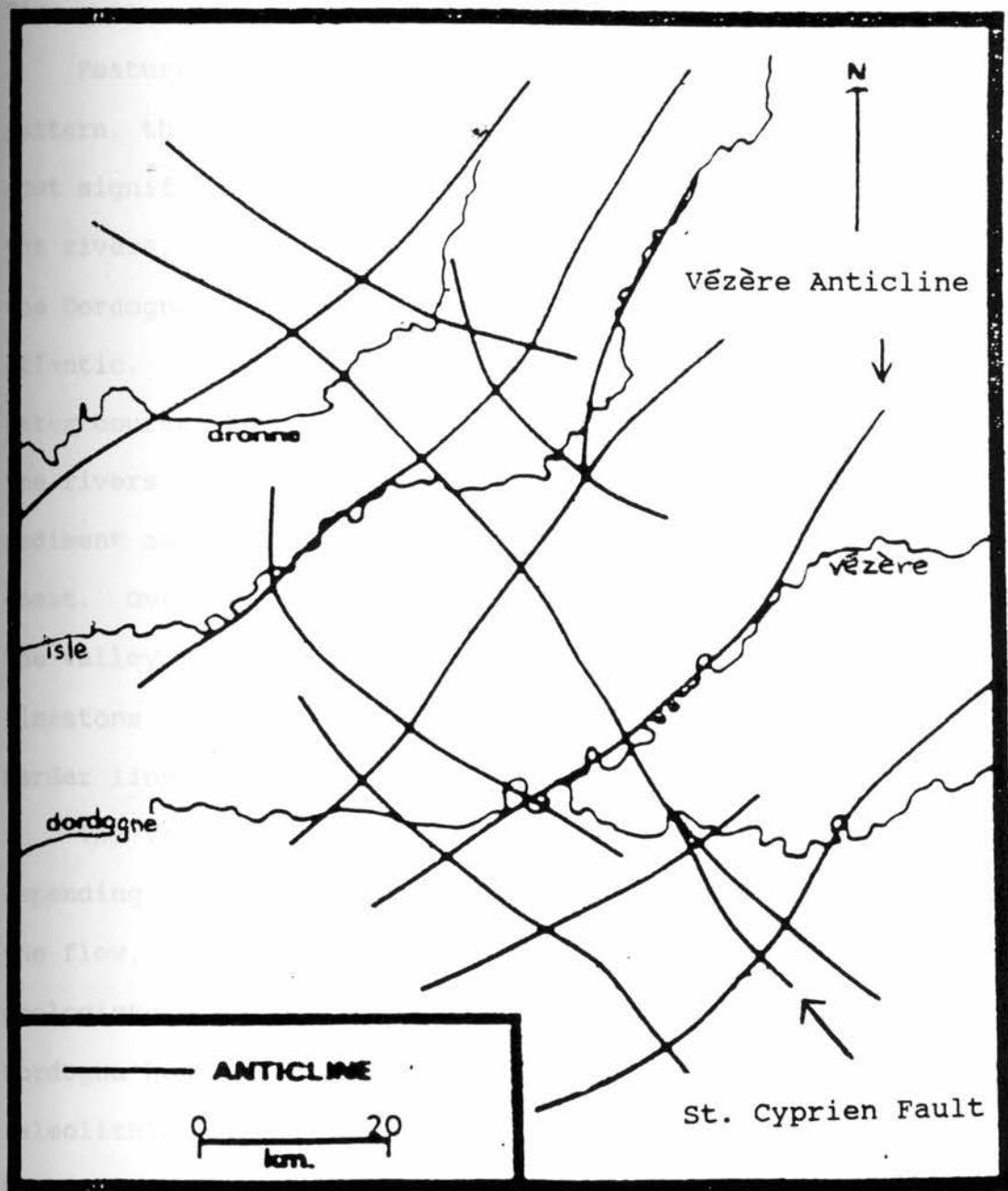


FIGURE 2. Faults and anticlines in the Périgord.
(from White 1980, after Fenelon 1951).

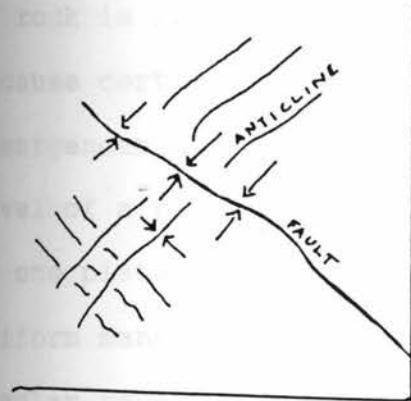
valley and themselves have perpendicular fissures (see Figure 3).

Features of the landscape are a result of the fault pattern, the type of sediment and degree of erosion. The most significant features in the Périgordian topography are the rivers. Beginning in the Massif Central, the source of the Dordogne and Lot river systems flow westward toward the Atlantic. In the mountains they are narrow fast-running water courses, flanked by steep gorges and rugged banks. The rivers gradually level out on the plains, depositing sediment as they flow into wide valleys approaching the coast. Over time the river course meanders from one side of the valley to the other, cutting into the less dense limestone walls to form cliffs and turning away at the harder limestone strata.

The valley floor, too, may rise and fall through time depending on the amount and kind of sediment brought with the flow, the volume of water and any blockage downstream. Geologists (Gèze and Cavaillé 1977) suggest that the Dordogne has remained at a constant level since the Paleolithic. Underground streams break through the thinnest points of limestone and create numerous springs in a karst system.

FEATURES OF THE PALEO-KARST

Geological activity determining features of the paleo-karst is both chemical and physical. Water seeks out cracks



1. Cournazac
2. Font-de-Gaume
3. Les Combarelles
4. South Beune Valley caves

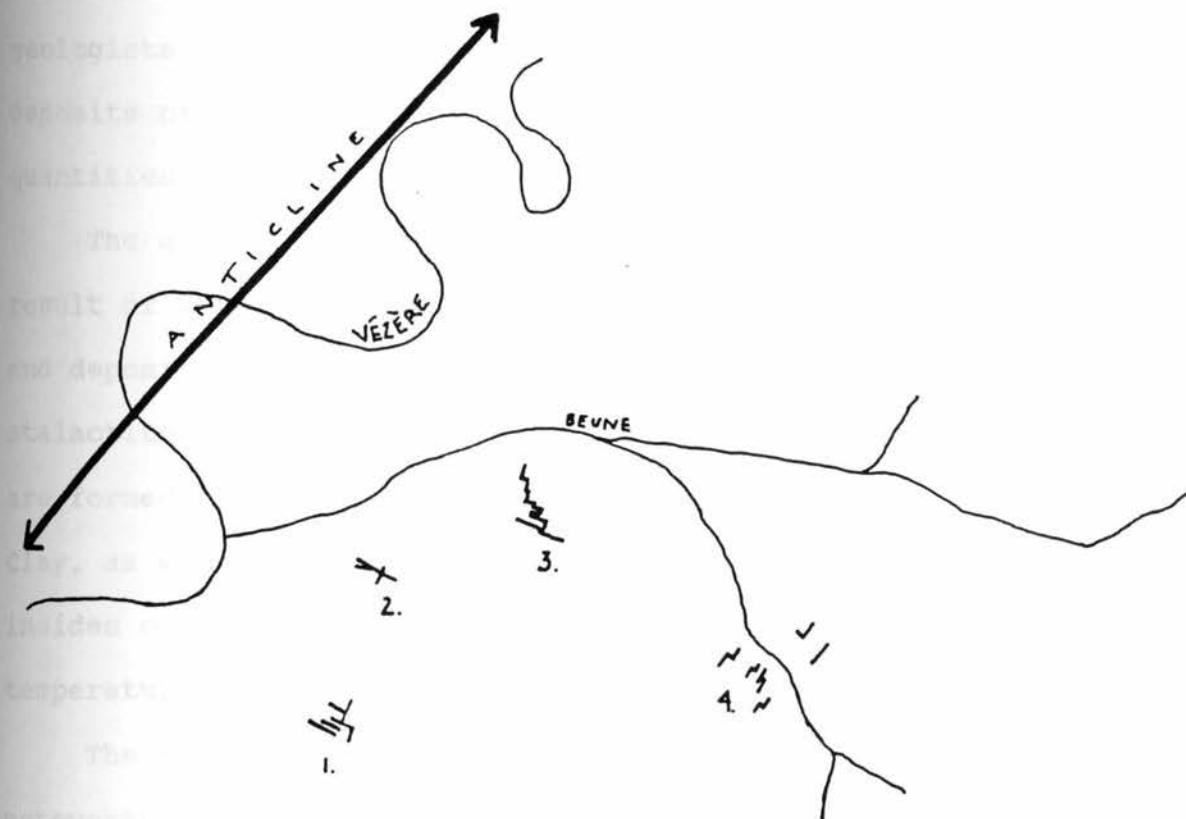


FIGURE 3. The Vézère anticline and formation of nearby caves in the Beune Valleys.

in the limestone plateau and widens them where the quality of rock is softest. Water also dissolves limestone. Because certain strata are more soluble than others, resurgences are typically found at one horizontal layer or level of a plateau. There may be three or four such levels in one plateau. Water flows out of the cliffside in a uniform manner, due to the pull of gravity, thus the more regular round form of caves. Some resurgences are very deep and connect to entire systems which may not be accessible to geologists or speleologists because they are blocked by deposits of clay and mud. At times of unusual water flow quantities of mud may wash out or move around.

The great variety of rock formations in caves is a result of water passing through limestone, carrying sediment and depositing it as the gradient drops. Stalagmites, stalactites, rims of pools, sheets of calcite and crystals are formed in this manner by the constant work of water. Clay, as well, is a residue of this process and lines the insides of cave. The action of water is affected by temperature; clay forms more quickly in warmer periods.

The number of features in Perigordian caves is noteworthy and represents a variety of spatial scenarios. Fissures are usually long, narrow and tall. Small domes called 'marmites' are found in the ceilings and floors of caves. They are the result of water moving in a whirlpool fashion. The vault, or ceiling, may be relatively consistent in height, or it may dip and soar unevenly in one

passage. Pockets of space each containing slightly smaller and higher pockets, open within the ceilings, showing slightly different densities of sediment and coloration. Vertical shafts (puits) are not uncommon. They may orient straight up or diagonally in the wall, or run straight down through the floor; some are very deep. Rock formations are found in Périgordian caves. The Grotte du Grande Roc is entirely filled with crystals. Caves usually contain water in varying amounts, in the form of pools, underground streams or tiny puddles. Many of the Périgordian caves have muddy floors and sometimes muddy walls. Animals make beds in the dry mud floors, and badgers have been known to change the entire configuration of small caves.

OVERVIEW OF SITES

The Grande Beune is north of the Petite or South Beune. The larger of the two tributaries, it runs westward and is separated by a steep hill and plateau from the South Beune. Photo 2 is a view looking north into the Grande Beune Valley from the hilltop that separates the two Beunes. In totality, the Grande Beune stretches 23 kilometers from its source to the Vézère River. Several Upper Paleolithic sites are present in the Grande Beune. The image sites are all well documented and include the caves La Grèze and Comarque, and the rock shelters Laussel and Cap Blanc. Denis Peyrony (1949), a French prehistorian who was active in the middle part of this century, cites two other deposits: the Abri du

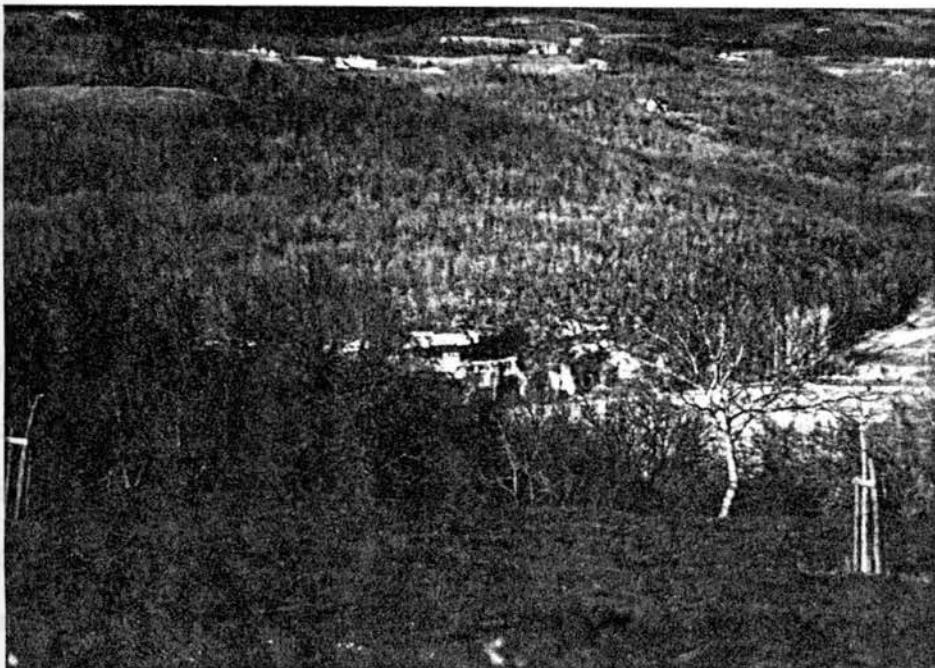


PHOTO 2. View north into the Grande Beune Valley.

Pigeonnier and the Abri du Moulin de Laussel.

Unfortunately, the excavations made at Laussel, Cap Blanc, and the rock shelters of the Moulin de Laussel and du Pigeonnier were made before 1910 and are not reliable by current standards. Many of the results were never published. However, the Cap Blanc archaeological material has been reexamined by Roussot (1972) and determined to be middle Magdalenian (III-IV). (See Chart 1 referring to Magdalenian dating and culture divisions).

Further toward the Vézère, at the juncture of the two Beunes, the Crabillat cave and rock shelter was examined by Peyrony, who dated the deposit to early-middle Magdalenian. A few kilometers downstream, approaching the mouth of the valley at the town of Les Eyzies, the caves Font-de-Gaume and Combarelles are major image cave sites. One other occurrence of engravings lies nearby in the cave, Grotte du Richard. Material published at the turn of the century suggests the Grotte du Richard to be Magdalenian. Several major Magdalenian habitation sites are in two nearby bends in the Vézère: one at its juncture with the Beune, the other 2 kilometers upstream.

The South Beune flows northwest from its source for 11.5 kilometers to its confluence with the westward flowing Grande Beune at 5.5 kilometers from the Vezere River. The South Beune Valley contains a high density of image cave sites. In the eastern-most portion, the caves Le Roc and Charretou are on the right bank. Much farther downstream

Breuil's Divisions

Leroi-Gourhan's Style

10,000 BP			
11	VI		
12	V	upper Magdalenian	
13	IV		IV
14	III	middle Magdalenian	
15,000	II		
	I	proto-Magdalenian	III
20,000		Solutrean	II
25,000		Gravettian	I

CHART 1. Magdalenian culture sequences and dating according to Breuil and Upper Paleolithic art styles according to Leroi-Gourhan.

Sous-Grand-Lac, Le Bison, Vielmouly II, Bernifal and Calevie are on the left bank. The image cave Nancy and the small habitation sites of Cazelle and Barry on the right bank. Except for Le Roc, all are considered to be Magdalenian sites.

Tree
sector A
Photo 3:
small cr.
stream ?
Photo 4:
brush cr.
CULT CONTEXT AS CONTENT: MAGDALENIAN CAVES AND CAVE IMAGERY
IN THE SOUTH BEUNE VALLEY
the valley
bank (soil)
burnt soil
cragg.
remains
humidities
in
north - 10°
vegetation
right
hostile
dryer
scrub
valley

IV. THE SOUTH BEUNE VALLEY

The valley curves almost imperceptibly through the sector and maintains a southeast to northwest axis (see Photo 3). The valley floor is flat and has been cleared of small trees to make a field in front of Vielmouly. A clear stream flows northwest in the center of the valley (see Photo 4). Several hundred meters north, groves of trees and brush cross the floor. It is marshy near the left bank. Cliffs on each side rise abruptly and are more forested than the valley floor. Reference will always be made to each bank facing downstream. The left bank flora includes hornbeam, holly bushes, thick mosses, violets, ivy, and fungi. Because of its southern orientation, the left bank remains largely in the cliff's shadow, and a constant humidity is maintained in warmer months.

In contrast, the sun is directed onto the right or north bank. This alignment effects a difference in the vegetation and erosion of the two sides of the valley. The right bank erodes more quickly due to a greater degree of heating and cooling. Plants that withstand a hotter and dryer climate make up the right bank's flora and include scrub oaks and pines, thorn bushes and rare holly trees.

A 1.5 kilometer section of this part of the South Beune Valley is the focus of the present study (refer to Map 6).

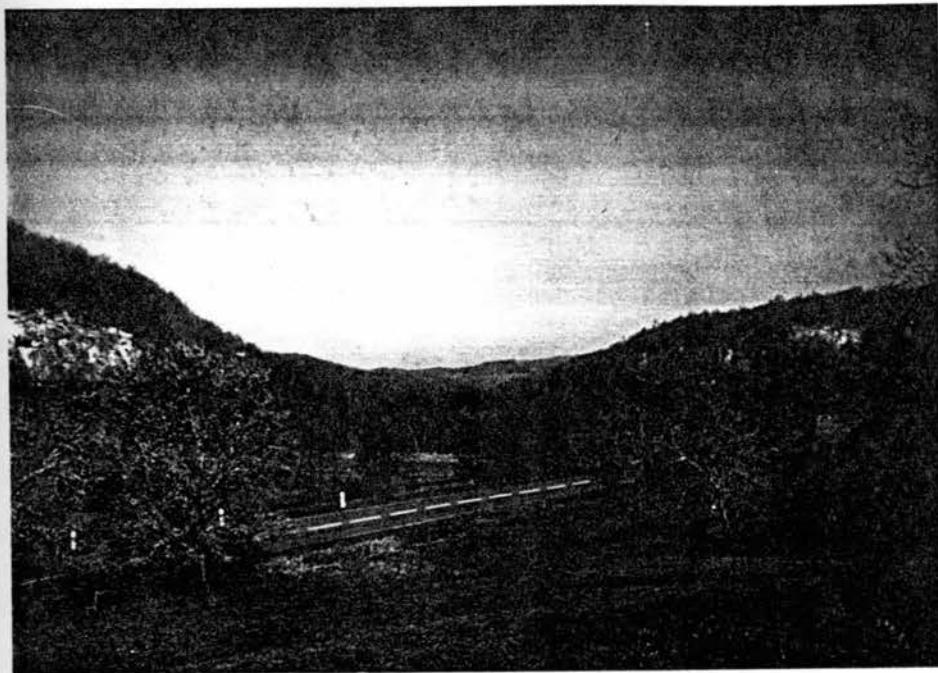


PHOTO 3. The South Beune Valley floor - view northwest toward the Vézère River.

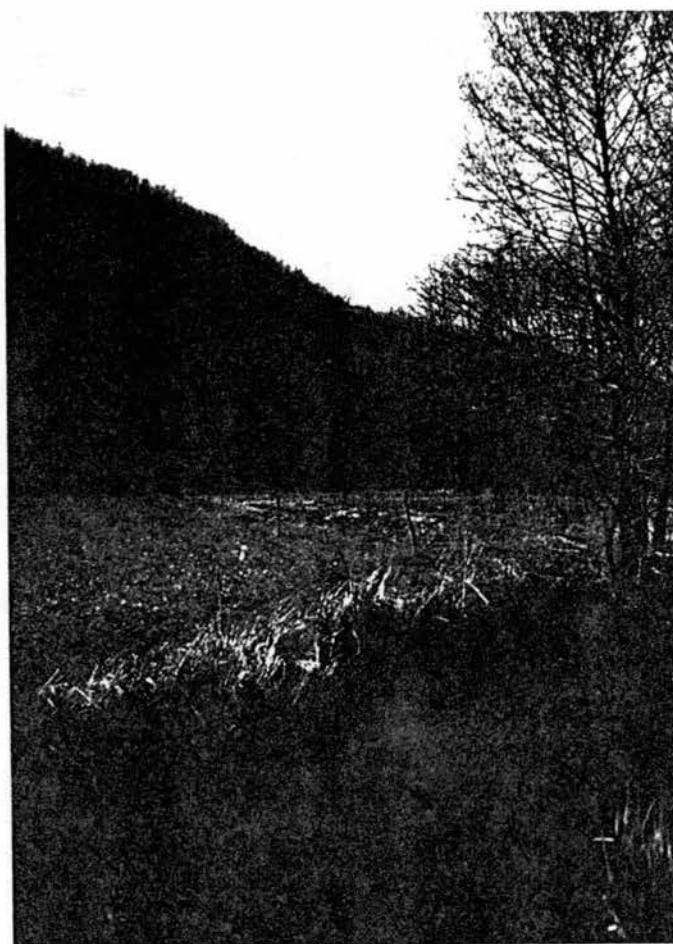


PHOTO 4. The stream on the South Beune Valley floor.

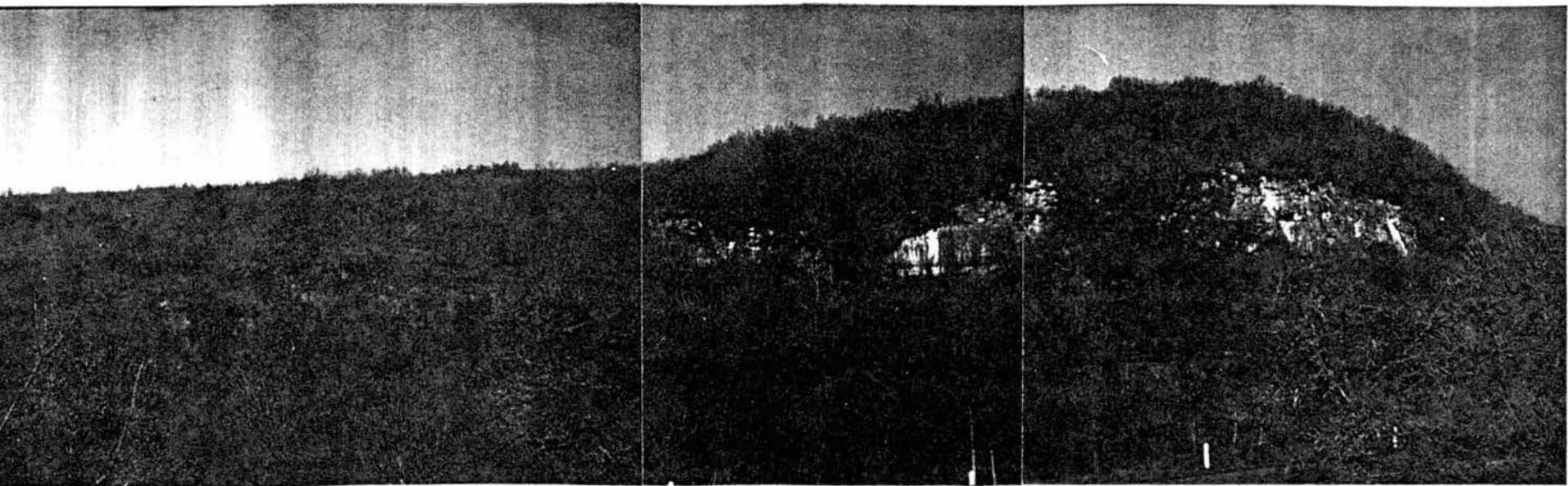


PHOTO 5. Panorama of the South Beune left bank cliffs in the study sector.

There are five image caves on the left bank and nine caves with no traces. One cave on the right bank has engravings and three do not. The total of image caves in the sector numbers six; caves with no engravings number twelve. Simple diaclases (vertical cracks or fissures), fox holes, and shallow cavities with éboulis (strewn rocks and rubble) are included in the description and analysis of underground spaces but are not considered by the author to be true caves and thus do not appear in the statistics.

Each bank consists of a series of cliffs with vales in between. The cliffs have as many as three discernible levels or tiers (See Photo 5). Vertical access from one tier to another is difficult in places, impossible in others. While at least one cavity was found at all levels of the bank, the great majority (27 of 30) are located in one strata or level of the cliff at 20 meters above the valley floor. This is true on both sides of the valley.

DESCRIPTION OF THE CAVES: LEFT BANK (EAST TO WEST)

See Photo 6 for a panorama of the left bank cliffs. Please refer to Map 6 in the attached folder for the locations of caves within the study sector.

SOUS-GRAND-LAC (#1)

The easternmost cave on the left bank is known as Sous-Grand-Lac. Its opening faces the northwest and is in the upper tier of the cliffside. Access is made by winding



PHOTO 6. Tiers of the South Beune left bank cliffs.

one's way along the bank's narrow horizontal protrusions, over rocks and fallen trees in the woods. Often the slope is at an angle greater than 45°. The entrance is preceded by a narrow porch 2 to 3 meters wide and is a good point of surveillance over the valley, 20 meters below.

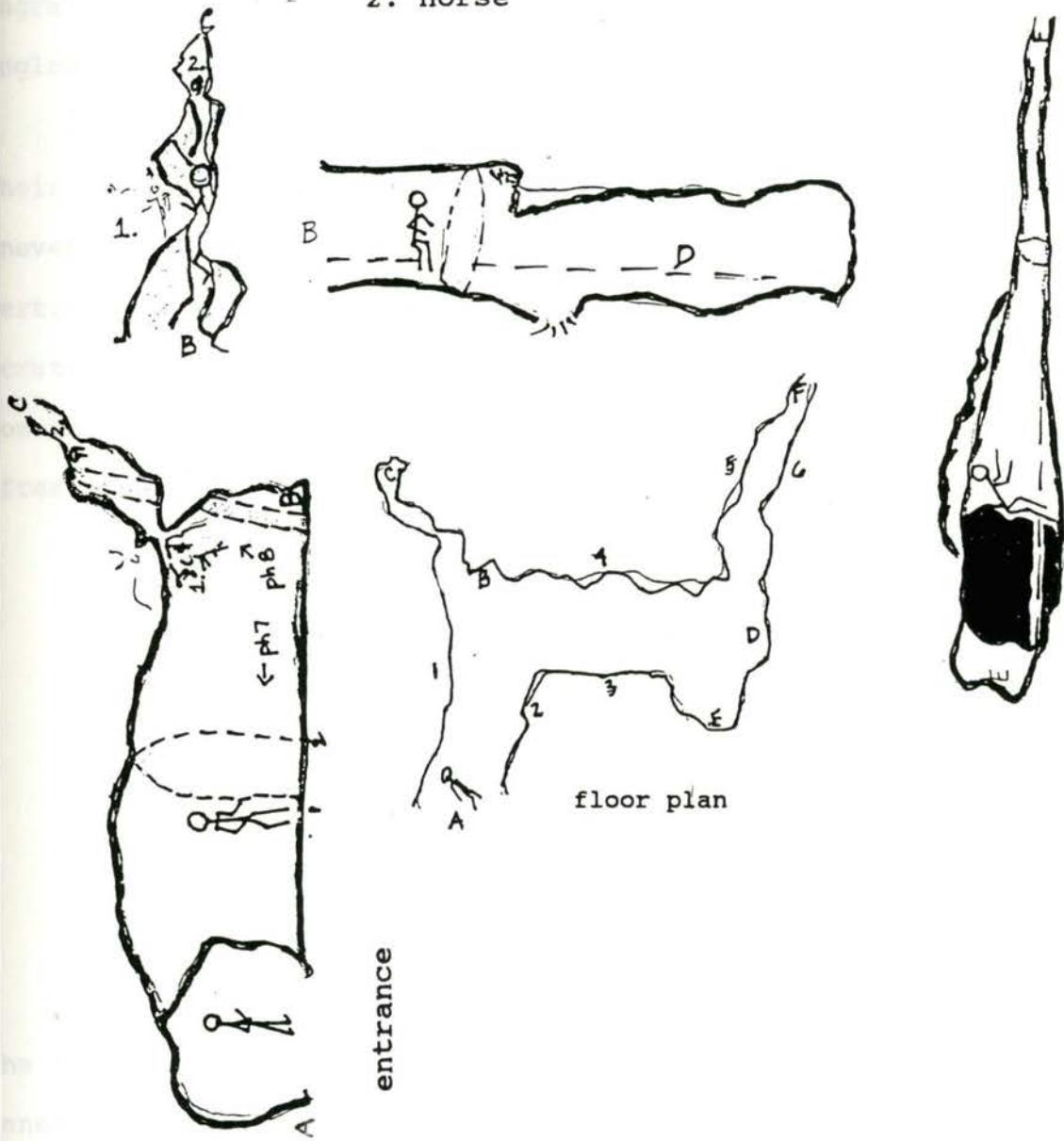
The entrance is 1.5 meters tall and 2.25 meters wide. Inside, the ceiling reaches 2 meters in places. The area is comfortable and wide enough to move around in. The cave makes a 90° turn to the right 6 meters inside. Beyond the turn the space overhead gets lower in places (1.5 meters) and trails down to less than .5 meters at the end of another 90° turn to the left. Here the cave runs itself out into a tiny crack after a total of some 30 meters.

The entrance is wide enough to allow the circulation of air just inside and up to the first turn. Ceilings and walls are only slightly damp. The floor is dry and consists of dry clay and large rubble in places. The walls are a yellowish brown characteristic of the area's caves - the color of the clay residue deposited in the process of calcium carbonate dissolving as water passes through the walls. In some places the ceiling is white.

A notable feature of the cave is a tall, narrow fissure or 'diaclase' (the French term for a geological joint), located to the left of the first 90° turn. The disclase is an extension of the juncture of the two passageways and reaches a terminal height of 3.5 meters from the floor of the cave. It is a small crack, large enough for a person to



1. scene of the man
2. horse



MAP OF CAVE 1. Sous-Grand-Lac.

"chimney" his way up and into only after climbing up onto the slight rock protrusion at chest height. This is the location of the main decorated panel in Sous-Grand-Lac. One may stand on the large rocks on the floor to view the engravings on the flat slab of rock at chest height, its top angled 15° away from the viewer (see Photos 7. and 8).

It is difficult to make out the engravings at once, in their totality. The viewer's hand held lamp spreads light unevenly across the panel, picking out shadows of long vertical lines here and there. Because any rock face has scratches and cracks, it is hard to tell if the 'figure' is something intentionally made and recognizable or not. Here, after a moment, the images become discernible.

The human silhouette is one of a person standing, slightly bent over.

... The two slender upper limbs are held out in front, with elbows slightly flexing and fingers spread open. The lower limbs, tapering, similarly flexed, terminate in a point. These characteristics give the silhouette a feminine quality, but a masculine sex is indicated... by an erection.... The rounded head seems enlarged by a sort of hairdo. The details of the face are summarily indicated, without being deformed (B. and G. Delluc L'Art des Cavernes p.178).

The man is 30 centimeters tall and the height of the total panel is 75 centimeters. The panel appears to include a series of vertical parallel lines. Some of the marks are possibly cave bear scratches, on top of which the engravings are made.

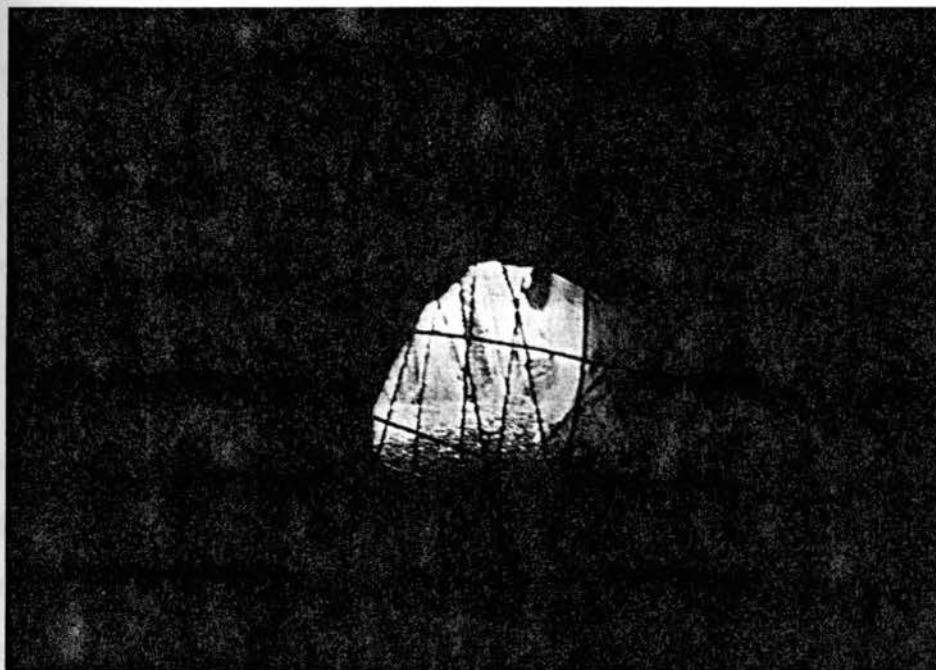


PHOTO 7. Sous-Grand-Lac - silhouette of the entrance from the decorated panel.

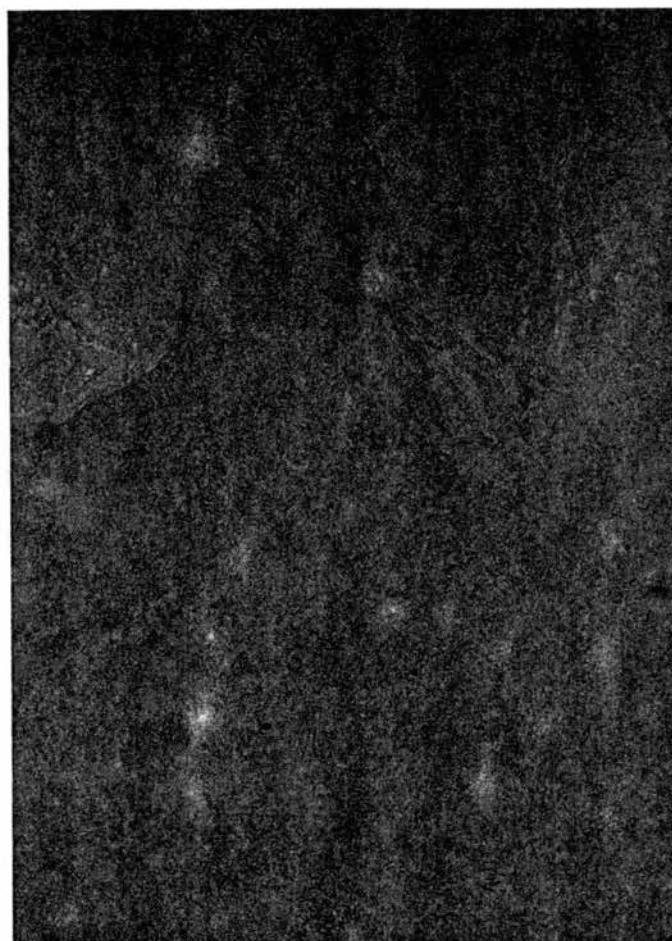


PHOTO 8. Sous-Grand-Lac - bottom of the diaclase at the decorated panel.

Two and a half meters up from the engraved panel, a small engraved outline of a horse is found inside the diaclase on a patch of white calcite. These images, along with the suggestion of a bull's head, and other traces of engraving on nearby walls, constitute the imagery in the cave. Midway along the second passage, several red dots are apparent on a white outcrop from the ceiling.

The walls and ceiling of the cave are in stable condition. However, a patch of mud sticking to the wall at knee to thigh height in the second passageway contains pieces of bone, broken antler and other debris. Slanting downhill 1 meter from this material is a choked well or mud shaft - evidence that the floor of the cave, once at the height of the mud patch, has been washed away. The cave was probably used by reindeer hunters as a small camp. The cave entrance could not hold more than four people, and the back recesses would have been barely, if at all, accessible due to the increased height of the floor. The old floor configuration would not have much effect on the spatial aspects of the main decorated panel; and would suggest that the panel of red dots was at a level of .75 meters above the floor.¹

In summary, Sous-Grand-Lac is a small cave at the top of the cliffside, whose location is of mildly difficult

¹ The red dot panel may have been perceived as a boundary or as the end of the cave. Marking boundaries or areas, especially the end of a passage or the termination of the entire cave, is a characteristic of the Magdalenian presence in caves.

access and whose visual point of surveillance over the valley is good. Its spatial qualities allow for comfortable entrance, moderate light infiltration up to the first turn, and the accommodation of only a few people as a camp site.

The presence of a hearth site with reindeer remains, the engravings which resemble almost identically the scene at the nearby cave St. Cirq (11.5 kilometers by valley), and its proximity to the Magdalenian aggregation sites in the great bends of the Vézère River at Les Eyzies suggest that Sous-Grand-Lac was an overnight hunting stop, perhaps used over several years. The cave also served in recording a scene of ritualistic behavior involving human potency, a relationship to animals, the potential use of sign(s), and the possible recognition of earlier marking of significant places in the landscape (by cave bears).

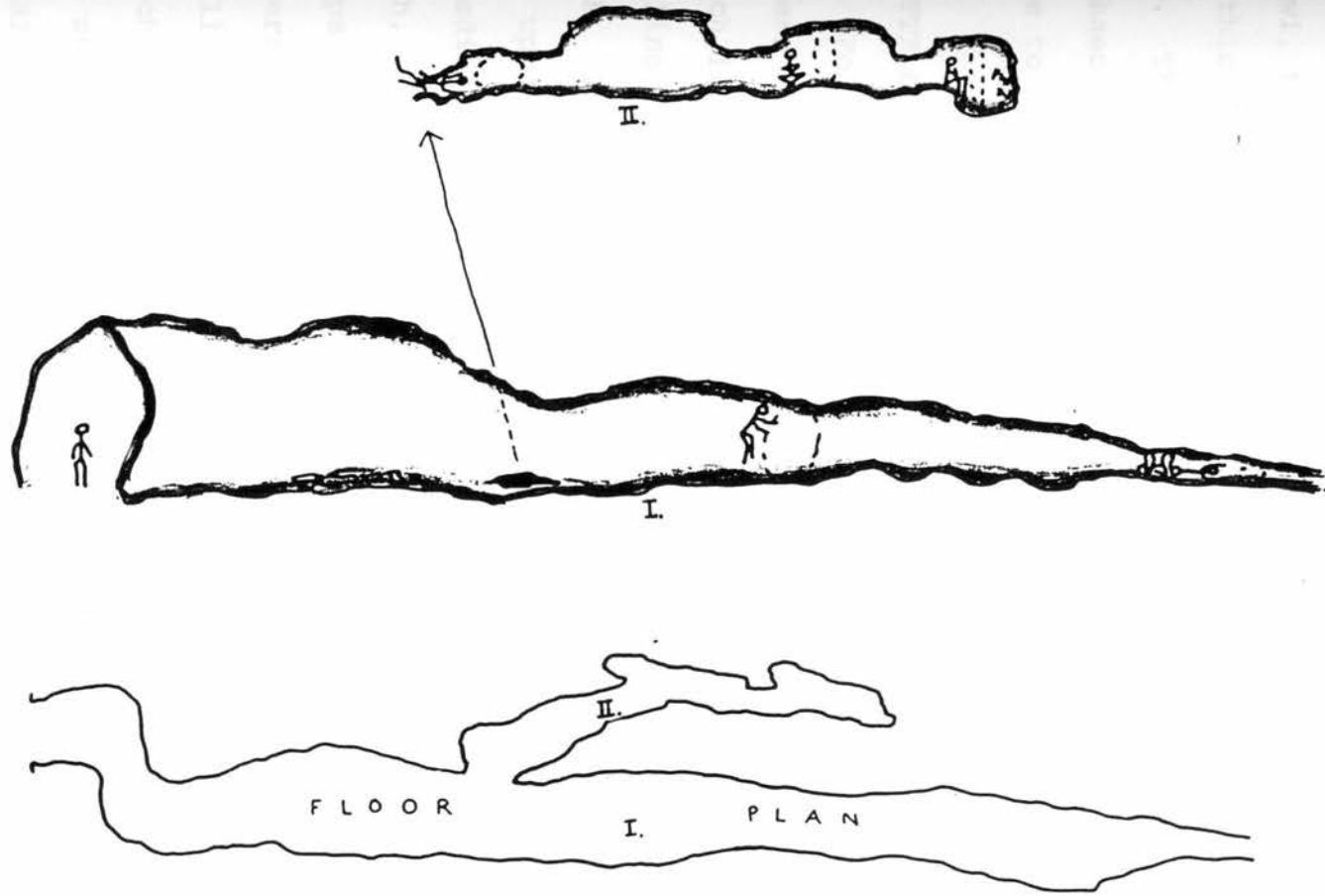
Once the visitor attains the level of the cliffside where the caves are found, getting from one cave to another is easier. One walks laterally along the slope through the woods, over rocks and fallen trees, staying at the same elevation. Just west of Sous-Grand-Lac, a small vale (see Map 6, fig. A) merges into the cliffside providing easier access from the valley floor to the level of caves. Beyond this indentation of the bank, the steep limestone walls continue on the other side of the small vale. Several meters west of the recurrence of rock escarpments a rock shelter, possibly the entrance to a cave, appears to be choked by mud (#2).

CAVE 'A' (#3)

Four meters from the mud-choked rock overhang, the entrance to cave 'A' is found among large boulders. The entrance is 2 meters tall and 1.25 meters wide, easily accommodating an adult. Initially, the cave is a small room, completely lit by daylight, its walls green with algae. This area is walled on two sides (the left and far walls), while the right side turns abruptly into a sizeable dark passage with many fallen rocks covering the floor. This passage is noticeably dark, even though the entrance is close by.

The passage is uniform in height and width, at 2 meters high, and continues for 5 to 6 meters. At this point, the floor begins to slope upward, the rocks on the floor are larger, and the cave narrows. Immediately to the left, a horizontal crack at the base of the wall requires the visitor to crawl on his belly into the crack, just avoiding a scrape to the back, down a slight mud slope. Entering a series of small compartments and passageways on hands and knees, spaces large enough only to crawl and sit comfortably in, one sees the smooth work of water in making the cave, washing out small round rooms in the softer strata. This section ends after several meters with an inscription in mud: 'Fin le Pot' (Out of luck).

Back in the main passage, the ceiling appears to have collapsed 10 meters from the juncture of the smaller



MAP OF CAVE 3. Cave 'A'

passage. Large segments of rock lie on the floor interspersed with large round holes, probably badger beds. The ceiling is lower, the visitor bends over, then begins to crawl, then continues on belly, boxed in, through a forest of thick stalactites and for 3 or 4 meters to the mud-choked end. The total length of the cave is 25 meters. No archaeological remains or images have been found in this cave to date.

GROTTE DE LA PIERRE (#4)

Following the contour of the cliffside at roughly 20 meters above the valley floor, there is another small cave which is reached by climbing up and grabbing onto small saplings to achieve a small platform a 2 meters above the path. This cave is the Grotte de la Pierre, so named for the upright stones found just inside. The entrance and immediate chamber are sizable, 2.5 meters wide, 2.25 meters high. The chamber is almost round in shape. The walls have bumps and protrusions covered with moss in many places. Six meters back from the entrance the cave ends except for a small, narrow passage, only large enough to crawl into, which extends 4 meters beyond the far wall and dead ends in the mud. No definite images or materials are present.

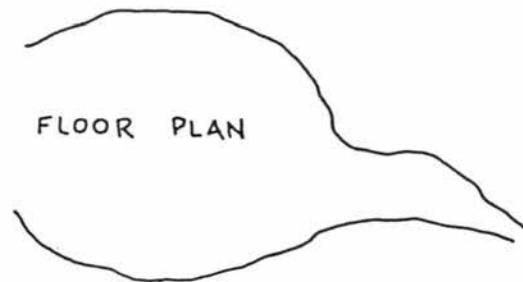
LE BISON (#5)

One of the better known caves, Le Bison, lies 45 meters west of the Grotte de la Pierre. Walking up the bank from the usual path, one approaches the entrance to Le Bison.

cliffside



FLOOR PLAN



MAP OF CAVE 4. Grotte de la Pierre

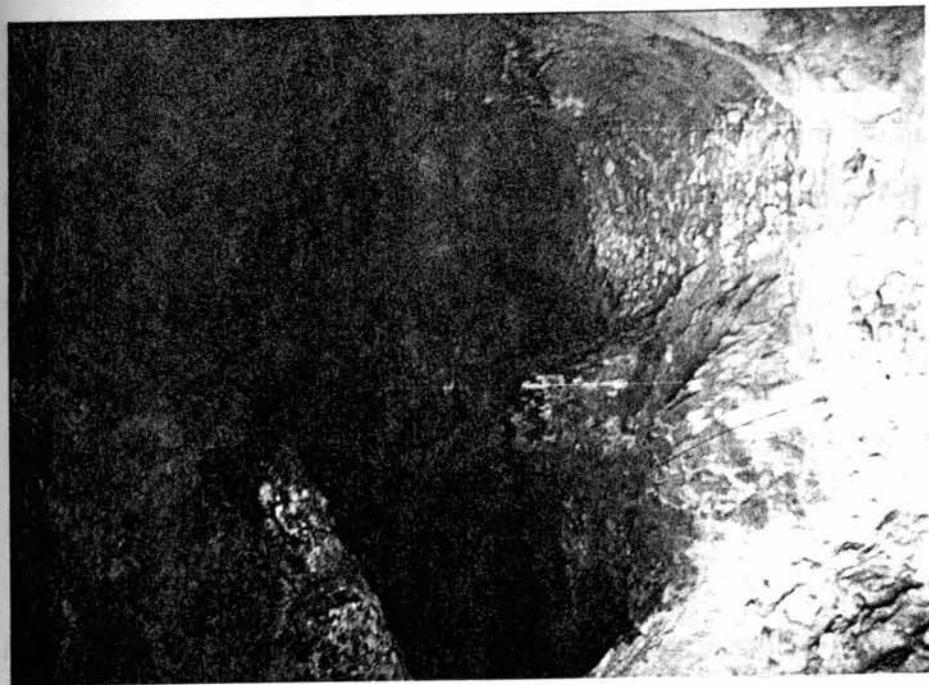


PHOTO 10. Le Bison -
two diverging passages.

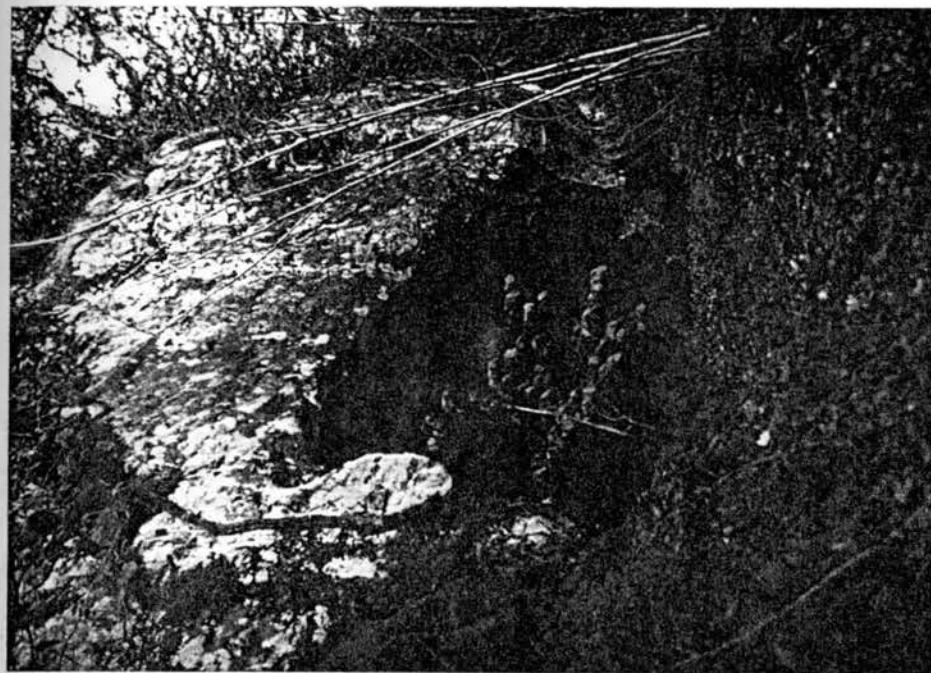


PHOTO 9. Le Bison - entrance.

See Photo 9. A view from the porch into the valley is possible. The entrance is 3 meters wide and slightly taller, and contains the remains of a stone wall which helped to enclose the front portion of the cave when it served as a sheepfold. The mouth of the cave shows evidence of being reworked to form an animal pen or habitation used during the Middle Ages. Remains of a bison and several flint tools were found in a small niche-like diaclase just inside the right wall of the entrance, hence the cave's name.

The cave's walls are covered with green and light grey algae near the opening. The walls are also irregular and bumpy, like popcorn, due to the formation of a special type of calcite configuration. Cooler air from deeper inside the cave fills the entrance.

Beyond the entry area, the cave divides into two passages (see Photo 10). The right passage continues straight back and is well lit for several meters. Many large and small rocks are on the floor. It narrows consistently for 18 meters then turns abruptly to the right in a very small but negotiable crack. A small adult can barely squeeze into this crack.

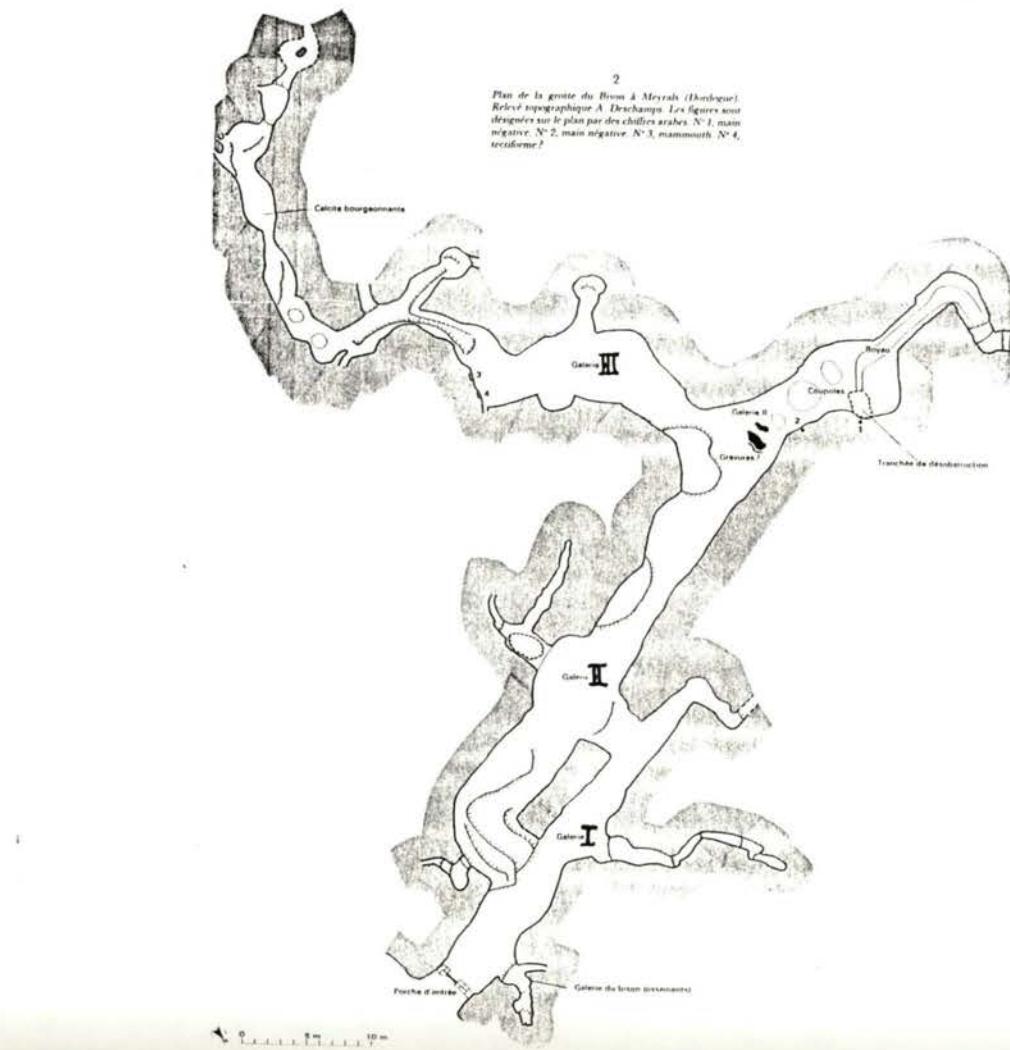
The other major passage turns off 90° to the left. It is almost totally dark until one's eyes adjust. Walking up a small mud slope, in the wide passage, the visitor stoops at first, then the ceiling reaches a height of 1.5 meters and continues along, wide enough to accommodate three people

abreast, past a horizontal crack off in the left wall. The main passage continues for 20 meters. The left wall contains another horizontal crack rising from the floor only .5 meters high. This tunnel is 35 meters from the cave entrance. White stalactites drip from the ceiling in sharp points leading to and surrounding the opening (see Photos 11 and 12).

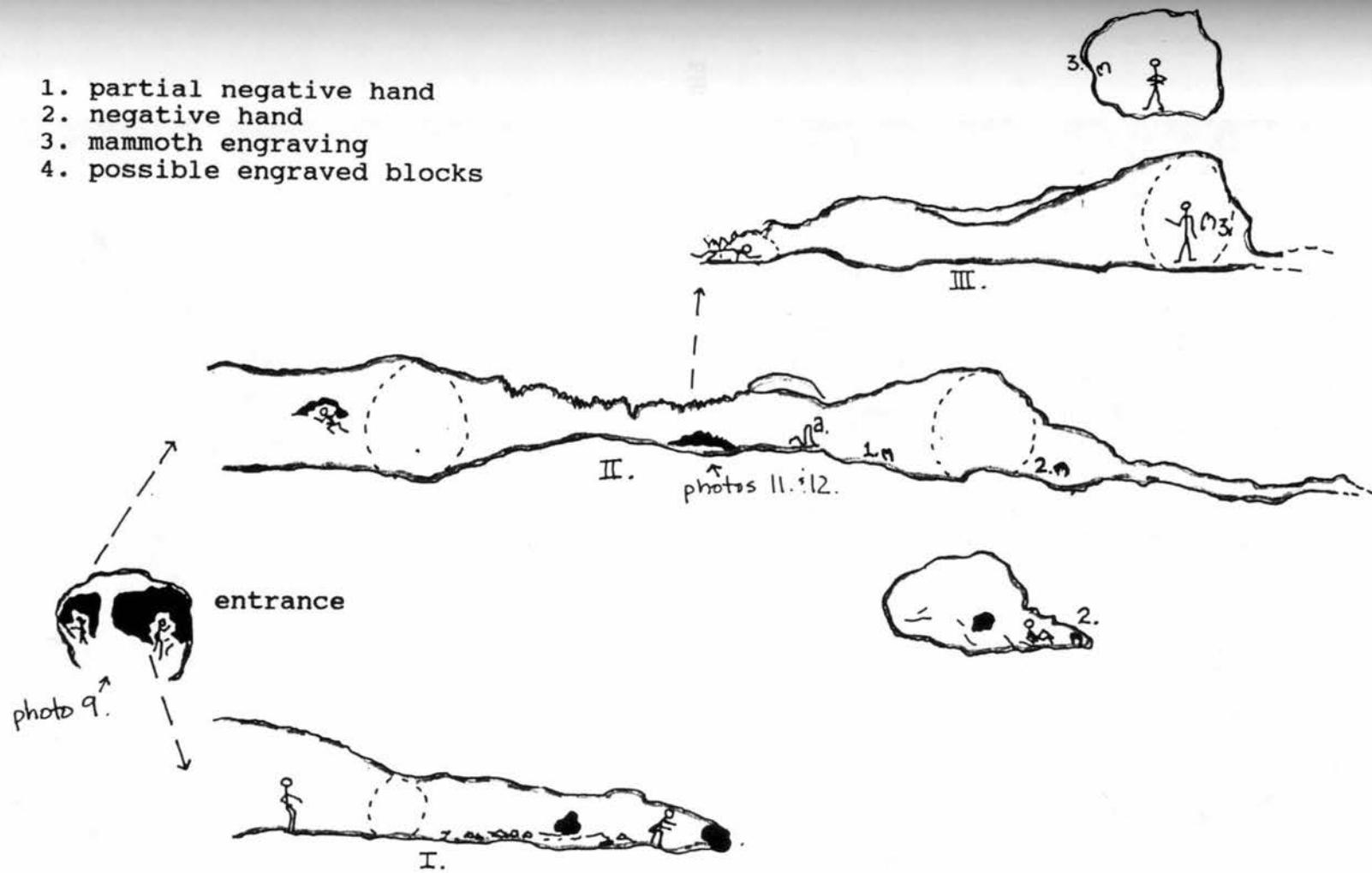
On hands and knees, being careful not to hit one's head, one passes through this opening into a larger round chamber, the ceiling .75 meters feet overhead and spacious. Near the back of this chamber and midway up the wall is the disintegrating engraving of a mammoth. To the left of the mammoth the traces of what may be a 'tectiform' (an abstract geometric sign found in Périgordian image caves) is badly deteriorated. The walls are brown-yellow, white in some patches, with a grainy consistency. The ceiling in this chamber is a round dome, known as a 'marmite' (a geological feature formed by water swirling in whirlpool fashion). A low narrow passage continues in the back of the chamber and soon becomes impenetrable.

Returning to the main passage, out of the small stalactite-rimmed hole, the visitor turns left to go deeper into the cave. Several stones with flat sides are upright, halfway buried in the floor. Suggestions have been made that there are Paleolithic engravings on these slabs, but it is very difficult to discern an image in the marks in the rock. The passage is 2 meters wide and allows walking

Traditional map of Le Bison - Cave # 5.
plan by A. Deschamps, L'Art des Cavernes.
(note no indication of three-dimensional space)



1. partial negative hand
2. negative hand
3. mammoth engraving
4. possible engraved blocks



MAP OF CAVE 5. Le Bison



PHOTO 11. Le Bison - opening into passage III with lamp only.

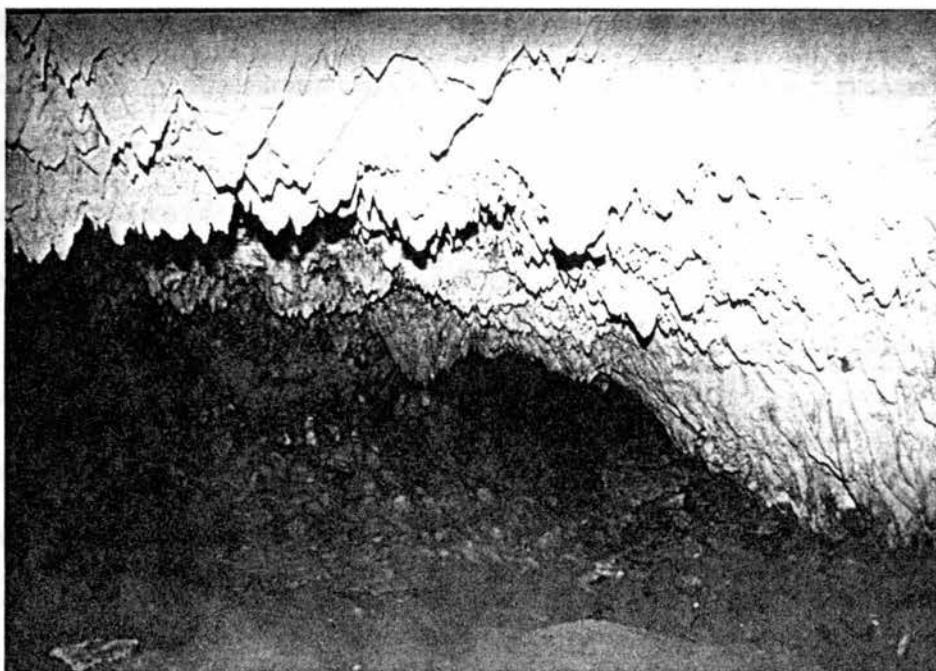


PHOTO 12. Le Bison - opening into passage III with camera flash.

upright, though one has to stoop slightly at times as the floor rises in places. Fifteen meters beyond the stone slabs, another marmite covers a round chamber whose mud floor slopes up in a mound. At the base of the right wall and the floor, hidden in a descending mud crack, the remains of a negative black hand-print are seen. It is the only image in this recess of the cave and is 50 meters from the entrance. Beyond this point a small passage winds its way in the mud. A person must crawl and then slither through a series of turns. The cave ends this way. Parts of one other negative black hand print are located across from the entrance to the mammoth chamber opening.

Le Bison is one of the larger caves in the study area, totaling more than 100 meters of cave length. More stalagmite formations are in this cave than any other except Bernifal. The spacious nature of Le Bison, the immediate divergence of main corridors, and the number and depth of passages to explore make it one of the more spatially complex caves in the study sector.

CAVITY OF EBOULIS (#6), SMALL FISSURE (#7)

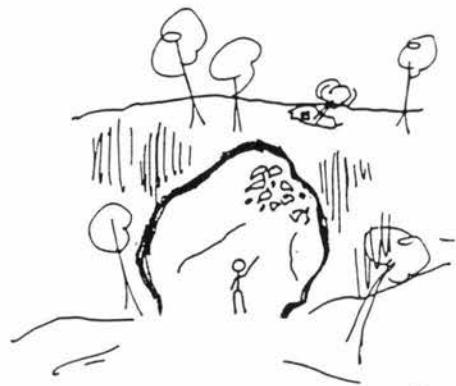
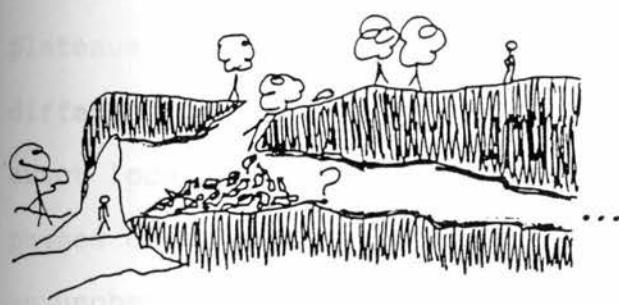
An round opening in the wall 15 meters west of the entrance to Le Bison is filled with fallen rocks and debris. Probably once the entrance to a longer cave, the 5 meter deep cavity is now choked and impassable. There is no way to tell without intense excavation how deep the passage was although the opening is relatively large (3 meters). The

walls are covered with dirt, debris, and algae. The floor is piled with rocks of different sizes. Eboulis is the French term for rock and rubble at the base of an incline. In some such 'cavities of éboulis' a hole is apparent in the ceiling the hilltop above collapsed inside, filling the passage.

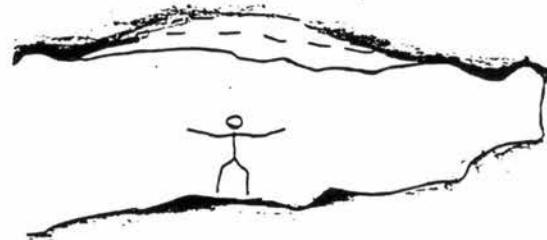
Ten meters west of the cavity a small crack is apparent in the rock wall. Only .5 meters wide and 1.75 meters tall, this diaclase is large enough for a small person to enter. It continues straight back for 8 meters, the ceiling becoming slightly taller in places, the walls getting even closer together in others. The wall undulates from top to bottom and is a coarse yellow-brown with bands of white near the ceiling.

West of Le Bison the bank gets steeper. Above the small path a sheer vertical cliff wall rises 18 meters. The crest here is the highest point of this part of the bank. The forest widens past the most steep sections of the cliff. Another cavity of éboulis (#8) is present in the rock wall. This opening is a larger cavity than the first, with a ceiling 3 meters high and wide and a depth of 5 meters. The cavity contains a tiny chamber in the right wall. One may climb into the chamber with difficulty and sit. The walls of the entire cavity are covered with irregular 'popcorn-like' calcite formations and mosses. Inside the smaller chamber the walls are composed of rough white calcite nodules.

- CAVITY - ÉBOULIS



DIACLASE



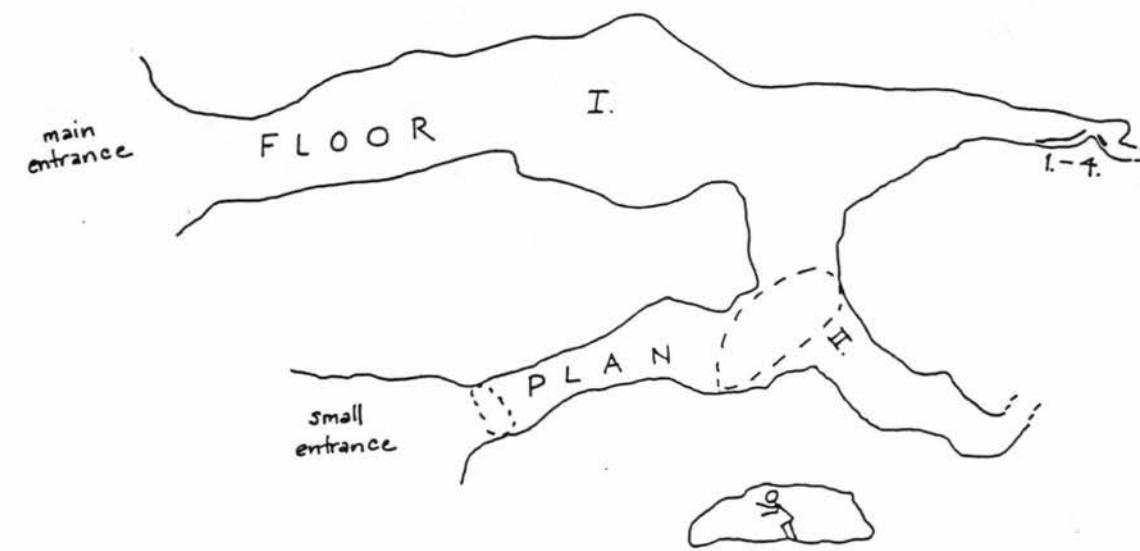
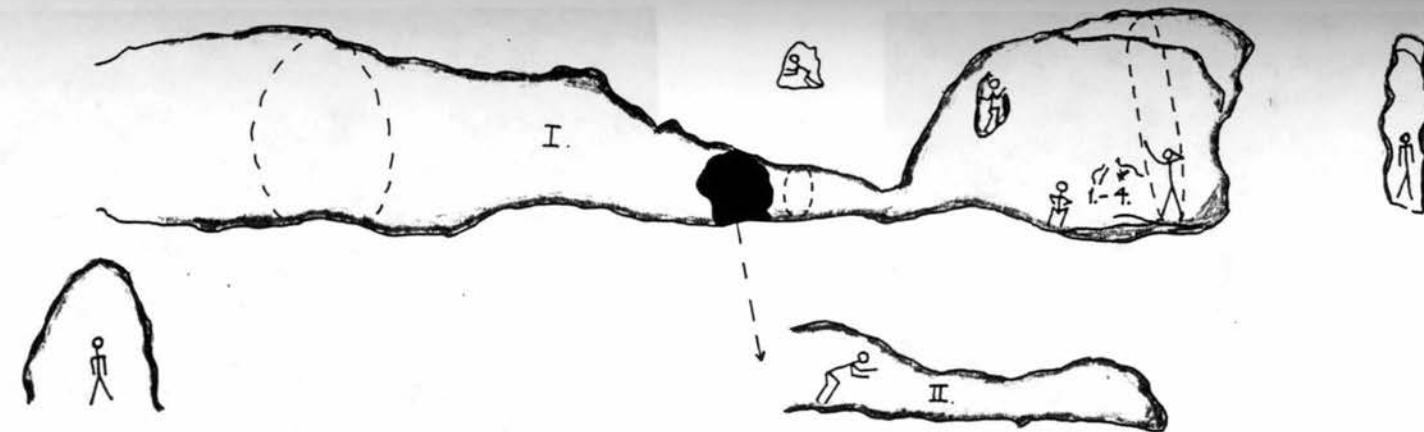
FLOOR PLAN

MAP OF CAVES 6 and 7. Cavity of Éboulis, Small Fissure.

Twenty meters west of cavity #8 and several meters up the bank is the entrance to another cave. It, like the others, is sometimes easy to miss, even when the visitor is confident of the location. Several tiers of exposed rock wall are interspersed with forest vegetation on wider plateaus that curve on away from the valley floor. The different levels can cause confusion in determining one's exact location. This was perhaps not the case during colder phases of the Magdalenian when the absence of trees allowed an unobstructed view into the valley and elevation could be better judged.

VIELMOULY II (#9)

The entrance to Vielmouly II is just underneath the highest tier of rock wall. It appears much like the other cave entrances. It is 2.5 meters tall, 2 meters wide, and proceeds in a regular manner into the main passage (see Photo 13). Like Sous-Grand-Lac and Le Bison, it is an inviting cave. Daylight penetrates the passage, which is wide. The floor is level, and the ceiling is high. Several large rocks are strewn on the clay floor, with two or three sunken depressions in an otherwise flat floor. At 15 meters from the entrance, the ceiling comes down, the passage narrows and then splits. The right way is low - one must crouch down almost on hands and knees to pass into a round chamber which connects to another smaller chamber in the back. Looking to the right more than 90°, a small tunnel



MAP OF CAVE 9. Vielmouly II

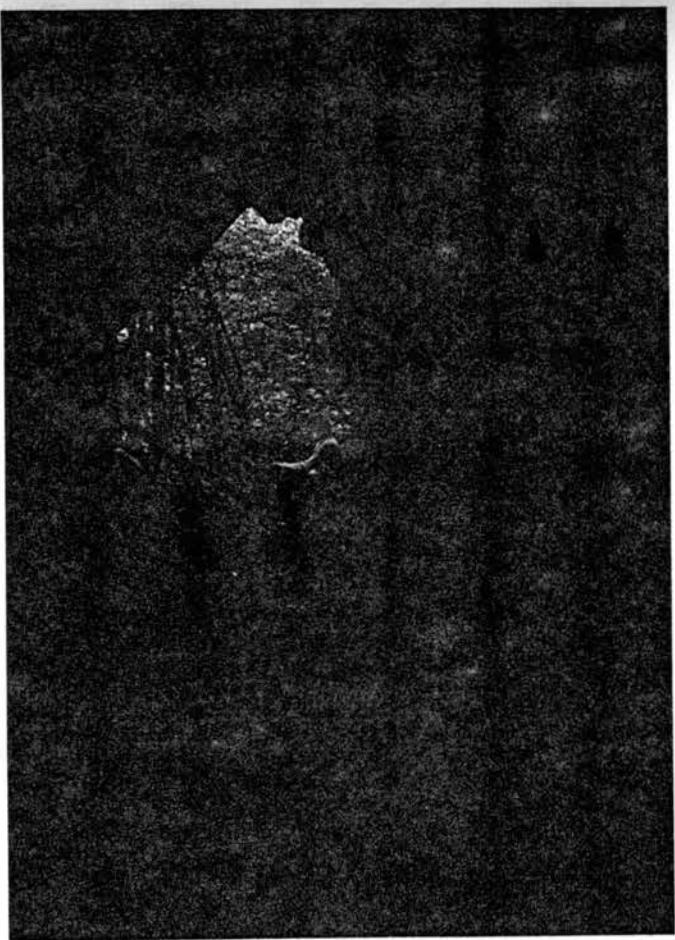


PHOTO 13. Vielmouly II -
silhouette of the entrance.

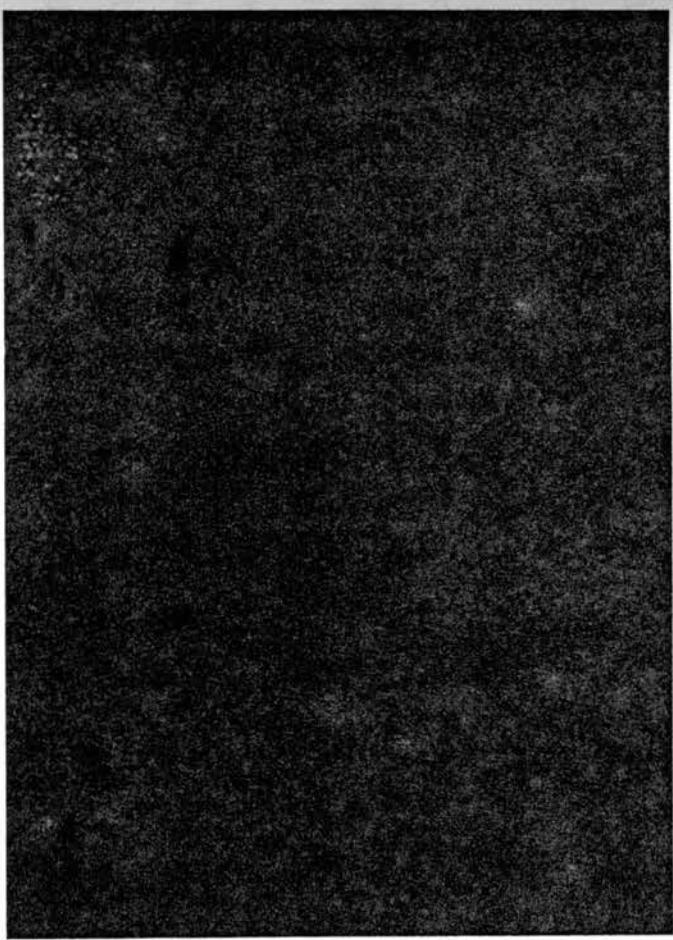


PHOTO 14. Vielmouly II -
narrowing into the back diaclase.

leads to a tiny opening to the outside. This opening is only .5 meters across at its widest point.

Returning to the convergence of the passages, the cave continues on a straight axis from the main entrance into what appears to be a dead end. Further exploration, on hands and knees under the imposing rock ceiling, shows that the passage has narrowed considerably but does pass below the descending vault (see Photos 14 and 15). The small tunnel goes straight back into a narrow (.6 meters) but tall diaclase, 3 meters long. The proportions of this space cause one to focus upward (see Photo 16), and give a sense of comfort and easy breathing. The walls undulate noticeably - the result of water acting on the different strata in the past. Everywhere the wall is light yellowish brown, with some patches of white calcite. A dense mud floor slopes up toward the back.

The walls on either side of a person's hips are limestone of a smooth and dense quality. Sitting on the floor, just inside the chamber, with legs facing toward the back and the walls close to each side, one can see the lines of engravings (see Photo 17). The figures are sparse - the line of what may be a horse's back and the rounded form of a human female (see Photo 18) which are common in Magdalenian imagery. They are the only figures found in the cave.

Vielmouly II presents many alternatives for placement of decoration. A small low back chamber, the area before the convergence of passageways, and the walls in the main

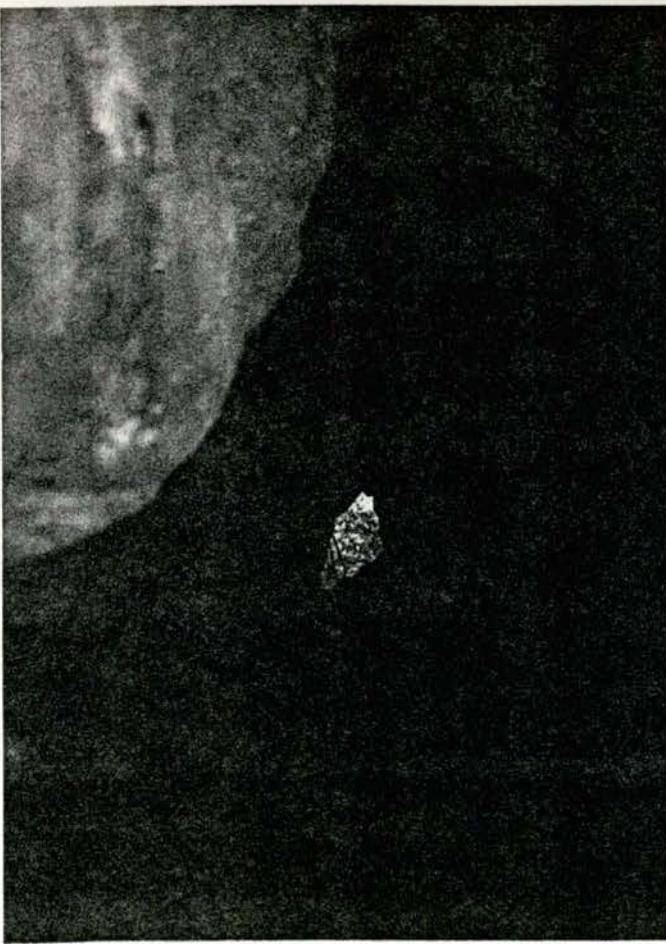


PHOTO 15. Vielmouly II - inside the narrowing looking toward entrance.



PHOTO 16. Vielmouly II - M. Pemendant standing in the tall diaclase chamber.



PHOTO 17. Vielmouly II - Author inside diaclase chamber examining figures.



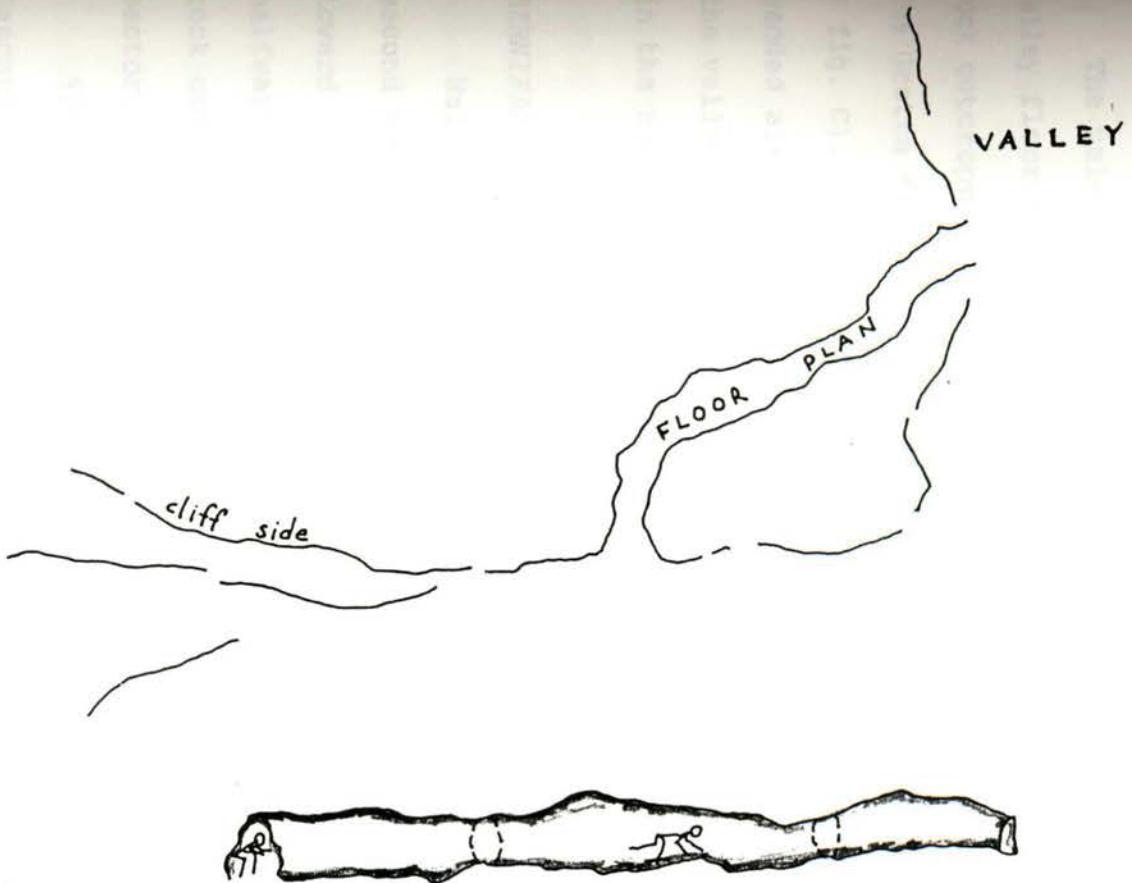
PHOTO 18. Vielmouly II - engraving of female figure.
(photo by B. and G. Delluc)

axis are all feasible places for image-making. The Magdalenian choice was the far back, close-sided but vertically spacious area, accessible only through a small opening. One feels contained within the cave here and removed from the outside, even though the entrance may still be seen when sitting in the diaclase.

GROTTE DU VENT (#10)

The elevation of the bank continues to decrease past Vielmouly II. Rock outcroppings become more scarce among the trees and growth of the forest. One of the last such outcroppings does hold a very small cave. The opening is 1.5 meters wide and 2 meters tall, but the continuing passage is only large enough to crawl through and maintains an constant height and width of 1 meter its entire way. The cave is 25 meters long and has the form of a 'c', with an entrance at either end. One entrance is in the rock cliff wall which runs parallel to the valley and the other entrance articulates with the side of a vale. The cave is essentially a tunnel, and is the result of faulting action at the corner of the limestone outcropping. The wind can be heard blowing through the cave, hence its name Grotte du Vent.

The small vale (Map 6 fig. B) running perpendicular to the main valley is the first of two vales in this area. Like others on each bank, the vales represent secondary breaks in the limestone plateau. They were formed as cracks



MAP OF CAVE 10. Grotte du Vent

due to the bending action of the plateau's faulting and water runoff. Coursing roughly in the same direction as the caves, the vales are further eroded by water runoff moving from the crest of the plateau into the valley.

The vales are situated in a gradual slope from the valley floor to the hilltop. They are wooded and have low rock outcroppings along either side. The first vale beyond the Grotte du Vent is smaller than its neighboring vale (Map 6 fig. C). A relatively flat stretch of trees separates the wooded area of the vales from the marshy overgrown floor of the valley a few meters below. A spring forms a small pool in the mouth of the second vale.

BERNIFAL (#11)

Walking up the gradual slope in the middle of the second vale, the visitor notices a gully running lengthwise toward the hilltop. By following its path upward, about halfway toward the top, in the midst of the forest with no rock outcroppings, the entrance to the largest cave on the sector, Bernifal, can be found.

The story of Bernifal's discovery is similar to that of Lascaux. A heavy storm turned over a tree on the side of the hill in 1902. A local farmer realized that the hole created by the tree's upturned roots was the opening to an underground cavity. Eventually, people who were interested in the possibility of discovering a cave with Paleolithic cave drawings were notified, this being a time of many such

discoveries in the area. One after another they tried to penetrate the tiny opening which was flanked on each side by solid rock until a jackhammer was brought in to widen it.

Another such hole was found across the valley in 1988.

The Abby Breuil and Denis Peyrony were among the first to enter the cave. It did contain engravings and paintings. Breuil published a short description of Bernifal in 1903, mentioning 26 figures. Today, more than 110 are recognized.

The natural entrance to the cave was cleared out in 1935, 10 meters in front of the initial hole in the ceiling. This entry is situated in what was once a small abri, now covered completely by soil accumulation, forest debris and rubble. Some prehistorians believe that the cave was closed intentionally by the Magdalenians who were "... ensuring the safety and secrecy of their sanctuary"

(Roussot, L'Art des Cavernes p. 172). The point of relating Bernifal's discovery lies in describing what is evident to visitors in the Beune today compared to the topography that existed 13,000 years ago. A primary difference is the eroding of rock faces and the accumulation of soil and debris. Erosion occurs more in the gradual sloping vales which act as funnels for a wider area's drainage.

The sheer cliff walls and underlying abris and caves entrances are transformed in another manner. Temperature fluctuations and frost chip away their upper walls. Over time, this action allows the shelters and entrances to creep up the cliff wall, a process taking hundreds of thousands of

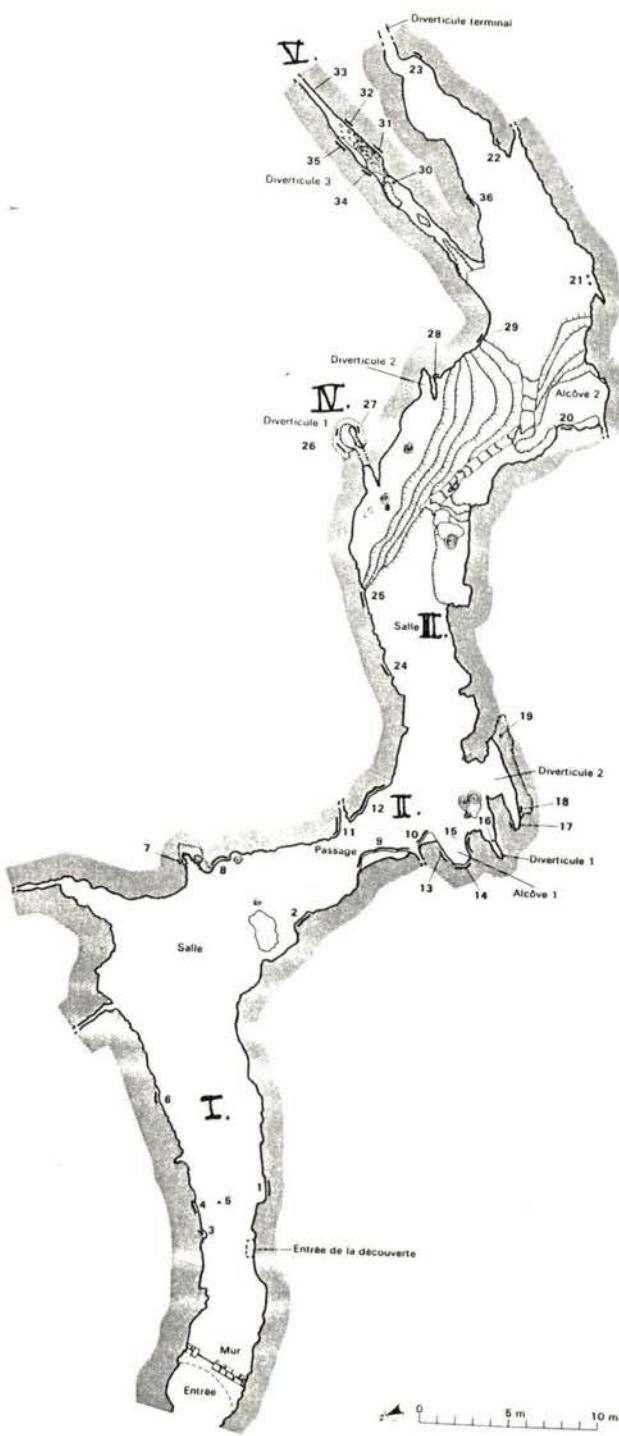
years. The inner recesses of caves are subject to internal flushing during especially wet periods. Mud can choke a passage or clear it out. Ceilings collapse in places, as do floors. These changes are observable, and it is unlikely that drastic changes have occurred in the relatively stable Beune valley since Magdalenian times.

Both the Grande and South Beune valley floors are unusual in their rate of accumulation of alluvial peat. Valleys are the natural avenue for the runoff from higher elevations. When the passage of water and debris is clear, and the slope adequate, the action further deepens and widens the valley. Often silt is deposited along the way. In the case of the Beune valleys, substantial blockage has occurred downstream because of the accumulation over time of clay deposits (Gèze and Cavallé 1977, p.98). Peat has built up in the Grande Beune at a very high rate in the past millennium. G. Delluc indicated that since the Middle Ages, the amount of peat accumulation approaches 12 meters in sections of the Grande Beune (personal communication). The Grande Beune in particular is marshy, absorbing water and debris rather than channeling it. Walking on the valley floor in its eastern end is almost impossible. The South Beune has marshy sections, one being the left bank in front of Calévie. Assuming that the valleys were somewhat deeper and narrower at the floor during the Magdalenian, they may also have had a different sedimentary base. The change in topography must be noted for this study.

Another significant difference in the Beune today is the result of a warmer, more humid climate. The present vegetation includes broad leafed trees and mosses. During a colder, drier period, when grasses and conifers were common, the flora would have allowed relatively unobstructed viewing into the valley from most points on the cliffside, regardless of the season. Likewise, cave entrances could be seen from the valley floor and landmarks more easily recognized. The accumulation of decomposing leaves and other abundant plant materials during humid eras covers the landscape rather quickly. The hillside around Bernifal is one example.

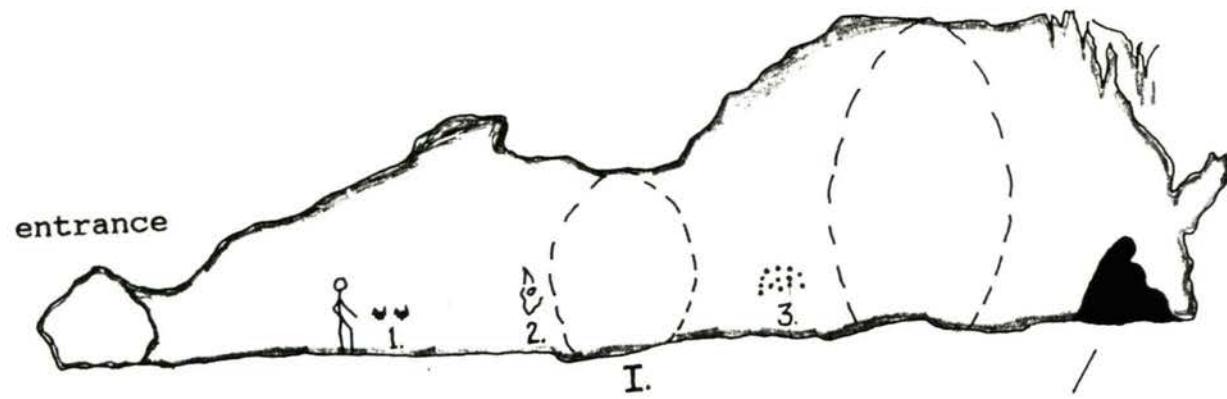
Today the entrance to Bernifal is through a locked metal door in the stone wall constructed to fill the natural cave opening in the small excavated abri. The opening is oblong and less than 2 meters tall. Just inside, the ceiling is higher and the walls spread out to 4 meters in width. Rock outcroppings from above cause the visitor to stoop in places. The vault is 4 meters. The cave is spacious, and gets larger as one goes along. It is damp, with walls glistening and shallow puddles contained in tiny ridges on the floor. The walls are covered with popcorn-like calcite formations in some places, other areas are smooth.

Marks and images are found throughout the cave. Near the entrance there is a unique pair of engraved stick-like hands, and the suggestive red outline of a bison's head

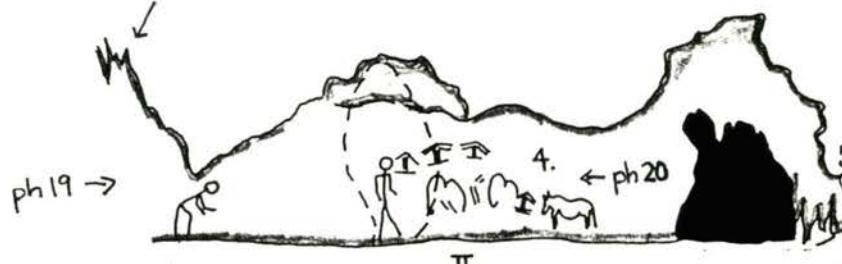


Traditional map of Bernifal - Cave # 11.
plan by N. Aujoulat, L'Art des Cavernes.

Map of Bernifal - Cave #11.
(continued)

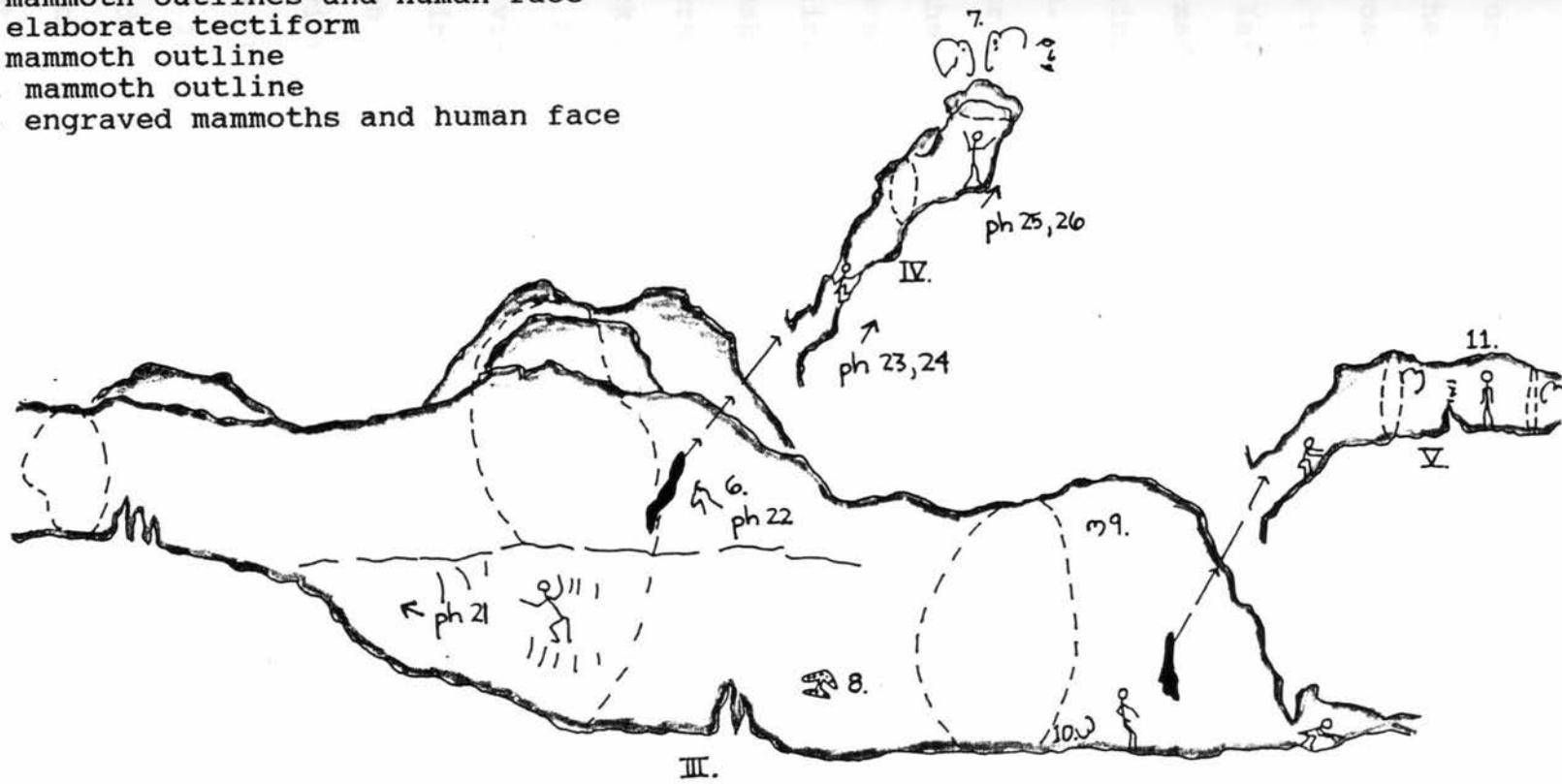


- I.
- 1. engraved hands
 - 2. red bison heads outline
 - 3. series of black dots
 - 4. engraved mammoths, pregnant bisons,
tectiforms
 - 5. black traces



ph19 → ← ph20
II. 5.
passage continues
(see below)

6. goat outline
7. mammoth outlines and human face
8. elaborate tectiform
9. mammoth outline
10. mammoth outline
11. engraved mammoths and human face



Map of Bernifal - Cave #11.

conforms to a rock outcrop on the left wall. Several paces further into the cave is a large collage of black dots. Approaching the juncture of the second passage 22 meters from the entrance, the ceiling is much higher (7 meters) and the lateral space increases. The proprietor pointed out man-made black dots on stalactites hanging close to the ceiling. It is hard to imagine how anyone climbed to reach them. Dots and marks of black manganese are present in other out-of-the-way places in the cave. In a small alcove at the very end of the second passage, where one must crouch down and twist inside to avoid hitting the uneven wall and falling on stalagmites, there are four uniform black streaks. And near the end of the cave, above a ledge 5 meters high just below the ceiling, is a roughly executed black mammoth image.

Standing under the first black dots 5 meters overhead, the visitor turns 90° to the right where the passage continues. The walls converge here, leaving a narrowing which one must stoop in order to pass through. The most heavily engraved area lies just inside this second passage. This juncture marks a limit or boundary beyond which the cave is different. The floor begins to slope down past the third turn and there is a feeling of being enclosed within the cave and completely separated from the outside and the first passage (see Photos 19. and 20).

Just inside the narrowing, the ceiling is 2 to 3 meters high in most places and reaches 4.5 meters in some places,

but the walls stay close. There are engravings of mammoths, pregnant cows or bison, tectiforms and other traces on both sides. The left wall shows a series of tectiforms in a row, at chest height. They are made with long deliberate incisive strokes. Elsewhere in this and the following corridor there are engraved and painted outlines of animals, especially in small niches in the wall - places good for drawing because of their size, shape and smooth concave rock form.

A third corridor turns 90° to the left and slopes downward markedly (see Photo 21). The visitor follows it down for 20 meters at a decline of 30°. Scaling up a mud bank on the left, one sees the small black outline of an ibex head in a small smooth niche along the otherwise irregular wall surface, grown over with calcite formations (see Photo 22). Beside this image, a crack in the wall opens up vertically. A person can crawl up this 'chimney' just wider than one's shoulders and sloped at a steep 60 angle, by wedging feet and back against opposite sides. Mud covers the surfaces and the going is slippery. The chimney reaches 7 meters upward and ends in a small domed chamber where the walls are white and tan (see Photos 23-26). The ceiling in the chamber opens up in billowing pockets of space - about the size of a Volkswagen's interior with no seats. The bright walls reflect light. Here, two mammoths and a human face were drawn on the ceiling by someone dipping fingers in mud, and quickly drawing the figures.



PHOTO 19. Bernifal - before the narrowing into the second passage.



PHOTO 20. Bernifal - beyond the narrowing inside the second passage.

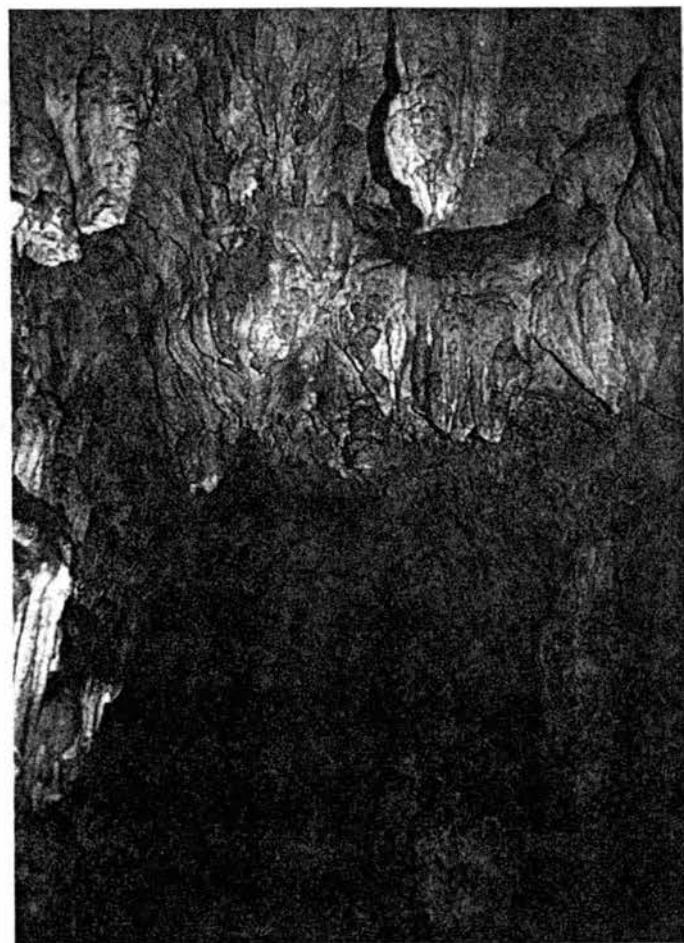


PHOTO 21. Bernifal - looking up the bank of the third passage.



PHOTO 22. Bernifal - outline of goat's head beside the opening to the first chimney.

The well preserved mud drawing and the presence of mud today indicate a consistency in the climate of the inner cave.

This out-of-the-way chamber is an example of the types of spaces used by Magdalenian image-makers. It is hidden. The opening of the fissure itself is not easily seen from the main gallery. To access the domed room requires concerted effort - only one person at a time can negotiate the passage, two at most fit in the dome.

Going back out of the chimney and sliding down the mud bank one reaches the 'bottom' of the cave. Further down this final passage another narrow chimney branches off of the left wall. One must hoist one's self up into the very narrow corridor, which angles at more than 45° and tops out in a level section 8 meters long. Barely discernible engravings of mammoths and, again, the barest suggestion of a human face are in this corridor. Even at its end, where a person must squeeze sideways to fit into the crack, there are mammoth engravings.

Being in these spaces generates a unique sensation. One's sense of time and place dissolves, and the fact of being isolated deep within the earth is compelling. The human faces render a powerful sense of personal communion with the setting. The chimney is a capsule void of time and charged with introspection. It is quiet and contained. It contrasts with the main passages of the cave, making them seem profane. These two chimneys, in addition to other spaces selected for drawing in nearby caves in the area,

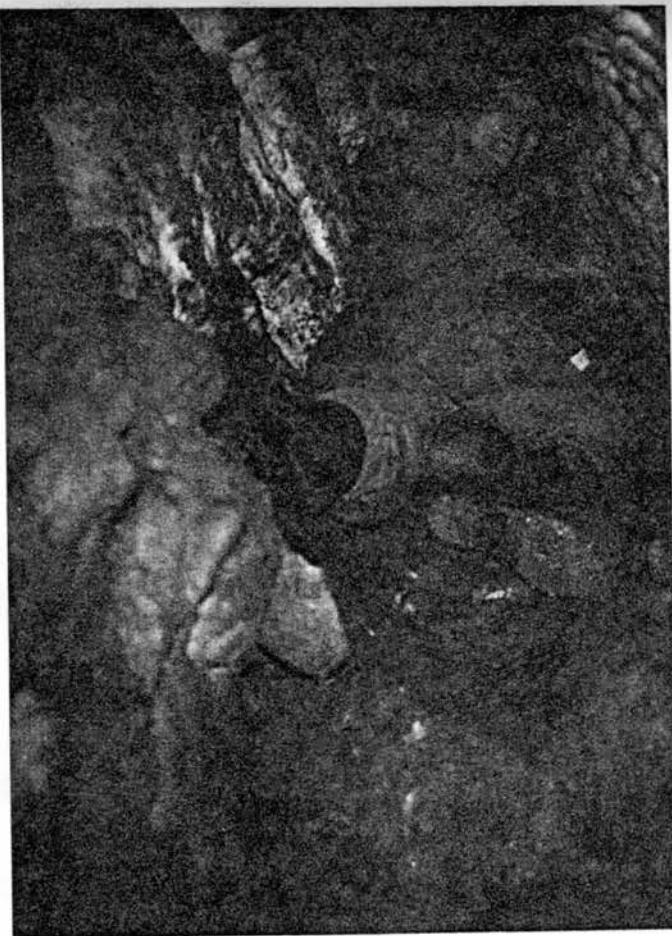


PHOTO 23. Bernifal
Sophie climbing the first chimney.
(photo by B. and G. Delluc).



PHOTO 24.
Bernifal - M. Pemendant reaching
the dome of the first chimney.

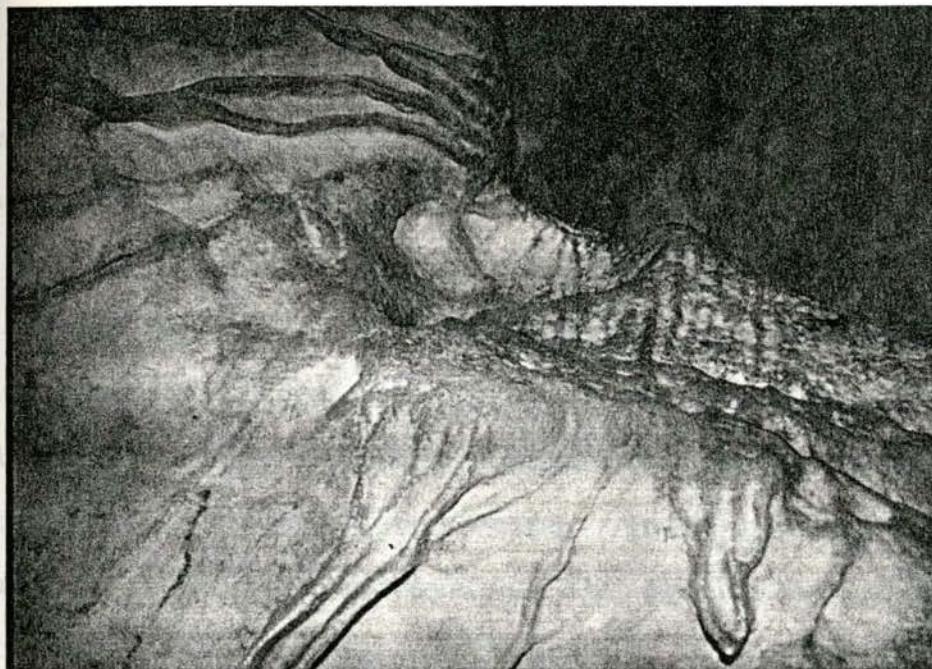


PHOTO 25. Bernifal - approaching the dome of the first chimney.

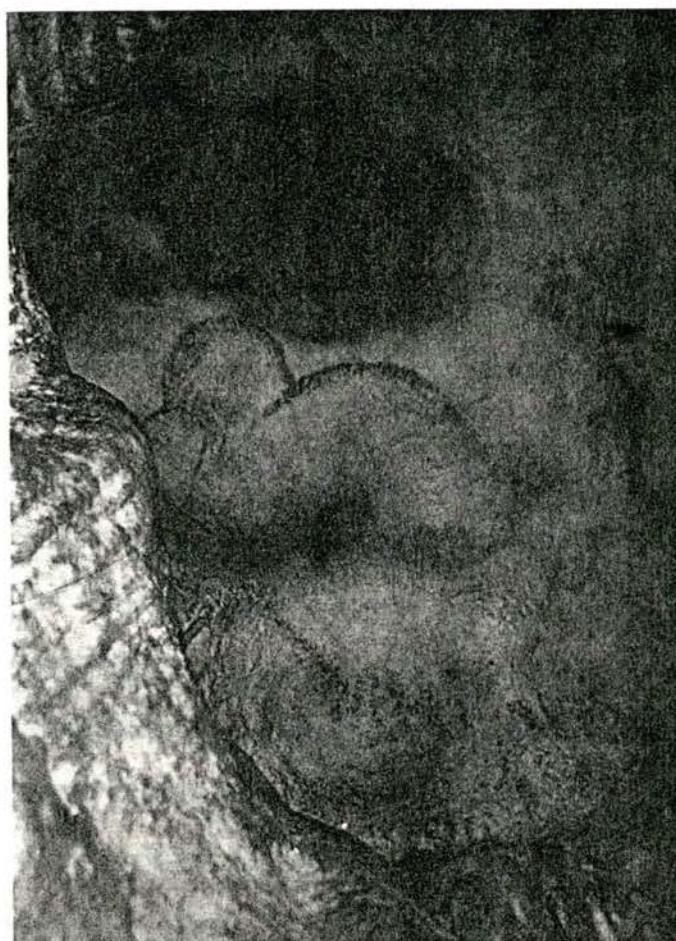


PHOTO 26. Bernifal - inside the dome of the first chimney, one mammoth and the human face.

suggest that individuals intentionally sought private, removed areas for image-making.

One other unusual image in Bernifal is on the right wall across from the steep mud bank at about head height. A very curious tectiform configuration was made by boring many small dots in rows, coloring them in with black pigment, and smearing the figure with red ochre. Infra-red photographs reveal the techniques employed in its production, making it all the more recognizable as the result of an investment of time, effort and a meticulous method. Beyond this image the cave continues for about 6 meters and ends in a small muddy vertical crack which a person can fit into on hands and knees but where no signs of Paleolithic presence are found.

Throughout the final passage, beginning at the top of the slope, the ceiling contains several places of upward opening space. These areas, or pockets, are the result of water eroding softer strata in much the same fashion as diaclases are formed. They follow the axes of the main passages and secondary diaclases. The highest spaces in the cave are formed by these pockets in the ceiling which add to the feeling of openness in the cave.

Dots of black pigment are found in many areas of the cave, usually in small secluded alcoves or chimneys, frequently marking the end of a passage or an area of the cave. Two rough black silhouettes resembling mammoths are in the back passage. One, mentioned before, is on a ledge just below the 6 meter tall ceiling. The other is almost

directly below it, underneath a ledge .25 meters above the floor, and hidden from view.

At 90 meters total distance, Bernifal is the largest cave in the study section. It contains the most imagery of any cave in variety of mediums and settings. Several caves in the region, Font-de-Gaume, Cournazac, and Rouffignac, contain almost identical tectiforms and other similar features. These similarities will be discussed in the conclusion.

A small amount of archaeological remains were found in the sediment blocking the natural entrance to the cave. These include several burins (flint tools with beveled points), flakes, a scraper, and other materials mentioned by Peyrony (1948) and de Sonneville-Bordes (1965), whose analysis classes these tools as late Magdalenian. Several reindeer teeth, fragments of cow bones, and a boar's tooth were also present. Small pieces of human cranium were also found but not dated. Specialists do not consider the cave to have been a habitation site, but it may have been the location of a brief camp for a few individuals.

The survey continues westward from Bernifal across the vale to the far bank, climbing up the rising cliffside. The familiar terraces of exposed rock surfaces appear. A narrow path leads through fallen rocks and trees along the upper tier of the cliff. Just after achieving this level, a cave entrance can be found in the midst of a rock face. Climbing

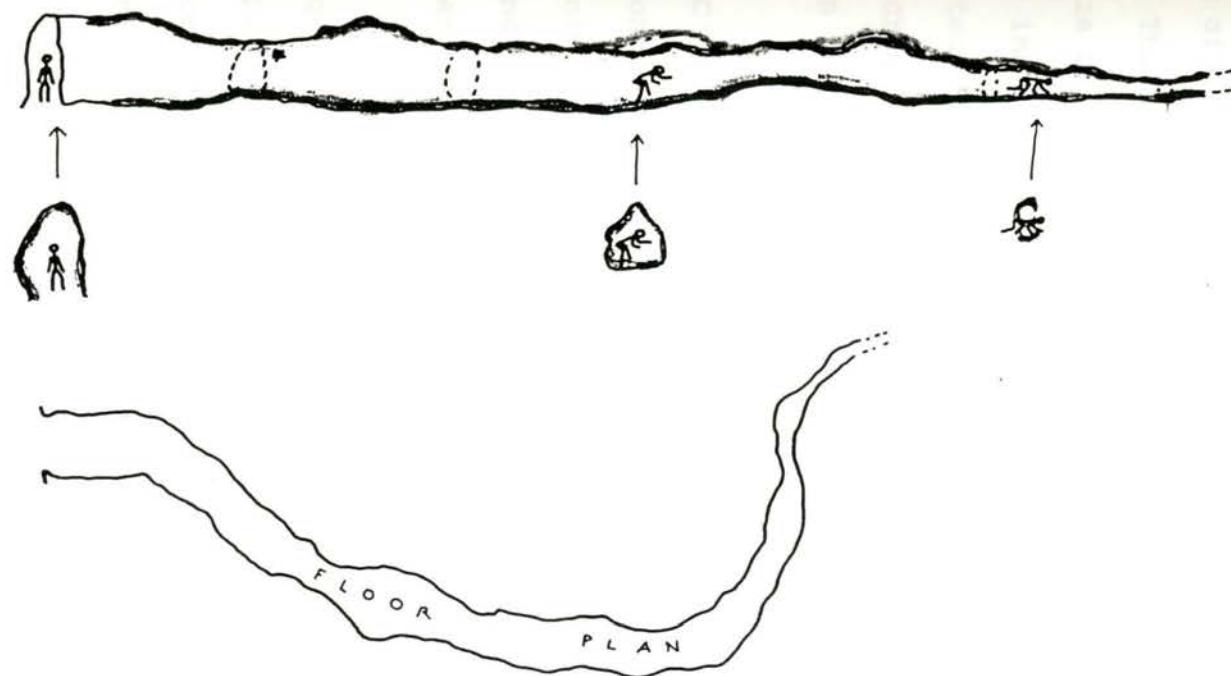
up onto a shallow platform in front of the opening, itself a meter above the path, the visitor may go inside.

ARCHAMBEAU (#12)

The entrance is 1.5 meters wide and 2 meters tall. The cave winds to the right and continues on with the same regular tube-like configuration. Several meters inside, patches of red pigment can be seen on the ceiling which almost scrapes the visitor's head. One of these patches was thought to be part of a negative red hand print, common in Upper Paleolithic image-making. Recently, however, it has been determined that this and other such spots of red color in caves further up the valley were a result of the natural oxidation of the rock.

Beyond this point it is necessary to bend over to move on. The cave continues, turning to the left and gradually getting smaller and smaller. Eventually the visitor is forced to crawl along the corridor. The total length of the cave is 40 meters.

A long rock shelter flanks Archambeau's west side, with a narrow porch or terrace separating its base from the drop of the hillside. Past the rock shelter one walks 10 more meters in the steep woods toward more rock outcroppings. Taking a turn uphill, the visitor may notice another large hole in the rock wall.



MAP OF CAVE 12. Archambeau

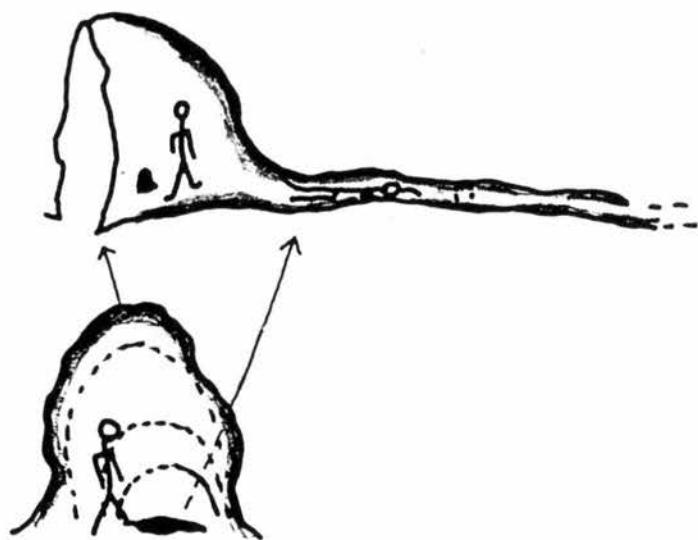
CAVE 'B' (#13)

The entrance to this small cave is hidden among large masses of rock in the process of breaking off from the cliff base. The dimensions of the short chamber inside reflect the size of the opening, 2.5 meters tall and 2 meters wide. Almost immediately the cavity ends. It would be a well protected camp for two people. At the back of the chamber a small crack is penetrable by sliding into it on one's stomach for 3 meters. The way then becomes choked with mud.

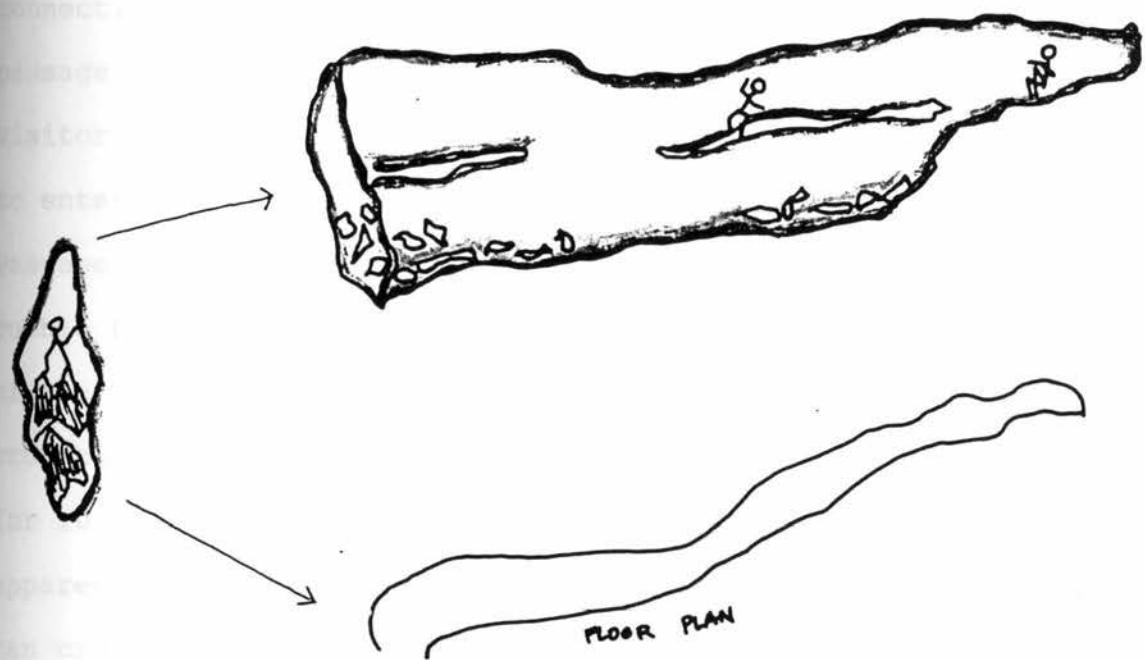
CAVE 'C' (#14)

Continuing along the path, a series of caves appears with forms very similar to each other. The first, Cave 'C', is found 20 meters west of Cave 'B'. The rock face is prominent here, creating a wall of about 5 meters to the top of the cliff. The path widens into a large, gradually sloping wooded terrace before it drops off over a sheer wall into the valley 20 m. below. Portions of the rock wall jut out along the way. Large slabs are in the process of cracking off of the main wall, accounting for the boulders which are scattered in the area. Because of the contour of the cliff, a person cannot stand in one point and see from one entrance to another.

The entrance to Cave 'C' is hidden behind a large protrusion of rock standing out from the cliffside. It is angled diagonally into the hill. Large boulders sit in and



MAP OF CAVE 13. Cave 'B'



MAP OF CAVE 14. Cave 'C'

around the entrance. The boulders and the mouth of the cave are black from burning out foxes. The opening is a classic diaclase shape; tall and narrow, 3 meters by 1, with a middle section curving inward. The cave is a product of two articulating resurgences, one on top of the other, with the connecting wall worn through. Large rocks in the lower passage are evidence of the collapsed middle layer. The visitor must crawl up onto some of the large black boulders to enter the cave which curves to the right immediately. Passage is not possible in the lower section because of the rubble but it is easy to wedge one's feet against the sides of the upper level and negotiate the way inside, by crouching over slightly. The cave continues in this fashion for 10 meters at which point the lower section is no longer apparent. The upper section becomes tighter and a person can crawl to its end 4 meters beyond.

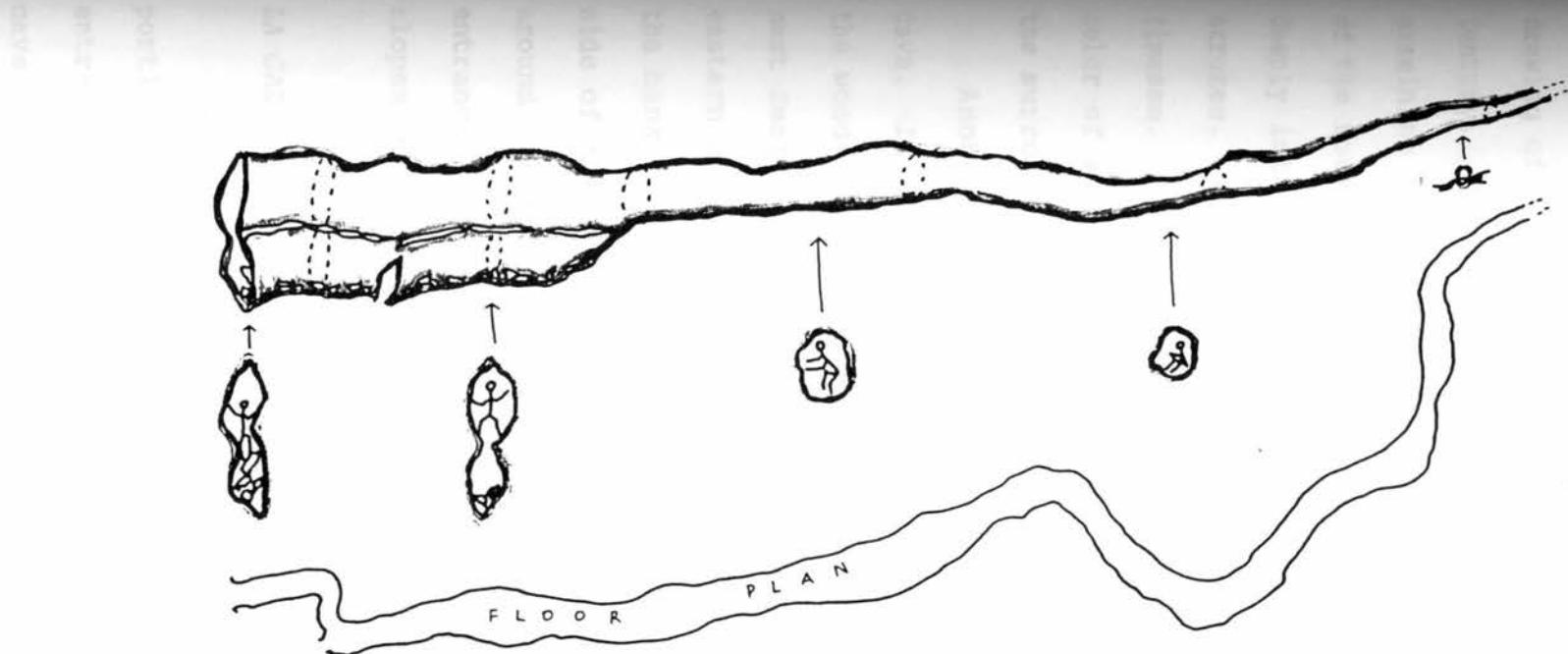
EMANUEL'S CAVE (#15)

Twenty meters west of Cave 'C', Emanuel's Cave is quite similar. It has a tall, narrow opening, easily overlooked in the rock outcrop. Rocks are strewn in the lower passage, though not as sizable or as numerous as the previous cave. One steps along the bottom edges of the upper section, wedged against each side, stooping over. The passage turns dramatically to the right, almost back onto itself, and a second opening to the outside is visible. This opening is narrower and is only as tall as the bottom section of the

cave (.75 meters). Curving back again to the left, the cave winds in serpentine fashion. It continues in both upper and lower passages, with long narrow holes in the floor of the upper section which show that the bottom passage is present. These holes become smaller further back and at 25 meters only the upper passage is apparent. The cave curves slightly along the way. It is most comfortable to crawl beyond this point, with the walls close beside each elbow. At one abrupt turn to the right the cave has a height of 1.3 meters. The passage goes on, becoming narrower and lower, eventually ending in the mud. Its total length is 65 meters.

The spatial and psychological dynamics of Emanuel's Cave are interesting. One feels engaged in the constant movement forward. The fact that the cave becomes restricting on either side is not a hindrance, but the confrontation with a dead end in such a space is startling. Immediately the reality of being in a tiny underground place with no room to turn around hits home. Movement is essential to the spirited feeling of adventure and well-being. When movement ceases or is not possible, the mood becomes one of frustration and even dread. Spelunkers often share similar comments about dead ends and dead caves and search at all costs for points of articulation with other passages.

Emanuel's Cave is comfortable to crawl and sit in. It could not have been used as a camp site, affording no place



MAP OF CAVE 15. Emanuel's Cave

for a fire and no room in which to spread out. No Upper Paleolithic imagery is in the cave. There is one hoax drawing of a rhinoceros, made by a person in the 20th century. There are ways to confirm a fake which include examining the style, the type of blade used, and the color of the rock inside the engraving. This rhinoceros was cut deeply into the wall with a metal blade, using many repeated strokes. Paleolithic artists generally exhibited more finesse. The line of engraving is almost white, whereas the color of a true prehistoric figure is the same as that of the surrounding wall, having had time to oxidize.

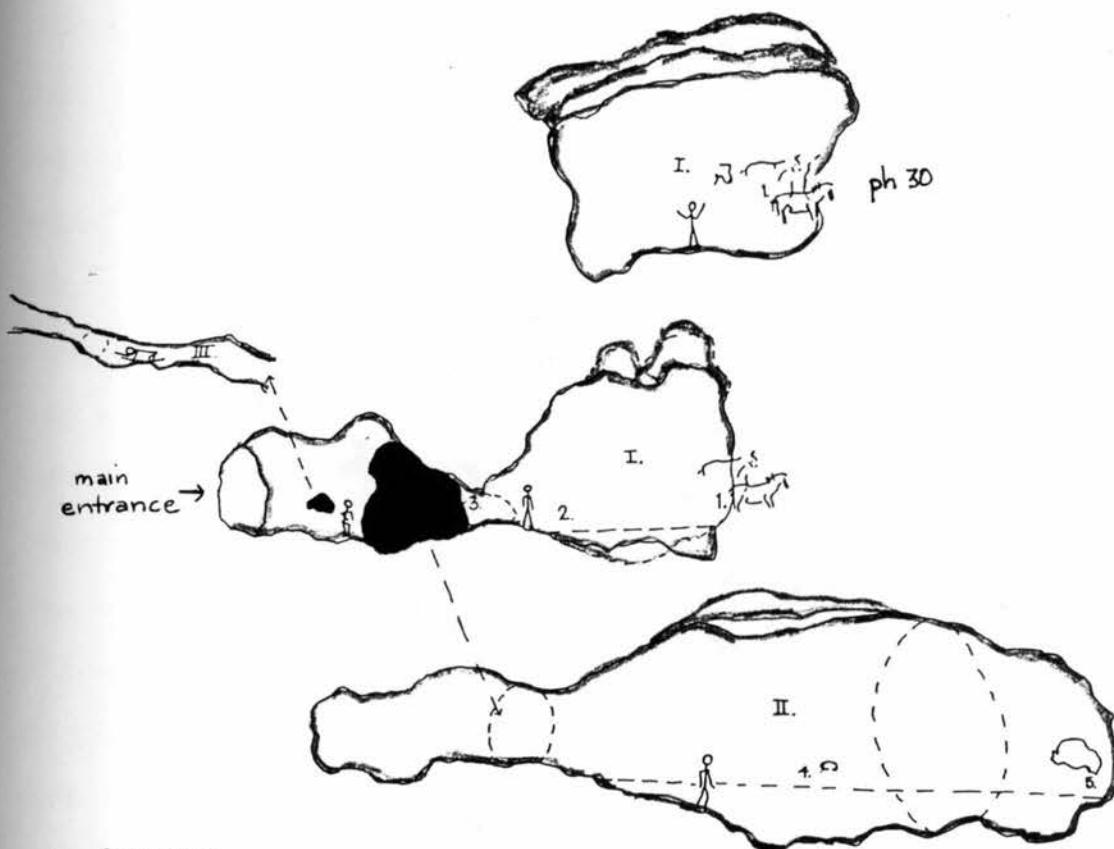
Another rock shelter flanks the west side of Emanuel's Cave. It is situated almost a meter above the path, over the wooded terrace. A small cavity of eboulis (#16) is the next feature, and is the same size as the others in the eastern part of the bank. Low rock shelters continue along the bank just underneath the crest of the cliff. At the far side of the series of small rock shelters the visitor walks around boulders and trees and up an incline to a large cave entrance. The terrace on the hillside is narrower and slopes more radically at this point.

LA CALEVIE (#17)

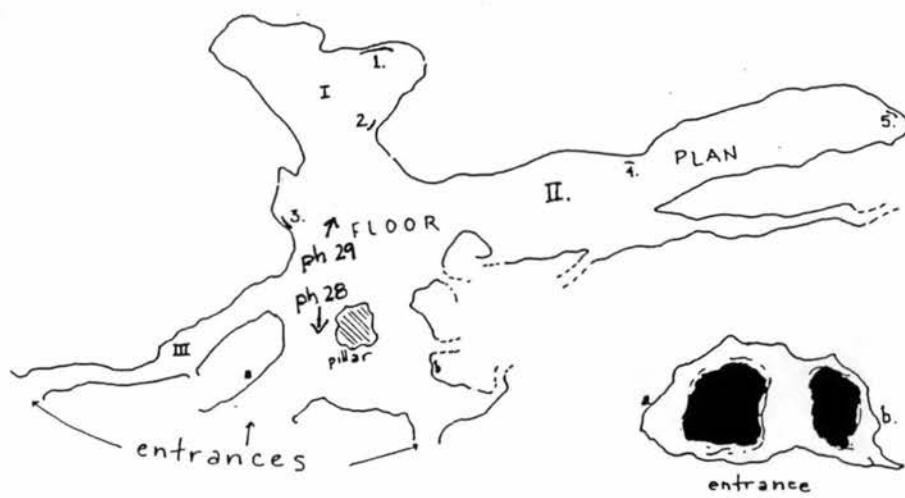
Calévie is the only decorated cave in the western portion of the left bank. It is also the largest. The entrance is 250 meters east of Bernifal. Initially, the cave appears to have a split entrance where two passages

immediately converge. It is necessary to climb up a small mud bank to the large entrance. At a closer look, a large stalactite connects the ceiling to the floor several meters inside one large chamber (see Photo 27). Turning sharply to the right in this spacious area, a second, smaller entrance is apparent 5 meters away. The main gallery runs axially from these two entrances 18 meters back. Its width is 8 to 9 meters, but interrupted by the stalactite and other rock protrusions in the first portion. Its height is substantial at 3 to 5 meters in some areas. A small tunnel leads from the left wall near the first entrance some 12 meters to a third entrance on a narrow rock ledge. The tunnel is just large enough to crawl into.

Beyond the stalactite, the floor drops .7 meters. Another large passage intersects perpendicular to the main one and stretches more than 30 meters to the right. Mud holes, a few large rocks and a mud line at 1 meter above the existing floor indicate that the floor has washed out. The ceiling is 4 to 5 meters high in this passage and the floor is uneven. Two engravings are found in this area: a bison engraved in mud at the very end of the passage, and an 'oval' shape on the left wall, 18 meters from the entrance. A narrow diaclase (.6 meters wide) articulates with the right wall midway down the passage and runs parallel to it for the last 15 meters. A person can climb up in the muddy slope of the diaclase which is angled at 45°. Four Bronze Age bracelets were found at the top of the diaclase.



- 1. horses
- 2. horse
- 3. traces
- 4. oval sign
- 5. bison



MAP OF CAVE 17. La Calevie



PHOTO 27. Emanuel looks out over the South Beune Valley cliff near the entrance to La Calévie.

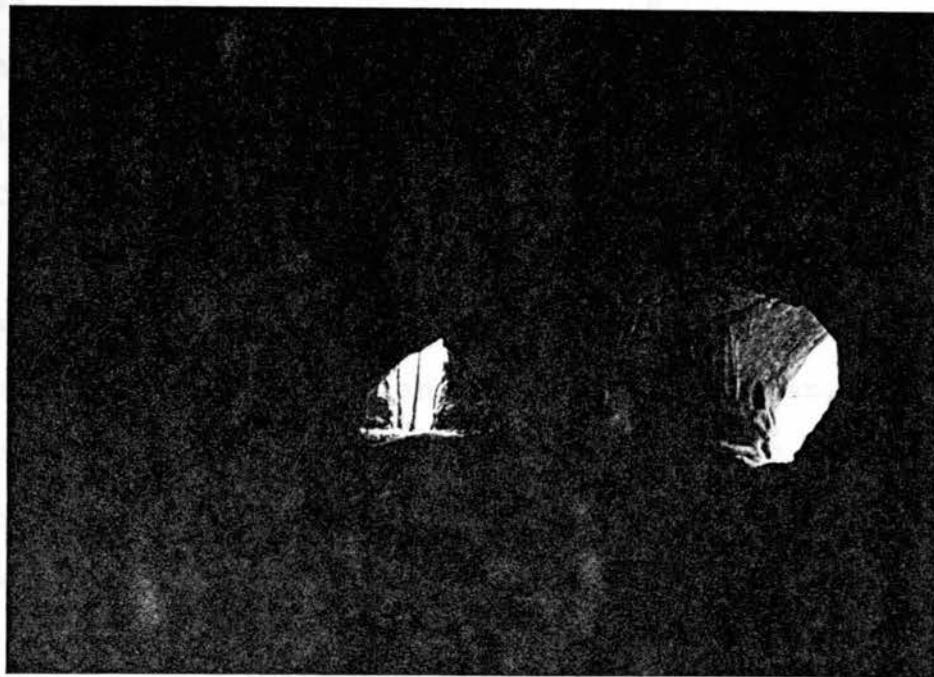


PHOTO 28. La Calévie - silhouette of the entrance.

The majority of images are on the far back wall of the first passage, opposite the entrance. The mud floor is not completely washed out to the left of the stalactite and behind. On the left wall, a panel of colored dots can be seen. Further back, the walls constrict and the visitor moves carefully over an uneven mud floor through a narrowing into another chamber, still on a line with the entrance and just now out of the reach of daylight (see Photo 28). The floor is sunken .7 meters and rocks are scattered. The chamber widens laterally at the back and the ceiling lifts to the highest points in the cave, undulating upward in oblong pockets. Balanced on the ledge of the right wall just inside the narrowing, a person can barely discern the outline of an animal, possibly a sheep. Bear claw scratches run in deep vertical lines beside this figure. On the very back wall at head to chest height, three horses and one head of a horse are engraved (see Photo 29). These engravings are difficult to see until the light is angled properly.

Calévie is more spacious than any other cave in the study sector, though it is not the longest. Having more open area laterally in the entry chamber, at the articulation of passages, and in the end chamber, and by receiving light from the entrance well inside, a roomy feeling is created. Several flint tools were found in the cave and are dated as Magdalenian III.

The bank outside Calévie is an uneven terrace of different levels of rock and soil which angle down from the



PHOTO 29. La Calévie - the narrowing before the back chamber.

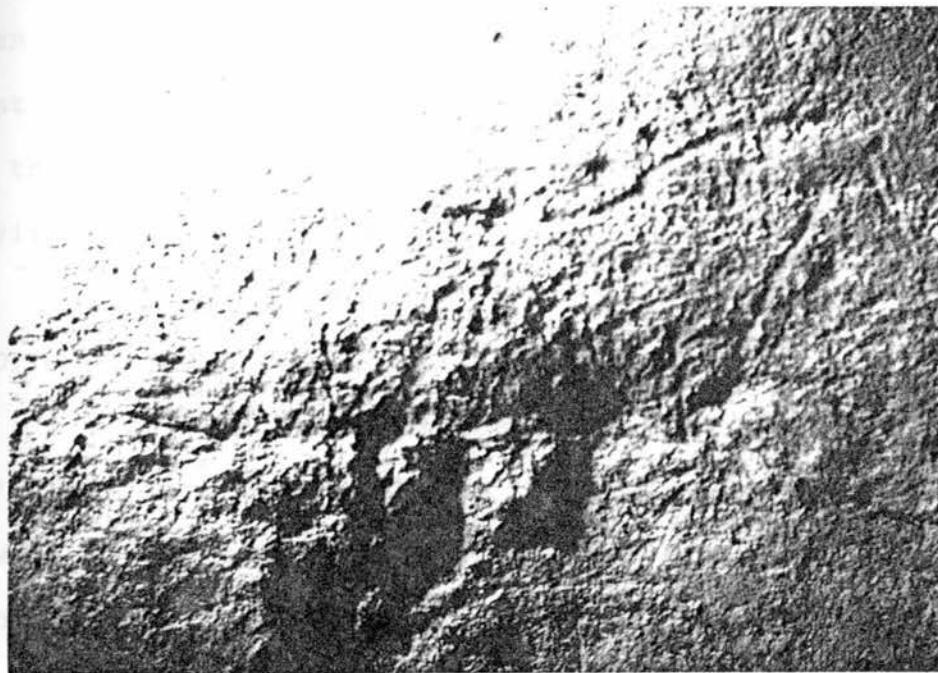


PHOTO 30. La Calévie - one of the engraved horses in the back chamber. (photo by B. and G. Delluc).

hilltop onto the valley floor. The valley floor is covered with thick wooded marsh. It is possible to negotiate the way up by moving back and forth in more or less horizontal paths up the slope. In places, walls of sheer rock separate the terraces (see Photo 30).

CAVES 'E' (#18) AND 'F' (#19)

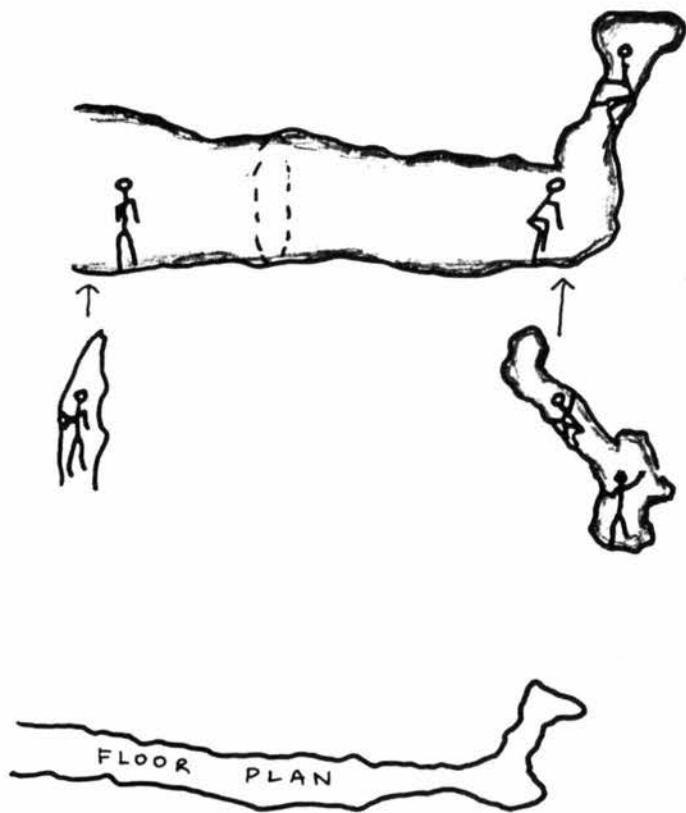
Westward from Calévie, the bank starts to descend and level off. The expanse of woods becomes greater. Shorter rock outcroppings line the crest of the hill. In these rock walls, two similar fissures form small, narrow caves. Cave 'E' is 2 meters tall and .7 meters wide at the entrance. It continues to be very narrow but slightly taller for its entire length of 10 meters. The crack goes straight back into the hillside and ends. See Photo 31. Twelve meters to the west, Cave 'F' has a slightly wider but lower entrance than Cave 'E'. Cave 'F' continues for 6 meters as a tunnel just comfortable enough to walk through at 1 meter wide, and at the end, has a tunnel up to the left at 45° with a small cavity at the end.

GROTTTE DE LA SEPULTURE (#21)

A very small vale can be found west of Caves 'E' and 'F'. The bank continues for 150 meter where its last and lowest projecting rock walls include the features of an eboulis cavity (#20) and a cave identical to the Grotte du Vent, called the Grotte de la Sepulture. It is thought to



PHOTO 31. The entrance to Cave 'E'



MAP OF CAVE 19. Cave 'F'

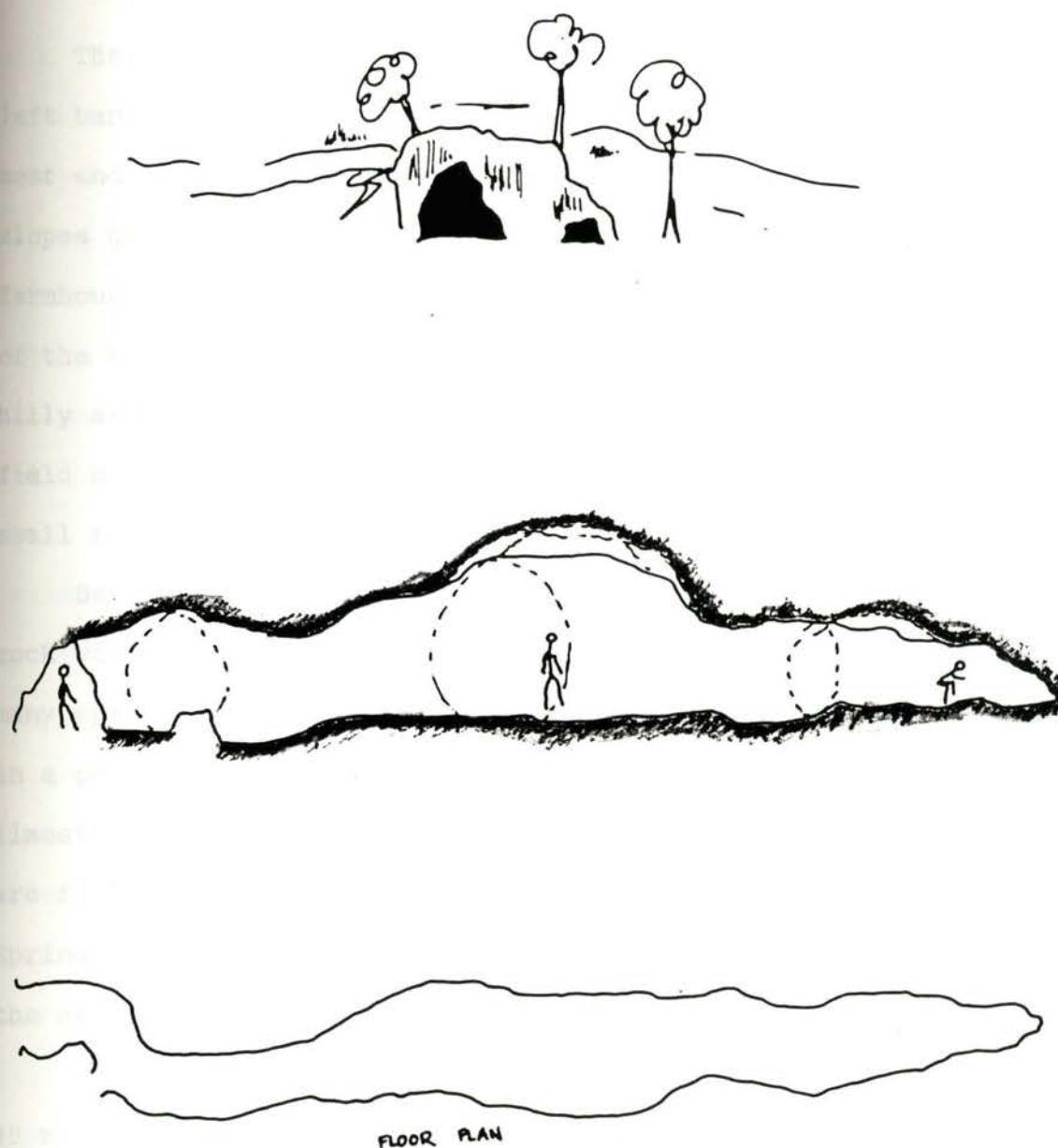
be the place where an infant's bones were found. It, too, has a curved shape, is only large enough to crawl through, and articulates with the front bank and a vale with a total length of 25 meters.

DU CHARBONNIER (#22)

The vale at the end of the study sector is only 2 meters above the level of the main valley floor (Map 6 - fig. D). It reaches far back into the low bank. The last cave in the sector is located along a footpath 100 meters into the vale. This cave, du Charbonnier, is known as an old charcoal maker's stash. The entrance is couched in a small protrusion of limestone. An adult must bend over to enter a small chamber, the ceiling of which is 2 meters high. The passage turns immediately to the right where another low opening, only .5 meters wide, opens to the outside. The passage turns sharply to the left with walls approximately 2.5 meters wide and a ceiling that is 3 meters tall at its highest point. The way continues for 25 meters in a straight line and ends. There are no images in the cave.

The left bank of the valley goes on more than a kilometer to its intersection with the Grande Beune Valley. I was told of two more small caves along the bank, one 10 meters, the other 25 meters long. The well-known image cave Combarelles is located only 2 kilometers from the western edge of the study sector.

DISCRIPTION



MAP OF CAVE 22. Du Charbonnier.

DESCRIPTION OF THE CAVES: RIGHT BANK (EAST TO WEST)

The South Beune's right bank has fewer caves than the left bank in the study sector. Beginning at the eastern-most end, directly north of Sous-Grand-Lac, the right bank slopes gently into the valley. This is the site of an old farmhouse (Map 6 - fig. F) with fields to the rear and left of the building as one faces the valley. The fields are hilly and contain several low outcroppings of rock. The field behind the house is in the basin of a vale, flanked by small rock ridges.

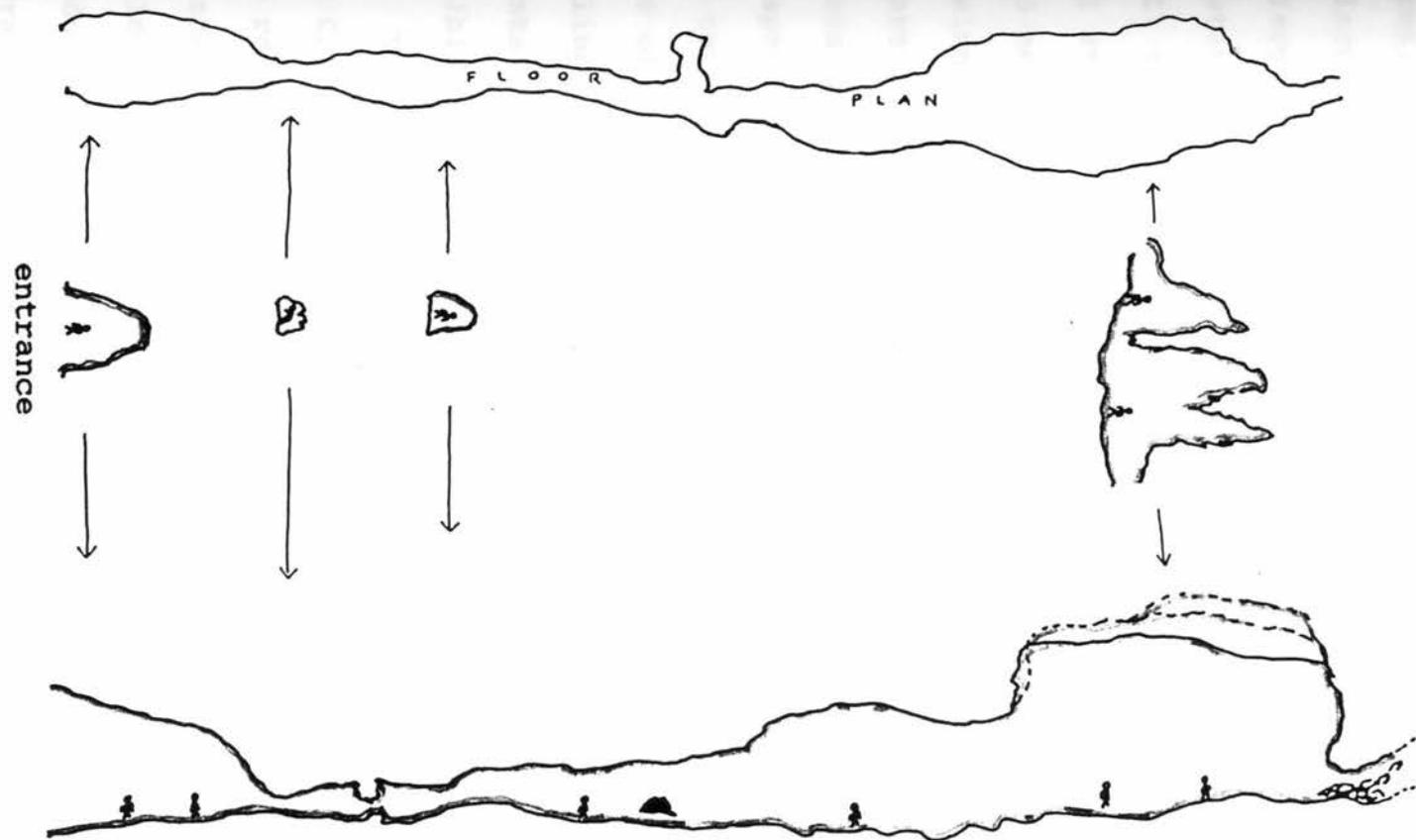
Beside the house a natural spring seeps from the low rock wall. The landscape of limestone plateaus features many springs. Across the road another large spring wells up in a pool of watercress. Very near this spring several limestone sinkholes can be found. They are quite deep and are filled with clear water that appears light turquoise. Springs line both sides of the Beune and the Vézère and make the area appealing for habitation.

An old mill is situated beside the clear-running stream 25 meters in front of the farmhouse. Known as Vielmouly, the mill is a landmark for surveying in this section of the South Beune. Two caves take their name from the old mill, Vielmouly I, nearby on the right bank, and Vielmouly II, in the far left bank directly across from the mill. Peat has grown up over the mill's wheel and the building itself appears half sunken in the ground.

VIELMOULY I (#28)

A road follows along the contour of the right bank. In most places the cliffside itself a steep 2 to 3 meter wall of eroding rock and scattered vegetation begins 1 to 2 meters beside the road. The road itself is located on a slight terrace some 3 meters from the valley floor at the point of the farmhouse. Access to the upper levels is easily achieved beside the farmhouse where a path leads up the gentle slope and along the narrow terraces of the bank. Following this path, at 7 meters above the valley floor and some 20 meters west of the farmhouse, the exposed cliff wall contains several large cracks and the entrance to a large cave, Vielmouly I. The entrance is closed by a stone wall and was used, no doubt, as early as the Middle Ages for protection and storage. The initial entrance is large: 6 meters tall, 4 meters wide. The first several meters maintain this spacious configuration, at the end of which another wall stands where the cave narrows greatly. Thus the "room" created serves as a bergerie. We should imagine that daylight filled most of this area before the construction of the walls.

Beyond the second stone wall the cave shrinks on all sides, becoming just tall enough for a person to stoop over to continue on. The walls are wet at this point. The visitor moves through a tunnel-like area 4 meters long and 1 meter tall. A large stalactite formation resembling a tree trunk connects the ceiling to the floor near the end of this



MAP OF CAVE 28. Vielmouly I

tunnel. The floor is muddy, slick, and uneven in many places. Negotiating the passage here takes care. Past the stalactite, the passage widens into a larger, relatively dry gallery. The ceiling lifts up to 2 meters, 2.5 meters, and 5 meters further on at 100 meters from the entrance. A small tunnel with a terminal chamber intersects the left wall at a 90° angle. Past this point the walls widen to 4 to 5 meters, spreading out into two distinct galleries running parallel and connected where an ancient wall separating them has completely eroded. The ceiling is 6 meters tall at its highest point, and contains lofty pockets of space. This configuration continues for 25 meters until the cave ends where the right passage becomes choked with tons of eboulis, creating a steep slope upward to the ceiling. A small hole opening to the outside of the hilltop exists at the very top of the pile of rubble, but is not visible from the cave floor.

Vielmouly I was formed during a less stable period of the Cretaceous when sea floors were constantly agitated. The resulting strata of limestone is grainy, with large bits of shell and sand forming the rock. This quality of rock is called 'molasse'. Thus, the walls of inner Vielmouly I erode easily and disintegrate under the rub of a hand. No engraving, painting or material remains have been found in Vielmouly I. It is the largest cave on the right bank and one of the most easily accessed.

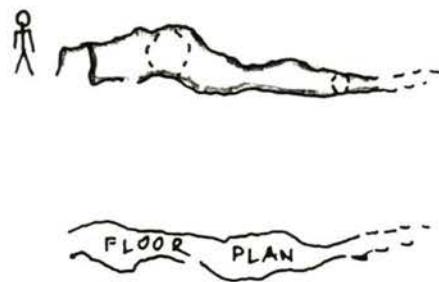
If there had been Magdalenian engravings in Vielmouly I, they may have easily eroded over time. However, engravings have managed to be preserved for tens of thousands of years in less than optimal conditions. There simply may not be images in places we would consider suitable.

When I asked a geologist about the choice a Magdalenian would exercise in selecting to draw in one cave over another, he postulated that it may have had to do with the quality of the rock wall. No 'artist' would be satisfied with a surface that crumbles under his touch.

It is true that most engravings are found on very hard limestone surfaces. The plaque at Sous-Grand-Lac, the Calévie horses, and drawings inside Vielmouly II are all examples. Others figures, however, are not on well preserved surfaces. The mammoth at Le Bison and the mud drawing at Bernifal are both fragile, yet preserved. Even rock that is almost impossible to carve because of its density, such as St. Cirq, was not an impediment to the production of images.

FOX RUN HOLES (#26,27)

Passing the entrance to Vielmouly and moving westward along the bank, there are many cracks in the rock face. Trees and bushes grow between the rock wall and the drop off to the road. Twenty meters beyond Vielmouly I several small entrances are found in the cliffside. They are very small,

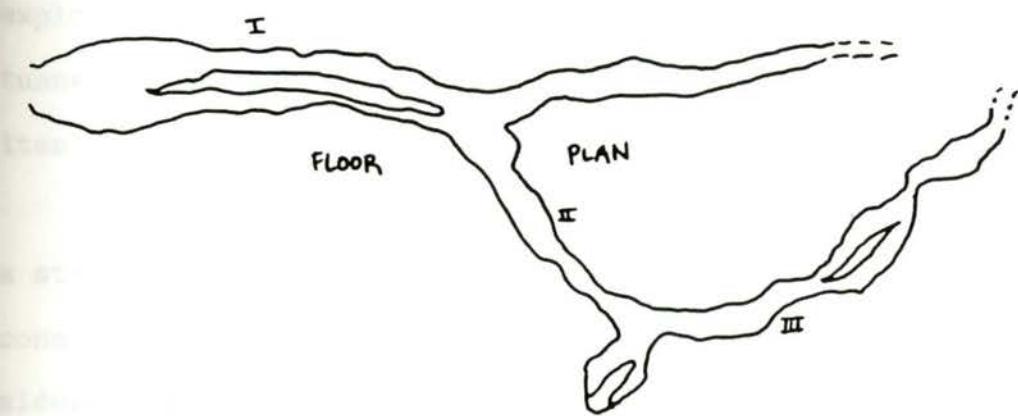
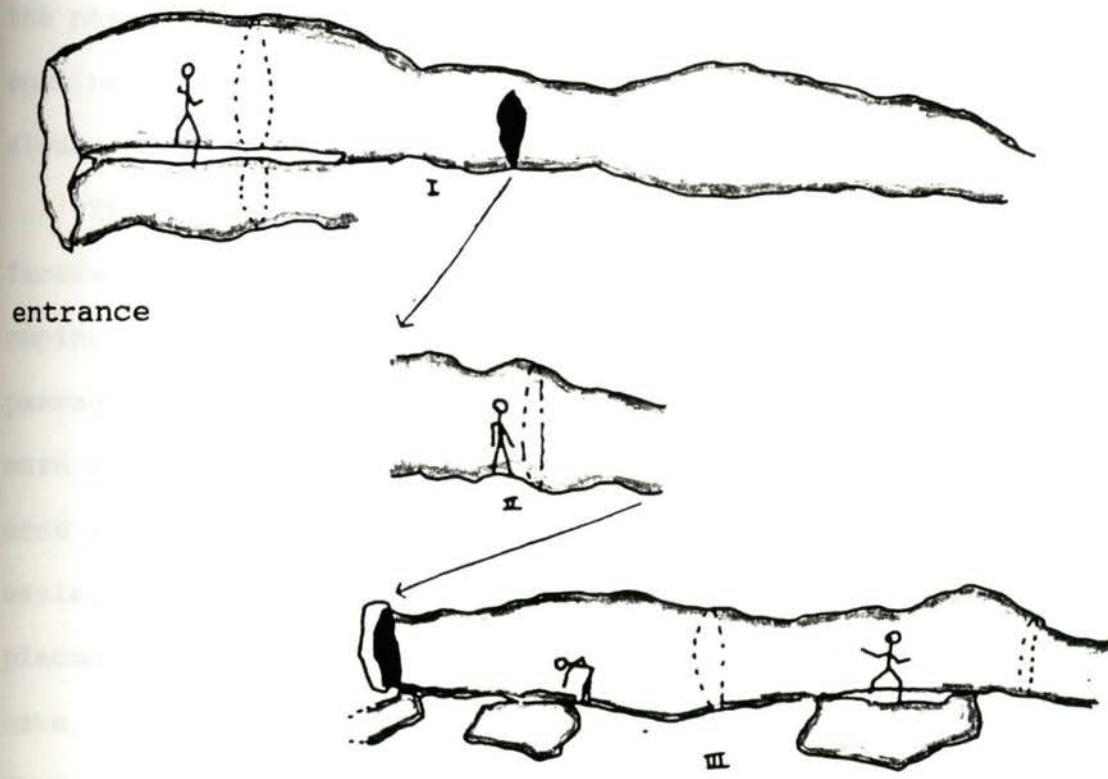


MAP OF CAVES 26. and 27. Fox Run Holes

and irregular in shape, in contrast to the usual round openings of caves, and are large enough only for a person to squeeze upright into some, or crawl on hands and knees into others. The cavities are little more than 'fox-runs'; a person can get inside and move around but the accommodation is tight and uncomfortable. The walls are formed of uneven calcite formations covered with white pasty clay dust and algae. The floors are not level and have rocks in places and hard mud-walled holes in others. Small tunnels trail off at the back of the cavities and are accessed by foxes.

CORNER CAVE (#25)

Continuing west along the bank, the terrace narrows and the slope gets steeper. Boulders and trees make the going as much a process of vertical climbing as horizontal movement. Just at the end of this section of the cliff a large vale cuts perpendicular to the valley floor far into the bank, making a 90° turn in the rock face. At the corner of the cliff a large vertical rise of rock contains a cave entrance. Getting to the entrance is difficult and requires climbing up and over boulders and using trees as handholds. Having deposited one's self at the entrance, the view from Corner Cave looks out high over the valley to the west. The cave has a narrow entrance, not even a meter wide, and is oblong from top to bottom (2.5 meters) with undulating walls typical of the form a cave takes when its upper and lower portions are connected by a slightly denser



MAP OF CAVE 25. Corner Cave

middle strata that has not eroded quite as much. Corner Cave is not easily negotiated. Much taller than it is wide, the passage spreads out to one meter inside. Near the opening the walls are covered with dense green and black algae.

The cave resembles certain left bank caves in which the floors have collapsed into lower tunnels leaving narrow gaping holes along the way and rocks and rubble in the lower passage. At times these holes are almost as wide as the main walls in Corner Cave, making footholds difficult. With arms spread out and braced against each wall, the going is easier. At some points the floor is intact, while in other places, long dark holes open up, threatening a fall. In a cave, this sort of configuration is dangerous and unpredictable, when lighting is minimal at best. It is hard to tell how deep the lower tunnel is. In the holes I explored, the depth varied from .75 to 2 meters. The lower tunnel follows the same path as the upper passage and may itself rest on another level of resurgence.

Corner Cave forks into two passages. One way maintains a straight axis 20 meters from the entrance, then narrows considerably, making an adult's way possible only by turning sideways and sliding between the walls. The other passage veers to the right 10 meters from the entrance and continues on for 12 more meters, with many large holes dropping into the underlying tunnel. This passage also narrows, barring the way.

In sum, Corner Cave is of interest geologically. It is hard to reach but challenging to negotiate and requires care. The narrowness of the cave did not allow a feeling of being restfully contained in a comfortable space. There is no place to sit or lie. The fact that it did not have a definite ending point contributed to the uneasiness. A person's visit here would likely be momentary. As a point of surveillance over the valley, however, the location is excellent.

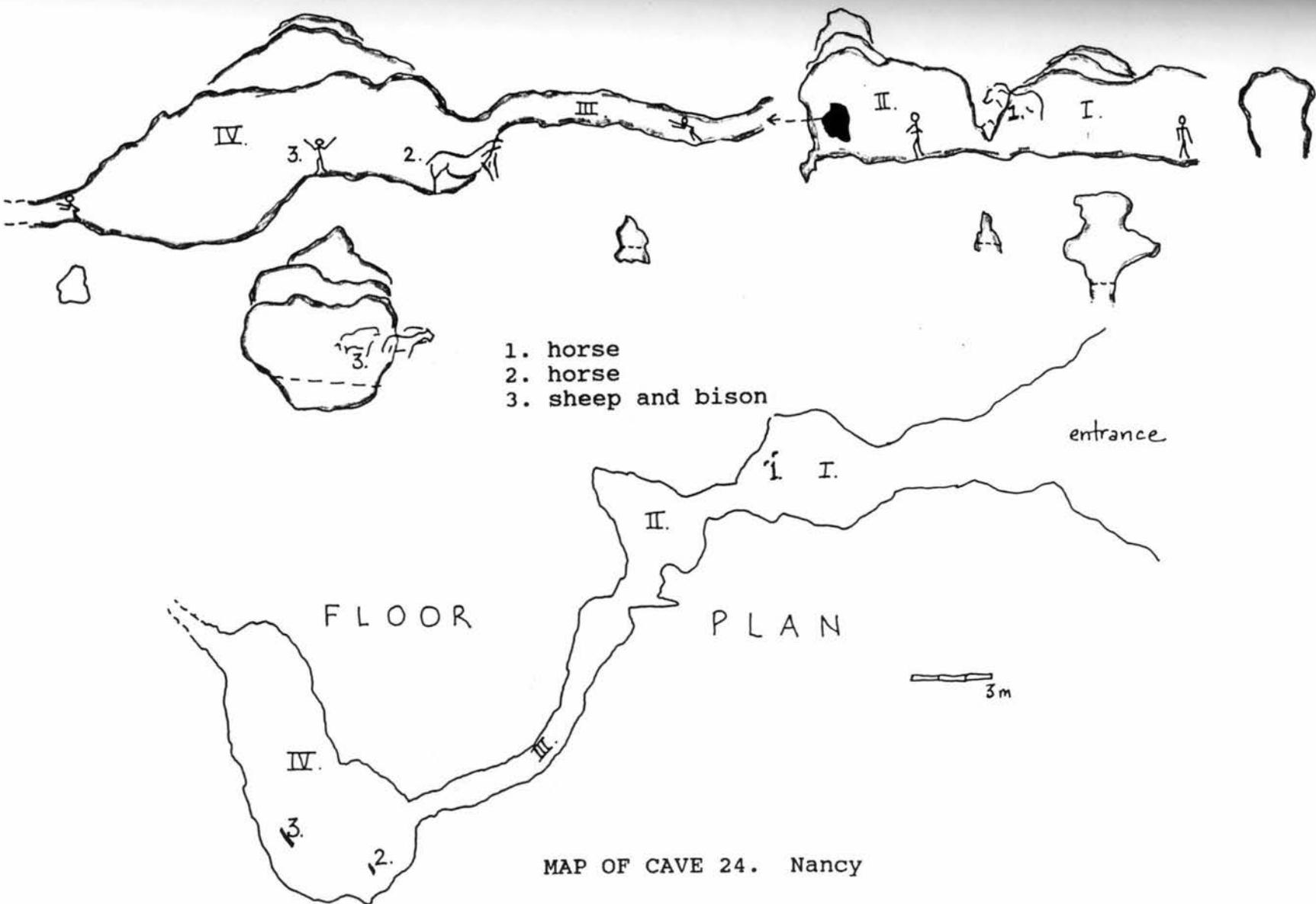
NANCY (#24)

The east side of the vale traps the moisture available on the otherwise dry right bank. Trees and vegetation are lush. The slope begins to level out slightly in moving from Corner Cave into the vale. Access from the vale and valley floor to the crest of the hill, or cliff, is possible at a 45 angle through the woods. Midway into the vale, a cave entrance is situated almost at the crest of the hillside. Called 'Nancy', this cave is the only one of the right bank caves to contain any images. The entrance is among boulders in the exposed rock face. A steep grade leads down 25 meters to the floor of the vale. The entrance is 2 meters wide and 3 meters tall. The first room is 6 meters long and has a rounded ceiling that arches over the visitor, getting narrower near the floor. The first images are located on the right vault of this narrowing. One is a horse, 1.25

meters long and in very deep relief; the other seems to be an animal but is unidentifiable (see Photo 32).

In the back of this chamber, the passage narrows almost to a crack, with a low place to pass through. There is a second small room beyond the opening. A person can stand once inside. A soaring diaclase reaches 6 meters overhead. This area is only two meters across, and orients perpendicular to the previous room. On the right side, a hole sinks down into a mud-choked well, the wall forming a small alcove around it. The passage continues to the left under a low rock overhang and into a very small tunnel, less than 2 meters high and .7 meters wide. Mud covers the sides of the tunnel, where one must crouch down very low or crawls on hands and knees to negotiate its 10 meters. A line of mud runs parallel to the ground line almost a meter from the present floor, for the entire length of the tunnel and back into the following chamber. It appears that the floor washed out down the well in the second chamber. As determined by the line of mud, the configuration of the original tunnel would have been that of a quite low passage less than 1 meter tall. Whether or not the original floor was intact when Magdalenians visited the cave cannot be said. We do know that Magdalenian image-makers penetrated very tight spaces for long distances.

The tunnel ends at a large cavity whose walls are more narrow at the near end and then spread outward and upward. A large muddy slope angles up toward the back of the



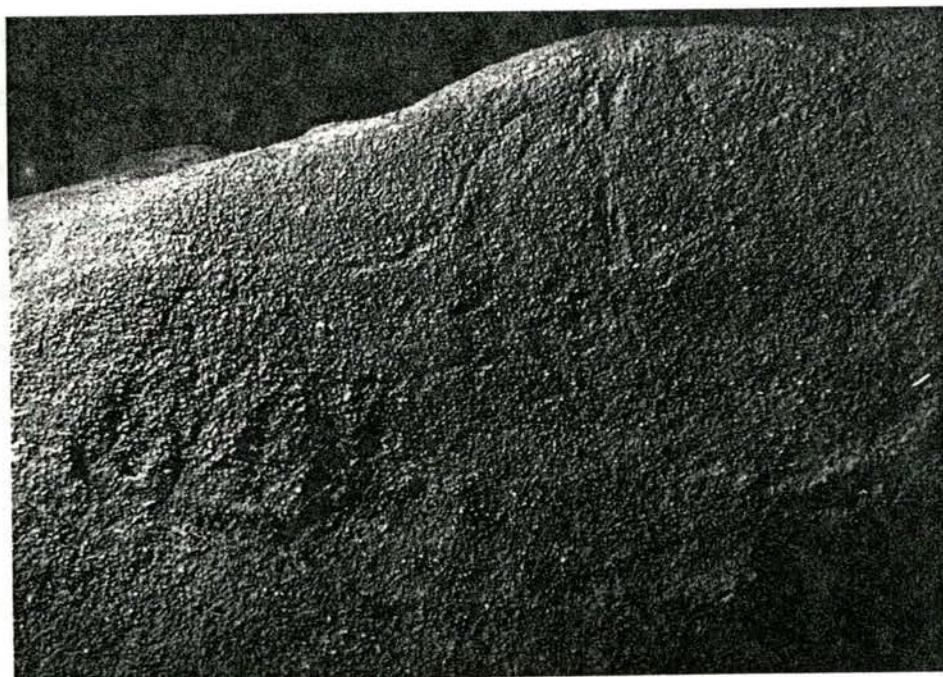


PHOTO 32. Nancy - horse engraving inside back chamber.
(photo by B. and G. Delluc).

chamber. The chamber is quite spacious overhead, with several high pockets of space in the ceiling. The third figure, a small horse, is engraved on a piece of rock jutting out of the wall to the left of the visitor. Further up the incline, a sheep and a bison were drawn on the left wall but are difficult to discern because of the very faint line of engraving. The engravings are at a height of 2 meters above the present floor, suggesting that they could have been made before the floor washed out. If this is the case, the cave recesses should be recognized as difficult to access, having to pass under a small crack at the back of the first chamber under the first figure of a horse, and slide on one's stomach through the 10 meter cat-hole to reach the back area.

At the back of the large cavity, another small, square tunnel begins at the top of the mud slope. It meanders deeper and deeper into the earth. The tunnel is being excavated by the owner of the cave by following a small mud-choked resurgence in hopes of finding a point of articulation with another cave network. He has had no luck so far.

Nancy is the second largest cave on the right bank. Its access is relatively easy. The initial entrance and porch are adequate places to camp. The recesses are removed by small tunnels and overhangs from the main entrance areas. Imagery is found in the back portions. Alain Roussot (1968) headed an excavation at the front of the cave which yielded

artifacts from several time periods. He dates the few flint tools to the middle Magdalenian, a time frame that corresponds roughly with Breuil's dating of the drawings to Magdalenian III.

FONTMARTINE (#23)

The vale outside Nancy is called 'Le Goulet' (Map 6 - fig. E). Today it is used as a quarry for the light yellow limestone characteristic of the region and widely used for construction in the area. Quarrying changes the natural topography of the landscape. Across the vale from Nancy, the west bank is much drier and steeper. The lower portions have been quarried, disturbing the cave called Fontmartine. Fontmartine is now a dangerous crack, small and hard to negotiate. Because the cave may be collapsing, I was warned not to go into it. Several possible man-made traces are said to be found deep in the cave but because of its tenuous condition, no full study has been made. The marks are described as "Eight short and deep vertical and parallel incisions ... on one wall" and on the opposite wall, "a sinuous vertical mark is flanked at its top end by two smaller [marks] like signs from Lascaux and Gabillou. Other traces exist elsewhere." (Aujoulat, L'Art des Cavernes p.76 my translation).

Magdalenian visitation of caves does include obscure, hidden places, with markings not dissimilar to the ones mentioned here. The difficulty lies in interpreting a mark

accurately as man-made or not. Beyond that question one must ask if the mark is of Paleolithic age or not. If the types of markings and the types of spaces visited by a culture have been satisfactorily documented, the argument can be made for a specific case. Evidence of other cultures visiting inner cave areas ranges from a 16th Century signature engraved on an inner cave wall, to Neolithic pottery sherds, to 20th Century carbon gas smoke marks. If the Fontmartine traces are Magdalenian, they strengthen the theory that underground places of highly difficult access were explored and marked by Magdalenian individuals. Such image-making activity would have been intense and personal, involving physical and mental obstacles. Unfortunately, the difficulty of identifying Fontmartine's marks with certainty hinder my discussing it further until more accurate information is available.

HIGH WESTERN CLIFFS

At the western edge of Le Goulet, the cliffside above the site of Fontmartine is very tall (30 meters) and steep. Most of the cliff is sheer vertical rock face. This is one of the highest points of the study section's cliffs. Surveillance over the valley to the east and west is excellent. Movement between the valley floor and the crest of the cliff is possible by using long, narrow horizontal trails. Boulders are common.

The vegetation on the right bank is different from that of the left bank. The sun shines from the south onto the right bank making the environment hot and dry relative to the rest of the valley. Pine trees, thorn bushes, and scrub oaks represent some of the few plant species. Heat also effects the weathering of limestone where constant heating and cooling cause faster erosion and more cracking of rock. Thus, smaller rocks and sandy residue are present on the right bank.

Moving westward, the angle of the cliff is more gradual, constituted by several tiers of rock face and scrub brush. Eventually the bank becomes a more level expanse of sand, rock and trees, with a gradual slope from the valley floor up to the top of the hill. Exposed sections of quarried rock wall are present in places. The bank continues in this fashion for 300 meters.

In the western section of the right bank, a path cuts down the bank connecting the hilltop community of Sireuil to the valley floor. An Upper Paleolithic habitation site called Barry was excavated near the path (Peyrony, unpublished report). The 'Venus of Sireuil', a statue of a female torso, comes from this site and is attributed to the Aurignacian Period. Peyrony also classed part of the site as an early Magdalenian deposit.

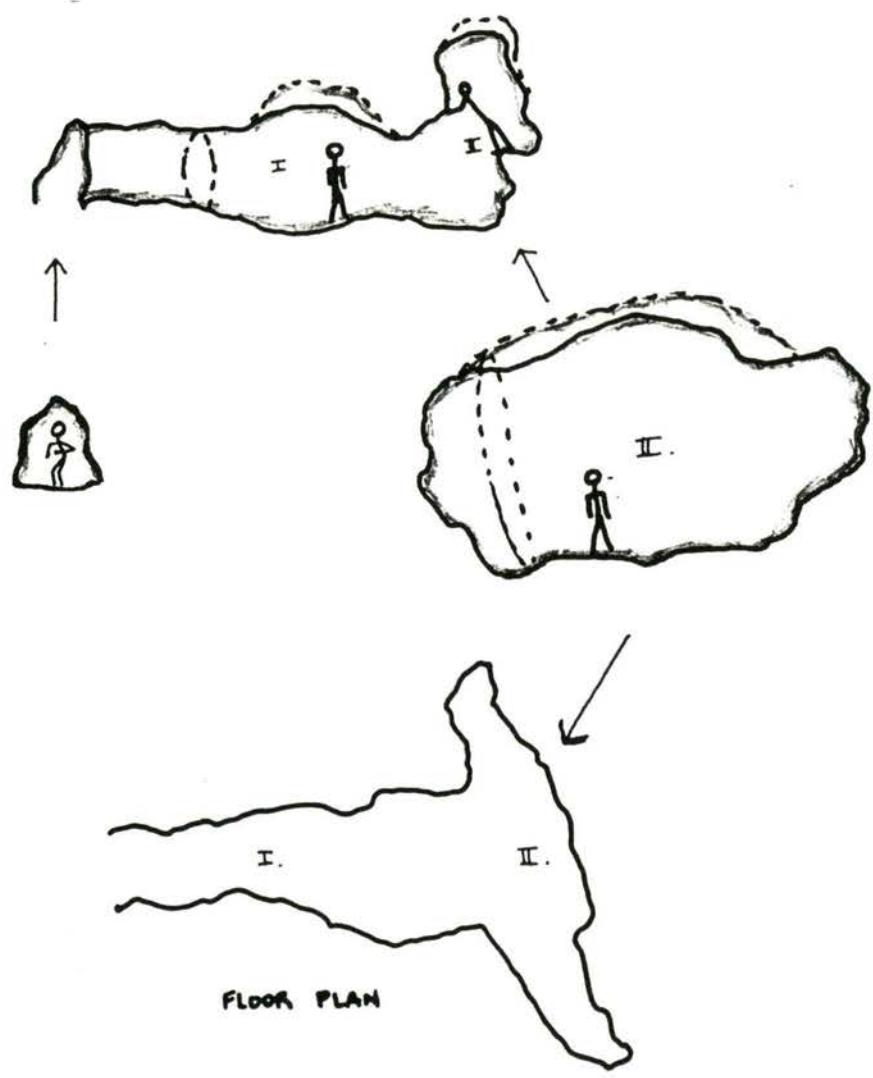
Directly across the valley from the left bank's Caves 'E' & 'F', the slope becomes steeper. A sheer cliff wall 25 meters high parallels the road. It is almost impossible

to climb from the road up into the cliffside. One reaches the upper levels by moving horizontally from the easier slopes to the east. Several layers of cliff constitute this very steep portion of the bank. Near the top level several small rock overhangs are present. A rock-shelter suggests that caves may be nearby in the landscape. The rock overhangs are not wide enough to afford protection from the elements.

POND CAVE (#29)

The only cave in this section of the bank is located 15 meters to the west of the shelters. Its entrance is above a small terrace high above the valley and is only large enough to crawl into. The cave is 8 meters in total length, with an initial cavity 1.5 meters tall and equally wide. The last meter and a half are 4 meters wide and close to 3 meters tall. The cave is a nice place for one or two persons to camp and is comfortable to sit in with light penetrating almost to the back wall.

Pond Cave is situated with a view into the valley overlooking a pond next to the stream on the valley floor. The study section ends here. The right bank continues west, and includes another small lush vale, the location of the old Moulin de Cazelle and several abandoned Middle Age habitations cut out of the cliff wall. A Magdalenian habitation was excavated under a rock shelter in the vale by



MAP OF CAVE 29. Pond Cave

Dr. Lalanne near the turn of the century. The site report remains unpublished.

Beyond the Moulin de Cazelle, the road crosses the valley and hugs the left bank, the valley proper contains a trout fishery which alters the natural bed of the stream, and the cliffs behind contain only one or two small caves similar to Pond Cave. The right bank ends where the two Beune valleys converge and turn southeast to continue the path to the Vézère River Valley.

Outside of the study sector, more than 30 other caves were visited in the valley. Most of these are east of the sector and before the natural break in the cliffside at the confluence of a valley and stream named La Paradoux. Each cave is briefly described in the following list. Please refer to map 7.

1. Cabrillac - a shallow cave with a porch and a large entrance and cavity, a tiny passage leads back through a cat-hole another 15 to 20 meters. (Nielson, personal communication)
2. Fontmartine - a long, narrow cave disturbed by recent quarrying, possible Paleolithic markings deep inside (see L'Art des Cavernes p.76).
3. Grand Lac - a very small cavity on the hilltop plateau near the farmhouse, possibly used for storage, containing rock formations.
4. A hole discovered in the hillside 150 meters from the road. Appears to be an opening in the ceiling of an underground passage, not yet penetrated.

5., 6., 7. Three long, winding, narrow resurgences on the upper tier of the right bank. 6. is tall and wide enough to comfortably accommodate a person for 40 meters, then becomes low and narrow. H. Breuil used this cave for his own graffiti. 7. has a large entrance with a porch surrounded by eroded rock arch. Its initial entrance is tall but not spacious, several very narrow joints go deeper into the cave but remain very tight.

8. and 9. Fort de la Rhonie caves, these small cavities were used during the Middle Ages as a dwelling and fort.

10. Nestled in the hillside of a sizable vale, this cavity contains a 20th Century engraving of a horse.

11. Just beside the road in the same vale, a crack in the earth leads down vertically to several tight passages.

12. This cave opens in a hillside toward the east. Its spacious entrance extends back for 10-12 meters. It was used in the Middle Ages.

13. The site of small cavities in the upper cliff wall, these cliffs are near the St. Raphael spring. They were probably used during the Middle Ages.

14. The Grotte du Puits de la Foret is a "tight fissure 4 meters deep" (L'Art des Cavernes p. 79) once thought to have faint engravings, today they are decidedly not of Paleolithic origin.

15. The Grotte du Moulin de Beyssac is found in the side of a vale under the Beyssac chateau. A long, now collapsed, entry chamber, 3 to 4 meters tall and 3 meters wide, leads into a series of very spacious chambers. The final chamber is a joint which reaches up to another opening 5 meters overhead. The cave is badly deteriorated. (see L'Art p.79).

16., 17., and 18. Caves under the Beyssac chateau which open in the tall cliff wall just above the road on the right bank. 16., the first chamber, 2 meters. high, turns abruptly to the left, becomes taller and moves off in a crossroad of narrower joints. The first part of the cave

contains naturally occurring reddish spots, once thought to be Paleolithic negative handprints. (see L'Art des Cavernes p.73-74).

17. A large cavity whose entrance is covered with soot and algae. The ceiling has collapsed in this cave and a massive boulder blocks passage beyond 10 meters.

18. Another cave in close proximity to Beyssac with many (8-10) tiny openings in the cliffside. The passages are extremely narrow and convoluted.

19. Pilier is a cave with several 5 entrances. It is tall in most places, 2.5 to 4 meters, even in back joints. The wide entry chamber has an uneven floor with large rocks scattered around. An entrance in the front of the cliffside looks 12 meters across the chamber toward an entrance opening onto the small vale to the right of the cave. A series of tall joints lead from the left wall of the chamber and move parallel to the cliffside, sometimes breaking through in small openings, then turn back into the cliff. The joints are tall and narrow (3 meters to 1.5 meters). (see L'Art des Cavernes p.78).

20. Boyer is one of the longest and most complex caves near the sector. A separate small, collapsing cave is just below its entrance on the cliffside, 20 meters long. Boyer opens in a small, round, low chamber high in the hillside. The chamber is not tall enough to stand in. The back wall contains a small crack, wide enough to crawl through to access the lower series of long passages. It is a sporting cave, with tiny chambers, steep drops and surprising points of articulation with other galleries. No Paleolithic figures are found in Boyer. Total length is 150 or more meters.

21. One corner of the left bank contains several underground cracks and caves. This is section 'z' of the map. Two of the caves are single large joints, roomy enough for a small camp. One is a crack in the bottom of the vale leading to tight muddy passages.

22. Pechmimi is the result of a hollowing out of part of the corner of the cliff at the confluence of the small valley, Le Paradoux, with the South Beune. The cave orients vertically, and is a very wide with deep series of ledges and boulders negotiated more by up and down movement than

laterally. The cave is quite deep at some points and resembles a giant obstacle course.

23. Petite Beyssac, relatively large with 100 meters of development, its main entry room leads straight back to a steep decline and following lower joints. Small chambers may be reached by climbing up into the walls.

24. Le Paradoux, 25. Le Breuil, 26. Cacaro

These caves have been prospected over the years by local spelunkers. Le Paradoux has an engraving in checkerboard pattern in the shallow left passage, recently determined to have been made by a knife. (see L'Art des Cavernes p.81) Rectangular traces were sited in Cacaro (L'Art des Cavernes p.78) which were probably the result of the horns of goats scraping the cave wall as the cave was used as a bergerie.

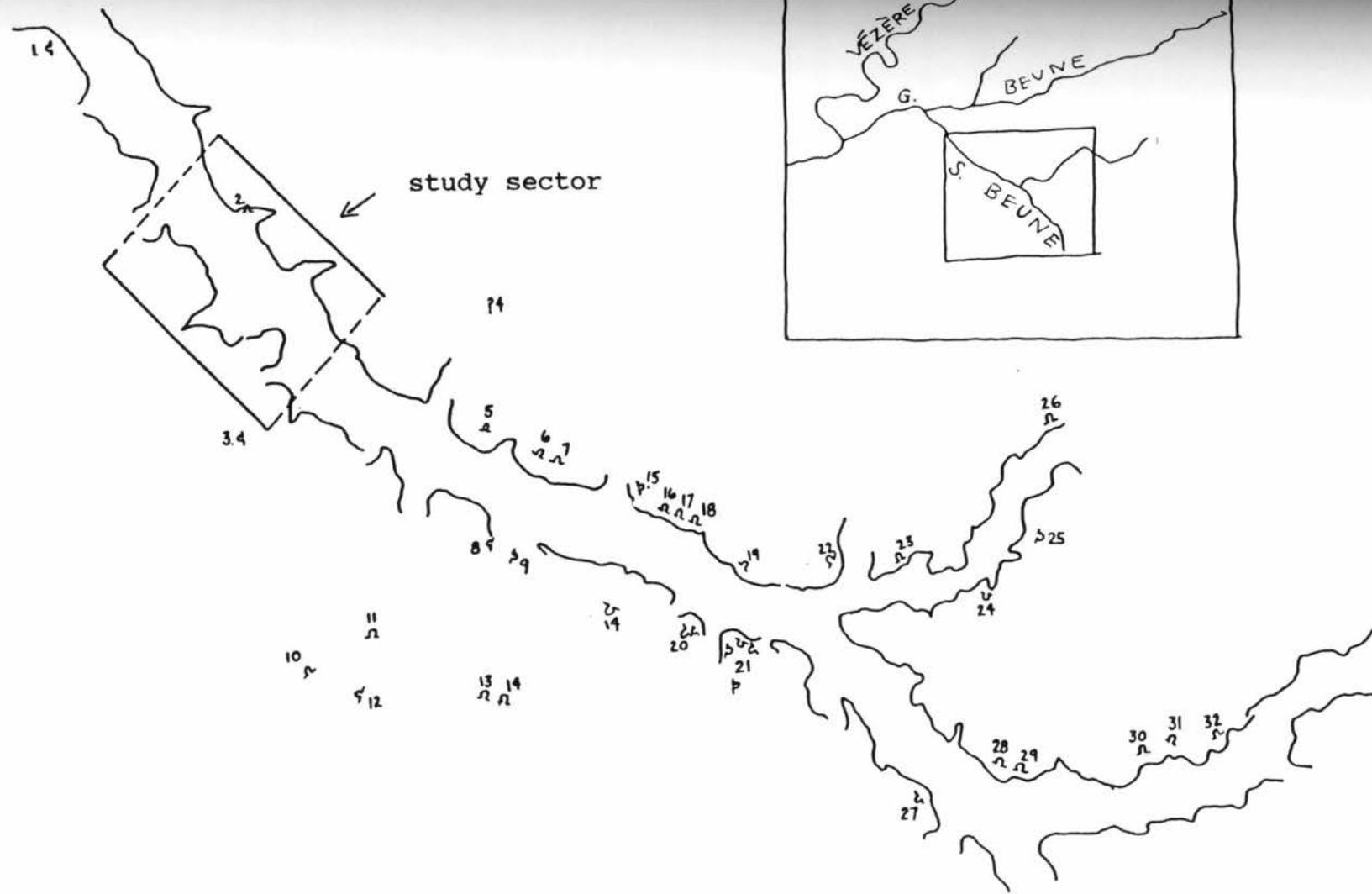
27. A low cave, rarely 1.5 meters tall, consisting of three distinct round rooms, each connected to one other, thus, its name 'Trois Salles'.

28. A shallow cavity just west of Le Charretou.

29. Le Charretou is a cave with an adequate entrance (2.5 meters wide and 2.5 meters high) whose first chamber continues back 8 to 10 meters. The vault comes down to a narrow horizontal opening which passes into a second, very low, but wide room with an uneven floor. To the left of this area a joint opens up vertically 4 to 5 meters. B. and G. Delluc describe possible Paleolithic engravings in this recess (see L'Art des Cavernes p.81).

30. and 31. Small caves in the proximity of Le Roc, with similar configurations.

32. Le Roc, a low and wide crevice covering more than 50 square meters, with two entrances in the low hillside. The clear engraving of a horse, of a style traditionally attributed to the Solutrean, is just a meter from one entrance.



MAP 7. The South Beune Valley: Caves surveyed from
Cabrillac to Le Roc.

INTERPRETING THE USE OF CAVES BY MAGDALENIANS

V. ANALYSIS OF THE SOUTH BEUNE CAVES

In the study sector, the cave entrances are all in the same level of the cliff at 20 meters above the valley floor, and all are relatively close together. Bernifal is the exception, but it is also uphill from the valley in the gradual slope of the vale. The cliff promontory stands out most noticeably at this point in the valley. The study sector encompasses the largest span of exposed cliff wall. The cliff itself is a landmark suggesting the presence of caves.

Differences in the ecology of the two banks figure into the analysis of the use of the valley as a repository for images. The left bank traps humidity and is in the cliff's shadow most of the year. The right bank receives direct sunlight and is warmer and drier. In a much colder climate, the advantages of living on the right bank are apparent. The only habitation sites known to date are on the right bank. The majority of caves and imagery, however, are found on the left bank. If, as it appears, Magdalenians usually did not draw at habitation sites, then their excursions to the left bank caves represented behavior removed from the main habitation area. This behavior could include a variety of activities, from exploiting the variety of plants and animals in the left bank's ecosystem, or simply

exploring, to deliberately seeking out caves for isolated activity. The time consuming act of engraving deep in caves is more in accordance with a deliberate, planned excursion.

Le Bison, Bernifal, Calévie and Nancy, where stone tools including burins and retouched flakes are present in the entrance, may have been overnight camp sites. Sous-Grand-Lac contains prehistoric material which has not been analyzed. Vielmouly II, a newly recognized site, has not been examined by archaeologists.

The material remains at the image caves on the left bank are scant and could be the result of a brief stop. Typically in many other image caves outside the Beune, when the cave is not a habitation site, only a few tools are left, usually the ones used for drawing. One feature repeated in many areas -- at Cournazac, Bernifal, and Les Trois Frères in the Pyrénées -- is the presence of a tool implanted in the wall near an engraving. Bernifal's second chimney has a burin embedded in the mud wall at its entrance. Other tools and pieces of bone are found at the entrance to the cave. The absence of material culture suggests that the visits were made by few individuals and for a short time.

The entrance to a cave is a large part of its identity. Though it may not always reflect the dimensions of the inner recesses, an entrance gives an immediate impression. It may be inviting and easily found, or hidden and small. A large cave entrance is an important feature in the landscape,

suggestive of a landmark. The entrance is also usually at a point of good surveillance.

The image caves all have sizable porches and entrances, with ceilings well overhead and a width of 2 meters at least. They are roughly round in shape. Bernifal is an exception - its prehistoric entrance was buried, but appears to be lower than the others. Sous-Grand-Lac is the smallest of the others. Light filters into the initial passage of all of the caves except Bernifal, but does not reach any of the figures.

SPATIO-PHENOMENOLOGICAL DYNAMICS

Caves are architectonic. Thiis-Evensen (1987) defines three elements of architecture. Motion is the dynamic aspect of experience; weight is always relative to gravity; and substance is the material with which the structure is made. These three elements, he suggests, are the basis of shared experience. At a universal level, the experience of space is a result of "spontaneous and unconscious reactions to structure and form" (Thiis-Evensen, p.25). It is the arrangement of the types of spaces in sequence, however, that determines one's total experience. This chapter will discuss architectonic patterns present in the South Beune caves.

The Diaclase

A primary feature of caves in the South Beune is the joint or fissure (the French term for such joints is

"dioclase"). A central passage is crossed by and connected to other joints, which together mark the configuration of the cave. Usually, the dioclase is narrow and tall, and the upward space it provides contrasts with its narrow width. An illusion occurs when one aspect is extreme; for example, a very tight passage draws extra attention to its height. Dioclases may have overhead space which comes as a surprise beyond a low dip in a passage.

There is a geological basis for the form of a cave and the directions its joints will take. The Beune caves run perpendicular to the cliff wall. Secondary joints run perpendicular to the main passage and are a result of the pressure of the initial faulting. Thus, in many caves, passages intersect at right angles. The abrupt change in direction adds an element of surprise to exploration of the cave. Refer to Figure 3.

Being in a dioclase with high upward space is simultaneously relaxing and inspiring. In contrast, the almost tangible pressure of low spaces encourages a person to move, preferably forward. While Magdalenians visited many places with low overhead space, most of the imagery in the Beunes is found in areas with relatively high upward space.

Vielmouly II is an example of the use of an area with substantial upward space. The cave is tall in the primary passage, then the passages split. One branch is low and wide, while the other passes under a low overhang and

becomes narrow and tall, with spacious area overhead. The images are located here. Sous-Grand-Lac shows a similar pattern. The main engraved scene is at the foot of the only diaclase in the cave, a crevice that reaches up 4 meters and is the tallest point in the cave. A horse is engraved up inside the diaclase.

The Vertical and the Horizontal

Lateral or horizontal enclosed space does not have the same effect on humans as vertical space. This may be attributed to the notion that horizontal space is "knowable" and thus less threatening. Horizontal space is the axis by which we know the world most fundamentally. We work, travel, and sleep in horizontal space, we are oriented and adapt to it. This is the realm of the profane.

In a cave, a very wide lateral space has a different character than a very high space. Wide, dark low spaces impart a feeling of the mundane or quotidian. The way into the second gallery of Le Bison is one such space, as is the side passage in Vielmouly II. These places require stooping and make a person feel cramped and pressed upon. Tall, narrow spaces are more pleasant. Even a measure of half a meter can make a great difference. One reason may be that there is more air in taller space - usually the air is cool and sometimes drafts are felt from its circulation. It is easier to breathe in a tall space, for one is not obliged to concentrate so much on moving forward. One's eyes focus on longer distances, drawing the attention away from the act of

physically negotiating the cave and closer to the setting itself. The Beune caves are relatively small and narrow but they include a good deal of vertical space. The vertical chimneys of Bernifal, the diaclase in Sous-Grand-Lac and the back chamber of Nancy are all examples of the use of vertical space.

Vertical space can elicit a sense of losing oneself, of a communion with potent unseen forces. It is this continuum which connects depth and height, the internal and the external, and by which distinctions are made between humans and the mysterious elements of the world. Mythology, cosmology and world religions all make use of this continuum - the underworld, underworld spirits, underwater spirits, the great sky god, spirits in the sky, in the wind, the sun, heaven. The continuum connecting these vertical dimensions is linked by the human who inhabits the nexus -- the horizontal plane of the earth. In this way, human space is the connection between the vertical and the horizontal, between the sacred and the profane.

Some people actively seek the experience of vertical space. Sky divers, scuba divers, acrobats, spelunkers, and mountain climbers all relate to the challenge of exploring vertical spaces, both depth and height. These activities expand a person's physical and mental limitations. As a measure of both personal and physical boundaries, a successful response to such a challenge generates a feeling of transcendence.

Spatial Transitions

Large round chambers with high ceilings are found at Calevie, in the final recesses of Nancy, and in a smaller version at Le Bison. All of these areas hold images. These places are reached after passing through a narrowing, and appear to be the end or back of each cave. Here, one feels a distinct separation from the outside, and even from the front part of the caves.

Being in the very back of a cave is an oddly secure feeling. A person has the sense of being protected, hidden, and contained within something bigger than himself. Depth is relative to other features and is apparent even in small caves. Losing one's sense of time is indicative of depth.

The small 10-meter-long tunnel at Nancy is a passage from one place to another, just as the low hanging hole is in Le Bison. Transit through the low area emphasizes the height and spaciousness of the chambers. The mild difficulty of moving through these thresholds exaggerates the sense of depth and removal.

The smallest caves provide different sorts of experiences. Small uniform fissures, cavities of eboulis, and caves at each corner of the plateau give little more than brief encounters with underground space. They are adequate places for brief shelter but are disappointing as places to explore. Small spaces should not be ruled out as unattractive to the Magdalenians, who sought out small places in which to draw within a larger cave. The smallest

caves end too quickly and have too few features, however, to provide the total setting found in larger caves. Some of the cavities of éboulis have very large openings but are not deep. Even in the Grottes du Vent and de la Sepulture the same private feeling is not as apparent as it is in small places within larger caves. This is not because the small space is not comforting and personal, but because there is no true sense of separation from the outside.

A similar atmosphere occurs at Archambeau, a larger cave of 40 meters deep. The passage continues deeper and deeper into the hillside and the walls get slightly smaller as one goes along. One has the feeling of never arriving, probably because there are no breaks in the passage, no connecting joints, no single point of narrowing, and no upward space to break the monotony of the movement. Even though it is deep, there is no feature that allows a transition in this cave.

Cave 'C' and Emanuel's Cave are somewhat different. Cave 'C' is short, but intriguing because of the dual resurgences. Emanuel's Cave contains two levels initially, several sharp turns, and long stretches of constant size. These are caves in which movement is integral to the experience. When movement is halted at the mud-choked end, the experience changes. There is no definite point of transition, no chamber to be reached, no upward-opening diaclase, and no Magdalenian imagery.

Small spaces inside larger caves were used frequently for drawing in the South Beune. The upward branching diaclase at Sous-Grand-Lac is one example, the back chamber of Vielmouly II is another. Bernifal manifests this use of space most vividly in the two diverting joints which reach more than 45 degrees upward in the left wall of the final passage for 12 to 15 meters. These two cracks are not obvious to a visitor in the cave, they must be intentionally sought out. Climbing up into them takes strength, agility, and sure footing. The chimneys may be likened to flights of steep narrow stairs. The fact that they are narrow implies that the visit was a personal venture.

The space at the top of the first chimney is a private place. It is quiet and secure, very much removed, and encourages introspection. The second chimney, as well, is a space conducive to thinking and personal expression. It is as if the walls themselves create a pressure, molding and drawing out the visitor's thoughts. Small spaces have this effect, especially following the penetration of the larger cave.

Summary

The image caves in the Beune are evidence that Magdalenians moved in almost all directions in the caves -- up and down steep inclines, in areas near the ceiling and chimneys in the wall, through cat-hole tunnels, and under low overhangs. They were not constricted in their exploration of underground spaces. In fact, the individuals

who made the drawings were of necessity physically resilient and adventurous.

In comparison with the other caves on the sector, the image caves share the following features:

1. a relatively large entrance
2. an overhead space above images
3. a narrowing, or transition, between the images and the entrance
4. the presence of small spaces within larger caves
5. a large, relatively complex configuration.

INHABITING SPACE

The novice is rarely prepared for the diversity of ceiling spaces in caves. The dimensions from the floor to the ceiling in one cave may vary drastically from 25 centimeters to 25 meters. It is overhead space which most impresses the human visitor, both physically and emotionally: this is the intimate and dynamic dimension of a cave. Close overhead space can impose a crushing, stifling feeling of literally being pressed upon where the only solution is to make haste forward (or backward) to the next point of transition in height, as in the small tunnel in Nancy before the back chamber or the recesses of Cave 'A'. Conversely, an area of expansive upward space allows one to experience equally vital sensations of great release. Larger overhead spaces elicit deep feelings of contemplation and aspiration. Bernifal, the back chamber of Calevie, and the final tall and narrow diaclase in Vielmouly II all exhibit this type of upward space. Architecture utilizes overhead space for social, political, and religious

purposes. It is not necessarily a function of the vault's line drawing the eye upward that enhances these sensibilities, for a tall tree in a field may do the same - it is the encapsulation of space in which one finds oneself that allows a definition of human space.

Each type of space has its own aesthetic. The following is one example, from my field notes, of space in a cave.

Emanuel and I get into the cave. The entrance is an hourglass shape, where two oval resurgences, one exactly on top on the other, were joined as the floor of the upper one caved in. We hoist ourselves up into the top passage, standing on large limestone blocks -- the remains of the connecting floor -- and move along. The ceiling is a hand's reach above my head, I cannot stretch both arms out fully. We negotiate the blocks. The passage twists around and we must pull our legs entirely into the upper section of the passage due to the narrowing of the joint. Walking like squatting Russian dancers, we continue as the cave gets consistently smaller. The lower passage is no longer there. It is completely dark now and the walls and floor are covered with the familiar red clay of the Beune. Now crawling, we are deeper in the earth. We arrive at a turn. Emanuel sits down, his knees bent comfortably, his back leaning against one wall, with toes touching the opposite wall, and not quite a foot of space over his head. I sit as well. He is not used to caving but relaxes immediately at this point and even wants to stay here for awhile.

This type of space is intimate space. We sat in this section of the corridor, not compelled to move back or go forward, but content to rest there. The cave at this point

generated a feeling of closure and privacy. The space was comfortably filled but not crowded.

LIGHT

It is a most difficult task to translate into words the qualities and significance of light in caves. For the Western visitor, vision is paramount in interpreting information and exploring possibilities. For people of non-literate cultures, vision is only one part of a multi-sensorial experience of the world (Carpenter 1964). Attempting to rely on vision for guidance, in a situation devoid of light, adds a new perspective.

Caves are dark. Photos using a flash or tours given by floodlights are artificial settings. Darkness may be the singular feature common to all caves. The light of a flame or a lamp is minimal and only part of an area is ever lit at any given moment. In this sense, the visual experience is partial or punctuated. In Sous-Grand-Lac, the flashlight focuses one's attention on the decorated panel, in Cave 'A' the light disperses and fades in the crawl toward the end, and in Archambeau only a section of the cave is illuminated at any time. The visitor's eyes are always directed by the light and focus on its orientation. Seeing form takes on a special effect -- seeing recognizable figures becomes a powerful event.

VI. OTHER BEUNE IMAGE SITES

A study of four caves in close proximity of the Grande Beune Valley expands and tests the analysis of the Magdalenian use of underground spaces in the South Beune. Three of the caves are located in small valleys branching off of the Grande Beune as it approaches the Vézère River. Font-de-Gaume is one kilometer from the junction of the Vézère River and the Grande Beune. Cournazac is further upstream in the same small valley, whose mouth is 3.5 kilometers from the study sector. Combarelles is midway between the Vézère River and the study area. Comarque is located in the Grande Beune 2.5 kilometers directly north of Vielmouly. These are the closest neighboring image caves to the South Beune caves, all are within four kilometers of the study sector.

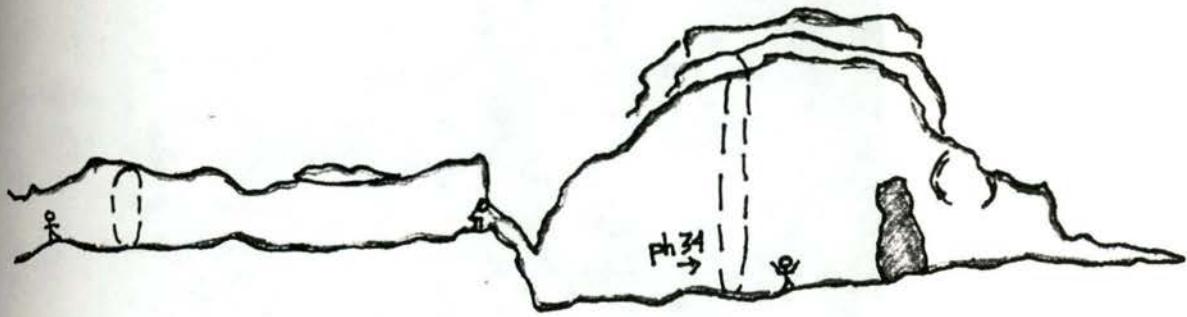
FONT-DE-GAUME

Font-de-Gaume is one of the oldest and well known image caves in France. It contains a great number and variety of images, including bison, mammoths and tectiforms, both engraved and painted. The cave itself is a large diaclase, 124 meters long, angled diagonally in the prominent high cliff just east of the confluence of the Vezere and the Grande Beune. Sheer cliff-side flanks the indentation of the

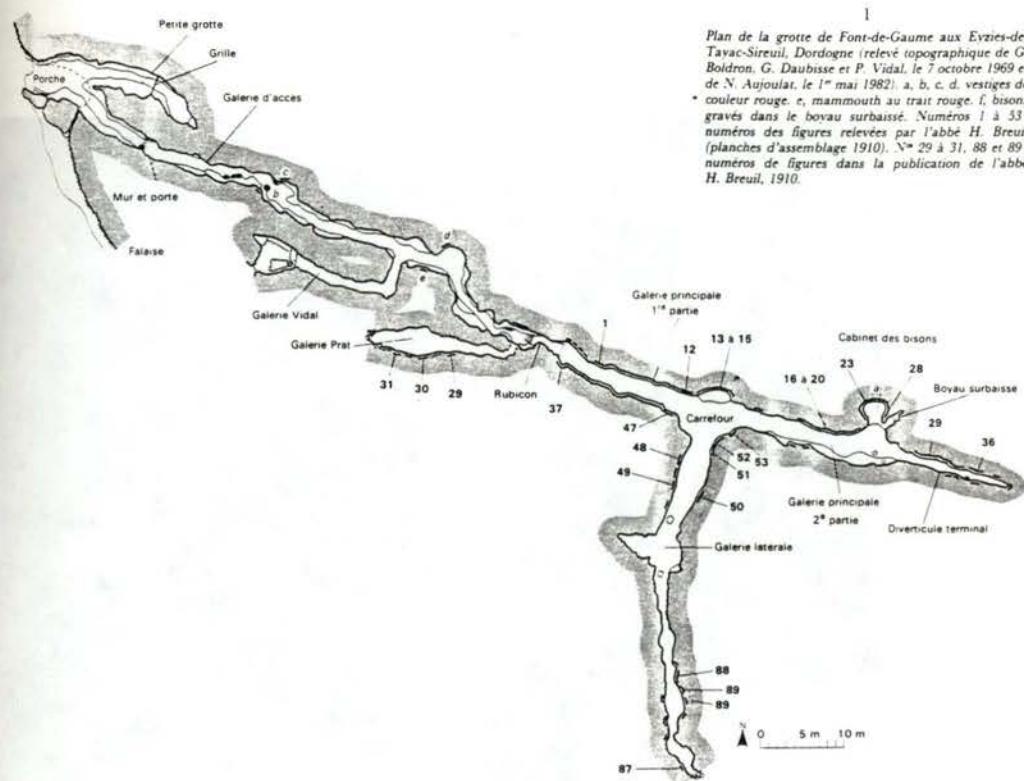
porch which is reached at the end of a long gradual path 25 meters above the valley. The porch is made of limestone and looks out high over the crossing of the smaller valley and the Beune.

The cave has two entrances side by side, of equal size, both very round and with smooth limestone contours. The left entrance is only a shallow orifice 15 meters deep and contains Mousterian remains. The right entrance is close to two meters tall and as wide as three people abreast (see Photo 33). One follows the passage, which keeps its initial dimensions, past the reach of daylight and for some 65 meters to the Rubicon, a juncture so named by H. Breuil. At the Rubicon the corridor narrows and drops vertically almost two meters. A metal ladder is now in place and the vault is heightened a few feet there. Beyond the Rubicon, the passage becomes uniform once again, 2 meters wide and with a very high diaclase opening straight up some 7 to 8 meters. The effect of upward space at this ratio is compelling.

The majority of images are found in this final section of the main diaclase and a perpendicular joint intersecting the right wall 25 meters from the Rubicon. Both passages are narrow and have even smaller trailing ends - images are in both. Each corridor has substantial space overhead, up to 10 meters in places. Fifteen meters from the termination of the main diaclase a small round niche opens in the left wall. It is covered with intensely colored, superimposed paintings and engravings of bison and mammoths.



Three-dimensional map of Font-de-Gaume.



Traditional map of Cave 30. - Font-de-Gaume.
by Boldron, Daubisse, Vidal, Aujoulat, in
L'Art des Cavernes.

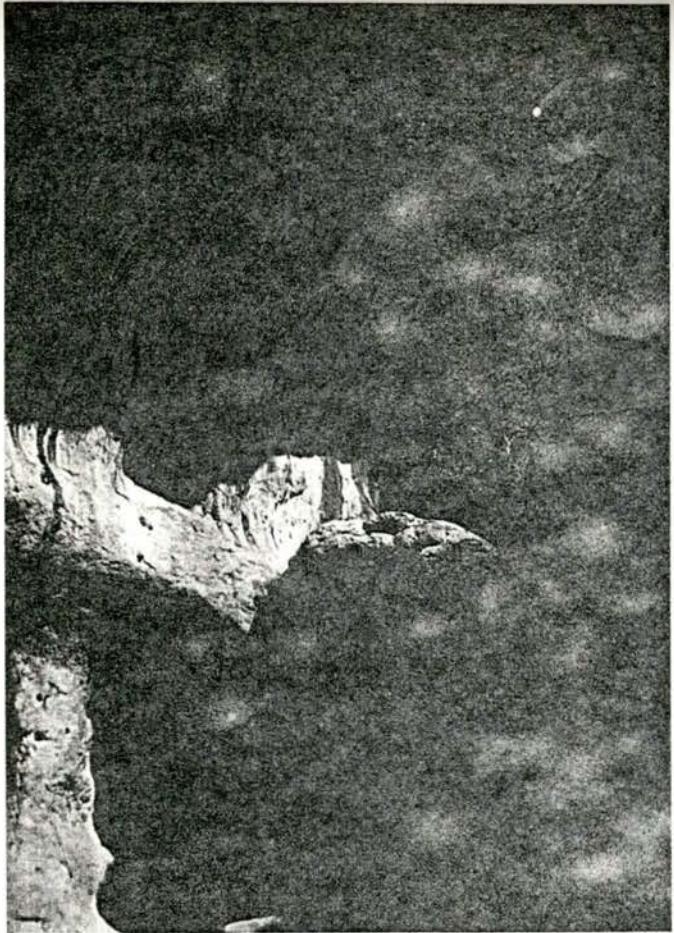


PHOTO 33. The entrance to Font-de-Gaume.

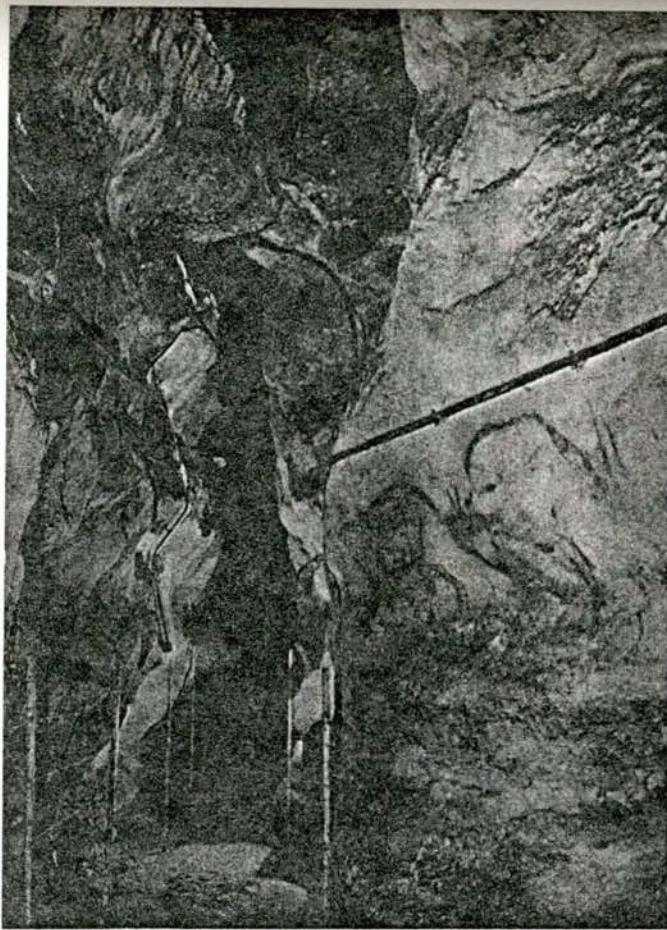


PHOTO 34. Font-de-Gaume -
Inside the main decorated gallery.
(from Breuil 1952).

Font-de-Gaume is one of the most attractive caves in the area. Its porch and entrance are clear of debris and vegetation and the light yellow limestone is very smooth. The first passage is consistent in its size, with undulating walls and ceiling pockets opening up. It accommodates a person nicely, the walls do not press in too tightly, the floor is relatively level, and the ceiling is at a comfortable distance overhead most of the way to the Rubicon. The Rubicon presents a point of spatial transition, separating the deeper cave from the uniform entry passage. Deep inside, the ceiling soars upward and the walls undulate, spreading and contracting overhead. The images are located in this area, in the adjoining diaclase and in the niche, called the 'Cabinet des Bison'.

Tourists line up to enter Font-de-Gaume and go single file following hand rails, only having to stoop in some places. They are reminded not to lean against or touch the walls as they walk past hoses and electric cables and into the main painted passage. Electric lights are placed strategically to reveal otherwise hidden engravings. Lights placed in the upper areas of the enormous diaclase create an eerie and spacious effect. One might wonder how the Magdalenians, without flood lights, could be aware of the dimensions of the great diaclase. An open flame, even as small as the lamps found at Lascaux and La Mouthe - or a crude torch - will give off an adequate amount of light to see for 12 to 15 meters. Light from a flame behaves

differently than that of a constant electric light. It moves more. Its intensity changes as it burns, darting and glowing in shadows and around corners. Aside from the effect of light in tall spaces, a very slight air current, coolness and the acoustic qualities of changes in space are apparent.

The tour of Font-de-Gaume includes the small chamber of the Bison, a curious choice for the placement of intense superimposed painting. At this point the tour turns around, ignorant of the last narrow passage that one must crawl into. In this final crevice, "... by turning on one's knees you can see, but with difficulty, as you are almost pressed against the wall, at a height varying between 2 and 4 meters, a lion, a group of engraved horses, the head of a horse, drawn in red, [and] a rhinoceros....". (Breuil 1952, p.82-83).

Archaeological remains from Font-de-Gaume include

... worked flint, bones, fragment of ochres, one a crayon, and a bone engraved with an elegant horse head. Several tools are attributed to the Mousterian, others to the early Périgordian, Aurignacian and Solutrean, others could be Magdalenian. Many flints are greatly dulled, especially sections of flakes, which could have served to incise or scrape the limestone wall. (Roussot, L'Art des Cavernes, p.130).

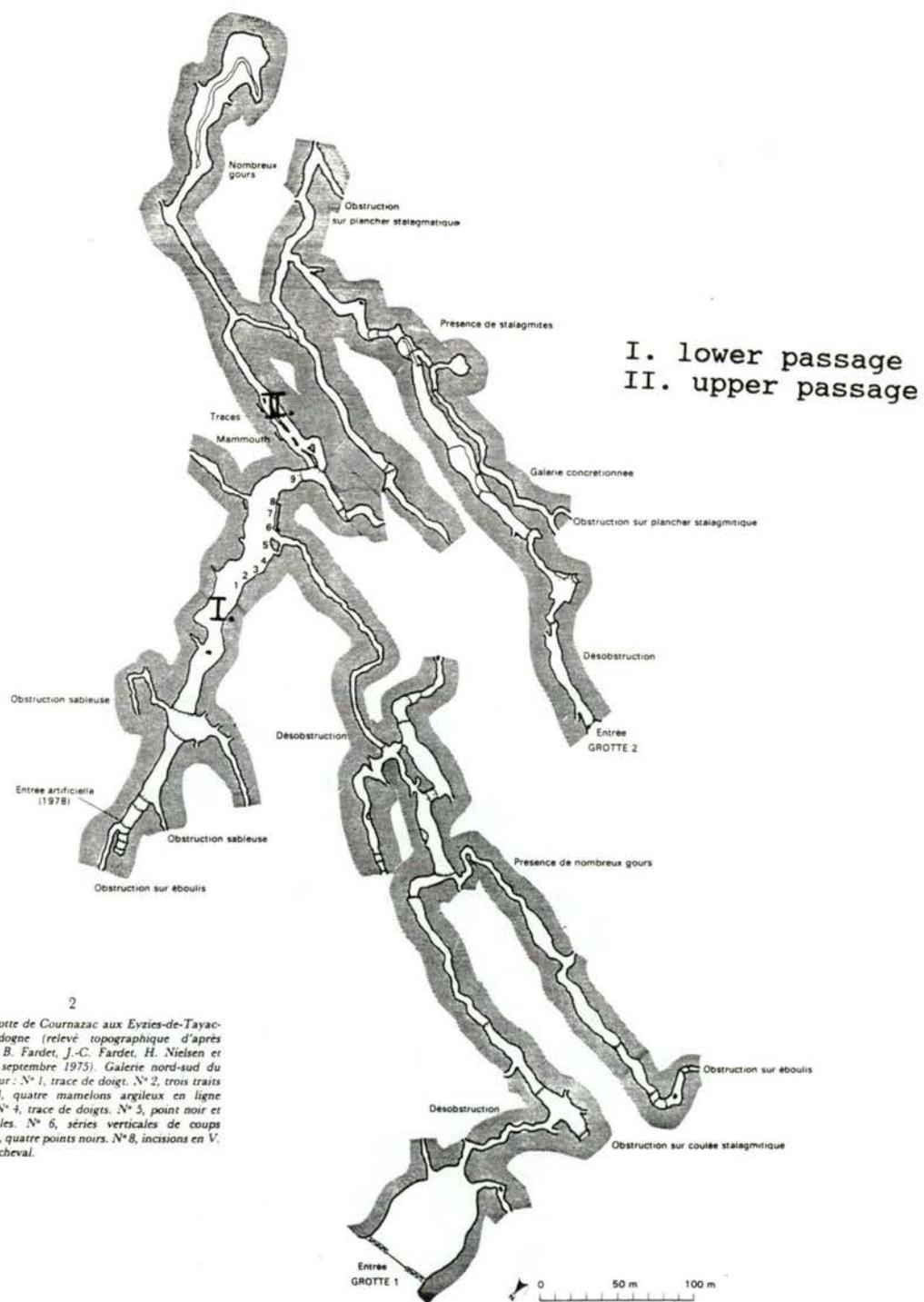
Font-de-Gaume has exceptionally tall overhead space in its latter part. The height seems exaggerated by the narrowness of the passage. The analysis of the South Beune caves determined an identical selection of spaces for image-making. Tall spaces in the back of the cave beyond a point

of transition were drawn in. In Font-de-Gaume, the Rubicon is a point of transition. Small, tight spaces at the end of the galleries were also used of for drawing, another feature of the study sector caves.

COURNAZAC

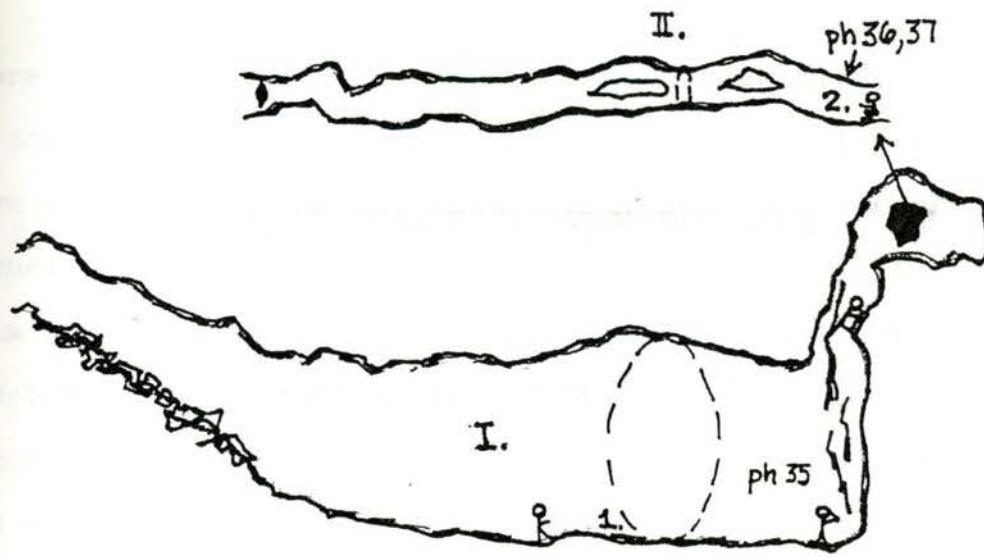
Across the small valley from Font-de-Gaume, another cave is situated in the hillside. Cournazac presents the most extreme example of a choice of image area by the Magdalenian image-maker. Cournazac is a complex series of corridors, on two levels, many separated by obstructed passages filled with mud and rock. There are two known accesses to the cave system. One is a large porch called Paulin. The smaller recesses of this entrance were recently cleared out to connect the way to other areas of the lower level of the cave system. The second access today lies in the basement of a house on the crest of the hill, where a tunnel was cleared in 1975 opening a way to the upper level of passages. In each case, narrow cat-holes must be negotiated. A third possible entrance, probably the way used by Magdalenian people, is today a pile of rubble and is inaccessible except for the artificial entrance made in the ceiling in 1978 (Aujoulat, L'Art des Cavernes, p.123).

It is not clear to specialists how the prehistoric visitor entered and negotiated the cave. The location of human-made traces, however, are clues. One descends through the artificial entrance on a steep pile of rubble for 15



2
Plan de la grotte de Cournazac aux Eyzies-de-Tayac-Sireuil, Dordogne (relevé topographique d'après N. Aujoulat, B. Faradet, J.-C. Faradet, H. Nielsen et G. Vaudois, septembre 1975). Galerie nord-sud du réseau intérieur. N° 1, trace de doigt. N° 2, trois traits graves. N° 3, quatre mamelons argileux en ligne horizontale. N° 4, trace de doigts. N° 5, point noir et stries verticales. N° 6, séries verticales de coups d'ongles. N° 7, quatre points noirs. N° 8, incisions en V. N° 9, tête de cheval.

Traditional map of Cave 31. - Cournazac.
 by Aujoulat, Faradet, Faradet,
 Nielsen, Vaudois in L'Art des Cavernes



Three dimensional map of Cournazac.

1. mud panels with fingernail traces and tectiforms
2. mammoth figure

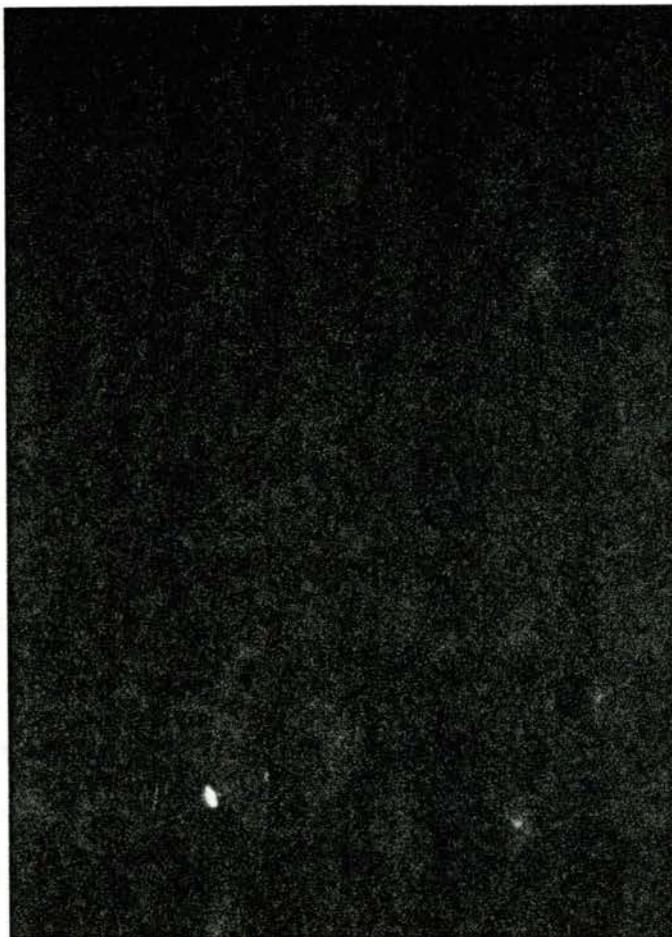


PHOTO 35. Cournazac - from lower level looking 12 meters straight up to upper level.

meters to reach a long, narrow chamber whose floor and walls are covered by thick, soupy mud. The vault is 14 meters above one's head. On the right wall, near the far end, mud patches were smoothed on the walls and drawn on with flint tools and fingernails. This is one of the rare instances of Magdalenian fingernail marks. Several of the horizontal and vertical traces resemble tectiforms. Black dots are present here as well. Flint tools were found in this passage. The end of this large corridor (narrow but tall, 3 meters by 14 meters) seems to present a dead end (see Photo 34). By scaling the wall, however, with a wire ladder or, possibly, by shimmying, wedged against each side of the vertical crack, some 12 meters upward, one arrives at the upper level of passageways. Less than ten meters from the ledge the figure of a simple black mammoth was drawn in a small tunnel. Today the figure is covered by a clear calcite film. It is the same style as two mammoth images at Bernifal in a similar spatial context - on the ceiling above a ledge (see Photos 35 and 36). This is the only known representational image found in Cournazac to date. The other traces of drawing are not representational.

Whatever the meaning of the mammoth, the effort of the individual to get to its location is incredible, even today with lights and ropes -- from either entrance. Here we have clues to some circumstances surrounding this case. It is probably that one person, not more than two could fit in the mammoth corridor. If so, would there not be two mammoths?



PHOTO 36. Cournazac - the mammoth's figure.



PHOTO 37. Cournazac - M. Nielson sits looking at the mammoth's figure in the upper passage.

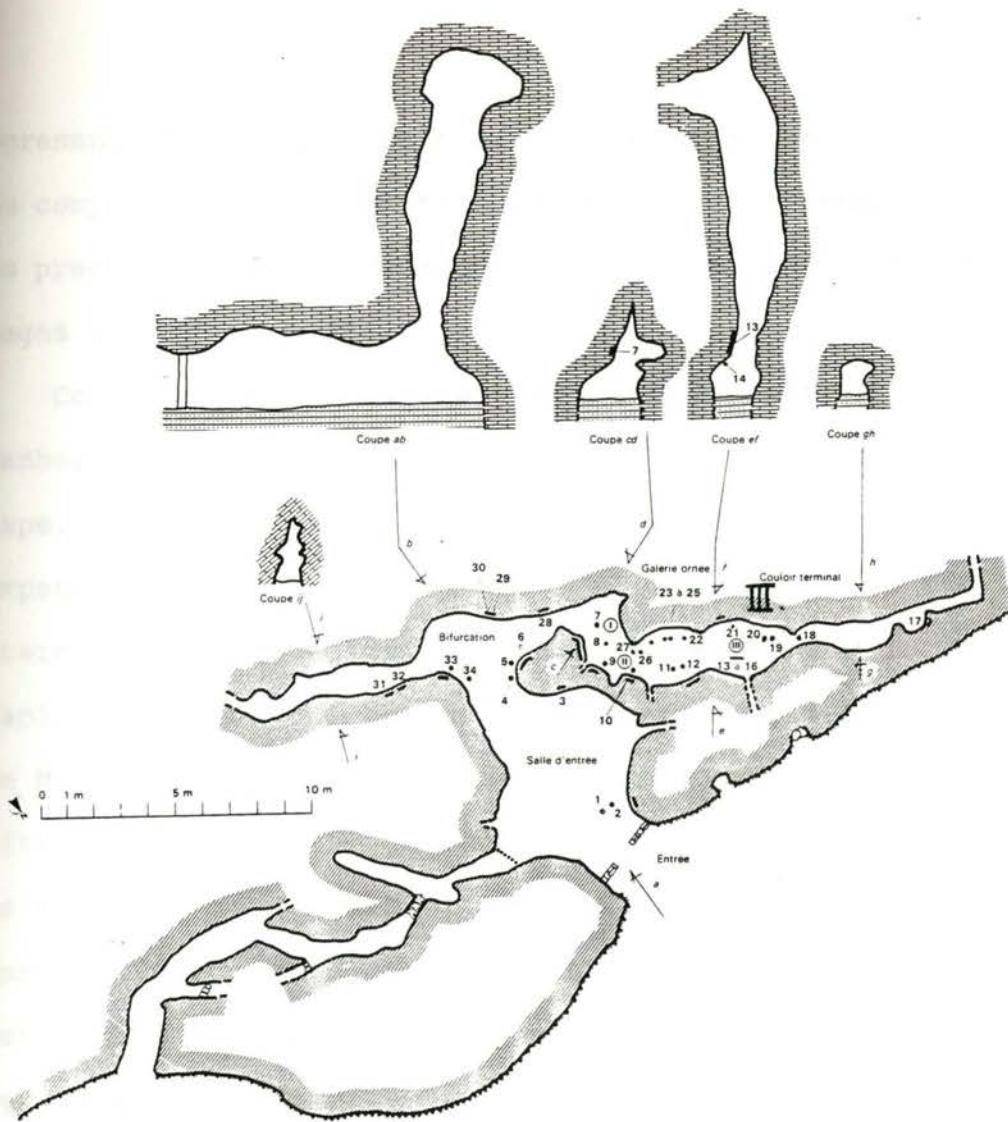
The area is unduly difficult to reach, thus the image is hidden - it was a private venture. The ascent and later descent is dangerous.

"Among the four flints collected in the mud floor of the lower gallery, at the level of the Paulin (entrance), there are no useful [dating] characteristics, except that one flake was retouched at one end (a 5th flint has been found above the slope at the junction of the two systems)." (Aujoulat, L'Art des Cavernes, p.125).

Cournazac represents extreme behavior in negotiating upper areas of a large cave to access smaller venues for drawing. An identical pattern is manifest at Bernifal.

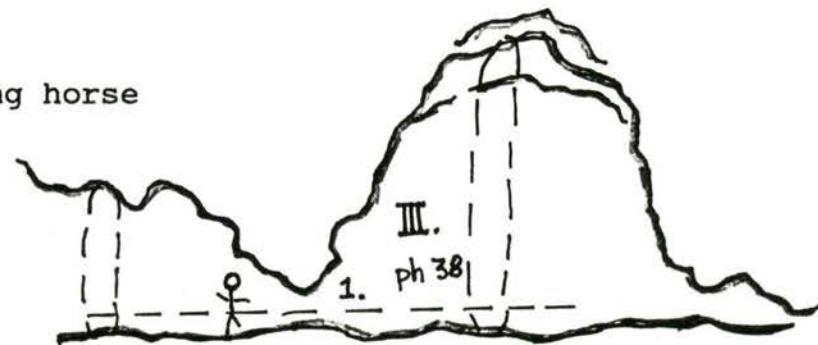
COMARQUE

The Comarque cave is sheltered beneath a large rock overhang in the Grande Beune Valley directly beneath a 12th Century castle of the same name. The original overhang of the cliff reached out several meters over the hollowed out cliffside. The overhang collapsed in front of the cave's entrance after the end of the Paleolithic. The cave was inhabited during the Magdalenian and furnishes a profile of faunal and floral data for this study. Though the original floor has washed out of the cave, a crevice in the wall collected the remains of Upper Paleolithic occupation and has yielded a carbon 14 date and material for pollen analysis (Delluc 1981). The cave also contains engravings which correspond in style and theme to Magdalenian



Map of Cave 32. - Comarque.
(by Galinat, in Delluc 1981).

1. large kneeling horse



Three dimensional map of Comarque.

representations found in nearby caves and rock shelters.

The composite of information at Comarque is unparalleled in its precise dating, fauna/pollen profile, and correlation to images and their context.

Comarque is a relatively small cave, with a front chamber measuring 4 to 7 meters wide and almost round in shape. The back of this chamber becomes a narrow diaclase perpendicular to the entrance, 1 to 2 meters wide and 35 meters long. The majority of figures are found in the back diaclase, far beyond the penetration of daylight. During the Middle Ages, the cave was utilized as a sheep fold. Fifteen meters inside the diaclase, the narrow wall passage was expanded to a width of about a meter, to allow sheep to pass by. Originally, the juncture had been much narrower. Just behind the point of enlargement, one finds the largest engraving in the cave -- an almost life-sized, kneeling horse. Its nose was barely missed by the blows of the modern tool used to cut the limestone. The placement of the figure in this location is significant. It is behind a narrowing in the passage - hidden and not easily accessible. During the Magdalenian, the cave floor was at least .5 meters higher. One would have been forced to crawl under the narrow joint to access this back passage.

Only one figure and several traces of engraving are located in the entry chamber. In the back portions of the cave, the narrow but tall diaclase reaches 6 to 7 meters upward and contains dozens of images and markings



PHOTO 38. Comarque - an engraved portion of the narrow recesses of the diaclase.
(photo by B. and G. Delluc).

(see Photo 37). Beyond the point where the diaclase is only tall enough to crawl in, the terminal end of the passage, only the traces of drawing remain.

A middle Magdalenian occupation of the cave was determined by bones and tools located in a niche (Delluc 1981). Faunal analysis shows remains of reindeer, arctic fox and hare. The fauna corresponds to the analyses of pollen which indicate a cold and dry period. The carbon 14 date taken from the cave is 13,370 + 340 BP. The data suggest that Magdalenian hunters inhabited the cave at the end of Dryas I, a very cold period.

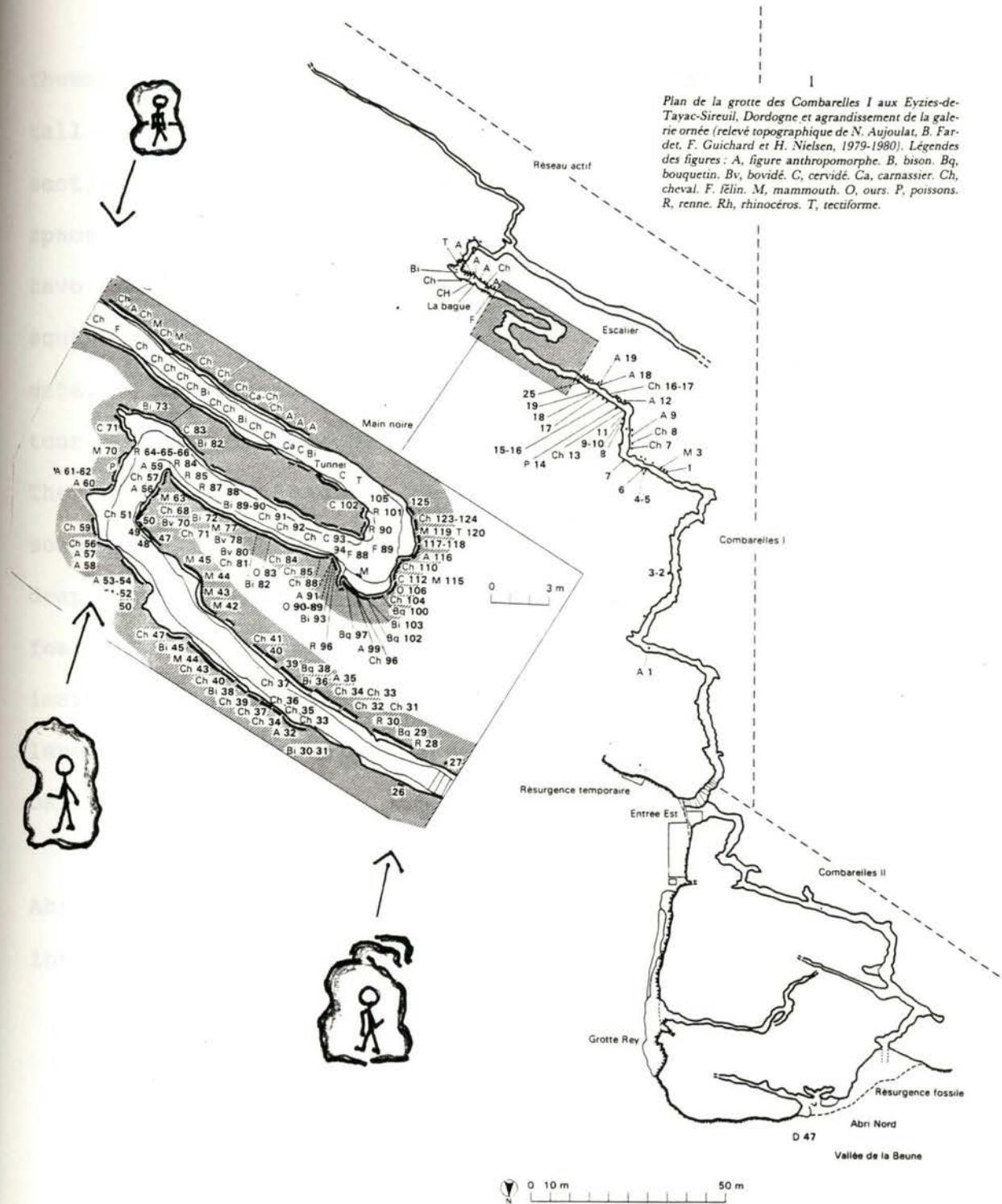
Comarque's imagery is found almost exclusively in the back recesses. The tall, narrow diaclase presents several pockets of space, accessed by crawling through a tiny low opening -- a distinct point of transition. The spatial journey in Comarque parallels that in the South Beune caves including Nancy, Le Bison, and Vielmouly II.

COMBARELLES I AND II

Caves open to the public are usually modified to facilitate the comfortable passage of tourists. In many cases the floor is lowered so that a person can pass along walking fully upright. The modern human-made changes in cave morphology present a context for the images different from the original setting. Combarelles II, a richly engraved cave, has been changed to accommodate small groups of tourists. Combarelles is the site of two very long

narrow caves, each winding several hundred meters into the cliffside. The common entrance was a habitation site during the Magdalenian and has been excavated by generations of archaeologists (Peyrony 1949, Barriere 1981). Excavation resulted in considerable modification of the entrance. Today Combarelles has a large entrance (4 meters tall, 8 meters wide) with several deep pits in the floor. A large wall with a gate protects the site. The actual openings to the caves are altered, with steps cut into the rock, making an accurate idea of the beginning of the true cave difficult. Inside, however, a clear line of mud and the straight-sided blows of an instrument mark the point of alteration between the original cave floor and the present one. Combarelles, like other caves in the area, is uniform in passage. It begins with a configuration the size of a tall person standing, who could touch both walls at most points by holding each arm out straight. Very soon, as evidenced by the line of the original cave floor, it would have been necessary to stoop over and even to drop on hands and knees to move along. The tourist today, however, continues to walk comfortably with a hand on the guide rail which prevents brushing up against or touching the walls.

Sometimes the contour of the walls moves outward slightly, sometimes in or down. A group of six or seven people can move single file closely together in the modified Combarelles and see the engravings in one place pointed out by the guide. After 175 meters, the tourists find



Traditional map of Cave 33. - **Les Combarelles.**
by Aujoulat, Fardet, Guichard, Nielsen in
L'Art des Cavernes

themselves at a dead end. The passage is less than 2 meters tall and 1 meter wide. A wire gate sits on top of a cross-section of mud where the cave continues. The small gated space above the mud is the original configuration of the cave at this point. The area of the tunnel is less than 1 square meter. There are engravings for 50 meters past the gate. Tourists may feel slightly claustrophobic during the tour and especially when the passage seems to dead end.

They never know that the Magdalenian engravers had to crawl, sometimes on their stomachs, most of the first 200 meters deep into the cave (which at the original dimensions would feel interminable) to make the engravings, and that the images were not at waist height but were just above the level with the actual ground line, itself one meter from the ceiling.

In a journal entry dated September 8, 1901, the young Abby Breuil describes one of the first modern visits deep inside Combarelles (Aujoulat 1979).

Arriving at the point most people think is the end, I, believing anything is possible, continue on. After 10 meters flat on my stomach, a new gallery of about 20 meters opens, then the vault lowers and almost touches the ground, except for one side. I slide, touching my shoulders and my stomach; but it is only 2 meters like this, then more engravings, ... then [calcite] formations so abundant that everything is hidden except scattered traces showing that they [prehistorics] had been there in the past. ...but Vlam! my candle blew out, I had let out a heavy sigh. I did not have any matches; I had to turn back. Not funny, but picturesque all the same. I found my way (not meaning to do otherwise) and I had taken along Mon. Capitan to follow me, but he had not been able to pass through the narrowing,

not being as slender as I. I came three meters from the end but there were fumes from carbonic gas strong enough to cause some concern, and I turned back.

Combarelles I is an exception to the rule that overhead space was a feature attractive to Magdalenian image-makers. It is the longest and lowest of caves in the region. Combarelles' extensive depth, and the permeation of its recesses, does, however, coincide with the spatial patterns illuminated by the South Beune caves.

Combarelles II is the corridor to the right of Combarelles I, and is not open to visitors. Thirty meters of the initial passage were filled with the debris resulting from successive years of occupation. When the material was removed, the possibility of a continuation of the passage behind the vault which dipped to the floor was cited by Capitan, Breuil and Peyrony in a 1924 publication. Ten years later, the way was unobstructed and led to an engraved area spanning 60 meters from the original block to its resurgence in the north cliff wall near the road. Never more than 1.5 meters wide, and often much less, the engravings are located midway in this section.

In Combarelles I and II, spatial dynamics indicate that the engravings were produced by a few people at a time, simply due to the configuration of space. The amount of time it would take to crawl such a distance inside and to engrave the deep reliefs, and the quantity of images in Combarelles suggest that the image-making here was more than the product of a casual artistic inclination.

VII. ANALYSIS OF GRANDE BEUNE AND SOUTH BEUNE IMAGE CAVE SETTINGS

CAVE RECESSES AND OVERHEAD SPACE

A look at the spatial dynamics of the four Grande Beune caves confirms the South Beune patterns for image-making. In general, all four show imagery in back recesses. Three of the four make use of areas with high ceilings, removed by a point of narrowing or transition from the initial entrance of the cave.

Font-de-Gaume's passage goes deep into the cave past a narrowing and a drop in the floor (the Rubicon). Images are found in the passage with high overhead space. There are also images in the narrow terminal corridors that are difficult to access.

Cournazac shows similarities in the use of the tall passage and the scaling of the chimney to achieve a hidden, high area to draw in - itself a much tighter space. Image-making at Bernifal reflects an identical behavior, on the ledge just below the ceiling and in the mammoth chimneys. The images in these areas of the two caves are themselves the same.

Comarque's spacious entry chamber is relatively void of imagery while the back joint is engraved, with especially large figures found behind a tiny opening into the narrow

but tall portion of the diaclase. Comarque, Font-de-Gaume and Cournazac show patterns in the use of space which correspond to the use of caves in the study sector.

Combarelles I is a different case. The overall notion of Combarelles I as a place for image-making is hallmarked by its uniformly low and narrow passage of great length. Engravings are most dense between 150 and 225 meters of the 382 meter long cave. Sheer distance provides a sense of spatial transition. The porch at Combarelles is a rich occupation site, dating to the middle Magdalenian (Rigaud 1968). In contrast, neither Font-de-Gaume nor Cournazac contain enough material remains to suggest occupation. Comarque does give evidence of being a habitation site.

Two features are apparent in the comparative analysis. One is the intentional selection of areas in the back of the cave. Cave recesses are different from shallow cave areas. Light is an important factor, it is necessary for visual orientation and to execute engravings. Light from a flame creates constantly moving shadows and distorts the form of the cave and its walls. Its effects are scant, erratic, and contribute to the dark, quiet setting. Being physically removed from the outside generates a feeling of being contained within the setting and apart from the familiar. Things that are measurable outside, like time and distance, become less discernible. It is not an atmosphere conducive to profane activities or thoughts. Generally, spatial areas

in the back of caves accommodate few individuals.

Magdalenian image-makers sought out this setting.

The presence of overhead space is the second common feature. Overhead space contains more air, usually cooler and circulating. The common ratio of narrow walls to high ceilings in many Beune caves produces a spatial illusion, where the ceiling seems higher in contrast to the width of the chamber. Caves with markedly tall central passages are more physically inspiring and may have inherently manifested a quality sought out by the Magdalenians. Those caves were consistently chosen. Larger dimensions make a more dramatic impression underground.²

Within caves with high overhead areas, imagery is found in the tall passages. There is also a trend toward climbing up chimneys. Imagery is also found in low side niches, as well, and in tiny terminal areas suggesting that the general configuration of the cave may be significant for reasons apart from the specific spatial features consistently chosen from cave to cave. Non-representational dots, lines and various traces are often found throughout the cave. Their presence implies behaviors which entailed thoroughly exploring and marking the cave itself. Small spaces with low ceilings within larger caves were used to draw in and present a different spatial dynamic from the tall central

2 A cave with inside space opening up is similar to structures such as the Roman Pantheon which exhibits an architecture of space rather than an architecture of mass.

passages. These areas generate personal and introspective feelings.

In many of the Beune caves, a low vault will precede an area of overhead space, and the transition into such a place makes its discovery more effective and its spatial dynamics more powerful. The journey into the space is as significant as the place itself; drawing in it is an expression of that fact.

THE ISSUE OF ERODED IMAGES

In 400 Siècles d'Art Pariétal, Breuil remarks that in Font-de-Gaume the fact that the paintings are found in the back chamber is a result of the physical character of the cave which would only allow the preservation of pigment past the Rubicon where air flow and plant growth are minimal to absent.

I agree that it is probable that images have disappeared. But if we assume that the shallow areas of caves and rock shelters were the obvious repository for figures, why are others placed so far back? It could not have been due to lack of space. An undulating cave wall presents a large surface area where daylight penetrates. It is unlikely that an entire engraved cave entrance would disintegrate without a trace. Three accounts of preserved engravings suggest that many images do not erode. At the Pataud rock shelter, a recently discovered engraved ibex was exposed on the open cliff wall until it was closed off in

the newly built Pataud Museum. The cave Calévie, with two large entrances and drafty chambers, still contains engraved horses despite considerable deterioration of parts of the cave. Further up the South Beune at the entrance of a cave, called Le Roc, the engraving of a horse remains just one meter from the opening. The deep reliefs at Cap Blanc or Comarque would last no matter where they were located.

It is true that many South Beune cave images are surprisingly well preserved, and there are five instances as evidence. The panel at Sous-Grand-Lac is only 6 meters from the entrance. There are hundreds of cubic feet of limestone wall in and near the entrance which are neither particularly fragile or overcome by calcite activity and have no imagery.

While some of the South Beune limestone is grainy, full of tiny marine shells, and does erode significantly, other strata in the same cliff are much denser. Vielmouly I, the largest cave on the right bank has particularly sandy walls which crumble under one's fingers. No engravings or other material is found in this cave, although it fits the spatial profile: a long, large entry, a distinct narrowing, and opening upward spaces in the final passage. If there had ever been figures in this cave, engraved or painted, they probably would have disintegrated. On the other hand, one geologist suggested that an artist would never have chosen such an unsatisfactory surface on which to work. Most of the engravings in the South Beune Caves are placed in denser

limestone strata, which itself is easier to engrave and erodes less quickly.

The cases show consistent use of deeper passages and of recesses off the main artery of the cave. Vielmouly II, Le Bison, the horse at Sous-Grand-Lac are examples. More intriguing are Bernifal and Cournazac, where a single image gives evidence of Magdalenian presence in dangerously inaccessible areas. The use of such spaces parallels placement of images in Pyrénées caves as well.

Deterioration of the paintings has occurred at a much greater rate since their discovery in the 19th and 20th Centuries than it has in the thousands of years since the Magdalenian. Gradual erosion of engravings and paint, especially those exposed to air currents, as on cliffsides, does occur through time. It is the exposure of paintings, even those deep in caves, to the passage of many people that speeds up the process of disintegration. Lascaux and Font-de-Gaume are the most poignant examples. Interestingly, most images that are painted are also engraved, making their total disappearance less likely.

The present work suggests through a brief survey that the question of eroded images does not bear directly on this study. The fact remains that one finds images intentionally placed in the deeper cave setting where spatial dynamics played some role for the image-maker. The issue is one of the motivation and intent of the image-maker who was concerned with selecting a specific context.

THE CONNECTION BETWEEN IMAGE-MAKING AND SPACE

Underground spaces, removed from the outside world and charged with introspection, are a natural setting for the imagination. Undulating walls and flickering light are formless, but suggestive. Essentially, the wall is a sounding board, and brings to the surface figures that the viewer projects onto it, things that are familiar to him or her, things that remain in the back of the mind. Vision is not the only catalyst. Sounds are both muffled and exaggerated, rock surfaces move in and retract, air is cool or warm, damp, still or circulating. The connection between art and space is a close one, in the balance of an enclosure which fosters concentration, with mass and volume and movement in shadows all around, in quiet stillness and in the presence of an active and full mind equipped with the means to carve out the object of its intention.

Inside space operates on a different set of principles than outside space. What is measurable and static outside is timeless and formless inside. People react to the setting in a different way. Thiis-Evensen (1987, p.19) suggests that the elements of architecture, the roof, the walls, and the floor, each "balance the forces of inside and outside". The dynamic between inner and outer is also a metaphysical one. It becomes manifest in the delicate channeling of human emotion and expression.

Much of the imagery in the Beune Valley caves can not qualify as 'art for art's sake'. The Cournazac and Bernifal

mammoth figures were not made on a casual whim. The long crawl into Nancy's back chamber or under Le Bison's low back vault was not made by accident. Many of the figures in the Beune caves are intentionally hidden in inaccessible places. They were not meant to be viewed by others. They were not made by more than a few individuals, sometimes by a solitary person. If image-making is a type of 'play', it involved serious work, and an awareness of a patterned, cultural behavior. Magdalenian artistic expression was not limited to parietal figures. The images deep in caves, however, have meaning as part of a complex activity involving exploration, personal quest, drawing, and the appropriate cave.

Not all caves have the spatial dynamics that make them a special place. Like the familiar cathedral, Magdalenian image caves often have overhead space. The phenomenology of space opening upward relates to breathing, relaxing, focusing on distance and participating in the unknown. Caves simultaneously employ the dynamics of depth, separation and containment which foster introspective thought. Small chambers within large caves have this effect. Not surprisingly, the spatial configuration of the cave appears in religious architecture across cultures and through time.

The apse in a church is cave-like, as is the naos in a Greek temple. Buddhist cave temples are common in India and China. Each employs architecture separating the inside from

the outside and within have further spatial divisions which foster concentration.

The Beune image caves include the feature of a point of transition, a lowering of the vault and a narrowing of the passage's width, beyond which imagery is placed. The cave itself is a physical structure that allows passing through an actual threshold. Patterns in the phenomenology of space in the Beune caves suggest a ritual use of the cave as a vessel for individual participation in Magdalenian ideology through the act of image-making, but, more importantly, by being in the underground setting.

THE PALEOLITHIC EYE

The cave setting effects a phenomenology of perception directly related to vision and to the play of light and dark. In our world of electricity, ninety degree angles and smooth surfaces, we seldom participate in the imaginative activity of watching a fire in a natural environment. Fire has animate properties. It flares and flickers, devours material, glows, and gives warmth. Watching a fire is mesmerizing. The character of a flame is one of motion, unpredictability, and illumination. Lighting that results from the use of live flame is at once the product of light which makes an area visible, and the cast of shadows which continually change and are an illusion. Form is produced by the play of light on a surface. The flame and the surface

are perceived as one thing by the viewer, and that thing is animate.

Our understanding of Magdalenian imagery and world view hinges on a rediscovery of the visual properties of light made possible in a cave setting. A powerful perceptual agent, fire must have influenced both sight, in delineating form, and thought, in thinking with and about figures. The intrinsic qualities of viewing by the light of a flame include movement, animism, and illusion. In this sense, a torch or lamp in a cave stimulates the imagination.

The jump from abstract form to image is a function of culture and environment. One tends to see what one is familiar with, or what one expects to see. The way we combine images in dreams and then interpret them is one example of the creative process of visual thinking. Image-making, especially in association with light from a flame, is a means of participating in living form, by giving it meaning. Individuals and cultures layer meaning over nature.

The way individuals 'see' is a product of culturally instilled attitudes toward world. Edmund Carpenter's Man and Art in the Arctic indicates a contrast in the way Eskimos and Euro-Americans approach the world. The environment of the Eskimo, characterized by white-outs, winter darkness and uninterrupted expanses of ice and snow, helps to generate a certain attitude of perception.

Nothing in particular stands out; there is no scenery in the sense in which we use the term. But the Eskimo do not see it this way. They're not interested in scenery, but in action, existence.... What exists, the Eskimo themselves must struggle to bring into existence. Theirs is a world which has to be conquered with each act and statement, each carving and song - but which, with each act accomplished is as quickly lost.... [The Eskimo] reveals form, he cancels nothingness.

(Carpenter, 1964 p.3).

The Eskimo carver allows the figure to emerge from the ivory. He does not know beforehand what image lies intrinsically in the medium. As he works, it comes out on its own. Their relationship is active, wherein each participates in the image-making. This attitude is different from that of imposing form onto matter. For Eskimo, the ivory, like the child, already has an essence of its own, which is released, not created. The carving itself has no single point of orientation. It does not have a base of a top. It is meant to be worn, handled and used. The carving is considered an extension of the ivory.

Like many cultures, the Eskimo rely on an "orchestration of the senses" (Carpenter, 1964, p.10).

Once, with visibility zero, I traveled rapidly along a dangerous coast-line, guided by Towtoongi who navigated by the feel of wind and smell of fog, by the sounds of surf and nesting birds, and particularly by the feel of the pattern of waves and current against his buttocks. (Carpenter p. 11)

The Eskimo's participation with the environment helps the Western observer to understand that, for many cultures, the role of the setting is active. This is especially true in the Magdalenian practice of drawing in caves.

Magdalenian engravings are a fundamental expression of their medium. At Le Cap Blanc, half a dozen horses stretch across eight meters of a rock outcropping. A recount of the number of animals leaves one perplexed. Sometimes only a haunch is shown on one animal, or a mere suggestion of a head and neck just beside another's clearly defined ear, eye, forehead and cheek. None of the horses is shown in full, as if they are not complete. Together they flush out a subtle scene. It is a herd of horses, some moving into others, just as one sees a herd of animals - never grasping all at once or seeing an entire horse at one time. Only the sinuous lines of backs, haunches, bobbing necks, legs moving in tandem, tips of ears switching. The details stream by with the movement. Movement is the essence of seeing the parts as whole. Here the paleolithic eye sees in terms of a landscape of moving image. There is no background, no single point of reference. These are living images that move and breathe. The Magdalenian engraver only enhanced what was already there in the rock wall.

Rock surfaces in caves are filled with potential forms. Underground, bulging wall surfaces and flickering lights illuminate some features and mask others. While the nature

of the cave wall influences the imagination, the spatial setting itself also has import.

LASCAUX

Lascaux is the most densely decorated location of Magdalenian imagery known to us. Its painting and engravings are the product of a unique style identifiable by fine details. The archaeological dating of Lascaux, by carbon 14, pollen, and tool analysis, places it between 17,190 ± 140 and 16,000 ± 500 BP, making it perhaps the earliest occurrence of Magdalenian inner-cave art.

The effort to execute the hundreds of figures, including the largest paintings in prehistoric art, suggests that the project was central in the eyes of the community. Remains of scaffolds, hearth sites, tools, paints, and more than one hundred lamps found inside the cave are not all the work of a few individuals. Painting and drawing the hundreds of animals in Lascaux was a cultural event. The cave itself was visited over a period of only 200 years, perhaps much less.

A tradition was established that lived on in Magdalenian legend and practice for several thousand years. Such a lengthy time frame seems implausible, but coincides in its extreme length of consistency with that of other hunting and gathering groups. Australian Aboriginal groups pass down traditional information and practices thought to be thousands of years old. Southern Africa's native San

culture also employs long term traditions. Image-making is an important medium for the flow of information in both of these cultures.

If Lascaux appears as a hallmark of Magdalenian culture, then stylistic elements and the use of certain types of spaces would be continued in the practice of drawing in other caves. This is true of at least three characteristics:

- drawing on the ceiling
- superposed images
- using difficult to reach, isolated recesses for a distinct type of image-making activity (the well).

All three elements exist in many instances of cave drawings. The narrative of the myth and imagery are elusive to us. They entail animal lore, regional use of abstract signs, and marking inner cave spaces. Spatial dynamics do, however, contain meaning.

One of the most attractive caves in the entire region, Lascaux is accessed today by moving down a steep incline of rubble for 10 to 12 meters before entering a large, oval room, with a white dome-like ceiling. This chamber is the Hall of the Bulls. It is more than 7 meters wide, 15 meters long and 4 to 5 meters high. The ceiling arches over the chamber and continues straight back into a more narrow but lofty passage. Huge painted cattle, horses and deer are abundant in a variety of bright colors. Lines of dots and other geometric signs are scattered among the animals.

Another long, straight passage opens in the right wall of the Hall of the Bulls, with paintings and engravings most of its 70 meters. This gallery is spacious as well, until near the end where figures are found even in the narrowest part. The walls are white, chalky limestone.

Lascaux manifests an interesting use of space in the well, a vertical diaclase 5 meters deep, found in the side of the second main passage. The imagery there is very different from that in other parts of the cave. There is an intentional association of figures. They are drawn as stick figures, a contrast to the detailed masses of animals moving above. A human and a rhinoceros are depicted - the only such representations among 300 other figures. A drawing of what appears to be a bird's head on a stick is also present. Fifteen stone lamps, at least one engraved, were found at the bottom of this chamber, along with engraved spear points, pierced seashells, and bits of mineral pigments. The well itself, as a feature of the cave, is carefully enhanced by figures of horses running in a circle in the rounded niche directly above its opening.

Being in a cave is one thing; protected from the elements, with unusual lighting, rock formations and uncertain footing. Being removed from the main area in a cave, in a narrow place of difficult access, where only one or two adults at most can fit, suggests the place is doubly secretive and that part of the purpose of the image is that it be hidden. The lamps that were left or tossed into the

bottom of the cave may have been a type of libation, part of an activity in acknowledging that the recesses of the cave were significant.

The use of the well at Lascaux marks the appearance of a patterned use of such spaces in different caves by Magdalenians. The Beune Valley caves supports this thesis. Bernifal, Cournazac, Comarque, Font-de-Gaume all have tight, hidden areas with images. The anthropological interpretation of Lascaux is as the establishment of a culture pattern, passed down for centuries. The cave was a vessel for Magdalenian expression and is tied intimately to it.

IX. DATING THE BEUNE IMAGE SITES: THE CASE FOR MAGDALENIAN III-IV

One of the problems in studying Upper Paleolithic image-making is that of identifying the images in caves with a particular culture sequence. The Magdalenian period alone spans 7,000 years. At least three distinct phases of tool assemblages are recognized for that time period (Rigaud, 1976). Image-making deep in caves is a specialized activity and would have been framed within a specific cultural complex of beliefs and practices. The argument that certain spatial features configurations of caves were used in the South and Grande Beune Valleys is strengthened by dating those caves to the same time period.

Magdalenian sites are present in the Beune Valleys and on neighboring bends of the Vézère River. A summary of the dated material suggests that this area was frequented during the middle Magdalenian (III-IV), 15,000 - 13,000 BP, and that most of the image sites in the valleys date to this time period. The information presented in this section is derived from carbon 14 dates, floral and faunal analyses and tool styles, and secondarily to figure styles.
See Map 8 for a catalogue of Magdalenian occupation sites in the Beune Valleys and nearby Vézère Valley.

<u>site</u>	<u>m x 2</u>	<u>culture sequence</u>
1. La Madeleine	3000	M iv,v,vi
2. Angle	400	M u
3. Bout du Monde	1500	M vi
4. Liveyre	400	cave M u
5. Pageyral	180	M u
6. Laugerie Haute	5400	M ii, iii Bordes
7. Laugerie Basse	6000	M iv, v, vi
8. Chez-Galou	750	M u
9. Bil-Bas	250	M
10. Abzac	680	cave M u SonnevillBordes
11. Chateau des Eyzies	2000	M vi
12. Peyrille	200	M u
13. Richard	185	cave M vi Daniel
14. Rocher de la Peine	400	M u
15. Guilhem	440	cave M
16. La Gaubert	100	M iii
17. La Mouthe	550	cave M u Riviere 1894
18. Font de Gaume		cave
19. Rey	110	cave M u Riviere 1894
20. Combarelles	250	cave M
21. Crabillat	70	M ii
22. Rocher de Cazelle	270	M Peyrony
23. Barry		
24. Calevie		cave
25. Bernifal		cave
26. Nancy		cave
27. La Greze	50	cave M u
28. Cap Blanc	450	M
29. Four du Laussel	300	M iv
30. Comarque		cave

(sites not indicated as caves are rock shelters)
(M u = Magdalenian; exact sequence unknown)

KEY:

- ▲ = sites > 1500 m x 2
- ▲ = sites > 550 m x 2
- ▲ = sites > 200 m x 2
- △ = sites < 200 m x 2



MAP 7. Distribution of Magdalenian habitation sites or occurrences in the Beune and Vézère Valleys.
(Data from White 1980).

Breuil (1954) divided Magdalenian culture sequences dating from 18/17,000 to 11/10,000 years ago into six categories, I-VI (refer to Chart 1). Bordes (1972) supported Breuil's dating in his work at Laugerie Haute. A 'Protomagdalenian' culture is postulated by some archaeologists for cultures dating as early as 18,000 BP and corresponding to the first phases of Early Magdalenian (I and II). Magdalenian III, which straddles 14,000 BP, typically falls into the early segment of Magdalenian cultural development. Magdalenian III, however, shares many features in common with Magdalenian IV, a culture sequence characterized by greater quantities of the same types of tools, but defined by the new presence of simple bone harpoons. Magdalenian IV - VI constitute the late Magdalenian cultures and are distinguished almost entirely by the complexity of the harpoon designs. They contain the traditional Magdalenian tools and span a time period from 13,000 - 11,000 years ago.

Magdalenian I and II sites are rare and difficult to analyze. They contain a high percentage of scrapers. Magdalenian III witnesses the beginnings of more plentiful bone tools, pierced batons, spear points, and half circle engraved 'baguettes'. Burins and retouched 'lames a dos' are more common. La Madeleine shows a consistent culture sequence of Late Magdalenian levels. The Magdalenian IV level at La Madeleine has everything in common with the Magdalenian III level at Laugerie Haute except for a new

item - the bone harpoon. Magdalenian V and VI levels are present at La Madeleine and contain more burins and a variety of harpoon designs. Scholars are quick to suggest that the actual divisions of the Magdalenian cultures II-VI is vague (Rigaud, 1976). The harpoon is only one of several new appearances in middle Magdalenian material culture. Bone was used for a variety of purposes, including spear throwers, 'bâtons de commandement', and for drawing. In this case, the invention of one element does not signal a culture break, but a continuation and flourishing of new behaviors couched in a successfully functioning tradition. Working with bone did, however, precipitate a new creative pulse, evidenced by the many forms of bone tools, and the drawings on bone and on parietal surfaces at this time.

The number of Early Magdalenian sites is scant compared to the number and size of sites beginning around 14,000 - 13,000 (middle Magdalenian) and continuing into late 11,000 BP. The bone implements allow sufficient relative dating among sites, girded by the number of carbon 14 dates and faunal studies in the Périgord. I suggest that the image-cave sites fall into the same time frame as the appearance of the harpoon and the flourishing of bone tools and bone engraving, from 14,000 - 12,000 BP. This time corresponds to the traditional division Magdalenian III-IV.

Middle Magdalenian levels at La Madeleine include engraved images of horse heads on bone, a very common motif during this time, both in the Périgord and in the Pyrénées.

Two figures of men, one with erect sexual member, also come from this site. Laugerie Basse, which is associated with Laugerie Haute, also contained engraved figures of horse heads, bison or ox and horse, reindeer and a carving of a woman. These images correspond in subject to the imagery found in nearby caves at the same time.

Leroi-Gourhan (1971) employs a separate category of styles in which he categorizes cave images, also using the divisions I - IV. Style III corresponds to the Early Magdalenian culture sequences, and includes Lascaux. Style IV spans the Magdalenian III-VI and has early and late periods. He dates the Beune sites as follows:

Sous-Grand-Lac - style III-IV
Le Bison - style ? (Aurignacien-Perigordian)³
Bernifal - style IV
La Calévie - style III recent
Nancy - style III
Combarelles I and II - style III-IV
Comarque - style III-IV
Cournazac - style (middle Magdalenian)
Cap Blanc - style III-IV
Font-de-Gaume - style III-IV
Lascaux - style III

The Beune cave sites correspond to the time period bridging Leroi-Gourhan's divisions during the middle Magdalenian, or culture sequences Magdalenian III-IV-V. An analysis by style indicates strong similarities among the images in these caves and suggests not only a regional but a temporal

³ Leroi-Gourhan and Breuil considered negative hand-prints and finger scrawls in the mud to be the product of an earlier time period because of the relative simplicity of the technique. The method of dating according to level of 'complexity' of technical achievement is not accepted by the author.

pattern in the use of caves for drawing. Due to the extreme behavior involved in penetrating cave recesses, it is probable that the time period is even more narrow than the dating indicates, and that drawing in deep caves was practiced for a short time between 14,000 and 13,000 years ago.

FAUNAL ANALYSES

Multi-disciplinary studies at Comarque in the last decade provide an excellent profile of the archaeological context (Delluc 1981). Faunal remains consist of 76% reindeer, 10% ox, 6% arctic fox. Pollen analyses reflect a very cold and dry climate, which, even in the moisture-trapping vale of Comarque, reveal only a minute percentage of trees (ash, alder, walnut and some pine) and indicate that the valley outside the cave was a "... landscape without steppe or marsh, ... a prairie constituted by a great variety of grasses, with very few trees." (Delluc 1981 p.14). A carbon 14 date was calculated from material inside the cave and results in the figure $13,370 \pm 340$ BP. This date falls at the end of the Dryas I, a cold and dry period when horse, bison, saiga antelope and reindeer were common. The few tools collected in Comarque, several burins, a scraper, a flake, correspond to the middle Magdalenian tool kit.

Arlette Leroi-Gourhan (Delluc 1981 p.87-88) indicates that the floral profile at Comarque compares in its variety

to only one other paleolithic site, La Marche, also at the end of a valley. This observation suggests that the Beune Valleys were complex ecosystems containing many micro-environments during the Pleistocene, as they do today. Such a landscape would attract inhabitants during severe climates.

Laugerie Haute east and La Madeleine, both sites on great bends in the Vézère River and within 10 kilometers of the Beune Valleys, have similar carbon 14 dates and faunal profiles indicating a cold and dry period (Delpech 1983). The cultural categorization of the level at Laugerie Haute east is Magdalenian III, and dates to $13,970 \pm 480$ BP. The level at La Madeleine dating $13,440 \pm 300$ BP was determined to be Magdalenian IV. Material from the porch at Combarelles also dates to the middle Magdalenian period (Rigaud, unpublished site report circa 1968). Significant overlap in the correspondence of Magdalenian III, IV, and V tools is recently reiterated by Rigaud (1976) and White (1980). They suggest that cultural divisions are not clearly distinguished for this time period.

At Laugerie Haute, La Madeleine, Cap-Blanc and Comarque, faunal remains show two aspects in common. Primarily, the climate is consistently cold and dry at the levels for Magdalenian III-IV, corresponding to the end of Dryas I. Secondly, the percentage of animals represented is almost the same for each site, reindeer bones dominate, followed by horse. Although reindeer were primary in

subsistence strategies during the entire Upper Paleolithic, the presence of other animals changes with slight climatic fluctuations. Combinations of arctic fox, white grouse (adapted to cold climates), vole, saiga antelope, ibex, ox, and chamois are found at these sites during Magdalenian III-IV. The faunal remains indicate that these sites were inhabited at the same time.

La Madeleine and Laugerie are exceptionally large, dense sites and were likely more permanent occupations. In contrast, Comarque, Cap Blanc, Combarelles were probably seasonal camps. Reindeer at Comarque were all killed in the summer (Delluc 1981). Smaller cave sites in the South Beune including Sous-Grand-Lac, Calévie, Nancy, Vielmouly II were no more than brief stops of a few nights at most. The caves in the South Beune may have been overnight hunting camps or ritual excursion sites or both.

Between 14,000 and 13,000 BP a significant shift in faunal remains at habitations sites suggests that horses were hunted more frequently then than at any time before or after in this area during the entire Magdalenian. Horses were moving into the area during the Bolling Period following the high grasses that precede other floral changes before the Dryas II. The appearance of a high percentage of horse bones corresponds to the duration of the Magdalenian IV culture, while Magdalenian V and VI return to a greater than 90% reliance on reindeer (see Chart 2).

A time frame may thus be established for sites in the Beune Valleys and on the Vézère River where both parietal and mobiliery images are found. The sites may be placed within the Magdalenian III-IV cultural phase, and including a correlation with a slightly altered subsistence strategy relying more on horses. Horses are also the most common image found drawn in caves.

THE IMAGES: STYLE AND CONTENT

All of the above mentioned sites have parietal and/or mobiliery imagery. Cap Blanc is famous for its life-size frieze of horses. La Madeleine and Laugerie have numerous examples of engraved bone and rock, which may have fallen from the wall, in their deposits. Although reindeer were consistently eaten at these sites, they rarely appear in the imagery. Horses are the most common, as they are at Combarelles and Calévie. Stylistic analyses of the images further link the caves in the Beune to the same time period. Similarities appear not only in style but in the subject matter of figures uniquely characteristic of this region. At Combarelles, Cap Blanc and Comarque, horses are a dominant theme. They are alike not only as the subject of the engravings, but explicitly in their manner of rendition (see Figure 4).

The horse head is the most prominent figure. Parts of the animal, rarely the entire silhouette are depicted by the engraver who used features of the rock wall to suggest form.

SHIFT from REINDEER to HORSE IN FAUNAL REMAINS

site	level	cult.	date	%reindeer	%horse
------	-------	-------	------	-----------	--------

La Madeleine

c. 11				96%	1%
c. 12				97%	2%
c. 13				93%	6%
c. 14	M v	13,440		63%	35%
c. 15	M iv			87%	12%
c. 16				89%	10%

Duruthy

(deer 16%)	c. 3	M vi	72%	2%
	c. 3'	M v	24%	70%
(ox 45%)	c. 4	M iv 13,510	25%	29%
(ox 30%)	c. 5	M iii	7%	62%

Comarque

(ox 10%)	M iii 13,370	77%	--
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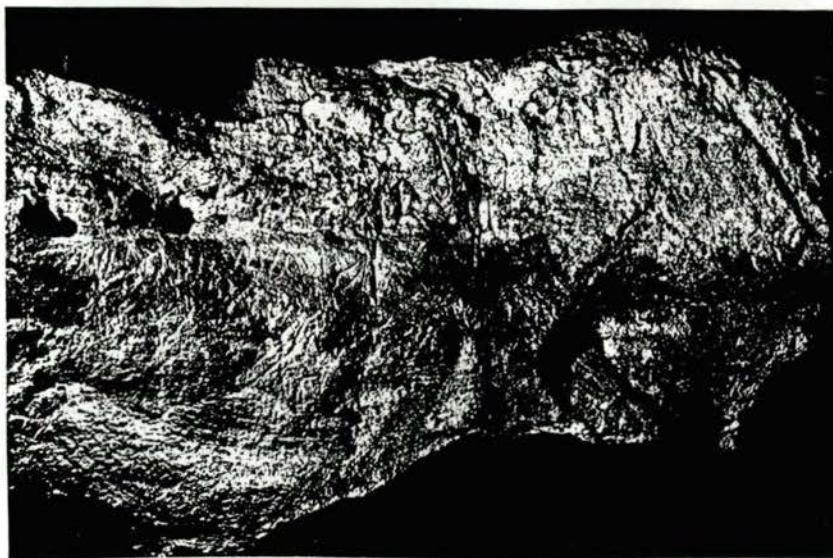
CHART 2. Instances of increased horse remains in
Périgordian Magdalenian sites from Delpech 1983.

Many of these engravings are deep relief, a style characteristic of this region. The horses resemble each other in detail, with strong, rounded cheeks, well muscled necks, ears defined, and head upright and at attention.

Combarelles and Comarque are similar in another aspect of imagery: female silhouettes and genital representations. Simple, abstract forms resembling female torsos have been found in several Magdalenian deposits in Germany and in France. A comparison of the images shows a consistency of the forms through space, although with stylistic variation (Lorblanchet 1977). See Figure 5. Combarelles contains a series of female figures. Comarque's representations are somewhat more simplified but still identifiable. The female silhouettes and genital representations at Comarque are well documented (Delluc 1981). Recently discovered imagery in a small cave in the Isle Valley, called Fontsac, also contains the female silhouettes.

Female genital representations are also characteristic of the middle Magdalenian. Abstract 'vulval' forms sometimes accompany the silhouettes, and sometimes appear alone. Usually rendered by three parallel lines, these images are sometimes in deep relief. One explicit example at Bedheilac in the Pyrénées can be found in a remote side passage where small clay models of horses lie on the ground close to the detailed clay model of a vulva, complete with a piece of stalactite representing the clitoris. Vulval imagery often accompanies figures of horses. Montespan,

Comarque (after Delluc 1981).



(technical analysis of the above)



Combarelles I (after Barrière, L'Art des Cavernes).

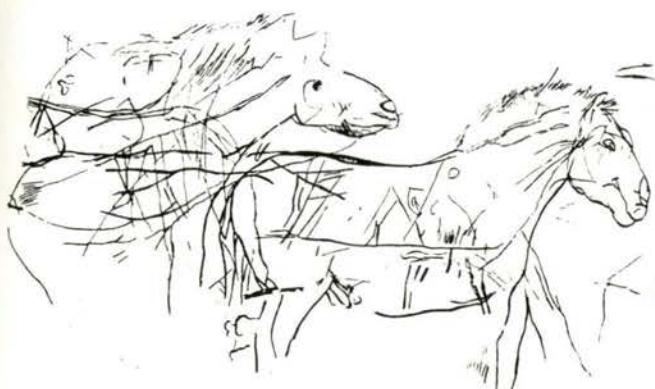


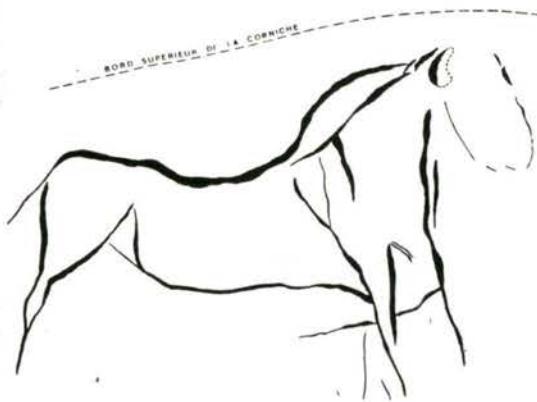
FIGURE 4. A comparison of horse images from Le Cap Blanc, La Calevie, Nancy, Les Combarelles and Comarque.
(continued...)

Le Cap Blanc (after Roussot, L'Art des Cavernes).



(detail of the above)

Nancy. (after Roussot, L'Art des Cavernes).



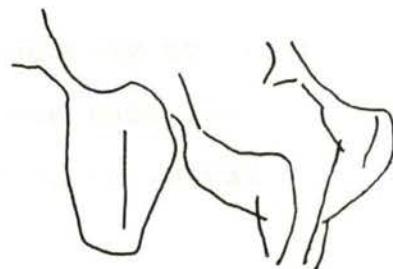
La Calévie (after Aujoulat, L'Art des Cavernes).



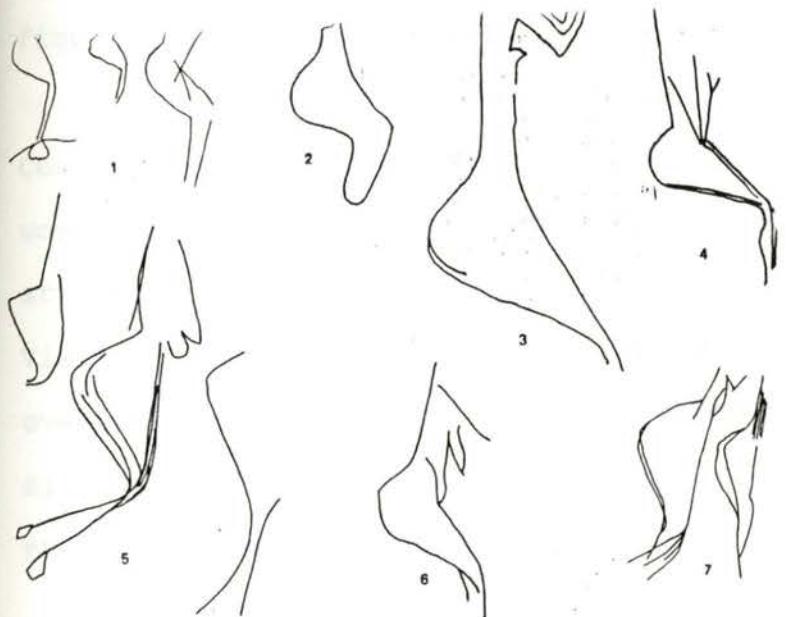
FIGURE 4. A comparison of horse images from Le Cap Blanc, La Calévie, Nancy, Les Combarelles and Comarque.

Combarelles

(after Leroi-Gourhan, 1971).

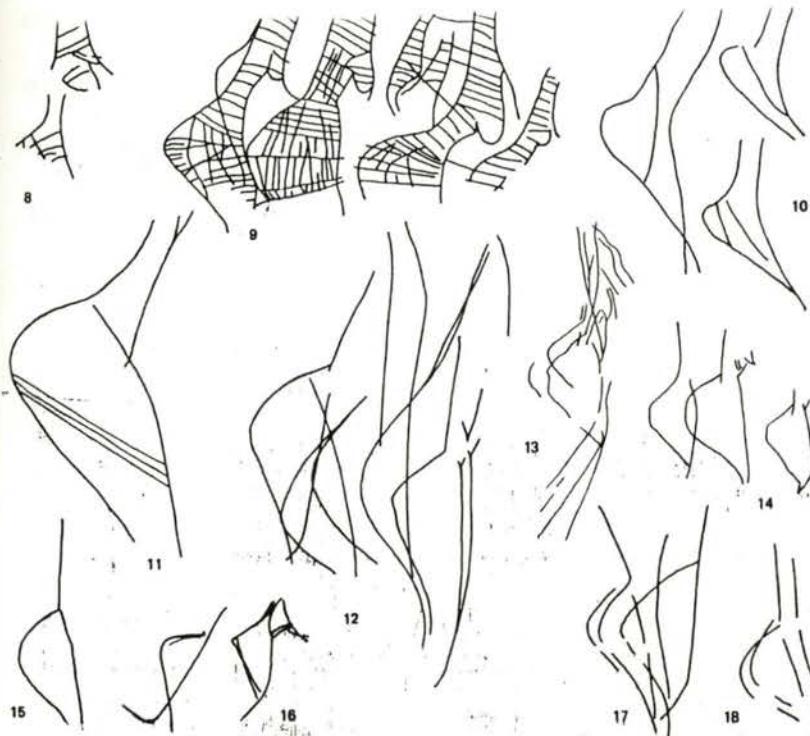


(after Lorblanchet, 1977)



Comarque

(after Delluc, 1981).



Vielmouly II.



FIGURE 5. A representation of Magdalenian
parietal and mobilier female silhouettes.

another Pyrénéan cave, famous for its large clay model of a bear, has many engravings in the back of the same low chamber, with at least two instances of a large vulval figure beside a horse's head.

The connection between the subject matter of Comarque, Combarelles, the Cap Blanc frieze (site of a Magdalenian woman's burial), and the South Beune Valley caves is strengthened in examining the faint representations in Vielmouly II. Inside the final chamber with its expanding overhead space, several engraved lines resemble a female silhouette. Above this, a slightly curving line suggests the back of a horse.

Magdalenian occurrences in the South Beune were found on the right bank at Nancy, a cave with engravings of horses and bison in its recesses, and at the small deposits of Barry (Peyrony, unpublished manuscript) and Cazelle (Lalanne, unpublished site report). This material is categorized as middle Magdalenian. Tools from Bernifal and Calévie on the left bank date to the same time. Calévie's figures are also of horses and a bison, but their depiction is not comparable to those of Combarelles, Comarque and Cap Blanc. This in no way suggests that they are the product of a different time period, only of a different style.

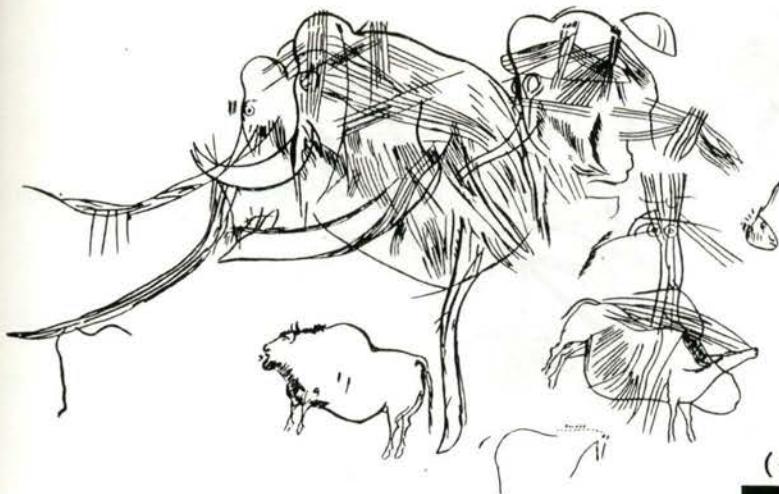
Bernifal has strong ties in subject matter to two other Beune caves, Font-de-Gaume and Cournazac. These caves are dated almost entirely by stylistic comparison of their imagery to Leroi-Gourhan's style IV. Font-de-Gaume was

briefly occupied during several phases of the Upper Paleolithic. Its Magdalenian tools showed signs of use for the numerous engravings but were not representative of an occupation. Cournazac and Bernifal each present only a few burins.

These caves have in common a large percentage of mammoth figures and tectiforms characteristic of the Perigord (see Figure 6). Mammoth bones are not found in living sites dating more recently than the Solutrean in this area. Two exceptions are fragments of mammoth molar, one at La Gare de Couze, a late Magdalenian site, the other at Laugerie Haute east, in the Magdalenian III level (Delpech 1983). It is quite possible that mammoths had not lived in the area for thousands of years. How, then, can we explain the number of mammoth images in the Beune caves?

'Tectiform' is a general term referring to abstract 'signs' that only the Magdalenians understood. Quite possibly, very few Magdalenian individuals had access to that information in their own culture. Tectiforms are not found on mobiliery objects, or near cave entrances. The type of tectiform indigenous to the Beune caves is not found outside the Périgord, one other location being the Rouffignac cave west of the Vézère River Valley. A tectiform is a geometric figure, composed of a series of striated marks, in the form of a 'T' with a base. Non-representational figures in the Pyrénées and the Spanish coast have different shapes, as do those at Lascaux. The

Bernifal (after Roussot, L'Art...).



(detail of the above)



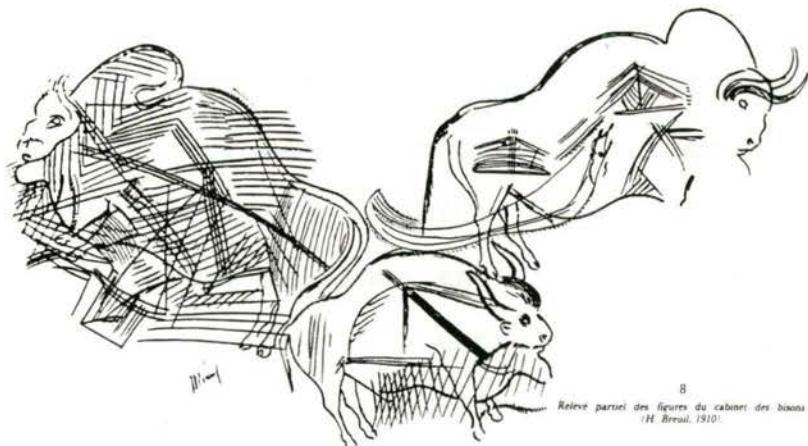
Le Bison (after Roussot, L'Art...).



0 1 2 3 4

FIGURE 6. A comparison of mammoth images and tectiform figures from Bernifal, Le Bison, Cournazac, and Font-de-Gaume. (continued...)

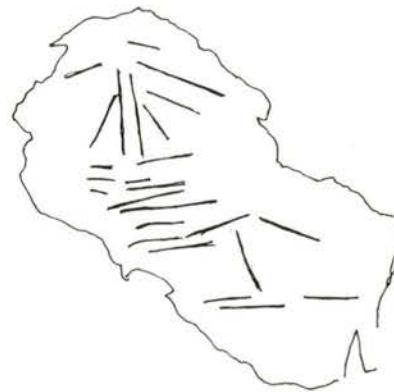
Font-de-Gaume (after Roussot, L'Art...).



(detail of the above)



Cournazac.



Combarelles I (after Barriere, L'Art...).



FIGURE 6. A comparison of mammoth images and tectiform figures from Bernifal, Le Bison, Cournazac, and Font-de-Gaume.

regional limit of the tectiforms, and their positioning in the far recesses of caves suggests that they were a local, secret trait used for a relatively short period of time.

Bernifal, Font-de-Gaume and Cournazac each have mammoths in association with tectiforms. The figures at Cournazac are separated spatially, but they are the only figures in the entire cave. The same use of spatial dynamics is apparent at Bernifal and Cournazac, where the figures of mammoths are found in tall, remote chimneys. These caves are related stylistically and spatially and are a product of the same cultural activity.

Comparing the style and content of images to infer relative dating are most effective in looking at Sous-Grand-Lac, a South Beune cave, and St. Cirq, several kilometers south in the Vézère Valley. See Figure 7. The panel of the man at Sous-Grand-Lac is an association of several elements. The man, hands outstretched, fingers flexed, penis erect, stands near the line of a horse's back. The horse's head is turned around toward the man, a bison's face and horns are nearby. An oval mark and many long straight lines compose the scene. The man's posture is slightly bent, and he seems to tremble.

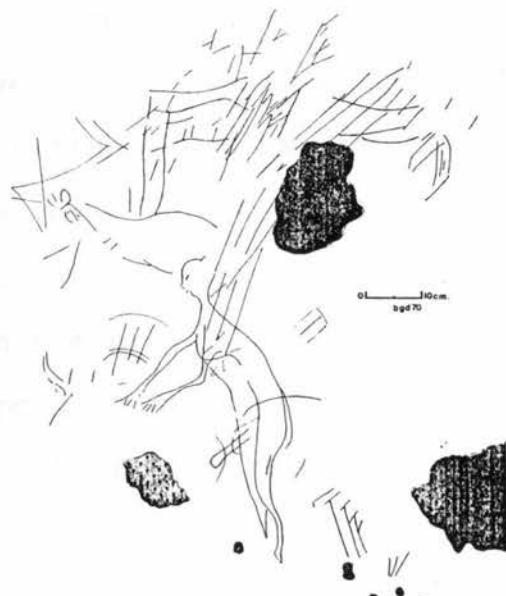
St. Cirq is a small cave in the very dense limestone rock escarpment of the right bank of the Vézère. Two caves look out over the valley before the river. The cave with imagery had a small porch (it's natural form was drastically changed during the Middle Ages, and again in the 20th

Century allow easy access for tourists). Two narrow joints formed a cross in the cliffside which reached 15 meters back. Various animals, including horse and ibex, are engraved in parts of the joint. On the ceiling of the lateral joint, deep inside and just next to its junction with the vertical joint, is the engraving of a man, bent over, with a rounded head, erect sexual member, and arms stretched out in front of him. The front of a horse with a triangular form imposed on its shoulders flanks the man's back side, a crude bison's face and horns face the man, with numerous traces in between.

The combination of the elements of the bent man, with arms outstretched, the presence of a horse and a bison's head, with other nonrepresentational marks was intentional. The same scene is found in two caves in the same region, suggesting a local cultural pattern. They are attributed to Magdalenian III-IV. Sous-Grand-Lac contains remains which include reindeer bones and flint tools. Other images of 'dancing men dressed in animal skins' come from Le Gabillou in the Dordogne (Magdalenian III), and Les Trois Frères in the Pyrénées.

The Beune and Vézère Valleys encompass image-cave sites in association with habitation sites, related by faunal and climatic analyses, with similar tool assemblages (Magdalenian III-IV) and carbon 14 dating. Images in these caves are related in style and subject matter, and by the same use of spatial dynamics.

Sous-Grand-Lac (after Delluc, L'Art des Cavernes)



St. Cirq (after Delluc, L'Art des Cavernes)

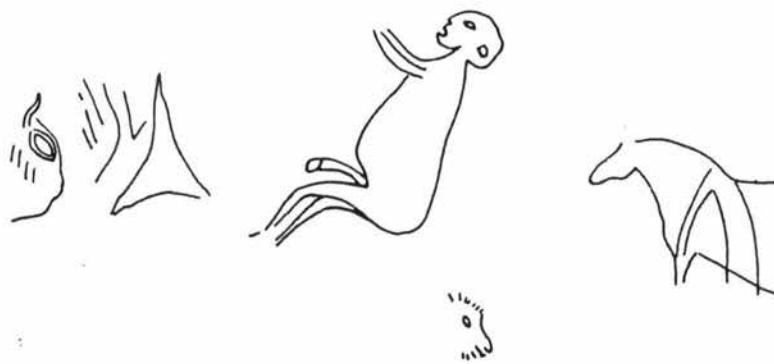


FIGURE 7. A comparison of scenes from Sous-Grand-Lac and St. Cirq.

TWO SPATIO-PHENOMENOLOGICAL PATTERNS

Two patterns emerge in the use of underground spaces. Both are in deep parts of caves and beyond a point of transition. The changes in ceiling space employ vertical and horizontal dynamics which serve to modify the experience of the passage. The effect of such spatial transitions is dramatic. Low spaces flatten the previous experience and heighten the effect of the upcoming taller spaces.

One pattern relates caves that were habitation areas (Combarelles, Comarque) or may have been only briefly (Calevie, Nancy, Vielmouly II). These caves have imagery in their deepest recesses. They frequently are engraved beyond a point of transition, where the vault lowers, then raises again to form a narrow, tall chamber. Combarelles is an exception, its great depth being an element of separation. The imagery in these caves is consistent in theme. The number of horses dominate the animal figures, and female silhouettes and genital imagery are present.

The second category of caves were not habitation sites. They show consistent, dramatic use of upward spaces. Bernifal, Cournazac, and Font-de-Gaume each suggest an intentional seeking out of inaccessible, private areas in caves with substantial overhead space. Spatial transitions are represented in the extreme by the use of vertically oriented joints in Bernifal and Cournazac. They contain images of a different theme, including mammoths and the

Périgordian tectiform. Le Bison also contains a mammoth figure in a back chamber.

The caves themselves figured into the lifeways and ideology of the Magdalenians between 12,000 - 14,000 BP. Image-making in caves in the Beune Valleys was a culturally patterned behavior. It was largely a private activity (opposed to community oriented) as dictated by the spatial configurations described previously. There were at least two specific types of image-making. One was associated more closely with daily life, with horses, an important food, a constant presence in the valley, and an image of specific cultural significance. The female form also finds representation in this context. These subjects are found closer, spatially, to living areas, though they are in cave recesses deliberately apart from the hearth or the group.

If horses and women were commonly found in the image-makers landscape, mammoths and tectiforms were not. These figures were the product of memory, tradition and secret information. They were placed scantily in hidden areas up and away from the main part of the cave and represent a behavior involving few individuals and an exploration of cave recesses. It is possible that spelunking played a role in social bonding between individuals. Footprints in Pyrénées caves suggest that imagery in deep cave areas was used in transmitting information intergenerationally (Pfeiffer 1982, Johnson 1988).

Drawing deep in caves was a Magdalenian behavior which encompassed traditional mythology rich in animal lore and symbolism. Caves were used as containers of powerful ideas and secret activities. Caves, as special spaces, did not store information for others: they are the sites of an individual's momentary interaction with a special setting. They were part of a process which linked the person to the prevailing ideology, to nature and the cosmos, and back again to the group. Magdalenians used caves as a vehicle for complex cultural expression, a practice which peaked in the Périgord between 14,000-12,000 BP. Whether the subject matter was mammoths or horses, men or women, sacred or profane, the cave provided the appropriate context. The cave had its own form and vitality, and its own role in Magdalenian ideology.

X. THE NEED FOR FUTURE STUDIES

This dissertation redresses previous interpretations of Magdalenian caves and cave imagery which emphasize the images to the neglect of the overall setting. The cave setting and the journey underground present the most marked feature of the cultural practice. For this reason, it is useful to consider the experiential element of the cave as content. The caves can, in fact, be considered material culture. They represent half of the equation in the important relationship between image and environment.

It is fortunate that we can experience the representations in their original setting. In the cave we are as close as we will ever be to the original implication of the images. The use of spatial features and the special underground atmosphere were central motivations for Magdalenian people in their use of caves.

Spatial studies of the underground setting are requisite for future work on Magdalenian caves and cave imagery. Mapping the caves in multi-dimensions has become more of a concern in the last decade of French archaeology, a field highly respected for technical detail. Several mapping techniques are being employed (Aujoulat 1987), but there continues to be a need for spatially sensitive

interpretation which relies on concrete data presented in three-dimensional mapping and which allows for phenomenological insights into the use of space. The present work is intended as a model for future studies. Spatial studies of the caves and cave imagery contribute toward delineating culture-specific patterns in the use of space, and in explaining the nature of the individual's participation in cultural ethos and the physical environment.

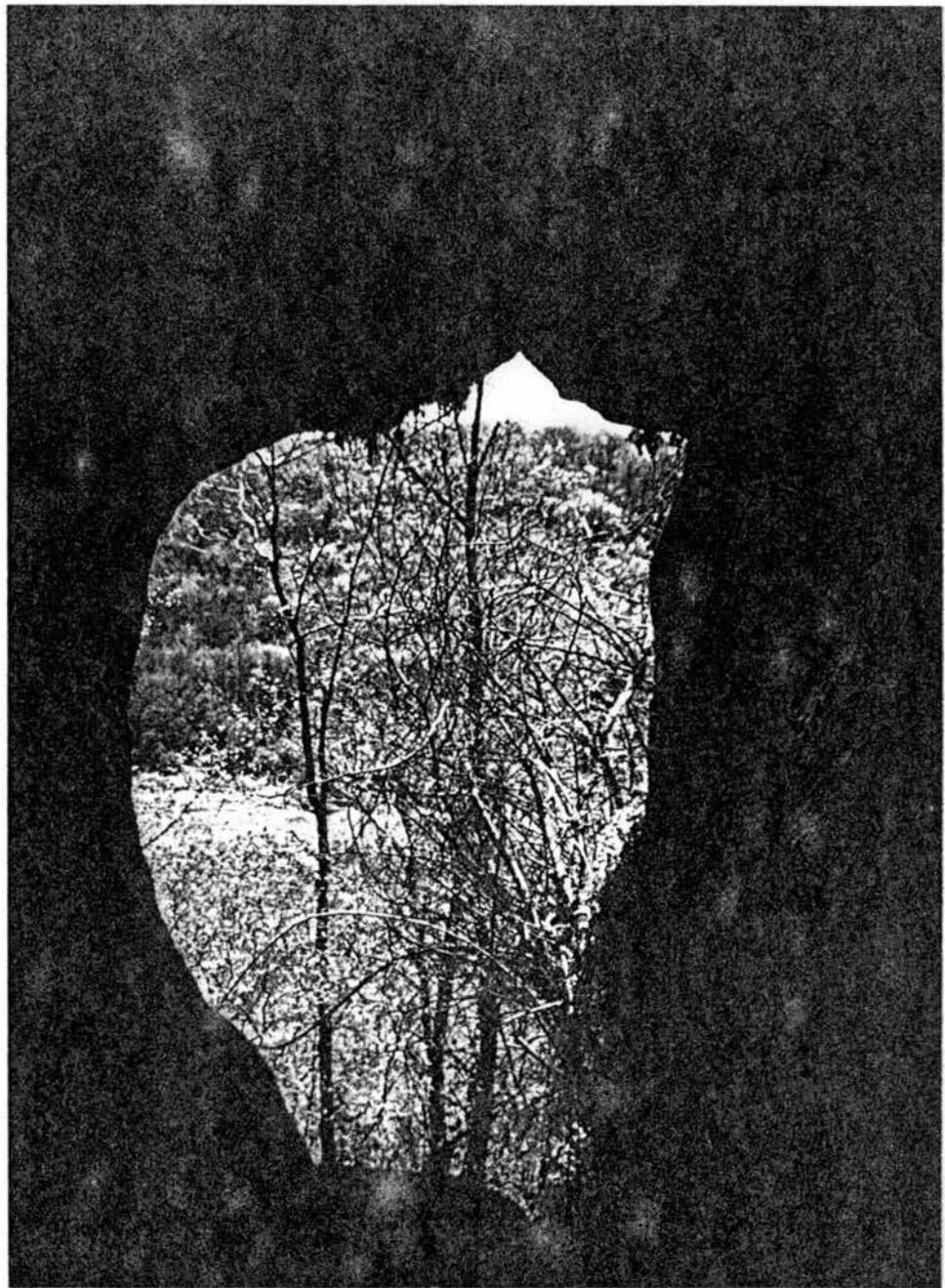


PHOTO 39. Breuil Cave. - silhouette of the entrance.

APPENDIX I

PERCENTAGE OF FRENCH IMAGE CAVES IN THE SURVEY.

The present study examines 6 caves on 1.5 kilometers or 5.3% of French image cave sites.

These caves constitute 18% of image caves in the Dordogne.

The addition of the 4 caves within 4 kilometers of the sector raise the figure to 8.9% of all French image caves, and to 30% of image caves in the Dordogne.

DISTRIBUTION OF IMAGE SITES BY DEPARTMENT.

	<u>total sites</u>	<u>caves</u>	<u>rock shelters</u>
FRANCE	130	112	18
Aquitaine	56		
Dordogne		33	11
Gironde			
Lot-et-Gironde			
Pyrénées-Atlantiques		10	2
(additional unconfirmed sites for Aquitaine = 42)			
Midi-Pyrénées	41		
Ariège		10	
Lot		20	
Rhone-Alps	11		
Ardèche		10	1
Bourgogne			
Centre			
Ile-de-France			
Langedouc			
Roussillon			
Limousin			
Pays de la Loire			
Haute Normandie			
Poitou-Charentes	22	18	4

GLOSSARY

abri - the French term for a rock overhang or rock shelter

anticline - "an arch of stratified rock in which the layers bend downward in opposite directions from the crest" p.91

bâton de commandement - a Magdalenian tool made of antler with a 2 to 3 centimeter wide hole placed in one end, believed to be used to straighten spear shafts and sometimes engraved

burin - "a prehistoric flint tool with a beveled point"
p.188

calcite - a mineral consisting of calcium carbonate, including limestone, chalk and marble

diacrase - the French term for a fissure or joint in the earth

éboulis - the French term of a mass of fallen rocks or rubble

fault - "a fracture in the earth's crust accompanied by a displacement of one side of the fracture with respect to the other and in a direction parallel to the fracture" p.452

grotte - the French term for 'cave'

karst - "an irregular limestone region with sinks, underground streams, and caverns" p.657

marmite - the French term for a pothole, here referring to hollow round formations in the ceiling

mobilier - referring to portable imagery, distinct from 'parietal' imagery on permanent rock walls

molasse - a type of grainy limestone consisting of large particles of marine animals which is very fragile

ochre - "an earthy usually red or yellow and often impure iron ore used as a pigment" p.817

parietal - referring to imagery on permanent rock wall surfaces, as distinct from mobilier imagery

puits - the French term for a well or usually vertical shaft in the earth

spatio-phenomenological - referring to a person's response to both spatial and sensory aspects of the physical environment

tectiform - an abstract, geometric figure found in Upper Paleolithic image caves

All quotes are taken directly from Webster's Ninth New Collegiate Dictionary.

BIBLIOGRAPHY

- Aujoulat, Norbert
1979 "Les Combarelles". Spéléo-Dordogne.
Bulletin du Spéléo-Club de Périgueux (no.73).
- 1987 Le relevé des œuvres pariétales paléolithiques:
Enregistrement et traitement des données.
Paris: Editions de la Maison des Sciences de l'Homme.
- Bachelard, Gaston
1969 The Poetics of Space.
Boston: Beacon Press.
- Begouen, Count
1929 The Magic Origin of Prehistoric Art.
Antiquity (3).
- Billy, Ginette
1976 Les hommes du Paléolithique supérieur.
IN La Préhistoire Française. H. DeLumley, ed.
C.N.R.S. p. 595-603.
- Bordes, Francois
1972 Le Paléolithique dans le monde. Cours ronéoté.
Université de Bordeaux I.
- Breuil, Henri
1954 Le Magdalénien.
Livre Jubilaire, S.P.F., p. 59-66.
- Breuil, Henri
1952 400 Siècles d'Art Pariétal.
Paris: Centre d'Etudes et de Documentation
Préhistoriques.
- Capitan, Dr.
1925 Les figurations des grottes quaternaires.
Actes du Congrès International d'Histoire des
Religions, 1923.
- Carpenter, Edmund
1964 Man and Art in the Arctic.
Browning, Montana: Museum of the Plains Indian.
- Conkey, Margaret
1980 The Identification of Prehistoric Hunter-Gatherer
Aggregation Sites: The Case of Altamira.
Current Anthropology 21 (5).
- Delluc, Brigitte and Giles
1981 La Grotte de Comarque à Sireuil (Dordogne).
Gallia Préhistoire Tome 24, fasc.1.

- Delpech, François
1983 Les Faunes du Paléolithique Supérieur dans la Sud-Ouest de la France.
Paris: Editions du Centre National de la Recherche Scientifique.
- Durkheim, Emile
1915 The Elementary Forms of the Religious Life.
New York: The Free Press.
- Eliade, Mircea
1959 The Sacred and the Profane.
New York: Harcourt Brace.
- Gèze, Bernard and Albert Cavaillé
1977 Guides Géologiques Regionaux: Aquitaine Orientale. Paris: Masson.
- Gideon, Sigfried
1962 The Eternal Present: The Beginnings of Art.
London: Pantheon Books.
- Graziosi, P.
1960 Paleolithic Art.
London: Faber.
- Guichard, Jean
1972 Journées de Rencontre de la Poujade: Rapport de Synthèse. E.S.P.E.R. Association pour l'Essor du Périgord Noir.
- Jochim, M.
1983 "Paleolithic Cave Art in Ecological Perspective"
IN Hunter-Gatherer Economy in Prehistory. G. Bailey, ed. Cambridge: Cambridge University Press.
- Johnson, Norris
1988 Prehistoric European Decorated Caves: Structured Earth Environments, Initiation and Rites of Passage.
IN Child Development Within Culturally-Structured Environments. J. Valsiner, Ed. Norwood, N.J.: Ablex.
- Laming, Annette
1962 La Signification de l'Art Rupestre Paléolithique.
Paris: Picard.
- L'Art des Cavernes.
1984 Atlas Archéologique de la France.
Paris: Ministère de la Culture, sous-direction de l'Archéologie.

- Lartet, E. and H. Christy
1864 Sur les Figures d'Animaux Gravées ou Sculptées.
Revue Archéologique, tome 9.
- Leroi-Gourhan, Andre
1971 Préhistoire de l'Art Occidental.
Paris: Mazenod.
- Lorblanchet, Michel
1981 Les Dessins noirs du Pech-Merle.
Congrès préhistorique de France, XXXI session,
Quercy, 1979. Paris: Société préhistorique française.
- 1977 "From naturalism to abstraction in European
Prehistoric rock art." IN Form in Indigenous Art.
P. Ucko, ed. New Jersey: Humanities Press.
- Munn, Nancy
1973 "The Spatial Presentation of Cosmic Order in
Walbiri Iconography" IN Primitive Art and Society.
A. Forge, ed. London: Oxford University Press.
- Peyrony, Denis
1949 Le Périgord préhistorique: Essai de géographie
humaine, suivi de listes des stations, gisements,
monuments divers connus avec leur bibliographie.
Périgueux: Société historique et archéologique du
Périgord.
- Pfeiffer, John
1982 The Creative Explosion.
New York: Harper and Row.
- Reinach, Solomon
1903 L'Art et la magie.
L'Anthropologie (14).
- Rigaud, Jean-Philippe
1976 "Les civilisations du Paléolithique supérieur en
Périgord" IN La Préhistoire Française. H. DeLumley,
ed. Paris: Editions du Centre National de la
Recherche Scientifique.
- Roussot, Alain
1972 Contribution à l'étude de la frise pariétal du
Cap Blanc. Actes of International Santandar
Symposium, p.87-113.
- 1976 Grotte de Pair-non-Pair, commune de Marcamps.
Union internationale des Sciences préhistoriques
et protohistoriques. 9th Congress, Nice.

- Rouzaud, F.
1978 La Paléospéléologie: L'Homme et le milieu souterrain pyrénéen au Paléolithique supérieur. Toulouse: Ecole des Hautes Etudes en Sciences Sociales.
- Simonet, R.
1981 La Grotte du Cheval a Foix. Bulletin de la Société préhistorique de l'Ariège, XXXVI. p. 21-35.
- Soffer, Olga
1985 The Upper Paleolithic of the Central Russian Plain. Urbana: Academic Press.
- Stevens, Anthony
1975 Animals in Paleolithic Cave Art. Art. March.
- Thiis-Evensen, Thomas
1987 Archetypes in Architecture. London: Norwegian University Press.
- Tuan, Yi-Fu
1977 Space and Place: The Perspective of Experience. Minneapolis: University of Minnesota Press.
- Ucko, Peter and Andree Rosenfeld
1967 Paleolithic Cave Art. New York: McGraw-Hill.
- Vialou, Denis
1986 L'Art des Grottes en Ariège Magdalénienne. Paris: Editions du Centre National de la Recherche Scientifique.
- Webster's Ninth New Collegiate Dictionary
1983 Springfield, Mass.: Merriam-Webster Inc.
- White, Randall
1980 The Upper Paleolithic Occupation of the Perigord: A Topographic Approach to Subsistence and Settlement. (unpublished dissertation) Dept. of Anthropology, The University of Toronto.

BIBLIOGRAPHY OF INDIVIDUAL CAVES

BERNIFAL

- BREUIL (H.) -- *L'Evolution de l'art pariétal...*, 1906,
P. 372-374.
- BREUIL (H.) -- *L'Age des Cavernes...*, 1912, P. 196, 199, 200.
- BREUIL (H.) -- *L'Evolution de l'art pariétal...*, 1935, P.
109, 110, 115, 116.
- BREUIL (H.) -- *Quatre cents siècles d'art pariétal...*, 1952,
P. 288-291.
- BREUIL (H.) -- *Ma vie en Périgord...*, 1960, P. 116, 122.
- CAPITAN (L.), BREUIL (H.) et PEYRONY (D.) -- *Une Nouvelle
grotte à parois...*, 1902, P. 269-270
- CAPITAN (L.), BREUIL (H.) et PEYRONY (D.) -- *Les Figures
gravees à l'époque paleolithique...*, 1903,
P. 219-230.
- CAPITAN (L.), BREUIL (H.) et PEYRONY (D.) -- *Les Figures
gravees à l'époque paleolithique...*, 1903,
P. 202-209.
- CAPITAN (L.), BREUIL (H.) et PEYRONY (D.) -- *La Caverne de
Font-de-Gaume...*, 1910.
- CARTAILHAC (E.) et BREUIL (H.) -- *La Caverne d'Altamira à
Santillana...* 1906, P. 24 et 33 fig. 9 et 11.
- LEROI-GOURHAN (A. j.) -- *Les Religions de la Préhistoire...*,
1964, P. 98, 102.
- LEROI-GOURHAN (A.) -- *Préhistoire de l'art occidental...*,
1965, P. 289.
- NABER (F.), BERENGER (D.) et ZALLJES-FLOSSBACH (C.) -- *L'Art
pariétaire paleolithique...*, 1976, P. 44-45.
- PEYRONY (D.) -- *Les Eyzies et les environs...*, 1903,
P. 34, 36.
- PEYRONY (D.) -- *Fouilles de la grotte de Bernifal...*, 1948,
P. 359-361.
- ROUSSOT (A.) -- *Informations archéologiques...*, 1976,
P. 530-531.
- ROUSSOT (A.) -- *Informations archéologiques...*, 1978,
P. 635-637.
- ROUSSOT (A.) -- *Grotte de Bernifal...*, 1976, P. 104-105.
- SONNEVILLE-BORDES (D. de) -- *Le Paleolithique supérieur en
Périgord...* 1960, P. 427, fig. 246.
- SONNEVILLE-BORDES (D. de) -- *Les Industries des abris...*,
1965, P. 167-180.
- VIALOU (D.) -- *Guide des grottes ornées...*, 1976, P. 75-78.

LE BISON

- DELLUC (B. et G.) -- *Graphismes rupestres non
paleolithiques...*, 1975, P. 165.
- NABER (F.), BERENGER (D.), ZALLES-FLOSSBACH (C.) -- *L'Art
pariétaire paleolithique...*, 1976, P. 49.

- ROUSSOT (A.) -- *Notes de prehistoire en Perigord...*, 1962,
P. 67.
- ROUSSOT (A.) -- *La Grotte du Bison, commune de Meyrals*
(Dordogne) ... 1970, P. 46-51.
- ROUSSOT (A.) -- *Informations archeologiques...*, 1976,
P. 529-530.
- SARRADET (M.). -- *L'Art prehistorique du Perigord...*, 1975,
P. 16.
- VIDAL (P.). -- *Grottes et abris ornés de la vallée de la*
Vézère..., 1967 P. 200.

LA CALEVIE

- BREUIL (H.), CAPITAN (L.), PEYRONY (D.). -- *Une Nouvelle grotte à parois...*, 1904, P. 1132-1133.
- BREUIL (H.), CAPITAN (L.), PEYRONY (D.). -- *Une Nouvelle grotte à parois...*, 1904, P. 379-381.
- BREUIL (H.). -- *Quatre cents siècles...*, 1974.
- BORDES (F.). -- *Informations archéologiques...*, 1970, P. 496.
- DELAGE (F.). -- *Inventaire des grottes et abris...*, 1912,
P. 372-386.
- DESCHAMPS (A.). -- *La Grotte ornée de La Calevie...*, 1973,
P. 4-9.
- GALINAT (B.). -- *Note sur quatre bracelets...* 1973, P. 10-15.
- KUHN (H.). -- *The Rock pictures...*, 1956.
- LAMING-EMPERAIRE (A.). -- *La Signification de l'art...*, 1962.
- NABER (F.). -- *L'Art pariétal paleolithique...*, 1976.
- NABER (F.), BERENGER (D.), ZALLES-FLOSSBACH (C.), PEYRONY
(D.). -- *Le Périgord préhistorique...*, 1949.
- ROUSSOT (A.). -- *Les Découvertes d'art...*, 1965.
- SARRADET (M.). -- *L'Art préhistorique...*, 1975.
- SIEVEKING (A. et G.). -- *The Caves of France...*, 1962.

CAP BLANC

- BONIN (G. von). -- *The Magdalenian skeleton from Cap-Blanc...*, 1935.
- BOUYSSONIE (J.) -- *Une Pierre-figure préhistorique...*, 1927,
P. 313-315.
- BREUIL (H.). -- *Quatre cents siècles d'art pariétal...*, 1952,
P. 282-285.
- CAPITAN (L.) et PEYRONY (D.). -- *Trois nouveaux squelettes humains...* 1912, P. 440-442.
- CONIL (P. A.). -- *Station magdalénienne du Soucy...*, 1900,
P. 244.
- DECHELETTE (T.) -- *Les Recentes découvertes préhistoriques en France...* 1910, P. 206-207.
- DELPECH (F.). -- *Les Faunes du Paléolithique supérieur...*,
1975.
- FIELD (H.). -- *The Early history of man...*, 1927.
- GIEDION (S.). -- *La Naissance de l'art...*, 1965.

- GRAZIOSI (P.).--*L'Arte dell'antica eta della pietra...*, 1956.
- LALANNE (G.).--*Un Atelier de sculpture de l'age du Renne...*, 1910, P. 33-44.
- LALANNE (G.) et BREUIL (H.). -- *L'Abri sculpté de Cap-Blanc...*, 1911 P. 385-402.
- LAMING-EMPERAIRE (A.).--*La Signification de l'art rupestre...*, 1962, P. 52, 221-222, 341-342.
- LAVILLE (H.).--*Climatologie et chronologie du Paleolithique...*, 1975, P. 341-347.
- LEROI-GOURHAN (A.).--*Prehistoire de l'art occidental...*, 1965.
- NABER (F.), BERENGER (D.) et ZALLES-FLOSSBACH (C.).--*L'Art pariétal...* 1976, P. 57-58.
- PEYRONY (D.).--*Notes sur quelques petits gisements...*, 1950, P. 63-64.
- ROUSSOT (A.).--*Cent ans de préhistoire en Périgord...*, 1965, P. 90-96.
- ROUSSOT (A.).--*Contribution à l'étude de la frise pariétale...*, 1972-1973 P. 87-113.
- ROUSSOT (A.).--*L'Abri du Cap-Blanc...*, 1976, P. 85-88.
- ROUSSOT (A.). -- *Observations sur le coloriage de sculptures...*, 1981, P. 200.
- SONNEVILLE-BORDES (D. de). -- *Le Paleolithique supérieur...*, 1960, t. 2: P. 404-406, 473, 509-510.
- VERBRUGGE (A.-R.). --*Le Symbole de la main...*, 1969, P. 268-270.
- VERBRUGGE (A.-R.). --*Le Symbole de la main...*, 1976, P. 352.
- VIALOU (D.).--*Guide des grottes ornées...*, 1976, P. 79-81.

COMARQUE

- BREUIL (H.).--*Quatre cents siècles...*, 1952, p. 285.
- BREUIL (H.), NOUGIER (R.), ROBERT (R.). -- *Le <<Lissoir aux ours>>...* 1956, p. 64.
- BREUIL (H.) .--*Ma Vie en Périgord...*, 1960, p. 119.
- BREZILLON (M.).--*Dictionnaire de la préhistoire...*, 1969, p.75.
- CAPITAN (L.), BREUIL (H.), PEYRONY (D.).--*Nouvelles grottes ornées....* 1915, p. 505-514.
- DELLUC (B. et G.) [et al.]. --*La Grotte ornée de Comarque...*, 1981, p. 1-97.
- GIEDION (S.).--*L'Eternel présent...*, 1965, p. 281-286.
- KUHN (H.).--*Die Felsbilder Europas...*, 1956 (d'après Naber)
- KUHN (H.).--*The Rock pictures of Europe...*, 1956 (d'après Naber).
- KUHN (H.).--*El Arte rupestre en Europa...*, 1957 (d'après Naber).
- LAMING-EMPERAIRE (A.). -- *La Signification de l'art rupestre...*, 1962.
- LEROI-GOURHAN (A.).--*Prehistoire de l'art occidental...*, 1965.

- MULLER-KARPE (H.).--*Handbuch der Vorgeschichte...*, 1966
 (d'apres Naber).
- NABER (F.-B.), BERENGER (D.-J.), ZALLES-FLOSSBACH (C.).
 --*L'Art parietal paleolithique...*, 1976, p. 73.
- NOUGIER (L.-R.) et ROBERT (R.).-- *Le Rhinoceros dans l'art...*, 1957.
- PEYRONY (D.).-- *Le Perigord prehistorique...*, 1949, p. 32.
- PEYRONY (D.).-- *La Sculpture rupestre prehistorique...*, 1950.
- ROUSSOT (A.).--*Les Decouvertes d'art parietal...*, 1965,
 p. 116-117.
- SIEVEKING (A. et G.). -- *The Caves of France...*, 1962,
 p. 65-66.
- UCKO (P.-J.), ROSENFELD (A.). --*L'Art paleolithique...*, 1967.

COMBARELLES I

- AUJOULAT (N.).--*Les Combarelles...*, 1979 P. 12-20.
- BARRIERE (C.).--*La Grotte des Combarelles...*, 1980,
 P. 137-148.
- BARRIERE (C.).--*La Grotte des Combarelles, Releves...*, 1981,
 P. 13-96.
- BARRIERE (C.).--*La Grotte des Combarelles, Releves...*,
 parois gauche 1983. Travaux de l'I.A.P. vol XXV..., 1983.
- BARANDIARAN (T.-M. de). -- *Excavaciones...*, 1962, P. 57-59.
- BOULE (M.).--*Les Gravures et peintures...*, 1901, P. 671-677.
- BREUIL (H.), CAPITAN (L.), PEYRONY (D.).--*Figurations du lion...*, 1905.
- BREUIL (H.).--*L'Age des cavernes...*, 1912.
- BREUIL (H.), NOUGIER (L.-R.), ROBERT (R.). -- *Le Lissoir aux ours...* 1956, P. 15-78.
- BREUIL (H.), BERCER-KIRCHNER (L.). -- *Franko-Kantabrische Felskunst. . .*, 1960.
- BREUIL (H.).--*Quatre cents siecles...*, 1974, P. 90-105.
- CAPITAN (L.), BREUIL (H.). -- *Une Nouvelle grotte...*, 1901,
 P. 478-480.
- CAPITAN (L.), BREUIL (H.).--*Gravures paleolithiques...*, 1902, P. 527-535.
- CAPITAN (L.), BREUIL (H.).--*Les Gravures sur les parois...*, 1902, P. 33-46.
- CAPITAN (L.), BREUIL (H.), PEYRONY (D.). -- *Carnassiers, rhinoceros..* 1906, P. 387-393.
- CAPITAN (L.), BREUIL (H.), PEYRONY (D.).--*Figures anthropomorphes....* 1906, P. 408-415.
- CAPITAN (L.), BREUIL (H.), PEYRONY (D.). -- *Les Combarelles...*, 1924,
- CAUVET (G.). -- *L'Art primitif. . .*, 1902-3.
- COURTY (G.).--*Les Eyzies...*, 1903, P. 10-13.
- DECHELETTE (I.).--*Manuel d'archeologie prehistorique...*, 1.
 1908, P. 20127 1.
- DELAGE (F.).--*Inventaire des grottes...*, 1912, P. 372-386.

- GRAZIOSI (P.). -- *L'Arte dell'antica età...*, 1956, P. 82-83.
 HAENSCH (W.-G.). -- *Die Paläolithischen Menschendarstellungen...*, 1968.
 JELINEK (J.). -- *Encyclopédie illustrée...*, 1976.
 KUHN (H.). -- *Die Felsbilder Europas...*, 1956, P. 133.
 LEROI-GOURHAN (A.). -- *Préhistoire de l'art...*, 1965,
 P. 290-293.
 LUQUET. -- *Sur les caractères...*, 1910, P. 409.
 MINVIELLE (P.). -- *Guide de la France...*, 1970.
 MORTILLET (A. de). -- *Sur quelques figures...*, 1903, P. 43-50.
 MORTILLET (P. de). -- *Le Préhistorique...*, 1911, P. 78-129.
 NOUGIER (L.-R.), ROBERT (R.). -- *Le Rhinocéros dans l'art...*,
 1957, P. 15-52.
 NOUGIER (L.-R.), ROBERT (R.). -- *Les Loups affrontés...*, 1960,
 P. 399-420.
 NOUGIER (L.-R.). -- *La préhistoire...*, 1963.
 NOUGIER (L.-R.), ROBERT (R.). -- *La Frise des lions...*, 239 a
 252 cliches 253 légendes, 1965, P. 18-84.
 NOUGIER (L.-R.). -- *L'Art préhistorique...*, 1966.
 NOUGIER (L.-R.), ROBERT (R.). -- *Scènes d'initiation...*,
 1968, P. 15-98.
 NOUGIER (L.-R.), ROBERT (R.). -- *De l'accouplement...*, 1974,
 P. 15-63.
 PEYRONY (D.). -- *L'Âge des dessins...*, 1909.
 PEYRONY (D. et E.). -- *Gravures pariétales de la galerie de droite...*, 1936 P. 736-739.
 PEYRONY (D.). -- *Le Périgord préhistorique...*, 1949.
 POWELL (TGE). -- *L'Art préhistorique...*, 1967.
 REINACH (S.). -- *Répertoire de l'art quaternaire...*, 1913,
 P. 57-60.
 RICHTER (R.). -- *Paläolithische Sexualdarstellungen...*,
 1954, P. 77-85.
 ROUSSEAU (M.). -- *Les Grands féliniens...*, 1967.
 ROUSSOT (A.). -- *Les Découvertes d'art...*, 1964, P. 99-125.
 SACCASYN-DELLA SANTA (E.). -- *Les Figures humaines...*, 1947.
 SARRADET (M.). -- *Les Combarelles...*, 1971.
 SARRADET (M.). -- *Le Périgord préhistorique...*, (s.d.).
 SIEVEKING (A. et G.). -- *The Caves of France...*, 1962,
 P. 55-65.
 VIALOU (D.). -- *Guides des grottes ornées...*, 1976
 WINDELS (F.). -- *Lascaux...*, 1948.
 ZERVOS (Ch.). -- *L'Art de l'époque du renne...*, 1959.
 SUCHNER (Ch.). -- *Die Menschendarstellungen...*, 1972.

COMBARELLES II

- AUJOULAT (N.). -- *Les Combarelles...*, 1979.
 BREUIL (H.). -- *Quatre cents siècles...*, 1952.
 CAPITAN (L.), BREUIL (H.), PEYRONY (D.). -- *Les Combarelles...*, 1924.
 LEROI-GOURHAN (A.). -- *Préhistoire de l'art...*, 1965.
 NABER (F.), BERENGER (D.), ZALLES-FLOSSBACH (C.). -- *L'Art pariétal....* 1976.

- NOUGIER (L.-R.) .-- *Le Rhinoceros...*, 1957, P. 16-52.
 NOUGIER (L.-R.) .-- *Le << Lissoir aux Saigas >>...*, 1958.
 PEYRONY (D.) .-- *Un Nouveau baton...*, 1934.
 PEYRONY (D.) .-- *Sur l'age des dessins...*, 1909, P. 212-215.
 PEYRONY (D. et E.) .-- *Gravures parietales...*, 1936.
 PEYRONY (D.) .-- *Le Perigord...*, 1949.
 RIVIERE (E.) .-- *Nouvelles recherches...*, 1894.
 ROUSSOT (A.) .-- *Note de prehistoire...*, 1962, P. 67-69.
 ROUSSOT (A.) .-- *Les Decouvertes d'art...*, 1965.
 SAINT-PERIER (R. de) .-- *Inventaire de l'art...*, 1965.
 SARRADET (M.) .-- *L Art prehistorique...*, 1975.
 SONNEVILLE BORDES (D. de) .-- *Le Paleolithique...*, 1960.
 SONNEVILLE BORDES (D. de) .-- *Les Industries...*, 1965.
 VOUVE (J.) .-- *Etude hydrogeologique...*, 1979.

COURNAZAC

- FARDET (B.) .-- *Grottes de Cournazac...*, 1975, P. 15-21.
 ROUSSOT (A.) .-- *Informations archeologiques...*, 1978, P. 639.

FONT DE GAUME

- BARRIERE (C.) .-- *Une Scene anthropomorphe a Font-de-Gaume...* 1969, p. 39-53.
 BREUIL (H.) .-- *L'Evolution de l'art parietal des cavernes...*, 1906, P. 371-377.
 BREUIL (H.) .-- *L'Age des cavernes et roches ornees de France...*, 1912 P. 199-200.
 BREUIL (H.) .-- *L'Evolution de l'art parietal dans les cavernes...*, 1935, P. 108-116.
 BREUIL (H.) .-- *Quatre cents siecles d'art parietal...*, 1952, P. 74-89.
 CAPITAN (L.), BREUIL (H.), PEYRONY (D.) .-- *La Caverne de Font-de-Gaume...*, 1910.
 LAVILLE (H.) .-- *Climatologie et chronologie du Paleolithique...*, 1973.
 LEROI-GOURHAN (A.) .-- *Deux gravures enigmatiques de Font-de Gaume...*, 1965, P. 79-82.
 LEROI-GOURHAN (A.) .-- *Prehistoire de l'art occidental...*, 1965.
 MOISAN (H.) .-- *Une Nouvelle grotte avec figures peintes...*, 1901.
 NABER (F.), BERENGER (D.), ZALLES-FLOSSBACH (C.) .-- *L'Art parietal...* 1976, P. 98-99.
 PRAT (F.), SONNEVILLE-BORDES (D. de) .-- *Dcouvertes recentes...*, 1969, p. 115-132.
 ROUSSEAU (M.) .-- *Les Grands felins dans l'art...*, 1967, P. 70.
 ROUSSOT (A.) .-- *Grotte de Font-de-Gaume...*, 1976, P. 70-74.
 ROUSSOT (A.), FROST (R.) et DAUBISSE (P.) .-- *Une nouvelle lecture des gravures enigmatiques de Font-de-Gaume...*, 1984.

- SARRADET (M.). --*Font-de-Gaume en Perigord...*, 1969.
- SONNEVILLE-BORDES (D. de). --*Le Paleolithique superieur en Perigord....* 1960, P. 160-161 et 320.
- SONNEVILLE-BORDES (D. de) . -- *Les Industries des abris...*, 1965, P. 176.
- VIDAL (P.).--*Le Probleme de la conservation des grottes...*, 1967.
- VOUVE (J.).--*Etude geologique de la colline de Font-de-Gaume...*, 1979.
- VOUVE (J.).--*Grotte de Font-de-Gaume (commune des Eyzies)...*, 1981.

LASCAUX

- BATAILLE (G.).--*La Peinture prehistorique...*, 1955.
- BLANC (S.) .--*Informations: antiquites prehistoriques...*, 1948, P. 395-398.
- BREUIL (H.).--*Une Altamira francaise...*, 1941, P. 347-376.
- BREUIL (H.).--*Lascaux...*, 1950, P. 355-363.
- BREUIL (H.).--*Les Datations par C 14...*, 1954, P. 544-549.
- BREUIL (H.).--*La Caverne peinte de Lascaux...*, 1956, P. 5-16.
- CASTERET (N.). --*Lascaux cave...*, 1948, P. 771-794.
- DELLUC (B. et G.) -- *Lascaux: Art et Archeologie.* Editions du Perigord Noir, 1984.
- FROIDEVAUX (Y.-M.).--*Amenagement des grottes de Lascaux...*, 1955, P. 97-105.
- GLORY (A.).--*Debris de corde...*, 1959, P. 135-169.
- GLORY (A.).--*L'Enigme de Lascaux...*, 1959, P. 586-595.
- GLORY (A.).--*Le Bruloir de Lascaux...*, 1961, P. 174-183.
- GLORY (A.).--*L'Interstade climatique de Lascaux...*, 1961, P. 2-10.
- GRAZIOSI (A.).--*Paleolithic art...*, 1960.
- ICHAC (P.).--*La Grotte a peintures...*, 1941, P. 9-16.
- LAMING (A.). --*Lascaux...*, 1964.
- LAMING-EMPERAIRE (A.). --*La Signification de l'art rupestre...*, 1962.
- LEFEVRE (M.). -- *La Maladie verte...*, 1974, P. 126-156.
- LEROI-GOURHAN (A.). --*Prehistoire de l'art occidental...*, 1965.
- LEROI-GOURHAN (Arl.).--*La Grotte de Lascaux...*, 1962, P. 91-95.
- LEROI-GOURHAN (Arl.) et ALLAIN (J) -- *Lascaux inconnu...*, 1979.
- NABER (F.), BERENGER (D.), ZALLES-FLOSSBACH (C.). -- *L'Art pariétal paleolithique...*, 1976.
- PEYRONY (D.).--*L'Industrie de la grotte de Lascaux...*, 1950, P. 135-137.
- SARRADET (M.). --*Lascaux en Perigord...*, 1970.
- VOUVE U) --*Geologie, colline de Lascaux...*, 1958, P. 2139-2142.
- WINDELS (F.), LAMING (A.). --*Lascaux Chapelle sixtine>>.* ..., 1948.

WINDELS (F.) .--*Lascaux cave paintings.* . . . , 1949.

NANCY

- BREUIL (H.).--*Quatre cents siecles d'art pariétal...*, 1952,
P. 287.
- BREUIL (H.) .--*Ma Vie en Périgord, 1897-1959...*, 1960,
P. 114-131.
- CAPITAN (L.), BREUIL (H.), PEYRONY (D.).--*Nouvelles grottes
ornees de la vallee de la Beune...*, 1915, P. 515-517.
- CAPITAN (L.), BREUIL (H.), PEYRONY (D.). -- *Les Combarelles
aux Eyzies...*, 1924, P. 150.
- COUTURIER (M. A. J.).--*Le Bouquetin des Alpes...*, 1962,
P. 572.
- GOURY (G.).--*Origine et evolution de l'Homme...*, 1948,
P. 418.
- GRAZIOSI (P.).--*L'Arte dell'antica eta della pietra...*,
1956, P. 161, 234.
- LAMING-EMPERAIRE (A.).--*La Signification de l'art
rupestre...*, 1962.
- LEROI-GOURHAN (A.). -- *Prehistoire de l'art occidental...*,
1965, P. 445.
- NABER (F.), BERENGER (D.), ZALLES-FLOSSBACH (C.). -- *L'Art
pariétal paleolithique...*, 1976, P. 144-145.
- PEYRONY (D.).--*Le Périgord préhistorique...*, 1949, P. 32.
- ROUSSOT (A.).--*Cent ans de Prehistoire en Périgord...*, 1965,
P. 121-125.
- ROUSSOT (A.). -- *Les Découvertes d'art pariétal en
Périgord...*, 1965, P. 118.
- ROUSSOT (A.), ANDRIEUX (C.), CHAUFFRIASSE (A.).--*La Grotte
Nancy....* 1966, P. 45-62.
- ROUSSOT (A.).--*Le Cheval dans l'art rupestre des grottes...*,
1967, P. 31-40.
- ROUSSOT (A.), ANDRIEUX (C.), CHAUFFRIASSE (A.).--*La Grotte
Nancy....* 1968, P. 21-50.
- SARRADET (M.).--*Font-de-Gaume en Périgord...*, 1969, P. 58.
- SARRADET (M.). -- *L'Art préhistorique du Périgord...*, 1975,
P. 44.
- SIEVEKING (A. et G.).-- *The Caves of France and Northern
Spain...*, 1962, p. 109.
- SONNEVILLE-BORDES (D. de). -- *La Préhistoire moderne...*,
1967, P. 79.
- UCKO (J.), ROSENFIELD (A.).-- *L'Art paleolithique...*, 1967,
P. 6.

SOUS-GRAND-LAC

- DELLUC (B. et G.).-- *La Grotte ornée de Sous-Grand-Lac...*,
1971.
- DESCHAMPS (A.) et PIERRET (P.). -- *Activités du Speleo-Club
de Perigueux...*, 1969, P. 196.

LEROI-GOURHAN (A.) . -- *Prehistoire de l'art occidental...*,
1971, P. 336.
NABER (F.-B.), BERENGER (D. J.) et ZALLES-FLOSSBACH (C.).
-- *L'Art parietal paleolithique...*, 1976, P. 192.

VIELMOULY II

DELLUC, (B. et G.) -- "Quelques gravures paleolithiques de
la Petite Beune (Grottes de Sous Grand Lac, de
Vielmouly II, et du Charretou)". Sarlat et le
Perigord. April edition, 1987.

OTHER SOUTH BEUNE CAVES

DELLUC, (B. et G.) -- *Quelques Figurations Paleolithiques
Inédites des Environs des Eyzies (Dordogne): Grottes
Archambeau, du Roc et la Mouthe.* Gallia
Prehistoire, tome 16, 1973.

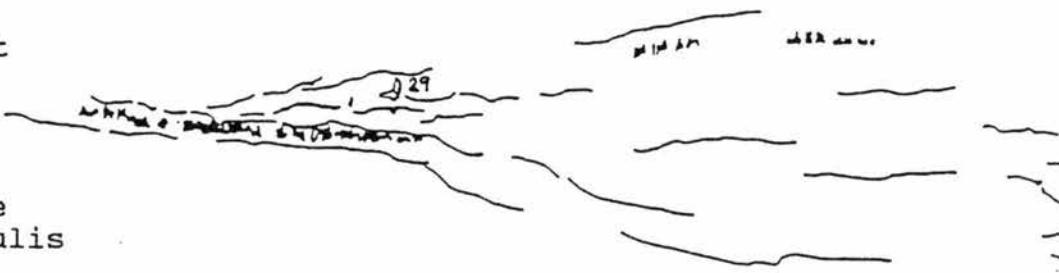
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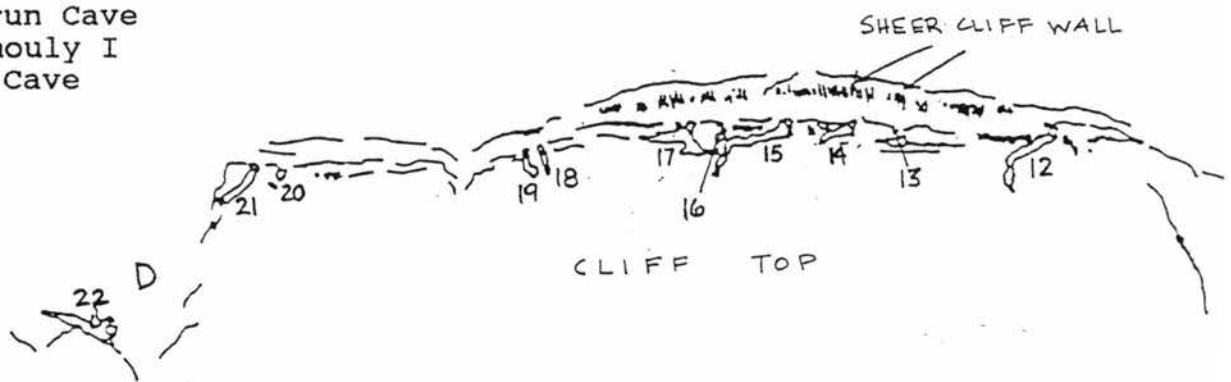
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1. Sous-Grand-Lac
2. mud-choked abri
3. Cave 'A'
4. Grotte de la Pierre
5. Le Bison
6. cavity of éboulis
7. diaclase
8. cavity of éboulis
9. Vielmouly II
10. Grotte du Vent
11. Bernifal
12. Archambeau
13. Cave 'B'
14. Cave 'C'
15. Emanuel's Cave
16. cavity of éboulis
17. La Calévie
18. Cave 'E'
19. Cave 'F'
20. cavity of éboulis
21. Grotte de la Sepulture
22. du Charbonnier
23. Fontmartine
24. Nancy
25. Corner Cave
26. Fox-run Cave
27. Fox-run Cave
28. Vielmouly I
29. Pond Cave

R I G H



V A L L E Y



L E F T

- A. Grand Lac
- B. vale
- C. large vale west of Bernifal
- D. vale
- E. large vale - Le Goulet
- F. Farmhouse

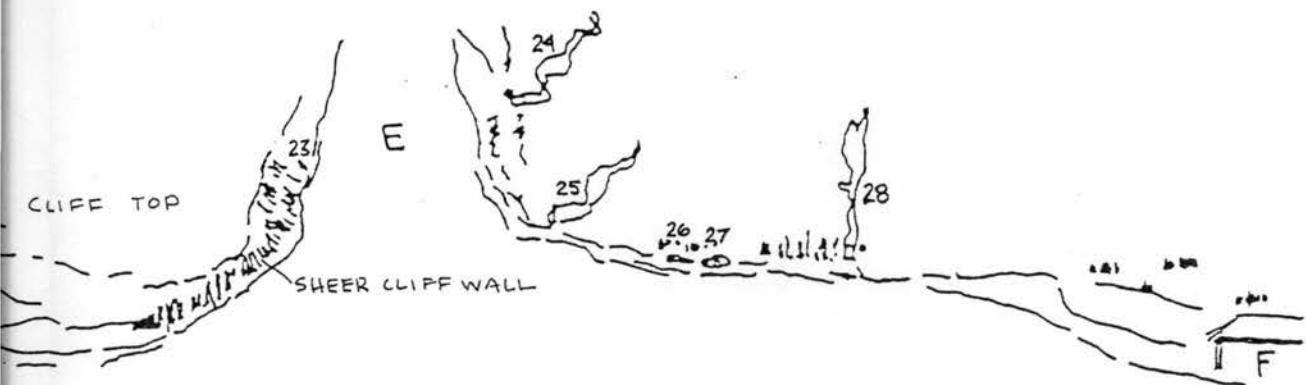
MAP 6. The South sector.

map spans 1.5 kilometers.

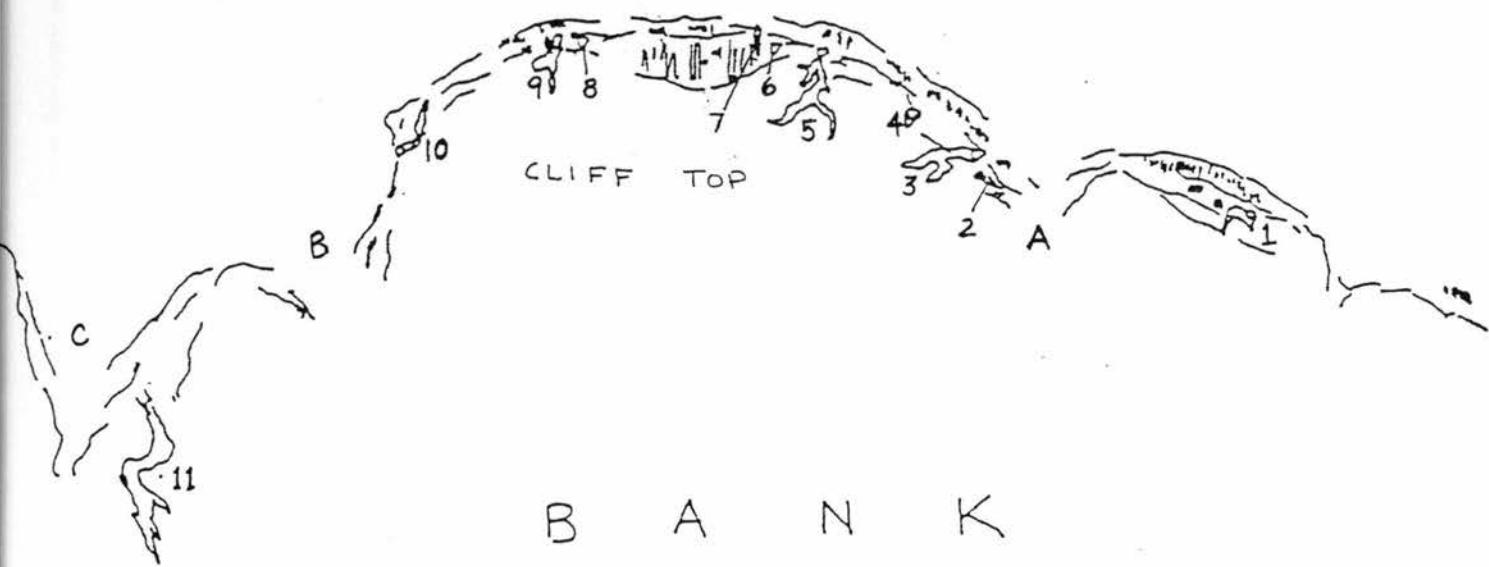
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F L O O R



eune Valley: Detailed map of the study