Tracing Upper Palaeolithic People in Caves

Methodological developments of cave space analysis,
applied to the decorated caves of Marsoulas, Chauvet and Rouffignac,
southern France

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## Contents

1. **Introducing cave art and its research issues** ................................................................. 1

   1.1 Introduction .................................................................................................................. 1

   1.2 Cave art and the Upper Palaeolithic in Europe .......................................................... 2

   1.3 The research history of cave art .................................................................................. 3

   1.4 Theoretical background .............................................................................................. 6

   1.5 Methodology: issues, refinements and developments .................................................. 7

   1.6 Aim and research questions ....................................................................................... 10

   1.7 Research material ...................................................................................................... 10

2. **Analysing cave space: categories, qualities and quantities** ........................................... 11

   2.1 Light zone: natural light .............................................................................................. 12

   2.2 Chamber type: space, artificial light and accessibility ............................................... 13

   2.3 Path network: accessibility ....................................................................................... 16

   2.4 Mode of movement: physical position ...................................................................... 16

   2.5 Available space: number of people ........................................................................ 17

   2.6 Internal conditions: influences on the human health ............................................... 17

   2.7 Archaeomorphological modifications: human engagement and arrangements of the environment ............................................................................................................... 20

3. **Applying the method: reanalysing decorated caves** ..................................................... 20

   3.1 The cave of Marsoulas ................................................................................................. 21

   3.1.1 Introduction to Marsoulas ...................................................................................... 21

   3.1.2 The research history of Marsoulas ........................................................................ 21

   3.1.3 Reanalysis of Marsoulas ....................................................................................... 22

   3.1.4 Summary of Marsoulas ......................................................................................... 24

   3.2 The cave of Chauvet ................................................................................................... 25

   3.2.1 Introduction to Chauvet ......................................................................................... 25

   3.2.2 The research history of Chauvet .......................................................................... 26

   3.2.3 Reanalysis of Chauvet ......................................................................................... 28

   3.2.4 Summary of Chauvet ............................................................................................ 37

   3.3 The cave of Rouffignac .............................................................................................. 40

   3.3.1 Introduction to Rouffignac .................................................................................... 40

   3.3.2 The research history of Rouffignac ....................................................................... 40
Abstract

Upper Palaeolithic cave art research has tended to focus on the images themselves, rather than the physical and social circumstances of their production. This dissertation explores and develops new practice-based ways of investigating cave art. A method analysing features of the cave environment, such as light, space and accessibility, internal conditions etc., and how these relate to traces of human activity, is developed and applied to three decorated caves from Upper Palaeolithic in southern France: Marsoulas (Haute-Garonne), Chauvet (Ardèche) and Rouffignac (Périgord). New insights are suggested into the underlying practice of cave art and its significance in Upper Palaeolithic societies.

L’abstract

La recherche l’art rupestre Paléolithique supérieur a eu tendance à se focaliser sur les images elles-mêmes, plutôt que les circonstances physiques et sociales de leur production. Cette dissertation explore et développe des nouvelles formes d’investigation de l’art rupestre basées sur la pratique. Une méthode pour analyser des caractéristiques de l’environnement de la grotte, comme la lumière, l’espace et l’accessibilité, des conditions internes etc., et comment ceux-ci sont associés à des traces de l’activité humaine, est développée et appliquée à trois grottes de l’époque Paléolithique supérieur dans le sud de France: Marsoulas (Haute-Garonne), Chauvet (Ardèche) et Rouffignac (Périgord). Une nouvelle vision est suggérée pour la pratique sous-jacente de l’art rupestre et son importance dans les sociétés paléolithiques.

Keywords: Palaeolithic cave art ~ Practice ~ Cave space analysis ~ Traces of human activity

Cover picture: Upper Palaeolithic people engaged in cave art practice, illustrated by Marcus Doverdalen 2014
1. Introducing cave art and its research issues

1.1 Introduction

This is a dissertation about research methods in the investigation of Palaeolithic cave art. It aims to explore and develop some of the new practice-based ways of investigating Palaeolithic cave art which are currently emerging in archaeological research (e.g. Pastoors and Weniger 2011). Cave art is a well-established field, but as recent developments have shown, there is still room for new and innovative approaches. Over the many decades of cave art research, archaeological attention has mainly been focused on the images themselves, while the wider cave environment and other relating traces are seldom discussed. In contrast to research on other forms of Stone Age artwork, little attention has been paid to the potential for understanding the process of producing cave art. Captivating as the images are, focusing only on the results of the cave art practice limits research in several ways. In particular, it sees the art as a visually similar result within one tradition, creating an illusion of a homogenous underlying practice. This is also emphasised in the search for the meaning of the art, which implies that all cave art shared the same meaning throughout the whole period, lasting for about 20,000 years. The interpretations surrounding cave art partly emerge from our understanding of the Upper Palaeolithic, as religious and ceremonial societies consisting of a few stereotypical characters, including “the shaman” (e.g. Clottes and Lewis-Williams 1998). Without a more comprehensive approach to this research field, these interpretations lack supporting evidence and the tradition cannot be placed in wider social circumstances, revealing its significance to Upper Palaeolithic societies.

Some of the more practice-based approaches to Palaeolithic cave art that have been put forward thus far will be explored in this dissertation (e.g. Pastoors and Weniger 2011; Delannoy et al. 2013). They emerge from a longer research tradition, as well as current research focusing on non-representational theories (e.g. Fahlander 2012, 2013), which will be reviewed below. After critiquing these approaches, suggestions on refinements and developments will be made. Further, the resulting method will be applied to three painted caves in southern France: Marsoulas (Haute-Garonne), Chauvet (Ardèche) and Rouffignac (Périgord), by reanalysing the existing documentation and comparing the emerging patterns. This will highlight how cave art research needs to be developed and the importance of adequately recording these sites, in order to demonstrate how the cave art practice can be reconstructed. The results of this study bring some new insights into the cave art practice and so into Upper Palaeolithic societies more generally. In particular, they show that the cave art tradition can only be understood as a collective activity, involving input and support from several individuals.
1.2 Cave art and the Upper Palaeolithic in Europe

The Upper Palaeolithic (40,000 – 11,700 years ago) is largely characterised by biological changes as well as behavioural. During this period, Homo sapiens arrived in Europe, where they first coexisted with Neanderthals to later replace them. At the time, Europe was in a period of glacial maximum. The southern parts, however, were covered by a rich tundra and steppe-like environment, but exhibited heavy snowfalls during winter. In these parts, animals (e.g. reindeer, wild horse, bison and mammoth) migrated seasonally to the lowlands during colder periods, followed by human groups hunting them. Thanks to this adaptive behaviour in humans and the ecological possibilities of southern Europe, there was a high increase in population density during this period (Guthrie 2005:18ff, 23f).

The Upper Palaeolithic is also characterised by an explosion in artefacts and within that, an explosion of “art”. A multiplication of the flint blade production and a greater diversity in tool forms and appearance in general, emerged, but also artefacts of ivory, bone and antlers, which appeared to have been produced as ornamentation (Mellars 2001:45f, 49, 51). These artefacts are referred to as “mobile art”, which can be described as “depictions found on small portable objects, excavated directly from archaeological occupation levels” (Mellars 2001:67). One of the most famous types are the Venus figurines, human formed statuettes with extreme female attributes.

This creative explosion was also illustrated on cave walls and in rock shelters, called “pierial art”. This tradition can be traced during 20,000 years, starting around 30,000 years ago and ending around 11,000 years ago at the end of the Ice Age. Animals and abstract signs were engraved or painted, mainly with charcoal (black), manganese oxide (black) or red ochre, often following the natural structure of the stone wall to emphasise contours of the figure depicted (Bahn 2007:12, 19, 21). Most of these sites are found in western Europe, especially in southern France and northern Spain (fig. 1.).

When researchers in the 19th century recognised these illustrations as Palaeolithic they were, and have ever since, been seen as our world’s first masterpieces of art (Conkey and Soffer 1997:2). This concept of “art” should, however, be used with caution. Margaret Conkey and Olga Soffer (1997) stresses that art is cultural and defined as to have an aesthetic function. Since this concept does not even exist everywhere in our modern world it can neither be assigned prehistory (1997:2). This aspect has to be acknowledged in cave art research and even though
the term “art” will be used in this dissertation, it will only be applied as a summarising word for an “imagery tradition” (cave art in this case) and not assigned any deeper meaning.

The parietal art that is found in caves, is often better preserved than that found in open air sites. This is due to the sheltered and stable environment that caves represent. Areas close to openings and entrances are subject to a more external climate than further into the cave, where the atmosphere and temperature is basically unaffected by weather- or seasonal changes (Bourges et al. 2006:1651, 1662). It is mainly this stability in climate that preserves the art, although extremely high humidity can cause bacteria growth and weathering on the walls also further into caves. This is the main reason why decorated caves are fully or partially closed to visitors, since humans contribute to an increase in carbon dioxide levels, temperature increase and stirring dust on the ground, changing the climate of the cave.

There are many theories surrounding cave art and its meaning. Many have emerged due to the isolated and hostile environment of caves, such as ideas of initiation rites and spiritual ceremonies (e.g. Pfeiffer 1982; Clottes and Lewis-Williams 1998). Cave art has also been explained as a response to the population increase that occurred during Upper Palaeolithic, as a need to express oneself ritually and ceremonially (e.g. Mellars 2001:75). It is because of such theories and the application of the concept “art”, that “the shaman” and “the artist” have been created as front figures of the cave art tradition. They also, along with “the hunter” and “the craftsmen”, represent the entire Upper Palaeolithic period.

1.3 The research history of cave art

The following resume concentrates on aspects relevant for this study. For a more comprehensive research history to cave art, see Bahn 2007 and 2011.

At the beginning of the era of cave art research, starting around the 1860s, an evolutionary view still dominated. The art that had been discovered in the deep caves was described as a manifestation of Homo sapiens’ superior intelligence compared to other animals. Thus, the explanations that followed viewed art as something inherent in human nature, which needed to be expressed (e.g. Quatrefages 1875). This also implied that the art, which was interpreted as being made during the Palaeolithic hunters’ spare time, had no profound meaning. The term “art for art’s sake” later came to define this way of thinking (Bahn 2011:349). This view was later challenged by ethnographical analogies. Australian aborigines, along with Inuit and the Bushmen of South Africa, were considered to constitute a living equivalent to the Palaeolithic people, and were therefore to be a mirror to the past. Hunting magic was associated with the
paintings of these people, and so it was hunting magic that would explain the Palaeolithic paintings (e.g. Sollas 1915; Parkyn 1915; Breuil 1952). However, in contrast to the paintings made by modern hunters and gatherers, the Palaeolithic art does not contain any hunting scenes. This later lead to criticism directed to this analogical approach, a criticism presented by structuralist André Leroi-Gourhan (1965) among others. Instead, it was proposed that the distribution of the paintings in the cave should be emphasised. This included studying whether certain motifs had been placed in certain parts of the cave, as well as their quantity (Laming-Emeraire 1962; Leroi-Gourhan 1965). In addition, Leroi-Gourhan stressed that there was an almost identical distributional pattern to be found in all caves, and that these places were to be viewed as sacred (1965). Even though this approach was later dismissed, mainly because we came to know that the decorations and geology of each cave vary, it did provide new insight into cave art research by highlighting the planning of the art’s placement (Bahn 2011:350).

Despite that a greater plan was revealed behind cave art, it was the idea of the caves as mysterious and sacred places that gained momentum. In the 1980’s, for example, John Pfeiffer developed the idea further. He argued that this hostile environment and the paintings provided a natural setting for initiation rites and other rituals (1982). Later on, towards the end of the 20th century, the ideas of shamanism resurfaced once more, this time, however, from a new perspective. Jean Clottes and David Lewis-Williams claimed that the art was the result of a trance, where a shaman depicted the visions with different motifs. Through the trance shamans also contacted the spirit world (1998). After this theory got rejected, due to outdated neuropsychological data concerning trance (Bahn 2011:350), Clottes continued to advocate the concept of caves as a passage between our world and the spirit world. He argued that the Palaeolithic people believed animal spirits tried to emerge from within the walls and by touching the wall and painting the animals, people could access the power of their spirits (Clottes 2005:23). Although the placement of the paintings started to receive more attention, the religious and magical character of the caves persisted (e.g. Clottes 2005). Over the years this interpretation has received little critique, resulting in a widely accepted view that forms the basis for many studies. However, there is little supporting evidence in the images themselves for this kind of interpretation.

This approach has also been strongly criticised by R. Dale Guthrie (2005:9f, 93) who presents an alternative way to interpret Palaeolithic cave art. Guthrie, coming from a scientific discipline, provides a comprehensive background of human evolution, ecology and cognition, before and during the Upper Palaeolithic, in his study (2005). He concludes that the paintings reflected
everyday life and constitute a much simpler explanation than has earlier been claimed. The
animals that were depicted corresponded with the animals that represented the fauna; the
animals that were hunted and eaten. By analysing footprints and handprints in the caves, as well
as highlighting the influence of the male testosterone, Guthrie also argues that the artists behind
the art mostly were young adventurous boys, exploring dangerous places and depicting the
things that occupied their minds: large animals of prey and fertile women (2005:151-208). Of
course, Guthrie’s study provides a classic stereotypical image of cave art and the Upper
Palaeolithic as dominated by male adults or sub adults. This view has in recent years begun to
be contradicted in similar studies also analysing handprints, revealing women as well as small
children taking part in the cave art practice (e.g. Sharpe and Van Gelder 2006; Van Gelder and
Sharpe 2009; Snow 2013).

Like Guthrie, Paul Bahn directs strong criticism towards the ideas of spiritualism, ethnography
and neuropsychology in cave art (2011:354). However, his proposed approach, presented in
2003, emphasises the placement of the art and its similarities to decorated open-air sites from
the same period. Visibility, light and closeness to different features of the landscape are all
major factors often discussed when dealing with open-air sites. Bahn argues that “In exactly the
same way, the natural architecture of caves clearly played a role in the way in which they were
decorated” (2003:14). He continues by stressing the narrow and high locations of paintings in
some caves, where the art is sometimes not even visible to the artist. This theory of “private”
and “public” places, along with the significance of sounds and echoes, and the importance of
light, both artificial and natural, provides the basis of his analysis and arguments. Bahn
concludes that the Palaeolithic people utilised all these premises when painting and that the
actual practice seem to have been as important as the art itself (2003:15f, 18f). This way of
looking at the cave art practice also permeates this study and Bahn’s concept of “private” and
“public” will be considered when interpreting the material at the end of this dissertation.

Others are also increasingly trying to include the context of caves (the surrounding landscape,
local history and to some extent the interior environment) (e.g. Bergsvik and Skeates 2012:3;
Bjerck 2012). In other fields of archaeology, some approaches are focusing more on practice.
This has been done within the chaîne opératoire approach, dealing with the mobile art from the
Upper Palaeolithic. The analysis allows a step-by-step reconstruction of objects, where
production, use and disposal are all investigated in detail. Technological choices and material
preferences uncover differences in values and priorities between the sites and regions studied
(Farbstein 2011:401, 404, 415).
This kind of thinking about processes, practice and choices also needs to be more widely spread when dealing with the parietal art that is found in caves. However, it is obvious that there has been great development when dealing with caves as well as the social life during the Upper Palaeolithic, at least during the last ten years. More of these developments are certainly on the rise, this dissertation included.

1.4 Theoretical background

As mentioned above, little emphasis has been placed on the cave art tradition as a whole. Instead, the explicit practice that is the production of art, along with meaning and representation have remained a central part of research for a long time. This dissertation is therefore influenced by a theoretical framework, mainly the non-representational theory, concerned with practice-based aspects rather than results. These ideas, emerging from the originator of the non-representational theory and the human geographer Nigel Thrift, have since the 90’s been explored within the field of social sciences (e.g. Thrift 1996; MacKenzie 2004). Within this field, underlying practices shaping social structures, such as politics, economics, culture and ethics, are identified in order to understand how these structures function and interact, thus explaining the visible actions and events taking place in societies (e.g. Amin and Thrift 2007). The non-representational theory is thus largely concerned with implicit everyday practice. Criticising beliefs in objects having an inherent meaning and value, Thrift states the importance of our unconscious actions through which meaning is created. There is a constant interaction between the human body and entities surrounding it, where many of the actions are not articulated (1996:7ff). The human geographers Ben Anderson and Paul Harrison explain this further (2010) by exemplifying this phenomenon as a “background” where we are, without noticing, constantly involved in practices. An inherent and already existing meaning and symbolism of things is thus deemphasised and instead highlighted as created through action (2010: 7, 11).

The non-representational theory has, except in the social sciences, shown its strength in Bronze Age rock art research (e.g. Jones 2006), in particular the Scandinavian (e.g. Fahlander 2012, 2013; Sjöstrand 2012). These non-representational ideas in archaeology have mainly been explored in the book edited by Ing-Marie Back Danielsson, Fredrik Fahlander and Ylva Sjöstrand (2012), as well as in the book edited by Benjamin Alberti, Andrew M. Jones and Joshua Pollard (2013). The traditional focus on meaning, symbolism and representation around imagery in archaeology is criticised and it is pointed out how our own knowledge and believes form the way we interpret what we see. Since this difference in perception both varies with time
and with social factors, these books instead engage in non-representational thoughts examining the material aspects of art, its effect on the viewer, and practice.

Mats Rosengren, professor of rhetoric at Södertörn University, also rejects the search for the meaning of art, stressing the little evidence underlying many of these interpretations (2012). Approaching the Palaeolithic cave art from a doxological point of view, he discusses how studying the context and production instead provides verifiable facts, which further can deduce hypotheses. Although this is only discussed in theory, Rosengren’s arguments for leaving the quest of the hidden meaning of art and drawing conclusions out of practice, creation and production, are both essential and fundamental for a comprehensive research.

In short, the non-representational theory largely engages with practical experience and events (Anderson and Harrison 2010: 19). The difficulty, however, lies in the fact that events does not last, but are gone as soon as they are over. This is of course the constant dilemma in all fields of archaeology and one of many reasons why the cave art research has been concentrating on the still existing images. Nevertheless, it is only by including the events and practice behind the art that may provide a more nuanced view of this tradition. These events and actions can be identified by examining all traces that can be related to the cave art tradition, as well as modifications and features of the cave environment. That is, stressing the human activities that are less explicit, at least from our modern perspective. However, this study will also examine the active and conscious choices of the Palaeolithic people to fully grasp the proportion of the cave art practice. Thrift also emphasises how the human senses, not only vision, affect peoples’ thoughts and actions (1996:7). Although some studies have explored the acoustic properties of caves containing art, revealing a correlation between well-decorated areas and high resonance (e.g. Reznikoff 1995), there is a need to include all senses and draw attention to the implicit practice. This requires a method dealing both with the affect the cave environment has on the human body, as well as the affect the human body has on the cave environment.

1.5 Methodology: issues, refinements and developments

The method proposed in this dissertation is partly a development of current ideas, largely those put forward by the Palaeolithic researchers Andreas Pastoors and Gerd-Christian Weniger (2011). In a recent article on cave art, they analyse the human relation to caves by classifying traces of activity, such as drawings, archaeological objects and imprints (not only foot prints, but also charcoal), into four main categories. This is applied to three French caves containing art from the Upper Palaeolithic. The four categories consist of supply location, drawing
location, drawing location with substantial activities and drawing location with consumption activities. Traces are all assessed with equal value (2011:393f). By identifying these locations of activity, the proportion of the cave art tradition becomes clearer, since such locations highlights the planning required underlying the cave art practice. A spatial organisation analysis, more commonly used in urban planning, is also applied to this material, examining features such as light zone, chamber type, path network, available space and mode of movement. By mapping these locations in relation to the mentioned features, their integrative approach manages to reconstruct the adaptation and movement of the Palaeolithic people in caves, providing a comparative research material between caves (2011:380, 393, 395).

As with any method, Pastoors and Weniger’s approach contains limitations. The main problem, however, is also one of the strengths with this method. Including other traces of human activity than just the drawings could reveal much more about the implicit practice and the prevailing conditions than the paintings themselves ever could. As the authors persuasively point out, the locations of activity mentioned above do reveal a probable movement pattern of the Palaeolithic people when residing in the cave as well as an insight to the proportion of the activity, but there is a dating problem. Although Pastoors and Weniger claim that all traces included (drawings, artefacts and imprints) in this pattern are culturally and chronologically coherent (2011:386) making it possible to carry out such an analysis, the dating methods are not accurate enough to show if the traces can be directly linked to the same activity. Therefore, they will be cautiously associated with the cave art practice in this dissertation.

This applies not least when dating the art itself, which falls within very wide frames and is very often dated stylistically. Even radio carbon dating, an absolute dating method that is sometimes used when dating the charcoal in paintings, often gives numerous and more inaccurate outcomes further back in time (e.g. Chauvet cave). In other cases, calcite layers and speleotherm film, partly containing uranium, cover the panels, and even though uranium-thorium dating can be used in these cases, it only dates the covering and not the actual art (Hellstrom 2012:1387f). This issue has not been emphasised by Pastoors and Weniger. Therefore, to avoid far-fetched conclusions, more persistent features that certainly prevailed during the Upper Palaeolithic, such as the cave’s topography, will gain more focus when interpreting the material presented in this dissertation. Traces of fire (charcoal) will also be included to a greater extent than other traces, as fire can be expected to have been an important component while painting in the dark caves and can be dated with some accuracy, though not perfectly as mentioned above.
A second issue that needs clarity concerns the categorisation used by Pastoors and Weniger (2011). The main categories (supply location, drawing location, drawing location with substantial activities and drawing location with consumption activities), which constitute the foundation of their analysis, are poorly described, if at all, at the end of the article (2011:393f). Nor are there any clear explanations of which traces are included in each category. A similar problem concerns the categories of the spatial organisation analysis. They constitute guidelines for questions that should be addressed. However, these are not enumerated by Pastoors and Weniger, and especially the path network-category lacks a comprehensible description (Pastoors and Weniger 2011:385). In general, their analysis works as a brief demonstration on how cave space can be analysed. In this dissertation, these categories and questions will be formulated more explicitly and new analytical categories will be defined to develop a much more detailed method that covers all affecting components in a cave.

While Pastoors and Weniger highlight the cave’s influence on human movement, the study of Jean-Jaques Delannoy et al. (2013) examines human impact on the cave. The cave art itself may be the most obvious modification of the environment, but the article, treating parts of the Chauvet cave and a rock shelter in Australia, mainly deals with the arrangement of geological formations. This does not only include moving around fallen rocks, but also shaping immovable objects (2013:14). The method should be included when analysing all caves. Similar arrangements have been identified in the Cougnac cave in southern France, where stalagmites were removed to clear a surface in front of a panel at some point during the Upper Palaeolithic. Recognising these modifications requires a reconstruction of the prehistoric environment of the cave, tracing the original position of these objects. It is then possible to determine whether this material maintained its natural position, e.g. after a fall, or if humans engaged in its placement. Delannoy et al. present three questions providing the foundation of their archaeomorphological analysis; where, when and how people engaged with the cave environment. In this way, constructed structures and social activities are highlighted (2013:14, 19, 28).

The shared objective of the studies discussed above, as well as the objective of this dissertation, is to examine traces of the activities taking place in caves during the Upper Palaeolithic. The implicit actions related to the cave art practice can be emphasised by developing one comprehensive method, partly based on the work presented by Pastoors and Weniger (2011), and Delannoy et al. (2013). Subsequently, the choices and preferences of the Palaeolithic people becomes clarified. The archaeomorphological approach demonstrated by Delannoy et al. will therefore also be included in the method proposed in this dissertation.
1.6 Aim and research questions

This dissertation aims to explore and develop some of the new practice-based ways of investigating Palaeolithic cave art which have emerged from non-representational ideas in recent years. A new method will be defined and applied to three painted caves in France, in order to highlight the potential of this analysis and identify how this kind of research could be developed further. Below are three overarching questions that form the basis of this dissertation.

- How can a practice-based approach to cave art be put into practice in methods for recording, describing, and analysing cave art sites?
- What potential does a more practice-based approach have for new insights into the cave art practice?
- In what ways should recording and documentation of cave sites be developed to support practice-based approaches?

1.7 Research material

To show the potential of the method developed in this dissertation, it will be applied to three decorated caves: Marsoulas, Chauvet and Rouffignac, all located in southern France (fig. 1.). The cave of Marsoulas is situated near the Pyrenees in Haute-Garonne, and was the first of many decorated caves to be discovered in this area. The 50 metres long corridor that is the Marsoulas cave, has been decorated with 220 depictions, dating to the Magdalenian (18,000-11,700 years ago). Despite the many paintings in this cave, the documentation is not very extensive. This is not the case concerning the cave of Chauvet. Since its recent discovery in 1994 in Pont d’Arc in Ardèche, it has gained attention from many fields, not least archaeology, resulting in many publications. The aesthetics and age of the 420 depictions, dating to the Aurignacian (33,000 – 26,000 years ago) and the Gravettian (28,000 – 22,000 years ago) making it the oldest cave art found, are some of the many special things about this cave. Its unusually vast size has also contributed to the research interest surrounding Chauvet. The cave of Rouffignac is also one of the most investigated and popular caves and has, since its art was recognised as Palaeolithic in the 50’s, attracted many tourists every year. Located in Périgord in Dordogne, as many of the decorated caves, it constitutes one of the most extensive cave systems with art found in Europe. Out of its three levels, the upper contains most of the art (in total 250 depictions), dating to the Magdalenian. This cave have a long research history, which is also reflected in the quantity of documentation.
These caves were chosen based on their mutual location in southern France, but also because of their regional variation, evenly distributed in this part of the country (fig. 1.). Their difference in geological formation, that is, size, general shape of system, as well as spatial features inside, affects the movement and practice in the caves. Thus, this difference has been important when choosing these caves, as well as the difference in documentation quality and quantity. The dating of the art, however, has not been taken into account, because of the inaccuracy of the dating techniques. The potential of the method developed in this dissertation, may be explored by applying it to different types of caves and also by showing to what extent the previous documentation of the caves can be used to answer the questions proposed in the method.

![Fig. 1. Distribution of major cave art and rock art sites in western Europe showing the coastline from the last glaciation. Approximate locations of Marsoulas, Chauvet and Rouffignac added by the author (after Mellars 2001:74)](image)

2. Analysing cave space: categories, qualities and quantities

In this chapter, the thoughts emerging from Pastoors and Weniger, and Delannoy et al., discussed in chapter 1.5, will be used and developed, along with new additions, and will be compiled to one unified method. The categories Light zone, Chamber type, Path network, Mode of movement and Available space, are based on Pastoors and Weniger’s work, while Archaeomorphological modification emerges from Delannoy et al. The category Internal
conditions is, however, solely developed by the author. All calculations in the following chapter are approximate, but nonetheless necessary to provide a better understanding of the cave environment. This method should be viewed as a beginning of a more comprehensive research on cave art, and will hopefully be further developed along with our knowledge of the Upper Palaeolithic and as the archaeological techniques progress.

2.1 Light zone: natural light

This category of questions seeks to investigate how people related themselves as well as the art to cave environments in relation to light. The eye takes in almost all the environmental information that surrounds us. To reside in the darkness of a cave is anything but natural for humans. In this darkness colour vision is also significantly reduced and contrasts become sharper where the light penetrates (Pastoors and Weniger 2011:380f). Light also have a weathering effect on art (Dragovich 1981:147). Due to these factors, it is important to examine where these light zones are present and how they relate to cave art.

François Rouzaud defines the different light zones as “natural light area”, “twilight area” and “dark area” of which all but the first require artificial light (1997:259). These categories are also used by Pastoors and Weniger as well as in this dissertation, but are instead referred to as “daylight zone”, “half-shade zone” and “dark zone” (2011:384). The first step is to establish which of these light zones are present in the cave. In general there is a daylight zone by the entrance of caves, depending on the cave’s orientation, which then naturally becomes a half-shade zone further into the cave and often ends with a dark zone (fig. 2.) (Rouzaud 1997:259). Daylight- and half-shade zones can also be present inside caves if other openings exist. It is, however, important to remember that the amount of light and the light zones are not permanent, but vary both with the sun’s position throughout the day and also during different seasons. Another factor that should not be overlooked is moonlight, which also constitutes a light source. Furthermore, there is a need to consider that openings can change over time and may not exist or be accessible in present days, as they may have been during the Palaeolithic, or vice versa. All these issues requires not only careful surveys but studies over longer periods, lasting for at least a year.

Furthermore, these issues lead to more detailed questions, including what time of the day that the sun- and/or moonlight reaches the caves’ openings and entrances, and if there are ways to reflect/transport the light further in to the caves from these places. In this way it is possible to establish whether the light illuminates special areas and to what extent the different light zones
coincide with paintings, engravings and other traces of human activity. This would provide an insight on how the Palaeolithic people chose to relate their art to the natural light and the dark, and perhaps indicate if this was a daytime or nocturnal activity, or if the time of day had no relevance at all. It would also be interesting to relate the height of the panels or single paintings to the different light zones. Daylight areas higher up may have been pursued or on the contrary, avoided. The height of the panels, measured in metres from the Palaeolithic floor level, may be defined as low (<1 metre), centred (1-2 metres) or high (>2 metres).

2.2 Chamber type: space, artificial light and accessibility

Chamber size is obviously an important factor in studying the Palaeolithic peoples’ movement inside caves. First and foremost, this determines accessibility, which will be brought up in detail later on when looking at available space and mode of movement. Secondly, it also determines the amount of artificial light needed in different types of chambers. Therefore, the categorisation of chambers will be based on the scope of a tallow lamp and a torch, kinds of artificial light that are known to have been used from several caves from the Upper Palaeolithic (Rouzaud 1997:261; Pastoors and Weniger 2011:384).

In order to obtain more precise measurements for the scope of artificial light and thus a categorisation of chamber size, a calculation of illuminance is required. Illuminance (the amount of light illuminating a surface) is measured in lux (lx) using the formula: \[ lx = \frac{lm}{m^2} \], where lumen (lm) is the unit of luminous flux (a measure for detected light intensity), and \( m^2 \)
equals the illuminated area in square metres. In this case, two factors are already known, lx and lm. The light from a Palaeolithic tallow lamp can be compared with the naked flame of a candle. Hence, it is expected to emit an equal amount of luminous flux, which lies in the range between 5 – 15 lm. Further, the illuminance of this light is considered to reach a value of 0.25 lx, about the same as a full moon. With these known factors it is possible to calculate the scope of the light source in metres, with the same formula converted: \( m = \sqrt{\frac{\text{lm}}{\text{lx}}} \). Since the cave environment does not have an absolute reflection, which these calculations assume, Pastoors and Weniger proposes that the final scope should be brought down to 4 metres, instead of lying in the range of 4.47 metres to 7.75 metres (4,47 \( m = \sqrt{\frac{5 \text{ lm}}{0.25 \text{ lx}}} \); 7,75 \( m = \sqrt{\frac{15 \text{ lm}}{0.25 \text{ lx}}} \)) (Pastoors and Weniger 2011:381f). Accordingly, the minimum distance for a tallow lamp would be 4 metres in diameter. A torch however, emits more light than a tallow lamp. Using the same formula it is also possible to calculate the minimum scope of a torch, and thereby determine a suitable categorisation of chambers. However, in this dissertation it has not been possible to establish the lux and lumen for a torch, which therefore will be assigned future research on this subject. Nevertheless, it can be assumed that the scope of a torch is wider than that of a tallow lamp, and thus that the measures for the categorisation of chamber type suggested below, may increase when such calculations can be made. At the moment though, the minimum scope of artificial light (tallow lamp) will be used, to demonstrate the potential of this method.

With the measures based on a tallow lamp, chambers may be divided into six different types: narrow-low (<4 m wide, <4 m high), narrow-high (<4 m wide, >4m high), medium-low (4-8m wide, <4m high), medium-high (4-8m wide, >4m high), wide-low (>8m wide, <4m high), and wide-high (>8m wide, >4m high) (fig. 3.).

![Fig. 3. Categorisation of chamber type based on artificial light (Pastoors and Weniger 2012:385)](image-url)
Only the medium-high and wide-high chambers are too big to be sufficiently lit by one tallow lamp, since the light only reaches one wall at a time. In all other chamber types light will either be reflected from the roof or both walls will be lit, since the height or the width will be less than 4 metres (Pastoors and Weniger 2011:384).

This categorisation of chamber types provides the possibility to establish which of these are present in different caves, hence giving insight into the conditions of the Palaeolithic people residing in this environment. In addition to revealing the amount of artificial light needed, chamber size will also show how traces of human activity relate to the amount of artificial light and space. Looking at cave art, assuming that no other traces offer contradictory evidence, a lower concentration of paintings and engravings could also indicate less activity in specific areas. Although there may be other reasons for the absence of art, for example the degree of preservation that needs to be taken into account, the number of figures and symbols (<1, <5, 5-10, 10-20, >20) can potentially show chambers that were more frequently used for producing cave art, as well as revealing a relationship between the number of depictions and size of the chambers. In addition, it is also interesting to consider whether a particular side of the cave was chosen or preferred to decorate, or if there is any correlation between specific cardinal directions. It is hard to tell just how isolated the Palaeolithic people felt from the outer world, but perhaps a knowledge of the cardinal directions indicate a certain awareness. Another practical dilemma that always needs to be addressed in this research is the height of the paintings and panels (using the division <1m, 1-2m, >2m). This question also relates to light zones, as previously mentioned, and provides insight into what efforts was put into paint or engrave in chambers. If the intention was to paint the ceiling instead of the wall at a comfortable height, there was certainly reason for this, whether it was due to lack of space or a preference.

As Reznikoff conclude in his work on resonance in prehistoric caves (1995), some caves exhibit a correlation between the sound value of a chamber and the amount of art. Although conclusions concerning ritual and magical practices (1995:550) will not be drawn in this dissertation, it is important to include this kind of investigations to establish whether this correlation exists in other caves as well. Sounds and echoes become more intense in the otherwise silent cave, and our hearing become more sensitive when residing in poorly lit areas or darkness, where our vision is not sufficient. Such an investigation is based on vocal resonance in different areas, which depend on chamber size as well as the shape of the walls, durable conditions that most likely prevailed during the Upper Palaeolithic (1995:543f).
2.3 Path network: accessibility

Caves consist not only of chambers but of paths between them. The path network can often be less accessible than the actual chambers, since it tends to be narrower. Nevertheless, cave art is often found in these passages (e.g. Bédeillhac cave, France, Pastoors and Weniger 2011:388). This is therefore another interesting category to investigate more closely. By determining both the different kinds of path network that are present in the cave, and the location of the art and other traces, it is possible to see how these coincide and if there is a higher concentration in certain paths. Some may, for example, contain groups of paintings or engravings while others may only have single ones. This may not only correlate with the size of the path, but also the size of the chamber that the path leads to.

This network has been divided into two groups by Pastoors and Weniger (2011), consisting of side passages and passageways. The former has only one way out, while the latter offer more than one way out. The path network is also linked through connection points. There are several kinds, such as crossings (which connect four communication lines), junctions (which connect three communication lines), dead ends (which do not connect) and entrances (Pastoors and Weniger 2011:385). However, the definitions of these groups are not very clear and are unnecessarily complex in relation to what the analysis requires. There is a need for a reformulation. It is simply an investigation of the location of art and human traces, whether they are found in a dead end, a passage or at an intersection. Since cave networks also may appear to be very complex it is important to keep the definitions simple. Therefore, this dissertation will define the path network (paths narrower than 2 metres, since 2m² is counted as required space for an adult standing upright [see chapter 2.5]) as a dead end, a passage or as an intersection.

2.4 Mode of movement: physical position

This section is based on the categories chamber size and path network. These are essential for establishing where it is possible to walk and/or necessary to crawl or climb in the cave, which will be investigated in more detail in this category (Pastoors and Weniger 2011:385). This also applies to the physical position needed while decorating in the different parts of the cave. Some areas obviously required more difficult positions for the artist, such as on the ceiling. These aspects need to be thoroughly investigated. It is important to be able to determine if the artist could stand upright, needed to stand on something, crouch or lie down while painting. If the panels are located high (>2 metres) it would be significant to examine if there are any natural
ledges close to the panel that could have been of use by the artist. There are also other questions that need to be answered in order to trace the Palaeolithic people, such as how many paintings or engravings that relate to less accessible areas in the cave. The same can be said for other traces, which equally reveal peoples’ activities, and may be even more interesting if the area lack art showing an interest in accessing these difficult places without the purpose of decorating. In the less accessible areas, light zones should also be included as a part of the study. Daylight zones or half-shade zones may have been present during the Palaeolithic, if not today, which may have generated more attention to that specific place.

2.5 Available space: number of people

This section discusses how much space that is available in the various chambers of a cave. These calculations can give us an idea of the maximum number of people (adults) who may have resided in a chamber at the same time, thereby revealing how many people could be included in the cave art activity at the same time. This also reveals the extent to which the artist(s) wanted the art to be visible for others. Bahn’s (2003) concept of “private” and “public” art may be considered here, as to show whether a panel, single depiction or decorated space, where intended for an audience or not. However, a cave chamber is anything but perfectly square, and the presence of children is also possible, meaning that all such calculations in this analysis should be viewed as approximate. Nevertheless, these calculations are still vital in order to move towards an understanding of how Palaeolithic people adapted to the cave environment. A reasonable measure is that one adult would need 2 m² for standing upright. This allows a somewhat free moving space. Thus, a space of 10 m² can be occupied by five people, 20 m² of ten people and so forth (Pastoors and Weniger 2011:385f).

2.6 Internal conditions: influences on the human health

By looking at the internal climate and conditions of caves today it may also be possible to reconstruct the prevailing conditions during the Upper Palaeolithic, since that the cave environment is relatively stable through time. Caves exhibit an external climate close to openings, but an internal climate further in which is stable despite weather- or seasonal changes. The humidity is much higher (close to 100 %) further into a cave than close to openings, which causes cooler temperatures. Confined zones are also common where the air circulation is limited causing denser air with a lower oxygen concentration (Bourges et al. 2006:1651, 1662; Fairchild and Baker 2012:140). Studying these factors will add to the understanding of the
environment that the Palaeolithic people faced when entering the caves and may explain to what extent people chose to move around.

There are a number of factors that needs to be accounted for. These are largely interdependent. This study will mainly deal with factors that may have a direct impact on the human body, such as air circulation, humidity and temperature, which also affects the oxygen level (e.g. the more air circulation, the higher oxygen concentration) and especially the concentration of toxic gases. Air circulation may be attributable to several factors, for instance: cave breathing (the frequency of circulation occurs at short intervals because of changes in barometric pressure) and chimney circulation (differences in air density and temperature resulting in an airflow in the cave system) (Fairchild and Baker 2012:122, 125). A constant air exchange is also provided through fractures and pores in the bedrock and not only through the entrance. Due to these factors, the risk of hypoxia (oxygen depletion) is often minimal (pers. comm. Boyd, 2013.11.05). However, if the space is more restricted and constitutes a lacking air exchange, along with carbon dioxide increase leading to oxygen decrease, this risk increases and other health problems will appear.

There are a number of sources spreading carbon dioxide and therefore constantly reducing the oxygen level. This occurs both in respiration of organic matter (entering the cave through the porous limestone) and increased concentrations in cave water, as well as the decomposition process of organic matter by micro-organisms (existing in bat guano) (Fairchild and Baker 2012:129). If humans furthermore add fire (tallow lamps, torches or hearths) to this constricted environment, more carbon dioxide will be emitted and more oxygen will be consumed. It is safe to inhale a lower concentration of carbon dioxide, up to 1.5 % does not have a toxic effect, but may cause loss of energy. Headache, dizziness and 100 % increased breathing eventuate when the concentration reaches 3 %. At 5 – 10 %, rapid fatigue only after heavy breathing and intense headache occur. Longer exposures of levels higher than 6 % may cause unconsciousness or death. Symptoms such as extreme panting as well as extreme exhaustion and severe headache strike when levels reach 10 – 15 % and suffocation will occur after a few minutes of exposure. Higher concentrations, up to 25 %, will result in certain death (Smith 1997; Langford 2005:229f). Limestone soils measure a level between 0.5 – 1.5 % carbon dioxide, which is why this percentage is often found in limestone caves. However, it is not uncommon that this content is even higher, due to the above mentioned biological processes. In more confined parts in French caves a level of 2 – 5% has been measured (Bourges 2001:686).

Reduced oxygen concentration provides similar symptoms as exposure to carbon dioxide. In a normal atmosphere the oxygen concentration is 21 %. When this concentration decreases, due
to e.g. carbon dioxide increase, the breathing volume and rate increases and thus more oxygen-rich air is inhaled while the exhaled air only contain 15 % oxygen. When the oxygen in the atmosphere reaches concentrations of 15 – 10 %, fatigue occurs rapidly after exertion. Concentrations of 10 – 6 % may result in nausea, vomiting, loss of movement and in some cases brain damage. When oxygen concentrations are less than 6 %, shortness of breath and cramps occur, and eventually death (Smith 1997).

There are obvious reasons to consider these aspects when studying the cave art practice. By measuring the oxygen level as well as the carbon dioxide concentration in different parts of the cave (by the opening, further in, in a narrow space and in a wider space, but especially in restricted areas), it is possible to determine for how long a single person and a group of people could stay in this specific area and what symptoms the Palaeolithic people would experience. The formula presented below can be used to calculate, for example, how low the oxygen concentration will be after a certain time span, in a certain space, with a certain number of people.

\[ L_f = L_i - \frac{tnC}{(V_r - nV_p)} \]

\begin{align*}
L_f &= \text{final oxygen concentration} \\
L_i &= \text{initial oxygen concentration} \\
t &= \text{time lapsed from initial oxygen concentration to final oxygen concentration (s)} \\
V_r &= \text{volume of enclosure (m}^3) \\
V_p &= \text{volume of a person (about 0.1 m}^3) \\
C &= \text{per capita rate of oxygen consumption (3.33 } \times 10^{-6} \text{ m}^3/\text{s, while at rest)} \\
n &= \text{number of people in enclosure}
\end{align*}

However, these calculations are approximate since the amount of inhaled oxygen varies with the state of the person (calm, exhausted, stressed etc.) and the amount of carbon dioxide in the atmosphere. To some extent, this could also depend on whether the person is an adult or a child.

The carbon dioxide level is also regulated by temperature, decreasing with lower temperatures in winter and increasing with higher temperatures in summer (Bourges et al. 2001:686). The most varied climatic zone in a cave is, as previously mentioned, by the entrance, the boundary between the internal and external climate. The effect that this exchange has on the rest of the cave depends on the size of the entrance and the cave’s geological formation, but generally the inner parts exhibit a more stable climate (Rouzaud 1997:259; Bourges et al. 2006:1651). Due to the closely saturated humidity in caves, especially further from openings, the temperature is
often cool, because of evaporation processes frequently occurring (Fairchild and Baker 2012:140). A more stable humidity, temperature and thus level of carbon dioxide, can therefore be expected further into a cave. Looking at the variation of these temperatures during different seasons, and thereby the same variation of the carbon dioxide level, highlights important factors that may have controlled the movement pattern of the Palaeolithic people. This requires an analysis of the then-prevailing climate.

Other toxic gases are also found in cave systems. Just as the level of carbon dioxide varies with temperature so does radon, a radioactive gas that is often introduced into this environment through particles in fluids. Although studies show a close correlation between radon and the development of lung cancer, because radon releases alpha radiation in the lungs, it has no direct impact on humans (this development has been observed in subjects who have been living in houses with radon for over 20 years) (Field et al. 2000:1091; Fairchild and Baker 2012:127f), which is why this will not be included to the same extent in this dissertation.

2.7 Archaeomorphological modifications: human engagement and arrangements of the environment

This category is based on the study of Delannoy et al. (2013) described above. It deals with the human engagement and impact on the cave environment, aside from the art. There are several examples in painted caves where Palaeolithic people modified the inner landscape, for both reasons that seem obvious and other that are less obvious. By reconstructing the Palaeolithic environment, it is possible to establish if material was moved or modified in some way (2013:14). These possible arrangements needs to be studied in relation to the art to reveal whether they could have played a part in the cave art practice. As will be shown later on when discussing the Chauvet cave, arrangements could also have been made to facilitate the accessibility where the terrain is more difficult.

3. Applying the method: reanalysing decorated caves

In this chapter, the potential of the method will be explored through analysis of the caves of Marsoulas, Chauvet and Rouffignac. Each cave will be described individually, starting with a short introduction, followed by a research history and a reanalysis of recording and documentation from several disciplines. Last, a summary of the reanalysis will be made for each cave.
3.1 The cave of Marsoula

3.1.1 Introduction to Marsoula

In 1885 Marsoula cave was discovered in Haute-Garonne near the Pyrenees by the archaeologist François-David Cau-Durban. The vertically raised limestone walls that form the Marsoula cave are a result of a fault. In the cave, artefacts from the Ice Age were found and collected by Cau-Durban, such as worked flint and animal bones. A layer of carbonaceous ash also covered the floor. Graffiti, engraved names and dates bore witness to earlier visits to the cave than that of Cau-Durban, which was why he did not care to more closely examine the red lines he saw on the left hand cave wall, as he assumed that they were modern (Cartailhac 1902:478). Some years later, in 1897, the first Palaeolithic paintings were recognised by Félix Regnault and Marsoula became the first painted cave discovered in the Pyrenees. During the time that followed until the first decennium of the 20th century, the cave of Marsoula was thoroughly explored by several researchers and a great number of paintings and engravings were discovered. Currently, more than 220 paintings and engravings of animals, signs and anthropomorphic figures have been found. Until the end of the 1990s some papers were written about the cave art of Marsoula, among others by the famous French archaeologist André Leroi-Gourhan. The paintings and engravings, most of them well preserved, have been stylistically dated to the middle of the Magdalenian, to around 14,000 – 15,000 years ago (Fritz and Tosello 2007:21, 28; Fritz et al. 2010:4). Among the motifs bison is one of the most common, varying in size from 6 centimetres to 2 metres. Horses are also represented through the whole gallery, with a higher concentration closer to the entrance. The three-dimensional effect that is seen in the pictures is due to the use of natural cracks and bulges in the cave wall, which is said to characterise the art of Marsoula (Fritz and Tosello 2007:27f; Fritz et al. 2010:4).

3.1.2 The research history of Marsoula

Amongst the earliest published documents on the cave of Marsoula was written by Émile Cartailhac in 1902. In this somewhat subjective article, he provide the reader with a clear description of the cave’s interior, one that is still used in articles written today, over a hundred years later (e.g. Fritz and Tosello 2007:21). In its simplicity, Cartailhac’s description takes the reader mentally into the cave making it easy to orientate oneself, which, in general, is a quite rare phenomena in more recent cave art research. Although Cartailhac contributes to a better understanding of the cave environment, there are features in the cave’s topography that could be described even more extensively. Such an addition did not seem to follow with subsequent
researchers to the extent that was possible, where the focus, according to Carole Fritz and Gilles Tosello, has been the iconography (2007:21). They have been leading the research on Marsoulas since the late 1990s, largely working with 3D models. Although they have put more effort into reconstructing the Palaeolithic environment and describing the exact location and size of the panels and paintings of Marsoulas, the focus is still on reconstructing the paintings themselves and their immediate context, which is the structure of the wall (2007:21f; Fritz et al. 2010:2, 5). They have, however, expressed an ambition to include the whole cave, not only the walls covered with paintings, in their 3D models in the future (Fritz et al. 2010:8).

Compared to other decorated caves, there is not much written about Marsoulas. During these 130 years, several researchers have investigated the cave, but only a handful of them have published books and articles, of which only a few are available. Despite this, the information about Marsoulas is richer than on most caves, largely thanks to the interior description made by Cartailhac in 1902.

3.1.3 Reanalysis of Marsoulas

To continue referring to Cartailhac’s description and also adding details from Fritz and Tosello, this reanalysis attempts to provide a clearer insight into the cave of Marsoulas during the Upper Palaeolithic.

During the Upper Palaeolithic the limestone walls that form the 50 metre long corridor (above water) collapsed and left the right hand side hanging on the left wall creating a triangular shape, 3 metres wide and 4 metres high. This does not occur until 20 metres into the cave, where the first part, from the entrance to the collapsed walls, is much wider and higher (Cartailhac 1902:480). Before the collapse occurred, a small rock shelter extended from the present opening of the cave. Today, cultural layers cover this terrace and the first 20 metres of the cave, where the middle- and top layer dated to the same period as the paintings, the Magdalenian. Some flints were discovered in a hearth in the Magdalenian layers, and, as mentioned above, ash, animal bones and smaller flint artefacts were collected from the cave floor by researchers at the end of the 19th century. In the Aurignacian bottom layer, there was a hearth containing artefacts (knives and scrapers) from this period. A big triton shell was also discovered in Marsoulas, an unusual find originating from the waters of Africa (Nature Publishing Group 1932:273; Fritz and Tosello 2004:56; 2007:21).

The corridor is further reduced, about 29 metres from the entrance, to a passage so narrow it is necessary to crawl. With the height slowly increasing, the ground is levelled for another 10
metres after the passage (40 metres from the entrance) and then sharply sloping downwards for 4 metres, reaching a level 6.5 metres lower than the previous. This is a confined zone, which, unlike the part until the slope, exhibits a stable climate and atmosphere throughout the whole year (fig. 4.) (Bourges 2006:1662). It is probable that a higher carbon dioxide concentration exists here, though not necessarily toxic.

The height continues to increase gradually, eventually reaching 5 metres and making it possible to stand upright on the lower level. This level consists of a soft clay layer which then leads to an underground stream 50 metres from the entrance (Cartailhac 1902:480; Fritz and Tosello 2007:21, 25; Fritz et al. 2010:2).

The cave is oriented North-West/South-East. Cartailhac claims that the afternoon sun and especially the light at sunset would reach so far into the cave that the first part of the main panel (in its entirety reaching between 19 and 25 metres from the entrance) would be lit (Cartailhac 1902:480f). If this is true it would mean that the entrance is facing west, a discrepancy which cannot be confirmed in this dissertation. However, with the small rock shelter, probably existing during the Magdalenian, it may not be as likely that daylight penetrated all the way to the main panel.

The first cave art encountered in Marsoulas is located only 3 metres from the present entrance. Because of the more exposed conditions found closer to the external environment, the engravings here are not as well preserved as the art further into the cave (Fritz and Tosello 2007:21). Further in, between 13 and 15 metres from the entrance, a bison has been engraved on the left wall. Even though it has been covered with graffiti, Fritz et al. have been able to reconstruct the original engravings, making it possible to distinguish all the details (2010:4f).
Along the left wall, between 13 and 18 metres, the trench from the 1883-1884’s excavation is still present (Fritz et al. 2010:3).

As previously mentioned, the main panel begins 19 metres from the entrance and is located at the left wall at eye level. With a length of 6 metres, it has a central position in the cave. It is also placed inside the collapsed part of the corridor, although it is hard to tell whether the collapse happened before or after the panel was made. According to Fritz and Tosello, this concentration of well-elaborated paintings must have taken several years to complete (2007:22f). The first 2 metres of the panel alone contain 29 figures: 18 animals and 11 signs, both engraved and painted. Among the animals on the whole panel there are mainly three large bison (one measuring 1,70 metres) and a horse (1,15 metres) that draw the attention of the viewer, not only because of their beautiful design but also because of the use of colours shifting between black, red and strong orange (Fritz and Tosello 2007:22ff). Between 35 and 37 metres from the entrance another panel has been painted. It is thus made after the passage at 29 metres, where the ground is still levelled but the space is very narrow. Located on the right wall it is mainly made up of bison motifs (Fritz and Tosello 2007:22). The final panel was made right after the slope, between 44 and 48 metres, a few metres away from the stream. Here on the right wall four figures were engraved: three bison and an anthropomorphic head. These mark the end of the art in Marsoulas (Fritz and Tosello 2007:22, 25).

### 3.1.4 Summary of Marsoulas

Marsoulas cave is an exceptionally small cave, constituting a corridor only reaching for 50 metres. Its size varies slightly throughout the whole cave, starting off wider in the first 20 metres and then decreasing to a narrow-low chamber, at times making it necessary for the visitor to crawl. After a sharp slope occurring 40 metres into the cave the height increases, becoming narrow-high, making it possible to stand upright again. Given these dimensions, one tallow lamp should be able to sufficiently light the dark zone of the cave. During the Magdalenian, a half-shade zone was probably present in the first few metres of the cave, especially in the afternoon and at sunset.

According to the calculations discussed in the section on *available space*, the entrance zone, up to 20 metres into the cave, could possibly hold 30 people (at least 3 m x 20 m). However, it may not be likely that 30 people would squeeze into such a space. As the collapsed zone begins and the space decreases further into the cave, so does the possible human capacity. Considering the spatial limitations of Marsoulas, and that most paintings seem to be at reachable height from
the present ground level, this does not suggest that producing art in this cave was an extensive activity where a lot of cooperation was needed. However, Cartailhac (1902) mention paintings located too high for modern visitors to reach (covering the easily accessible ones with inscriptions) and some descending below the floor level (1902:480). The thickness of the cultural layers, as well as the less accessible paintings, have not been widely discussed by other authors and it will not be possible to verify this information in this dissertation. If, however, the Magdalenian floor level was notably lower, this indicates that the original height of the paintings were higher than today. Thus, painting the cave of Marsoulas does no longer appear to be a one-man job, but rather an organised operation involving a number of people. The quantity and quality of the art also implies that there may have been several people involved.

Unlike most decorated caves from the Upper Palaeolithic, depictions are found relatively close to the entrance of the cave. Today only a few engravings are visible closest to the opening. Starting at 13 metres, the art is better preserved due to a more stable climate. It is therefore not unlikely that the entrance zone contained both paintings as well as more engravings during the Magdalenian, since this area is subject to an external climate with changing weather, creating variations in humidity, temperature and air flow, which affects the level of preservation. Despite this, there is a high density of art in Marsoulas (220 decorations in a narrow 50 metre long cave), with the highest concentrations in the first 30 metres. This corresponds well with the accessibility, which is gradually reduced further into the cave. The other traces of human activity are all concentrated in the entrance area. All this suggests more intense activity in this part of the cave, whether the traces are chronologically coherent to the cave art or not.

3.2 The cave of Chauvet

3.2.1 Introduction to Chauvet

“In our euphoria we gazed feverishly in all directions, trying to note as many details as possible” (Chauvet et al. 1996:36). When Chauvet cave was discovered in Pont d’Arc, Ardèche, in December 1994, Jean- Marie Chauvet and his team immediately understood the importance of the limestone cave and sealed the entrance with a metal door, which has continued to preserve the paintings and the environment in perfect condition. Chauvet cave, consisting of over 500 metres of network on a single level, is today one of the most famous caves among archaeologists as well as geologists, thanks to its astonishing paintings, calcite formations and its unusually vast size, with some chambers reaching over 50 metres (Chauvet et al. 1996:36, 46, 66, 76). Despite the size of the cave, almost all the walls have been painted and engraved, with a total
of 420 depictions (Pettitt 2008:908). Initially, the paintings were thought to originate from the youngest part of the Upper Palaeolithic, the Magdalenian, because of their complexity and aesthetic design. However, the 50 samples collected for dating the paintings and charcoal proved otherwise. Two main periods were recognised, one dating between 33,000 – 29,000 years ago to the Aurignacian, and the other dating between 27,000 – 25,000 to the Gravettian, making the paintings of Chauvet the oldest yet discovered. Moreover, each of the samples collected from the paintings dated to the previous phase, suggesting another kind of activity, not directly involving the paintings, during the later phase (Lawson 2012:293, 295f).

3.2.2 The research history of Chauvet

Although it has only been 20 years since the discovery of Chauvet cave, many studies have been conducted using the most up-to-date technology possible in order to reveal all the secrets of this extraordinary cave. The number of paintings first counted was doubled over ten years ago, and the complexity and performance of the art has been elucidated thanks to technological advancements (Clottes 2003:210). Although mostly limited to Chauvet, topographical features along with traces of human activity other than the art, have also been assigned more attention. This contributes to the understanding of how the Palaeolithic people utilised the cave space and has resulted in some interesting conclusions. In a book directed and written by Jean Clottes and his fellow researchers in 2003, they concluded that the cave art practice in Chauvet was limited to a small number of people. They do not only argue that the art exhibits the same stylistic features throughout the whole cave, but also that topographic elements were used in the same way, such as hollows and fissures. Thus, according to the authors, this indicates that the artists shared the same ideas and perceptions and therefore it is not reasonable to assume that the cave art tradition involved a larger number of people (2003:149). A desire to draw concrete conclusions appears obvious in this book, and though this theory should not be dismissed, there are examples of larger groups of people sharing the same traditions, values and ideas over long periods, such as religion.

However, the research presented by Clottes (2003) did result in some interesting conclusions, such as distributional patterns among the depictions and several phases of construction concerning some of the panels (2003:149). This research has contributed immensely to the understanding of Chauvet since the publishing of the first book seven years earlier (1996). The first book, written by the discoverers, exhibits a narrative character with the intriguing story of how this cave was discovered (e.g. Chauvet et al. 1996). Its descriptions have been widely used, although it is the book directed by Clottes (2003) that mainly provides the foundation of the
Chauvet research, both for specific studies on Chauvet as well as more overall works on cave art (e.g. Lawson 2012). Clottes’ research contains most components necessary for a comprehensive study of the cave art practice. Archaeological objects and imprint and some of the features presented in the method of this dissertation (e.g. light, mode of movement and chamber size) are highlighted, but not consistently throughout the book. As usual, these aspects are also discussed separately and not to the same extent as the paintings (e.g. Clottes 2003).

This issue is even more apparent in the many articles written about Chauvet. Not surprisingly, the art often constitutes the whole content (e.g. Clottes and Geneste 2007; Fritz and Tosello 2007a; Balter 2008), as the paintings’ complexity in relation to their dating is unique in the parietal art from the Upper Palaeolithic. Even in the famous documentary “Cave of Forgotten Dreams”, directed and written by Werner Herzog (2010), an overview of the interior of Chauvet has largely been excluded, while details of the most astonishing paintings of the cave are well presented. There are also several articles focusing on the dating, since this is still a controversial subject (e.g. Pettitt 2008; Sadier et al. 2012). All disciplines with an interest in Chauvet, whether it is archaeology, climatology (e.g. Bourges et al. 2006), speleology or palaeozoology (e.g. Philippe and Fosse 2003), maintain this separation by not conducting interdisciplinary research. This issue could be associated with the limited amount of space in an article. However, there are a few researchers that deal with Chauvet in a wider sense, even in articles.

One example of a more interdisciplinary article is the study of Yanik Le Guillou (2005), where art related to specific morphological features of the cave, that is, art located in places difficult to access, have been investigated. This relationship, between these features and art, has emerged from a wider analysis of the cave environment, made in the same study. In this way, the choices made by the Palaeolithic people visiting the cave become clearer and a deeper understanding of the practice behind the art can be obtained. Le Guillou concludes that the prehistoric adult man (debatable) had an interest in the cave environment and utilised even the least accessible areas (2005:117, 119f, 127, 130f). As described in chapter 1.5, Delannoy et al. (2013) also investigate the actions and movement of the Palaeolithic people in Chauvet, using the cave’s morphology, although highlighting the active human modification and arrangement of cave space (2013:14). The conclusions reached may not seem revolutionary. However, these kinds of studies, using knowledge from different fields, are important components in understanding the human activity in caves, including the cave art practice. The following reanalysis builds on several works on Chauvet, in order to obtain an overview as complete as possible.
3.2.3 Reanalysis of Chauvet

Today, the only accessible entrance into Chauvet cave is through a passage that drops 10 metres before reaching the actual cave. However, it is not likely that this passage was used during the Upper Palaeolithic, since it has been widened with erosion from the narrow size it was found in, during many thousands of years. A rock fall sealed the original entrance, probably not long after the Palaeolithic peoples’ visits in the cave, which left the environment perfectly preserved (Lawson 2012:293f). Entering the cave from the original entrance, daylight would have lit up the first part of the cave. In this area, called The Entrance Chamber, no artwork has been discovered. This chamber splits up into two different chambers: The Brunel Chamber to the right and The Chamber of Bear Hollows to the left (fig. 5.) (Clottes 2003:62; Herzog 2010; Lawson 2012:297).

A third chamber is connected to The Brunel Chamber, called The Morel Chamber, which is entered by a narrow passage that is only possible to crawl through. Probably to facilitate the accessibility through this passage, stalactites have been broken off during the Palaeolithic. A chaotic loggia opens up after the passage. Thanks to the height of the ceiling at the beginning of this area, it is possible to stand upright, despite the uneven calcite layered floor. However, further in the height decreases and it is necessary to crouch. Despite all these difficulties, The Morel Chamber contain several paintings and engravings, such as red dots on the ceiling, engraved lines and spots of charcoal on the walls, probably from torches. Another smaller chamber appears along the right wall. It is also entered by crawling, but does not contain any traces of human activity. Compared to the rest of the cave, The Morel Chamber is difficult to access and is screened from the rest of the cave, and although it seems impossible, traces of cave bear and ibex have been found here. These traces suggests that at some point there must have been a way to enter the chamber from the outside, since it is not reasonable that an ibex or a cave bear could squeeze through the passage from within the cave. Whether such an outer entrance existed or was used by the Palaeolithic people is hard to tell (Clottes 2003:62; Herzog 2010; Lawson 2012:297).

When entering the cave from the modern entrance, The Brunel Chamber is at the end of the passage. The dark red floor of this vast chamber, 40 metres wide and 30 metres high, gives a chaotic impression as it has been covered with many stone blocks and stalagmite formations. This cluttered environment was also present during the Palaeolithic, since the people entering the cave chose to paint on these fallen blocks and formations. In one of the concretion draperies, the Palaeolithic people placed a flint flake. Almost all the paintings in here are visible at
distance. Every panel, except the first mentioned Sacred Heart Panel, are located on the right side of the chamber. They have all been painted in red ochre contrasting the light walls and ceiling, containing six panels in total: The Sacred Heart Panel (6 x 3 metres covered with red palm prints), The Panel of Dominoes (symbols, the black head of a feline and red palm prints, palm prints made above concretion in ceiling), The Alcove of the Yellow Horses (two of three horse heads in yellow, symbols and a roof pendant with red palm prints), The Panel of the Dotted Animal (red palm prints forming a body of an animal), The Recess of the Bears (two cave bears made with a red outline and a thirds head painted in a violet colour, and two ibex) and The Engraved Stoup (two superimposed engraved horses). The Recess of the Bears is accessed through a low passage, only 70 centimetres high. Before it emerges into the small rounded space that is The Recess of the Bears, the passage widens after a few metres. At the back of the recess it is not possible to stand upright (Clottes 2003:17, 47, 64, 69, 71; Lawson 2012:294, 297f).

The largest chamber in Chauvet cave is The Chamber of Bear Hollows, 40 metres wide and 70 metres long, consisting of few stalactites and an exceptionally flat floor (probably due to an ancient lake), which emphasises the size of the chamber (Chauvet et al. 1996:66; Lawson 2012:294). However, as the name of the chamber implies, there are several nests or hollows dug out in the floor by cave bears, and bear and wolf tracks cover large areas. During the Upper Palaeolithic, this chamber was probably partly lit by daylight. Few drawings have been found in this area, the first appearing at the back of the chamber, 80 metres from the original entrance. It is a rhino that has been painted on the left wall, about 70 centimetres long. The right side, consisting some red signs 1.5 metres above the floor, forms the entrance to The Cactus Gallery (Chauvet et al. 1996:66; Clottes 2003:60, 62).

The name of the 20 metre long Cactus Gallery originates from the shape of a massive concretion, formed by fallen blocks, but also from all the colourful calcite crystals in white and orange, growing like small cacti on the floor. Centred in the gallery, a circle of limestone blocks have been placed around a stalagmite concretion that was much smaller during the Palaeolithic than it is today. In a crack in one of the blocks, a flint tool was discovered. The block also exhibits traces of torch smoke. The first art encountered in the gallery is a small mammoth in red, above the entrance on the back of a rock pendant. Among the isolated figures within the gallery, two mammoths and a symbol have been depicted. A red bear has also been painted 4 metres above the ground, on a pendant hanging from the ceiling, in a visible position from the rest of the gallery. Underneath this rock pendant is a ledge, which had to be used to be able to
paint the bear. This ledge is reached after crossing some concretions. Altogether the gallery contains over 30 figures, most of which are included in two panels. *The Panel of the Red Bear* is found at the back of *The Cactus Gallery* and, along with two lions, is mainly made up of two painted bears, one of which forms a central position in the panel. The slightly eroded body of the less centred bear has been combined with the head of one of the lions, close to the second lion. The second panel, mainly containing a large black mammoth, is separated from the first by a crack in the wall. A black and red bear has also been painted on a rock pendant above the latter panel (Chauvet *et al.* 1996:66; Clottes 2003:60, 62, 76; Lawson 2012: 298).

Following from *The Chamber of Bear Hollows* one arrives at *The Red Panels Gallery*, a 30 metre long and 7 - 14 metre wide extension of the chamber. A mass of blocks and stalagmites has collapsed on the right side of the entrance. The height of the ceiling decreases towards the back of the gallery, while the height at the entrance is quite high. Unlike *The Chamber of Bear Hollows*, this gallery, with a red floor and white walls, contains both paintings as well as stalagmites. The paintings mostly occupy the first third of the gallery, while the second and third parts are covered with stalagmites and masses of debris, which are necessary to cross to reach the back of the gallery (Clottes 2003:77).

Scattered over an area of 5 x 1.5 metres is *The Panther Panel*. It is located on the left wall on a projecting ridge of the ceiling, appearing first among the paintings in *The Red Panels Gallery*. A panther and a hyena/cave bear, both spotted, dominates the panel, surrounded by bears, felines, ibex, some vague animals and a red hand print. A few animals have also been engraved a little further away. *The Panel of Signs* is the first panel on the right side of the gallery. It mostly contains undefined figures, partly because they are covered with concretion. The largest figure resembles a twelve-legged insect. The 12 metre long *Panel of Hand Prints* is the second panel to appear on the right wall. A projecting ridge constitutes the first part, where five rhinos and a W-shaped symbol have been painted. The main motifs, however, are the five hand prints and the two hand stencils dominating the central part of the panel. The second part has been decorated with several feline heads, two more rhinos, a horse, a mammoth and some signs. An indentation marked by a threshold, containing two panels, appears at the back of *The Red Panels Gallery*. One of them is known as *The Panel of Hand Stencils*, 4 metres long and 90 centimetres high, and includes two red hand stencils, each one covering the black outlines of a horse and a mammoth. Red abstract figures and dots dominates the other panel, called *The Panel of the Little Bear*. However, it is the painting of a red bear that gave the panel its name. Another
possible bear and a red deer stag are also represented. Throughout the gallery the right wall is the most decorated (Clottes 2003:83; Lawson 2012:298f).

The Red Panels Gallery branches off to the right into The Rouzaud Chamber, where only one painting has been found. In this area, which is the most humid in the cave due to water that frequently gets in, it is not possible to stand upright. This is because the thickly-layered calcite floor rises rapidly from The Red Panels Gallery to The Rouzaud Chamber. The painting consists only of one outline of an animal, which has led some researchers to believe it to be an unfinished drawing (Clottes 2003:86; Lawson 2012:299). However, the lack of paintings in the chamber may as well be due to the extremely humid condition, resulting in bad preservation or uncomfortable working conditions for the Palaeolithic people.

The Candle Gallery is entered to the left from The Red Panels Gallery. The passageway is marked by a few red spots and a 1.5 metre drop in the floor, but the height of the ceiling varies throughout the whole chamber. Ancient underground flows have created potholes and concretions similar to those in The Red Panels Gallery and The Cactus Gallery. The 20 metre long gallery lacks drawings except one mammoth that has been carved into the clay layer of the wall. The gallery is narrow in places due to concretions covering the walls. Charcoal from torches and a hearth (placed underneath a low rock pendant) was used for carbon dating, resulting in an age of 26,000 years (Clottes 2003:20, 87; Lawson 2012:299).

Unlike most of the other galleries and chambers, The Hillaire Chamber mostly consists of engravings. Over 100 figures (mostly animals) have been found and were made with a finger or a tool in the soft clay covering the walls. The chamber, being 30 metres in diameter, is low in height at the entrance from The Candle Gallery, but reaches up to 17 metres in places. By the entrance, a stepping stone seems to have been deliberately put to decrease the height difference from the 70 centimetre higher Candle Gallery. Centred in the chamber is a 5-6 metre deep depression that reaches 10 metres in diameter. On a rock pendant a horse and a duck-like bird have been engraved along with an owl, a motif never found in Palaeolithic art before. Because of the difficult location of these engravings it has been assumed that the depression is subsequent to the engravings. The left wall of the chamber consists of three panels, all at eye level. In The Rhinoceros Pendants panel a rhino has been engraved on the wall behind three ridges hanging from the ceiling. The ridges themselves are decorated with engravings of several animals such as mammoths, a bear, aurochs and rhinos, all figures facing the centre of the chamber. The three ridges are all included in The Rhinoceros Pendants panel. The second panel is called The Intermediate Zone and is made up of several rock pendants decorated with some
scraped lines, resembling a horse, a mammoth and a bear. The last panel on the left wall, *Panel of the Engraved Horse*, is dominated by a large engraved horse. This 6 metre long panel is an extension of *The Rhinoceros Pendants* and contains 13 incredibly well preserved drawings, all of them facing left. Among the animals mammoths and bison are common motifs (Chauvet et al. 1996:46, 48; Clottes 2003:21, 46, 88; Lawson 2012:299f).

Further into *The Hillaire Chamber* more drawings appear along the main path. These have been engraved in a 10 metre section on rock pendants in the ceiling. Among the figures mammoths, ibex, horses and a long eared owl are represented, next to some torch wipes. There are a few more engravings at the back of the chamber, some of them 3.5 metres above the ground, but unfortunately they are partly eroded. Two black figures, a bear and a mammoth, have been painted on the left in the back, where the height of the ceiling is also significantly reduced, marking the entrance to the next chamber, *The Skull Chamber* (Lawson 2012:300).

Behind some fallen blocks and stalagmites is the partly concealed entrance to *The Skull Chamber*. The floor of this chamber consists of a grey clay basin partly covered with an orange calcite crust. On a rock in the middle of the chamber traces of a fire along with a bear skull, which have named the chamber, were found. Traces of charcoal have also been found on the skull. This deliberately placed skull is one reason to the religious ideas surrounding the Chauvet cave along with related traces of fire, which have been interpreted as incense (Herzog 2010). The charcoal dates to around 32,000 years ago. The floor surrounding the bear skull is scattered with other bones of bear. In this chamber the ceiling has been well decorated. Above the rock with the bear skull, a mammoth has been engraved, and next to it three more mammoths, black and engraved. The head of a bison appears to the right of the first-mentioned mammoth. Reindeer, mammoths and the head of a horse have been both engraved and painted in black on several rock pendants throughout the chamber. Some black figures, among them a musk ox, have partly been scratched by bear claws, on the left wall at the back. Engravings of ibex, mammoths, horses and aurochs are found in recesses in the right wall and on pendants above it (Chauvet et al. 1996:50; Lawson 2012:300f; Delannoy et al. 2013:15).

The final gallery in the left branch of the Chauvet cave network is *The Gallery of the Crosshatching*. Entering the gallery one must climb a small plateau equivalent to two high steps before bending forward and passing through a low passage, which open up to a room full of stalactites, stalagmites and a floor covered with orange concretions and clay. In this gallery, three human footprints were discovered, leading towards *The Skull Chamber* (Chauvet et al. 1996:50; Clottes 2003:21; Lawson 2012:301). These are the only footprints found in Chauvet.
and seem to belong to one person, a 1.3 metre tall preadolescent boy, according to Clottes (2003:34).

The height of The Gallery of the Crosshatching makes it possible to stand (at most 3 metres high), but it decreases towards the back where the ceiling almost meets the floor. 3 metres from the entrance, the width of the gallery reaches 12 metres. Rock pendants in the ceiling, overhanging the path, make it necessary to crouch and show traces of torch wipes, black lines and red and black dots. A large horse and four mammoths have been engraved in the yellow clay at the back, naming this group of figures The End Panel. The panel was made using a finger, by an artist in an uncomfortable position kneeling and bent backwards. It is not unlikely that this gallery once continued past the concretion that now forms the meeting point of the floor and the ceiling (Chauvet et al. 1996:50; Clottes 2003: 104f; Lawson 2012:301).

Returning to the back of The Hillaire Chamber there is a natural protrusion between the path leading to the left branch, with The Skull Chamber and The Chamber of the Crosshatching, and the right branch. This protrusion consist of three panels, 15 metres long, clearly visible at least at 30 metres distance. The floor beneath the right panel, The Reindeer Panel, is covered with a thick calcite layer preventing the researchers from studying the panel in detail. However, they have been able to determine that the surface of The Reindeer Panel was scraped clean of old paintings and marks from bear claws, before being painted with figures. All in all there are 13 animals depicted, such as a large rhino, aurochs, horses, stags, bison and reindeer. Torch wipes on the left side end this panel before the next one starts (Lawson 2012:301f).

The centred panel is called The Alcove of the Lions. In this indentation (2 metres deep and less than 1.3 metres wide) that is The Alcove of the Lions, the right wall includes the head of a horse, a lion, two aurochs and an eight-legged bison, making it appear to gallop. Two lions along with four horses constitute the inner part of the left wall, while a cluster of aurochs, a horse, the head of a lion and a megaloceros constitutes the other. A small waterhole in the alcove floods when heavy rain penetrates through a crack in the wall. Further to the left the last panel appears. This is The Panel of Horses, one of the most famous panels in Chauvet, which seems to have been composed from the right to the left. Only 4 metres long it contains several phases, the oldest starting at 2.5 metres above the ground. This first phase consists of an engraved mammoth and a rhino. On a prepared surface (most likely smoothed by a hand), two rhinos, two mammoths and a deer in black represent the second, forming the central part of the panel. The lower right part of the panel is decorated with what appears to be two fighting rhinos. These constitute the third phase, while three heads of aurochs constitute the fourth in the upper left part of the panel.
To the top right, four adjacent horses have been painted with charcoal, also belonging to the fourth and final phase. These horses, with their beautifully detailed heads, are the reason for the name of the panel (Clottes 2003:106; Herzog 2010; Lawson 2012:301).

Constituting half of the right branch extending from The Hillaire Chamber, is The Megaloceros Gallery. By its entrance two handprints (right hand) were made in the clay, probably belonging to the same person who made the footprints (Clottes 2003:38). The vaulted ceiling is due to the two oblique walls that are joined together at the top. This gently sloping 30 metre long corridor is interrupted at intervals by distinct steps of 1-2 metres in height, and slippery parts. Despite this, the walls have been decorated throughout the gallery, often with panels facing each other on each side of the corridor, with short black lines connecting them. Several hearths, along with beige flint tools and bones, have been discovered in the gallery, concentrated to cavities in the floor. The hearths are clearest towards the end of the gallery on the left side where the height is slightly higher than the right. It has been suggested that the fires were used to make charcoal for painting, due to the many pieces of wood also found in alcoves underneath the paintings, and not only to light the gallery. The charcoal from this gallery may also have been used for the paintings in The Hillaire Chamber, since there are no traces of hearths in this chamber (Chauvet et al. 1996:56f; Clottes 2003:21f, 45f, 118).

The first painted part of The Megaloceros Gallery consists of drawings on the right wall, which was first smoothed before being decorated. This part has been named The Entrance Chamber (not as in the first chamber of the cave). Made with charcoal, some mammoths and rhinos have been drawn along with a black megaloceros 50 centimetres long. Two rhinos, both black, appear on the opposite wall. The centre and the last painted part of The Megaloceros Gallery are called The Engraved Panels and The Last Painted Panels. The Engraved Panels, constituting the middle portion of the corridor, mainly consist of four paintings, two on each wall. A feline and a pubic triangle sign decorates the left wall, while two pubic triangles decorate the right. The final part, The Last Painted Panels, covers both the right and the left wall as well as a rock pendant in the ceiling, which is decorated with a large ibex. Six horses, two bison, two megaloceroses and two rhinos have been painted on the left wall, while the right contains four rhinos, both engraved and painted (Lawson 2012:303, 305).

The final chamber of Chauvet cave is The End Chamber, containing more than a third of the animal depictions in the entire cave. After entering through the 5 metre wide opening and following the abrupt reduction of the floor level, a room, naturally divided into three sections, appears. Terraces, due to water flow, and bear hollows covers the floor, while rock pendants
are hanging from the 5 to 12 metre high ceiling, which is covered with deep solution pockets. Unlike the rest of the chamber, the right wall of the first section only consists of a few paintings, including a head of an animal and some abstract signs. However, three lions, three rhinos, a bear, the head of a bison and a pubic triangle have been engraved and painted in black at the end of the wall above a ledge. The left wall contains several paintings and engravings. The first of the three panels is made up of drawings of a horse, a rhino, a mammoth and two heads of felines. The second is dominated by the outlines of two adjacent lions facing right, almost 2.5 metres long. Three engraved mammoths also belongs to the second panel. The third and final panel ending the first section of the chamber (12 metres wide at this point), consists of five paintings. Facing left are three red lions, a colour not common in this part of the cave, and two black rhinos (Lawson 2012:305f).

The second section contains what probably are the most studied artworks in the whole cave, *The Lion Panel* and *The Sorcerer Pendant*. These are the only decorated areas in this section, that is, the left wall and a rock pendant to the right of it. *The Lion Panel*, extending for 12 metres, is divided into three parts, all constituting a smooth surface. The left part consists of nine lions, a six-legged reindeer, 17 rhinos with curved nasal horns, and two bison. Like the rest of the panel, these figures are made in black with an exceptional design. The central part is an indentation 4 metres from the left side of the panel. This section, called *The Central Niche*, has been decorated with four rhinos, the forequarters of a bison and the head of another, one horse and five mammoths, one of which has an unusually slender body and circular feet. The right part of *The Lion Panel* resembles a hunting scene, dominated by bison and lions. To the left, five bison and two rhinos are facing left. Two lions have also been painted in the left area, one of them facing the same way as the other figures. To the right, one bison and an engraved mammoth are almost impossible to spot among the 15 painted lions, all facing left. The engraved mammoth has been placed a little higher than the general height of the panel, which reaches up to 2.5 metres. This cluster of lions marks the end of *The Lion Panel* (Lawson 2012: 247, 306).

The remaining art in the second section of *The End Chamber* contains a few more paintings on the left wall and, as mentioned above, *The Sorcerer Pendant*. Subsequent to *The Lion Panel* is another indentation, though shallower than the previous. This has been decorated with paintings of bison, rhinos and lions. *The Sorcerer Pendant* is a rock pendant appearing after these panels, made up of a controversial mixture of a bison, a lion and a pubic triangle. In front of it, traces of a hearth, along with a pile of charcoal fragments, was found (Clottes 2003:148; Lawson
According to the discoverers, this chamber contains among the most breath-taking paintings in the entire cave. Among the animal depictions in the cave, more than a third were made in *The End Chamber*. Yet, the time one is able to stay in this chamber is limited. A sudden increase of carbon dioxide at *The Megaloceros Gallery*, from 1.5 % to 3.5 %, extends into *The End Chamber*, exposing the visitor to toxic levels. This chamber is also the lowest point of Chauvet, which contributes to the poor air circulating in this area (Chauvet *et al.* 1996:58; Bourges 2006:1662; Herzog 2010).

The third and last section of *The End Chamber* is quite undecorated compared to the other sections. However, it also consists of two smaller galleries, *The Sacristy* at the back left corner, and *The Belvedere Gallery* at the back right corner (fig. 5.). At its far back, between the two galleries, the floor descends in terraces for 1.5 metres, and then climbs again to about the same height. *The Sacristy* is entered through a low corridor along the left wall of *The End Chamber*. While the height of the gallery reaches about 8.5 metres, the width varies between 3.5 metres at the entrance after the passage, and 50 centimetres 8 metres into the gallery. This gallery is decorated with black drawings of the same design as the rest of the chamber. Some of them are included in two panels and some have been painted separately (Clottes 2003:144; Lawson 2012:308). The gallery at the right corner, *The Belvedere Gallery*, is entered along the right wall, by crawling underneath a 50 centimetre high overhang. This passage continues for 7 metres before it opens up to the gallery where it is possible to stand upright. One engraved animal and the black outline of a mammoth, both made at eye level, are the only art found here. At the back of the gallery, an overhang opens up to *The Belvedere*, which is located 2 metres higher up than the rest of the gallery and *The End Chamber*. Torch marks and charcoal fragments along the wall of the overhang show that the Palaeolithic people did climb up here. From the opening of *The Belvedere*, the whole left wall of *The End Chamber* can be viewed (Clottes 2003:147; Lawson 2012:308).

In the entire cave, 20 flint tools and flakes and an ivory point have been found. Most of them were spread out on the ground, but two flints were deliberately put in a crack of a limestone in *The Cactus Gallery* and in a concretion drapery in *The Brunel Chamber*. Only three of the flints were retouched, unlike the remaining blades and flakes, none of which have been used very frequently according to microwear analyses. Since there are no traces of raw material from knapping in the cave, researchers have concluded that these tools were produced outside the cave and then brought into Chauvet. However, among the beige flints found in *The Megaloceros*
Gallery, raw material also appears, suggesting that these products were actually produced in that gallery (Clottes 2003:47).

3.2.4 Summary of Chauvet

As the original entrance to Chauvet was blocked during the Upper Palaeolithic, the environment has remained unchanged ever since. The internal climate is basically the same throughout the whole cave, with a few exceptions. One is The Rouzaud Chamber, which exhibits a higher humidity than the rest of the cave, and the other is The End Chamber, where there is a significant rise in the carbon dioxide level, which starts in The Megaloceros Gallery though is not noticeable until The End Chamber. Because of the high levels of carbon dioxide, researchers visiting the chamber today have a very restricted amount of time that they can spend in here. It is not unlikely that these high levels also were present during the Upper Palaeolithic. They may even have been higher at times when the fires of The Megaloceros Gallery were lit, contributing more carbon dioxide and restricting the air circulation to the chamber. This would have at the least resulted in symptoms such as headache, dizziness, highly increased breathing and loss of energy. Nevertheless, The End Chamber is often thought to contain the most elaborated artwork in the cave.

The original entrance was probably the only opening into the cave during the active period. However, there must have been an opening from the outside into The Morel Chamber at some point, since the chamber exhibits traces of cave bear and ibex, although, this opening did not necessarily exist when the Palaeolithic people visited the cave. Human traces in the passage leading from inside the cave to The Morel Chamber show that at least this passage was used by humans to enter the chamber. Taking this into account, it can be established that the Chauvet cave did not exhibit more than two daylight zones, and, considering that there is no evidence of people using an outer opening, probably only one daylight zone existed, at the entrance to the cave. Except lighting The Entrance Chamber, this zone also likely lit parts of The Chamber of Bear Hollows. Despite the many large surfaces in these chambers, and the vast size (the biggest chamber) and easy terrain of The Chamber of Bear Hollows, no art has been found here. This is not likely due to bad preservation, since the Brunel Chamber is still well decorated despite its close location to the entrance. The Candle Gallery is another area lacking art, except one figure. Some surfaces were clearly preferred to others.

However, accessibility does not seem to have been the reason for not choosing these areas. On the contrary, many difficulties were overcome to reach narrow galleries and high locations.
There are several narrow passages in the cave requiring the person to crawl. The people painting in *The Morel Chamber* must have been very determined to reach this small chamber, since they even managed to brake the stalactites blocking their way, and at the same time lighting the passage with torches. The Chauvet cave also partly consists of slippery and uneven floors with many differences in height. In places, blocks were moved and the environment was manipulated to simplify accessibility, e.g. the stepping stone between *The Candle Gallery* and *The Hillaire Chamber*. However, some of the arrangements made were obviously not made for practical reasons, like the cave bear skull placed upon a stone in *The Skull Chamber*. Concretions and ledges were climbed to paint in high locations, something that must have required assistance from another person. Even though most of the art is found at reachable height, some unreachable (without a tool) locations (between 2.5 and 4 metres) were not left untouched. Considering this, the possibility should not be excluded that the pendant hanging over the depression in *The Hillaire Chamber* was painted after the depression appeared.

The art of the Chauvet cave gives an astonishing impression, consisting of many large detailed panels. The preparation of the surfaces and the realistic and vivid scenes of these panels suggests that they were not made in a day. There also seems to have been a large production of charcoal in the second half of the cave, where the black paintings are concentrated. The first half, in contrast, contains a large concentration of red paintings. Engravings and finger tracings are not common in any part of the cave, except in *The Hillaire Chamber* where engravings outnumber paintings. Most spaces are vast and requires many sources of light to illuminate the whole area. However, the many traces of hearths spread out in the cave must have contributed significantly to the illumination. While the width does not vary to any great extent, the height changes dramatically in places. Chambers therefore mostly vary between being wide-high and wide-low. The size also suggests that the number of people was not restricted in most places. Nevertheless, in *The Chamber of the Crosshatching* footprint from one person, probably a preadolescent, were discovered. This chamber reaches 12 metres in width, and yet, there do not seem to have been many people entering this chamber, or else more footprints would be present.
Fig. 5. Overview of Chauvet cave (after Clottes 2003:13)

1. Corridor
2. Sorcerer Panel
3. Lion Panel
4. Niche of Dots
5. Panel of the Rhinoceroses
6. Panel of the Big Lions
7. Right Panel
8. End Chamber
9. Pubic triangles
10. Entrance Chamber
11. End Panel
12. Panel of the Scraped Mammoths
13. Reindeer on rock pendants
14. Big Blocks
15. Panel of Horses
16. Alcove of the Lions
17. Reindeer Panel
18. Black drawings
19. Scraped animals
20. Owl on rock pendants
21. Panel of the Engraved Horses
22. Intermediate panels
23. Rhinoceros pendants
24. Panel of the Little Bear
25. Panel of Hand Stencils
26. Panel of Hand Prints
27. Panel of Signs
28. Panther Panel
29. Panel of the Red Bear
30. Panel of Dominoes
31. Alcove of the Yellow Horses
32. Panel of the Dotted Animal
33. Recess of the Bears
34. Engraved Stoup
35. Sacred Heart Panel
3.3 The cave of Rouffignac

3.3.1 Introduction to Rouffignac

The extensive limestone cave of Rouffignac, one of the largest decorated caves in Europe, is made up of three levels of network together reaching for 8 kilometres. The upper level is the most extensive and most easily accessible, while the lowest contains an underground stream which floods seasonally, although not to high levels (Plassard, F. 2012:108f). The cave is located in Périgord in Dordogne, an area containing many of the painted caves from the Upper Palaeolithic. Although the cave attracted many people’s attention in the 19th century, and even more since its public opening in the 1950’s, it was mentioned as early as the 16th century. Throughout the whole painted part of the cave, graffiti also bear witness to early visitors, dating from the 18th century. Unlike the art of Marsoulas and Chauvet, the art of Rouffignac, more than 250 depictions, mainly consists of engravings and finger tracings. The paintings are, almost exclusively, made in black, often with manganese oxide, in a simple manner. Mammoths (constituting two thirds of the decorations), bison, horses, ibex and rhinos dominate among the motifs. While the art of Rouffignac has been dated to the Magdalenian, to around 13,000 years ago, the entrance zone, with an absence of art, was occupied during the Holocene (Plassard, F. 2012:108f, 114f).

3.3.2 The research history of Rouffignac

The research history of Rouffignac is lengthier than that of most Upper Palaeolithic painted caves. As noted above, the cave of Rouffignac was first mentioned in the 16th century. However, its art was not recognised as Palaeolithic until 1956. Intense work followed this belated recognition, led by Henri Breuil, and Louis-René Nougier and Romain Robert, with the astonishing art at Le Grand Plafond and The Henri Breuil Gallery as the main focus of their research (e.g. Breuil 1958; Nougier and Robert 1959). In 1957 and 1962, the floors of the galleries and the entrance porch were explored by Claude Barrière, who also collected the archaeological material that he found (Plassard, F. 2012:110). When Barrière later on published an extensive work on the art of Rouffignac (1982), this material was included. Although the book mainly focuses on the art, there are also, in parts, general descriptions of the environment in several galleries. Each gallery of the cave is treated and referred to in a detailed map (fig. 7.), making his descriptions relatively easy to follow. Barrière’s book is one of the few more comprehensive works on Rouffignac and will therefore largely constitute the foundation of the
reanalysis below. More recent literature by Jean Plassard (1999) and Frédéric Plassard (2012), will also be used as complementary sources and contribute up to date information on the cave.

The research that followed Barrière’s work investigated specific aspects of the art. Abstract signs were treated by Eric Capdeville (e.g. 1985) and Denis Vialou (e.g. 1986), while others focused on the horses (e.g. Pigeaud 1997), the mammoths (e.g. Penvern 1997), and how abstract and figurative motives relate to each other (e.g. Igarashi 2003). Jean Plassard’s book from 1999, does, however, provide an overview of the cave, although with emphasis on its more extensive and famous works of art. The doctorate dissertation of Frédéric Plassard finished in 2012, gives the impression of being the most comprehensive work made on Rouffignac this far, and even though it is very extensive, Barrière’s 1982 remains the most useful source for this dissertation.

There is a need for new approaches to this cave, which can capture other aspects and shed new light on Rouffignac. Still, there are a few researchers which have contributed alternative ways of examining the art as well as the people behind it. Leslie Van Gelder and Kevin Sharp have studied the many finger tracings in the cave and concluded that both women and children participated in the cave art practice (e.g. 2006; 2009). Their studies provide important information that challenge previous interpretations only involving men. Hopefully the method proposed in this dissertation will also contribute to new perspectives on Rouffignac.

3.3.3 Reanalysis of Rouffignac

The current entrance is connected to the upper level of Rouffignac. This is the same entrance that existed during the Upper Palaeolithic and also the only opening connected to the outside. This is therefore the only place in the cave where various light zones are present. The entrance is orientated to the East, which means that the sun would be able to penetrate the cave during the first light hours of the day. Since the path leading from the entrance soon hits an intersection, the daylight zone cannot extend much further than the first 150 metres. This area does not contain any paintings or engravings. However, the entrance, also including a slope just to the left in front of the cave, consists of stratigraphic layers dating from the Mesolithic to the Iron Age. In this 6 metre thick sequence, a long continuity of Mesolithic habitats have been recognized, starting about 9100 BP to 6400 BP. Subsequent to these remains is a layer containing burial pits where at least 11 individuals have been found. More detailed information on this is not available. The age of this layer is not considered to be younger than the 800th century BC, to which ashes in the next layer date. More ashes throughout the cave along with ceramics also date to the 800th century BC, which has been recognised as the Hallstatt culture. Gallo-Roman remains constitutes the top layer by the entrance. Traces of the Upper Palaeolithic
are not encountered until 300 metres from the entrance where the first panel appears (Barrière 1982:14; Plassard, F. 2012:112ff; pers. comm. Plassard, F., 2013.11.08).

*Gallery G* stretches along the main axis of the cave (fig. 7.). The left wall of the gallery contains the location of the first panel, *Première frieze dessinée* or *Le Premier Panneau*, 76 metres from the 0-piont marked on the map in figure 7, from which all measurements in this description are measured. It contains six animals (*1-6 on map*), both bison and mammoths, which have been engraved on a ledge coming out of the wall. The panel has an average height of 2 metres and extends for 3.5 metres. On the right wall, 148 metres into *Gallery G* by the entrance to *Gallery B*, a 2.2 metre long panel appears. This is the second panel, *Deuxième Panneau*, where an indeterminate head, a bison and two mammoths (*7-10 on map*) have been engraved. Underneath an overhang ten red bars (*11 on map*) were discovered on the right wall 150 metres into the gallery. Only 1 metre further on another four (*12 on map*) appear (Barrière 1982:14f, 17; Plassard, F. 2012:114).

After the right turn of *Gallery G*, Hallstatt deposits, including the point of a bronze spear and some bronze buttons, have been found. The ceiling slowly starts to decrease in height at 408 metres. An indistinct mammoth (*13 on map*) has been painted in black on the right wall in a corner of a small concavity at 413 metres. A bigger concavity occurs at 455 metres, also in the right wall. In its ceiling two rhinos have been engraved (*14-15 on map*), both between 96-97 centimetres long, and underneath one of the many flint nodules in the limestone walls of the cave, an engraved mammoth has been depicted on the right wall (*16 on map*). In the ceiling at about the same distance into the gallery (454.3 metres), though closer to the left wall than the rhinos, the engraved lines of a mammoth also appear. There are two more mammoths decorating the left wall at 457 metres. *Gallery G* reaches an intersection (*Le Carrefour*) at 466 metres, where it continues to the left (*La Voie Sacrée*) and a new gallery (*The Henri Breuil Gallery*) stretches to the right. The last panel found before this division is *La Petite Frise*, occurring at 464 metres. It is composed of five subsequent mammoth, two of which only consists of a dorsal line. The 3 metre long panel has been engraved on the right wall before the entrance to *The Henri Breuil Gallery* (Barrière 1982:17, 19, 21, 23f).

Opposite to *Le Premier Panneau* at 76 metres, is another gallery called *Gallery A* (fig. 7.). It is divided into several sections, all far from decorated. A large amount of ashes, ceramics (both broken and unbroken) and some animal bones, dated to the Hallstatt culture, were discovered at the intersection between *Gallery G* and *Gallery A*. The first 120 metres into *Gallery A* from this intersection does not contain any paintings or engravings at all. Section *A1* then stretches
towards the left, making a sharp left turn after 20 metres from its entrance. Some traces of bears scratching the walls and the ceiling, and a serpentine engraving have been found before the turn. This section was ones filled with water which left a brown-red layer of clay covering all surfaces, providing it a dark impression. The floor appears even darker because of all the flint nodules that have fallen off the walls and the ceiling. This slightly sloping section is at first wide, but then tapers and decreases in height to about 1.6 metres. This occurs after 40 metres from the entrance to the section. The topography of the following lower part, *Le Plafond aux Serpents*, is characterised by a slippery floor consisting of calcite ridges and potholes, all due to water infiltration. The ceiling and the walls are covered with serpentine-shaped finger tracings. Altogether these motifs cover an area closer to 150 metres$^2$. Continuing in *Gallery A*, passing sector *A1* on the left, one soon reaches another intersection that splits into sector *A2* on the right and sector *A3* to *A5* on the left. Very few drawings have been found in this part of *Gallery A*. Except engraved mammoths along with some finger tracings at the last intersection and in the *A2* section, there is no more art in *Gallery A* (Barrière 1982:88, 91ff; Plassard, J. 1999:78; Plassard, F. 2012:117).

The upcoming galleries, *Gallery B, C, D, E, and G3*, before *Le Carrefour* ending *Gallery G*, contain even less art than *Gallery A*. Along the right wall at 170 metres, is the entrance to *Gallery B*. Even though it is quite extensive, only the black outline of one mammoth has been discovered in here (Barrière 1982:94). *Gallery C*, entered from the left side of *Gallery G*, is rarely mentioned in the literature, since it does not contain any drawings. Parts of the walls and the ceiling have collapsed and the only traces found in this gallery consist of some black flakes, made up of iron, copper and titanium among other elements (Barrière 1982:187; Plassard, F. 2012:112). However, the art, along with other traces, increases when reaching *Gallery D*, also called *Le Salon Rouge* because of the red clay covering the walls and the ceiling. Parallel to *Gallery B*, it opens to the right. A part of the entrance is blocked by a wall, which, together with some ceramics, are associated with the Hallstatt. A stooped position is required when walking in this gallery, where the whole ceiling of the gallery has been engraved with several figures. Mammoths are the most common motif, some reaching between 200 to 300 centimetres in length (Barrière 1982:95ff; Plassard, J. 1999:69; Plassard, F. 2012:114).

*Gallery E* appears quite shortly on the left side, after the right turn of *Gallery G* (fig. 7.). Like many others, the interior of this gallery is covered with a soft red clay resulting in a number of finger tracings. A part of these, along with some graffiti, are, however, not Palaeolithic traces, but date to historical times. The Palaeolithic engravings are made up of signs and a mammoth.
These are located in the ceiling after a reduction of the height to 1.5 metres, occurring 10 metres into the gallery. The mammoth is engraved at the far back on a rock pendant (Barrière 1982:110, 187). The next opening on the left side of Gallery G, at 390 metres, leads to Gallery G3. In its entirety it reaches for 28 metres. The paintings in Gallery G3 include two black mammoths facing each other, on the right wall. These were painted on a smooth surface 13.5 metres from the entrance. The surface is delimited by two flint nodules. A black feline and a red sign are located on the wall at the far back of the gallery (Barrière 1982113).

Reaching from Le Carrefour at 466 metres into the cave, to the next intersection at 594 metres, is The Henri Breuil Gallery (fig. 7.). There is a great increase in artworks in this gallery as well as in La Voie Sacrée, extending to the left at Le Carrefour. Only 10 metres from the entrance to The Henri Breuil Gallery, a panel, called Frise des trois Rhinocéros, appears on the right wall (183-185 on map). It contains three rhinos, each reaching close to 1 metre in length. These black drawings have been painted at breast height above a white calcite layer and underneath a horizontal row of flint nodules (Barrière 1982:115). The head of a horse, called Le Cheval au rognon (186 on map), has been painted in black 20 centimetres above the last rhino (185 on map). The fact that the head was made directly adjacent to a flint nodule gives the impression of the horse emerging from behind the nodule. Three engraved mammoths (187-189 on map) follows the head of the horse and the three rhinos. Except for a few engraved signs further into the gallery, La Frise des Onze Mammouths is the last panel on the right wall, located 22 metres from the entrance of the gallery. The name of the 7 metre long panel implies that it contains eleven mammoths, although, in reality, it only contains ten (190-199 on map). All mammoths are painted in black (Barrière 1982:116f, 119f).

There is also a high density of drawings on the left wall of The Henri Breuil Gallery. These starts 12 metres from the entrance with Panneau du Patriarche (200-221 on map), reaching for 25 metres. Of the 22 figures constituting this panel, there are 16 engraved mammoths. The remaining figures include a bear, a rhino, a bison and signs, all engraved. Succeeding the panel and throughout the rest of the gallery, several mammoths, a bison and finger tracings decorate the left wall. At 37 metres, right after Panneau du Patriarche, two mammoths have been drawn in the ceiling (254 and 255 on map). It is probable that a stick was used to accomplish these drawings since the height in this part reaches 2.7 metres. Their rough appearance also suggests that the artist was standing on irregular ground like the ground by these mammoths. Except for the high placement of these figures, all other depictions, until the next intersection, are easily accessible (Barrière 1982:120, 122f, 125ff, 131f, 134, 187). In front of one of these depictions,
representing a mammoth, there is a pile of flint, partly processed, mixed with flakes of charcoal. However, there does not seem to be any evidence relating these traces to the mammoth or Palaeolithic, but rather to the Mesolithic period since there are characteristics similar to the flint found at the entrance (Plassard, F. 2012:170, 173).

At the end of The Henri Breuil Gallery, 594 metres into the cave, another intersection appears, dividing the earlier gallery into two paths, the left one leading to Gallery H and the right one to Gallery I (fig. 7.). In the middle between these paths the dorsal line of a mammoth has been engraved (258 on map). Continuing to the left into Gallery H, finger tracings and engraved signs partly cover the walls and the ceiling. Two more extensive areas, one 4 metres long and the other 10 metres long, decorate the ceiling with the same patterns as earlier in this gallery. An engraved mammoth and some finger tracings were depicted 36 metres into the Gallery H on the left wall. Two more mammoths have been made with one finger close to the next intersection, 636 metres into the cave, between the continuing Gallery H and Gallery H1. In this intersection two blocks have fallen from the ceiling, which were then decorated with finger tracings. Further into Gallery H, reaching from 48 metres to 106 metres from the first entrance to the gallery (at 594 metres into the cave), there are several drawings of animals and signs on the walls and in the ceiling. Among these repeating motifs there are two anthropomorphic figures which have attracted extra attention. They are called Adam and Eve (243 and 244 on map). They were made with one finger and are located at the back of Gallery H. Except for a few abstract finger tracings there is no more art appearing in this part of the cave. Gallery H continues for another 100 metres, also dividing into one more path to the right, Gallery H2, lacking any artwork (fig. 7.) (Barrière 1982: 135ff, 139,141f). Returning to Gallery H1 at the intersection 636 metres into the cave, there are a few drawings. During the first 20 metres the left side of the ceiling contains finger tracings. The gallery divides into two more paths 44 metres from its entrance. These are called Gallery H1a, which does not contain any drawings, and Gallery H1b. The latter is only decorated with two abstract signs in the ceiling, 16 metres from the division of Gallery H1, where it is reachable (Barrière 1982: 144).

The last remaining path yet to be described after The Henri Breuil Gallery, is Gallery I and its side paths (fig. 7.). The first art appears only 4 metres from the entrance of Gallery I. It has been interpreted as a bison or a rhino and is placed on the left side of the ceiling. Further ahead, starting at 41 metres on the left wall, one mammoth has been painted in black and another is engraved. A horse-like figure, also on the left wall, is the last art found in Gallery I. At 59 metres a smaller path, Gallery II, opens to the left reaching for 31 metres. Finger tracings cover
the central part of the ceiling between 3 metres and 9 metres into this gallery. The entrance to Gallery I2 appears to the right at 92 metres into Gallery I. It barely contains any traces of human activity, except a few finger tracings on the right wall. The topography of this gallery has its own character, which, because of its structural features, is often called Le Grand Confessionnal (The Great Confessional). Gallery I3, the last side path from Gallery I, is entered at 109 metres on the left side. This is about 700 metres into the cave. At the far back of this 34 metre long path, two mammoths have been painted in black in the descending ceiling (Barrière 1982:145, 147f).

The most elaborate part of the cave is probably La Voie Sacrée, extending from Le Carrefour, the intersection 466 metres into the cave (fig. 7.). The first part of La Voie Sacrée, before Le Grand Plafond occurring at 555 to 570 metres into the cave, is decorated in the same design as the majority of the cave, that is, mainly engraved walls and ceiling, largely depicting mammoths and abstract signs, but also bison, rhinos, serpentines and a feline. However, what characterises La Voie Sacrée, especially at Le Grand Plafond, is the extensive decoration of the ceiling. The height starts to decrease at Le Carrefour, starting at 2.5 metres, then reaching less than 1 metre at Le Grand Plafond (Barrière 1982:24f, 27ff, 31f, 34, 37f, 40ff; Plassard, F. 2012: 119). A few metres before the art of Le Grand Plafond, there were pieces of charcoal found, indicating a hearth, along the right wall. The ceiling at Le Grand Plafond is made up of 66 drawings, 63 of them are black. The figures are mainly mammoths (25 of them), but there are also many bison, ibex and horses (12 of the cave’s 16) and some rhinos. One of the horses reaches 2.7 metres in length and in general the animals are quite large and detailed. Considering the limited space for the Palaeolithic people in this area, where they probably had to lie down in order to paint, this ceiling is an incredible artwork. Some paintings appear on the walls too. The figures in the ceiling are disposed above one of the cave’s shafts, the 5 metre deep Le Puits, leading down to the second level. By this shaft a chisel and a flint blade have been found (Barrière 1982:65; Plassard, J. 1999:53; Plassard, F. 2012:163f).

Entering Le Puits, the floor of the second level consists of a thick clay layer. Following this gallery at the second floor, there are two dead ends, one on the left and one the right (fig. 6.). Continuing along the right wall, there is a crack in the floor leading down to the third level where an underground stream flows. Several depictions, almost exclusively black paintings except for one engraving and a red painting, are located on the right wall around the crack. A grey-brown flint nodule was brought here and put underneath the art concentration. In this concentration there are three mammoths around 60 centimetres above the floor (1, 2 and 12 in
and another at 1.2 metres height (3 in fig. 6.). There are also three bison about 30-50 centimetres in length (4, 6 and 8 in fig. 6.), a small horse only 18 centimetres in length (7 in fig. 6.), and two indeterminate figures (5 and 11 in fig. 6.). These constitutes ten of the twelve pictures at the second level. The last two, appearing further ahead, also on the right wall, are both representing bison, one red and one black (9 and 10 in fig. 6.). There are only a few lines, made with finger tracing, present on the left wall. Just like this lower gallery starts, it also ends in a dead end (Barrière 1982:68ff).

![Fig. 6. Overview of the second level at Le Puits with location of decorations (Barrière 1982:69)](image)

After Le Grand Plafond at the upper level, some finger tracings were made along the ceiling, between 580 and 583 metres into the cave, probably by just holding the hand over the head while walking. At 591.8 metres, the largest part of the width of La Voie Sacrée is occupied by a crater. An engraved mammoth, about 1 metre in length and height, appears along with three finger tracings following the flat white ceiling. At 600 metres, there is an intersection in La Voie Sacrée. This is the intersection between Gallery G (the main gallery of the cave and the gallery containing Le Grand Plafond and La Voie Sacrée) and Gallery F (fig. 7.). This part of the cave is chaotic because of the many bear hollows in the floor and the vaults reaching low heights, making it difficult to travel. The right part, however, offers easier paths, where a few engravings and finger tracings also have been found. Just before the entrance to Gallery F, scrapings, with no clear direction, cover the ceiling. Further within the intersection along the right side, mammoths and bison have been engraved with fingers as well as tools, on fallouts from the vault, on the ceiling and along the wall (139-149 on map). Mammoth 146 and 147 appear on an overhang from the right wall, about 1 metre above the floor. Following along Gallery G, there are finger tracings in the ceiling, at 614 metres, mainly on the right side where it is easier to walk. However, some have been placed more centrally and on the left side further ahead, up to 645 metres into the cave (Barrière 1982:72ff).
At 653.5 metres, another crater occupies the left half of the gallery. An engraved panel, *Frise de la Grande Fosse*, containing four mammoths and a bison, is located in the ceiling along the central axis, by the crater that also names the panel. The gallery is divided a few metres after the panel, by a lowering of the vault along with clay fillings, creating two smaller galleries. Traces of flint knapping and a small amount of human skeletal remains was discovered in the right one. It is unfortunately not possible to date the skeletal remains. The left part of the division exhibits finger tracings in the ceiling, reaching for 8 metres. From this point until the end of Gallery G at 760 metres, there are more finger tracings and a few engraved mammoths (154-160 on map) placed mostly in the ceiling, but also on the walls. At the entrance to Gallery F by the intersection dividing *La Voie Sacrée (Gallery G)*, abstract engravings and finger tracings are found on the left wall. Serpentine-like finger tracings run along the ceiling towards the back of the gallery where bear pawprints and human footprints have been discovered (Barrière 1982:80, 82, 85, 87, 114).

### 3.3.4 Summary of Rouffignac

The upper level of Rouffignac is not only the most extensive, but also contain the largest part of the Palaeolithic art. Although the height varies, the upper galleries are often wide and generally this level is quite easily accessible. This is not consistent with the lower networks, which instead provide a narrow and difficult terrain with clay-covered floors and an underground stream. Shafts in the upper network provide access to these lower levels, which, unlike the upper, are not connected to the outside. The entrance area should, due to its orientation to the East, provide a daylight- or half-shade zone in the morning, which does not extent further than 150 metres into the cave. No other light penetrates the cave.

The chamber size in the upper level mostly varies between wide-low (in many places a crouching position is needed) and wide-high, although this is not applicable for all spaces because of the lack of documented measurements, especially concerning width. However, some conclusions can be drawn from the existing measurements. Places such as *Le Grand Plafond (La Voie Sacrée)* and *Le Plafond aux Serpents (Gallery A1)*, are not remarkably restricted in width, but in height (less than 1 metre and about 1.6 metres), suggesting that one tallow lamp sufficiently could illuminate these areas. However, the dark clay, covering the area of *Le Plafond aux Serpents*, does not reflect the light as well as a lighter space, indicating that one tallow lamp may not be enough. At *Le Grand Plafond*, there are traces of a hearth that could have been used while decorating this area, providing some extra light. Except in places where the ceiling is low, it would have been necessary to use at least two tallow lamps to illuminate
the cave. Of course illuminating the entire cave may seem excessive, but considering the difficult terrain in some parts, it would have been useful to sufficiently light the path ahead. This also applies to the second level, which, although narrower, exhibits slippery and uneven floors covered in dark clay.

There is a long continuity among the traces of human activity in Rouffignac. Many traces derive from the Holocene. These are concentrated at the cave’s entrance, but can also be found sporadically along the main axis until the right turn of Gallery G, 270 metres into the cave. Some worked flint, found underneath a depicted mammoth in The Henri Breuil Gallery, may belong to the Mesolithic and would, in that case, constitute an exception in terms of how far into the cave these traces are found. As usual, the art composes the largest part among the Upper Palaeolithic traces, though, unlike Marsouls and Chauvet, the art in Rouffignac is predominantly engravings and finger tracings. The entrance area does not exhibit any art (the first panel appears 300 metres from the entrance), thus all art is concentrated in the dark zone.

Even though most decorations were made at a reachable height, there are some that must have required a helping tool, like a stick, which was probably used when drawing in the ceiling of The Henri Breuil Gallery, or assistance from another person. Reaching the second level through the 5 metre deep hole at Le Puits, and especially getting up from it again, also suggests a more extensive operation. Despite its difficult location and terrain, the Palaeolithic people decorated this level. Considering this, along with the long journey necessary to reach the inner parts of the cave and the many difficulties crossed on this path, cooperation must have been an essential part of residing in the cave and the cave art practice.

Nevertheless, some places were left more or less untouched, something that does not seem to be related to accessibility. The highest art concentration is centred around Le Carrefour. It seem to increase towards the intersection and then decrease after the first part of La Voie Sacrée and The Henri Breuil Gallery. The highest concentration of paintings is found at Le Grand Plafond. There are several galleries at the beginning of the cave (Gallery A2-5, B and C), and towards the end (Gallery H1, H1a-b, I2-3, F and at the end of Gallery G [La Voie Sacrée]), that are as accessible as the rest of the cave, yet the Palaeolithic people chose not to decorate these galleries to the same extent. It could be argued that the lack of art at the entrance is due to the external climate exhibited in this area. However, this does not explain the undecorated galleries further into the cave, where the climate is stable and thus not affecting the preservation. Furthermore, the majority of the art in Rouffignac is engravings, meaning that if there would have been any art at the entrance, there are strong indications suggesting that it would have been engravings.
If this area was well-decorated, there would supposedly be traces of engravings left, despite the external climate. The possibility that the entrance area was decorated should not be excluded, but at the present there is nothing pointing in that direction.

Fig. 7. Overview of the upper level in Rouffignac cave. The galleries and the locations of the art are marked (after Barrière 1982:209)
4. Discussion and conclusions

The reanalyses of the caves of Marsoulas (Haute-Garonne), Chauvet (Ardèche) and Rouffignac (Périgord), have demonstrated how the method developed in this dissertation can be put into practice. The different patterns that have emerged in each cave will be compared in order to highlight how documenting and recording cave art sites need to improve and what social conclusions, concerning the cave art tradition and Upper Palaeolithic societies, can be drawn from a more comprehensive practice-based approach.

4.1 Comparative discussion

The three caves that were investigated in this dissertation all exhibit human traces from Upper Palaeolithic, notably painted and engraved images. Their differences both in regional location as well as in shape of cave systems and size and the quality and quantity of documentation available have, however, formed the basis of the reanalyses.

When studying the human activity in the caves analysed, some general patterns emerge. For one thing, they all exhibit traces at the far back of the cave system, especially depictions. In Rouffignac, this means that the Palaeolithic people travelled for kilometres inside the cave to practice cave art. It should thus be reasonable to assume that supplies were brought into the cave when dealing with more extensive cave systems such as Rouffignac and Chauvet. The many hearths discovered in Chauvet, not least in The Megaloceros Gallery, suggest that wood was such a consumable supply that was brought into the cave, which moreover can be directly associated with the cave art activity.

Secondly, the art is relatively evenly distributed throughout the entire caves, with some exceptions which will be discussed below. However, the most obvious absence is located in the entrance areas in all three caves. This could be interpreted as a universal tradition not to paint in this area, possibly to avoid daylight, since this absence is also present in most decorated caves. In Chauvet, the entire daylight zone that was present during the Upper Palaeolithic, seem to have been avoided, strengthening this theory. Marsoulas, however, exhibits a few still visible engravings relatively close to the entrance. Originally there may have been even more, but the external climate at the entrance could have contributed to their weathering. Nevertheless, Marsoulas is a difficult example, compared to Chauvet and Rouffignac. Because of its small size, the choice of space is much more limited, since it contains limited surfaces to paint on. Thus, it could be argued that the decorated entrance is due to the lack of space in the cave, which also the high density of art in the rest of the cave suggests (220 depictions compared to
the 250 in Rouffignac). However, all possible surfaces further into the cave have not been utilised, and regardless, the fact that there is art present by the entrance in some caves, including Marsoulas, still contradicts any ideas of strict universal rules of any character playing a large part in the cave art practice and choice of space, and rather points to individual adjustments made for each cave.

Likewise, there are no obvious similarities concerning the choice of space in Chauvet and Rouffignac. In Chauvet, the largest chamber lacks art, despite its central position in the cave and its easy terrain. Other chambers, such as *The Morel Chamber* positioned away from the cave’s main axis, exhibits a very difficult terrain and still contain several depictions and traces of fire. Nor have the chambers located at the far back of the cave been left untouched, not even the carbon dioxide concentrated *End Chamber*, where highly increased breathing, headache, dizziness and loss of energy affected the visitor. Looking at Rouffignac, this is not really the case. Art is found along the whole main axis and in the continuing galleries. However, some parts closer to the entrance as well as further into the cave have not been decorated. Except the undecorated entrance area, the inner galleries of *Gallery A*, and two of the side galleries (*B* and *C*), basically lack art. If the collapse in *Gallery C* occurred before the Palaeolithic people visited the cave, this would explain why this part has not been engraved, but the terrain in the other galleries mentioned does not appear to constitute any greater difficulties. The same is true for the inner galleries of *Gallery H* and *I*, and *Gallery F*, all containing very little art. Nevertheless, there is one gallery where the topography may be the reason for this absence: *Gallery I2*, which exhibits a very special character, inspiring the name *Le Grand Confessionnal*. However, it is important to remember that the lack of art is not directly linked to lack of activity or visits, as the right gallery after *La Grande Fosse* in Rouffignac, only containing traces of flint knapping and parts of a skeleton, proves.

The placement of the art can also be viewed more specific. Rouffignac certainly constitutes a much higher concentration of art in the ceilings than Chauvet and Marsoulas. Because of its topography, Rouffignac also offers several levels of networks, which to some extent, despite the difficult access, have been decorated, and perhaps have been used more widely than what has been discovered or documented. In Chauvet, other unreachable locations have been decorated, such as rock pendants and high up on walls. Interestingly, there are some traces in Chauvet revealing how the cave environment was managed and arranged in order to facilitate the accessibility, such as moved blocks. There was a great engagement and arrangement of the cave by the Palaeolithic people in Chauvet, which is not visible in the same way in the other
caves, at least not among the documentation available. In Marsoulas, the Palaeolithic floor level was probably lower than today, indicating that the paintings located at unreachable levels in modern times, most likely were even harder to reach during the Upper Palaeolithic. Despite the narrow and low parts in Marsoulas, as well as the slippery slope leading down to the stream, the Palaeolithic people penetrated all the way to decorate the most remote part of the cave.

Among the decorated areas in the caves, some were obviously not meant to be accessed by a larger number of people. As Bahn (2003) argues, the varying accessibility of painted places suggest that some were more public than others, where those easier to access allowed people to behold the art (Bahn 2003:17). In Chauvet, *The Brunel Chamber* is a good example of an easily accessible and public place, where all the art of the chamber can be viewed at distance. The more difficult places, such as the second network in Rouffignac or the last slippery part of Marsoulas, may not have been intended for an audience. Another “private” place is *The Belvedere* at the far back of *The Belvedere Gallery* in Chauvet. This point is reached by first crawling through a passage to the gallery and then climbing a 2 metre high overhang. There may not seem to be much reason for entering this gallery, considering the great effort in relation to the little art found in here. However, reaching the top of *The Belvedere* is worthwhile, when the most amazing panels of the Chauvet cave can be overviewed from this special place, stretching like a small balcony at the back of the last chamber.

The choice of technique when making the art (painting, engraving or finger tracing), may also be considered in terms of “public” and “private”. Paintings, which dominates the art in both Chauvet and Marsoulas, appear much clearer and are more colourful than engravings and finger tracings, which are most common in Rouffignac. Paintings may therefore be interpreted as a more “visible” and “public” form of art. The light (both natural and artificial), however, changes the way engravings and finger tracings are experienced. The deep markings cast shadows, making them appear more alive. The choice of technique surely is determined by the way the artist wants to present the art. In the otherwise painted Chauvet cave, *The Hillaire Chamber* is dominated by engravings. The same phenomenon is present in Rouffignac at *Le Grand Plafond*, which is made up of a great concentration of paintings. Choosing a different technique in these chambers is also an active choice, creating a different impression from that in the rest of the cave.

There are certain ideas that the Palaeolithic people visiting the cave of Marsoulas, Chauvet and Rouffignac seem to have had in common, such as their desire to reach the most inner parts of the caves and penetrate difficultly accessed areas. It is easy to conclude that accessibility in any
form, was not a hindrance. To reach *The Morel Chamber* in Chauvet, stalactites were even removed to get through the uncomfortable passage ending in what was then the unknown. In Rouffignac a similar effort must have been made to reach the second network at *Le Puits*, going down the 5 metre deep hole, and getting up again. Curiosity, determination and, most of all, cooperation must have been essential parts in this practice. The amount of art and the many places accessed in the caves also suggest that this practice was very extensive. Supplies, such as wood, material for torches and tallow lamps, and probably flint tools and raw material in some cases, were brought into the most remote parts of the larger caves, reflecting a well prepared organisation involving a larger number of people, even though all places were not meant to be displayed to a bigger audience. At the same time, the many differences that have been revealed in the cave art practice, especially concerning the choice of space, clearly point to a varied tradition and practice that was adapted to each cave.

### 4.2 Social discussion and conclusions

The method that has been developed and applied in this dissertation has revealed a whole new dimension concerning how Palaeolithic cave art was made. By examining all available traces in the cave from this period and emphasising the implicit practice, not only the result that is the art, a new picture of cave art has emerged, revealing many variations in the process of production and the great effort invested in decorating these difficult environments.

It is no longer possible to view cave art as a homogeneous tradition with one underlying meaning waiting to be uncovered. Instead, the cave art tradition was a multifaceted practice and individual adjustments were made for each cave and for each chamber, e.g. concerning choices of technique, the placement of the art and modifications of the cave environment. These variations in the practice emphasise the different choices and preferences among the Palaeolithic people involved in this tradition in different caves during the 20,000 years of producing cave art. This suggests the possibility that cave art was viewed in several ways and that its importance and meaning was created in the process of production, which varied with time and place. Furthermore, this opens up for many possible interpretations of the art thus stressing the importance of studying every cave individually and draw conclusions from the existing traces found in each cave.

Interpretations involving a lone shaman should also be excluded at this stage. The cave art practice was a collective activity involving a larger number of people. The long journeys into the caves and the many difficulties that were overcome to reach the least accessible areas to
decorate required extensive planning and preparatory work. A knowledge of the cave environment was also essential to be able to account for all supplies necessary, both concerning artificial light as well as tools for modifying the environment for access. This suggests that the caves were visited several times before decorated, also showing that the cave art practice as a whole involved many stages of work inside and outside the cave before it was decorated. All these activities, in many cases also including the act of decorating, required assistance and cooperation with other people, without whom this tradition could not have been carried out to the same extent. Areas affecting the human health, such as carbon dioxide concentrated spaces, may also have required assistance or even the possibility to replace the artist to minimise the risk of e.g. hypoxia (oxygen depletion). This extensive cooperation and involvement of people in all stages of the process also changes the way we look at Upper Palaeolithic societies. The few characters, such as “the hunter” and “the shaman” that for long have shaped our vision of the Palaeolithic and not least the cave art tradition, can now be replaced by multi-functional and unified groups of people, probably including individuals of different ages and sexes contributing with different abilities in the process of creating art. The cave art practice played an important part in Upper Palaeolithic societies and for the many people involved, not necessarily of a religious character as no traces strongly can suggest, but rather highlights an interest in cooperation and in strengthening the group.

4.3 Methodological discussion and conclusions

The developed method that have been put into practice in reanalysing the caves of Marsoulas, Chauvet and Rouffignac, has revealed more knowledge concerning the human activity in decorated caves as well as the importance of the cave art tradition in a wider context that is Upper Palaeolithic societies. It has shown the potential of using a more comprehensive approach when studying cave art, despite that all questions discussed in the second chapter have not been answered. This is due to the fact that these analyses were based on already existing documentation, even though the information was gathered from several disciplines and research fields. This highlights the gaps in the existing research and, thus, the potential of an interdisciplinary investigation of these sites by applying the approach developed in this dissertation. If this was to be applied, all aspects concerning the cave art practice could be considered.

Many of the shortcomings in the existing documentation concern fundamental information about the cave environment. Several of these have been identified regarding the caves analysed in this dissertation. Among the most essential features, measurements, both of the chamber size
as well as of panels, are often left out. This applies to all caves, but especially Rouffignac, where these details are essentially never mentioned. In Chauvet, measurements are brought up inconsistently and are often descriptive rather than exact. Traces other than the art and topographical features not related to art, are in general poorly mentioned. Again, this is especially applicable to Rouffignac, which becomes obvious since all maps of the cave are incomplete. None contains all three levels of the cave, but only the upper network containing almost all art (it is even questionable if it is the whole level of 5 kilometres). The map of Barrière (1982) contains a vague marking of the part of the second level which includes some depictions (fig. 7.). However, none of the other shafts leading down to the second level are marked.

In Marsoulas there are instead other dilemmas, such as factors vaguely mentioned by some authors that are not confirmed by others (thickness of cultural layers, size of collapsed entrance etc.). Further, the art is not described in relation to the cave’s topography and there is no information concerning the underground stream, whether this part has been surveyed at all or if its level was the same during the Upper Palaeolithic. The little documentation about Marsoulas is also difficult to obtain, although it is often detailed.

Overall, there is a great need for completing research on all three caves. Chauvet, the most well-documented cave of the three (thanks to its recent discovery), provides a more complete picture of the human activity in the cave. However, the art still gains most of the attention and what is recorded depends upon the interest of the researcher. An interest in the cave environment and its internal conditions need to increase and, as has been revealed in this dissertation, an understanding of the significance of the practice behind cave art, which may be even more important than the art itself, should be obtained and gain a greater part in research.

It would be of great advantage if this method was to be further used in cave art research, to provide all caves with easily accessible, fundamental and detailed documentation. Hopefully this method will be further developed along with our knowledge of the Upper Palaeolithic and as the archaeological techniques progress. There is a need to refine and improve dating techniques and explore more ways to relate art to other traces, none of which are easily dated. The method also needs to include further information on torches as artificial light: light intensity, oxygen consumption rate, carbon dioxide emission and timespan for burning. The further development of this method would provide more detailed information on the conditions in caves during the process of creating cave art.
The method that has been developed in this dissertation should be viewed as a new and more comprehensive way of recording and documenting cave art. It has been shown to have potential to uncover its underlying practice, which has proven to be very extensive. The cave art tradition may provide a homogeneous impression, but has now been put in a new perspective as a much more diverse, well-organised and collective practice. This highlights the cave art tradition as an important part of Upper Palaeolithic societies, not only involving “the artist” or “the shaman”, but also many others that made it possible to carry out the final and last part of the work, the art.

5. Résumé

Dans la recherche l’art rupestre du Paléolithique supérieur, les circonstances physiques et sociales ont rarement été discutées, alors que nous nous sommes concentrés sur les images elles-mêmes. Cette focalisation et recherche de la signification derrière cet art a laissé une impression homogène de cette longue tradition de l’art rupestre qui s’étend sur plus de 20,000 ans. Pendant des années, les interprétations impliquant rituels et chamans ont été proposées et peu critiquées, avec comme résultat vue acceptée qui a formé la base de beaucoup d’études. Cependant, il y a très peu d’évidences dans les images elles-mêmes pour cette interprétation.

Cette dissertation explore et développe une nouvelle stratégie de l’investigation de l’art rupestre en analysant les caractéristiques de l’environnement et tous les tracés d’activité humaine (y compris l’art même), pour éviter d’avoir des conclusions sans base. Des idées non-figuratives, critiquent le sens inhérent des objets et largement concernées avec l’implicite pratique de tous les jours, l’expérience pratique et les événements, a aussi contribuée a cette étude. Une méthode base sur aspects est développée partiellement basées sur les travaux récents de Pastoors et Weniger (2011) et Delannoy et al. (2013) traitant l’activité humaine et leur engagement dans les grottes ainsi que des additions par l’auteur. Cette méthode explore des catégories comme la zone de lumière, la taille des chambres, réseau de chemins, le mode de mouvement, l’espace disponible, les conditions internes et modifications archéomorphologiques pour révéler les techniques sous-jacentes à la pratique de l’art rupestre. Cela est ensuite appliqué à trois grottes décorées dans le sud de France : Marsoulas, Chauvet et Rouffignac, pour souligner le potentiel de cette méthode et identifier comment cette recherche pourra être développée dans une future. Ces trois grottes exhibent leurs différences autant dans leur forme géologique (la taille, la forme générale de des systèmes, caractéristiques spatiale), la qualité et quantité documenté, ainsi que leurs locations régionale. Il y a trois questions générales qui forment la base de cette étude: Comment une approche contextuelle de l’art de ces grottes peut être mise en place avec des
méthodes pour l’enregistrement, la description et l’analyse des sites d’art rupestre? Quel est le potentiel d’une nouvelle vision dans la compréhension de la pratique de l’art rupestre? De quelle manière devraient l’enregistrement et la documentation de sites rupestres être modifiés afin de supporter des approches contextuelles?

Après avoir re-analysé ces trois grottes en usant la méthode mentionnée ci-dessus on a réussi à avoir des connaissances sur l’activité humaine et sa relation avec l’art dans ces environnement. La tradition de l’art rupestre a été une pratique multifacette et individuelle, ce qui contredit des impressions d’homogénéité. Les difficultés énormes qu’il fallait pour passer à la pratique révèlent le gros effort qu’il fallait investir pour décorer dans des environnements difficilement accessible, soulignant l’extensive planification, le travail préparatoire et la collaboration, démontrant que cette activité était une activité collective.

En étudiant l’art rupestre cette méthode a montré une approche plus potentiel et compréhensive, malgré que tous les questions été discutées n’ont pas répondues. Ceci est due au fait que ces analyses ont été basé sur des documentations déjà existantes, même que les informations ont été rassemblées dans plusieurs disciplines et champs de recherche. Ceci souligne les lacunes dans la recherché actuelle, et donc le potentiel d’une investigation interdisciplinaire en utilisant l’approche développée dans cette dissertation. En l’appliquant, tous les aspects de l’art rupestre pourraient être pris en compte.

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