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Master Erasmus Mundus em
QUATERNARIO E PRÉ-HISTÓRIA

Final Dissertation:

CONTRIBUTION TO THE TAGUS ROCK ART COMPLEX STUDY

THE GARDETE ROCK ART SITE

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A few people in particular that I must express a few words to. First of all Jorge Cristovao with all his subtle encouragements and energy which kept up my spirits at a time when it seemed like everything was touch and go. I have to express myself in a way that I could not in person, and that is to tell you, that you are more than a colleague but a good friend. The next on this list is Thalison dos Santos whom I have to be honest and say was my 'sparring partner' for the completion of this Master Thesis. The numerous discussions spent over late nights, expanding the hours each time proved to be fruitful engagements of both our intellects and tested at the same time, our strenghts and weaknesses in character. Finally, there is one person whom I can not express my most dearest of gratitudes towards, whom I feel indebted too, and whom I deeply admire as a person and a colleague. Yes I do believe you know already who you are, Sara Garces. There are three things that I have discovered about your character in this experience, your patience, your humour and your enthusiasm, all of which you have shown with me, where others would have given up. I want to thank all three of you for those last moments before the end, where I imagine emotions would have been chaotic for most of us writing our thesis, but to have you three in particular at my side, was the 'best formula'.

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Front Cover Photo: This engraving is named the 'PHANTOM' as it is a personal favourite G12: M499. Source: ITM 2013

ABSTRACT

The Rock Art along the Tagus River is considered one of the largest open-air post-Palaeolithic engraving sites in the Iberian Peninsula and in Europe itself. Thousands of engravings bath the banks of the Tagus River with a repetoire of imagery that expands all manners of representation. However with the dam constructions in the 70's over 90% of this rock art has been condemned to the depths of the river water forever. The Latest Rubber moulds produced of the rocks before they were submered under water in rescue works of the early 70's, are all held in the COA Museum and were the responsibility of the now ex-CNART (Centro Nacional do Arte Rupestre). For the RUPTEJO program 2008-present these moulds were borrowed to the Instituto Terra e Memoria in Mação, Portugal. Researchers are able to study and attempt at understanding their cultural, social and technical aspects thus serving some justice to the original authors of this facinating production of engravings. This Research Thesis is going to analyse the site of Gardete and is part of a contribution of works made on different sites of the Tagus in previous years, focusing on its typological classification and its technical aspects. A catalogue of figures of the entire site will be produced in an effort at keeping alive the mystique and curiositiy that the Tagus Rock Art Complex provokes on its observers.

Keywords: Rock – art, Tagus Valley, Chronology, Engravings , Typology

ABSTRACT

A arte rupestre que se estende ao longo do rio Tejo é considerada como um dos maiores complexos ao ar livre de arte Pós-Paleolitica, não só na Península Ibérica mas também da Europa. Milhares de imagens banham as margens do rio Tejo num repertorio que conjuga todas as formas de representação. Contudo, com a construção da barragem nos anos 70, mais de 90% desta arte rupestre foi condenada às profundezas do rio para sempre. No entanto e antes do nível da água subir, conseguiu-se preservar grande parte da arte através da transferência das gravuras para moldes de Latex. Estes moldes, ao cuidado do Museu do COA, são da responsabilidade do CNART (Centro Nacional de Arte Rupestre). Por meio do projecto RUPTEJO 2008 – Presente, os moldes foram emprestados ao Instituto Terra e Memoria, Mação, Portugal, onde os investigadores ligados ao projecto podem estudar e tentar compreender os aspectos culturais sociais e técnicos, dando deste modo alguma justiça aos autores originais deste conjunto fascinantes de gravuras. Esta tese foca-se no estudo do sito de Gardete analisando os seus aspectos tipológicos e técnicos, estando inserida numa serie de estudos levados a cabo noutros sítios do Tejo ao longo dos anos que tentam contribuir para uma melhor compreensão de todo o complexo do Tejo. Elaborou-se deste modo um catálogo das gravuras de modo a manter viva a mística e curiosidade que o complexo de arte rupestre do rio tejo desperta nos seus observadores.

Palavras – Chave: Arte Rupestre, Vale do Tejo, Cronologia, Gravura, Tipologia

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INTRODUCTION

The study of the sites that make up the Tagus Rock Art Complex is part of the RUPTEJO project conducted at the 'Instituto Terra e Memória' (ITM) and by the Museum of Mação in Portugal. Previous research projects have already been conducted on various sites of the Tagus, and this Thesis is a contribution towards this goal of achieving a complete and thorough record on the sites of the Tagus.

Due to the construction of dams in the 1970's, around 90% of the Tagus Rock Art was submerged under water making it near impossible to study them. Salvage work on saving the engravings through making copies of the prints using Latex Rubber in the early 1970's preserved its memory, and those moulds are now stored in the Rock Art Laboratory at the ITM. Gardete is fortunate enough to be on the west side of the Fratel Dam, as its water levels are controlled by the dam which allows its banks to be above water level during parts of the day. Therefore one is able to visit Gardete in person and see for one's self the magnificence of what is deemed as one of the most important post-Palaeolithic outdoor rock art sites in the Iberian Peninsula as well as in Europe.

This Thesis aims to provide the RUPTEJO project with another site analysis, a typological classification as well as correlate Gardete itself with what has been written and established in almost 43 years of research about the Tagus Rock Art Complex. This research also aims to create a catalogue of figures that will function as a typological analysis but also to give readers an indication of the various forms and styles present in the site of Gardete, and to also help imagine the possibilities that should have been available to us, but now are under water and lost for our own viewing pleasure.

The thesis will progress from the very beginning to arrive at the very end answering the basic questions of whether Gardete confirms the established or is more accurate to say, the agreed upon interpretations and statements made by authors who have dedicated themselves for decades on researching and establishing theories and models regarding the Tagus Rock Art Complex.

The beginning of this Thesis will provide a brief but detailed historiography of the Tagus Researchers and its main authors at the time and at present, so that readers of this

thesis will have a foundation to approach the following chapters with basic knowledge on the direction and procedure in which this thesis is tackling the site of Gardete. The methodology employed is also part of a wider framework established by the ITM Researchers and all parameters that go with this framework will be adhered to as much as possible.

The aim is to reach the end of the analysis of Gardete and be able to relay this information in the most informative and accessible way for future researchers as well as for those readers of the Tagus Rock Art.

1. HISTORY OF RESEARCH

The Rock art of the Tagus Valley was probably known by some besides its re-discovery in October 1971. In the 40's there were indications near the Fratel zone that "written stones beside the still waters" of the Tagus, but not much if anything was considered regarding this. There is also the presence of an inscription punched in the rock found in April 2011 during campaign surveys conducted in 'Cachao of Sao Simao' which read "1721" and "Father Freitas Costa" which demonstrates that these rock engravings were known from a much older time. However over time this information was lost and only recouperated through the conveyance of locals who witnessed the presence of these engravings. In 1971 through the suggestion by ethnologists Paul Caratao Soromenho a team headed out to the area to confirm the information. The team's initial prospection was the margins of the Tagus and at the end of October in 'Cachao do Boi' or as is now simply known as Fratel zone they discovered the first rocks that commenced what would be considered a major Post-Palaeolithic rock art complex of the Iberian Peninsula.

Group for the Study of Paleolithic Portuguese (Gepp)

The Gepp is a group of people who underwent the first surveys and recordings of the Tagus rock art, and became some of the most imminent archaeologists in their fields in Portugal and beyond. At the time Portugal was still under a dictatorship that was toppled in the coup of 25 April 1974. This leadership strongly narrated some of the early activates and approaches that were taken to study the Rock engravings of the Tagus Valley. The team coordinated initially by Eduardo Cunha Serrão was composed primarily of young student volunteers, from the Faculty of History of Letters, University of Lisbon, who gathered in a room of the National Museum of Ethnology and Archaeology with the central goal of expanding their knowledge on the matter of prehistory (Lemos 2011; Raposo 2011). Their initial methods followed a very structuralism demeanor including the methodological organization which developed under the survey work of the engravings along the Tagus Valley (Baptista 2011). No doubt they were very heavily influenced by the ideas derived from Claude Levi-Strauss and Andre Leroi-Gourhan from the

works related to the study of mental structures and systematic thinking among living societies still considered ‘primitive’ and the studies on Paleolithic art in the Caves of France and northern Spain. They discussed everything emphatically on the premise of reaching the same end goal, considering the times, each meeting or discussion felt the burst of a new freedom of thought, commenting on the injustices of life that wrought the country under it’s then current leadership (Raposo 2011:5). The activities undertaken by the group were further hindered by the news that they were under police surveillance by the International Defense of the State (PIDE) (Raposo 2011), which led to those working on the Tagus banks to become more discrete in their doings and sayings.

The PIDE acted as a strong arm and a New State through its coercive, repressive and censorship program. This instilled an upheaval that challenged the dominance of the New State which surfaced across the country, and consequently led to the advent of April 25, 1974. The streets were invaded by flux of social unrest which somewhat halted the work of the archaeologists as the atmosphere was quite inappropriate for archaeological reflection (Baptista 2011). However the vicissitudes of the period brought about new feelings instigated by social justice, utopia of socialism and a desire to access a culture for all. This lured the team back to their responsibility in taking action to preserve and defend the Common Heritage and spread the knowledge (Serrão 2011).

Thus a free course on rock art was organized even though the Faculty of Arts of Lisbon was closed for a whole year to display its support in the possible link between social and political turmoil (Lemos 2011), the knowledge regarding the Tagus rock engravings was becoming a more popular topic amongst the general population. Even after most of the rock engravings were submerged, some of the student volunteers continued to pursue archaeology whilst others ventured into different paths. Among some of the participants in that great survey and recording quote are: Eduardo da Serrão Cunha, Vítor Oliveira Jorge, Susana Oliveira Jorge, Maria de los Angeles Querol, Francisco Sande Lemos, Jorge Pinho Monteiro, António Martinho Baptista, Luis Raposo, Vítor Serrão, Antonio Carlos Silva,Teresa Marques, Manuela Martins, Mário

Varela Gomes, João Gonçalves Ludgero, João Caninas and João Francisco Henriques.

These were the young people who we come to know as the ‘Tagus Generation whom experienced a wonderful encounter in times of unrest and through a time where liberation also swept through (Baptista 2011). These names are some of the main authors of publications and rock art specialists of the Tagus Valley, and for associated with the leading interpretative theories and chronologies on the whole.

It seemed fate willed the discovery of these rock engravings, as almost a year later the construction of the Fratel Dam would see most of the rock engravings become submerged under water lost to us for viewing appreciation and to science its study. With knowledge of the, approaching events to come the researchers undertook a major campaign lifting and recording the engravings by latex molding. This imprinted on the mold the exact copy of what was engraved on the rocks, thus preserving the memory of these engravings for a future time. Before this disaster struck, there were prints that were identified to great extent along the banks of the Tagus and divided into 13 stations from upstream to downstream: Cachão de São Simão, Alagadouro, Lomba da Barca, Cachão do Algarve, Ribeira de Ficalho, Fivenco, Fratel, Cascalheira do Tejo, Foz da Ribeira de Nisa, Chão da Velha, Silveira, Ribeira de Figueiró e Gardete (Baptista *et al.* 1978; Querol *et al.* 1975a; Serrão 1982; Serrão *et al.* 1973). There were also discoveries made along the Tagus River in in Spanish territory of Herrera de Alcantara, which became the most upstream station of the rock art complex (Baptista 1981; Serrão 1978).

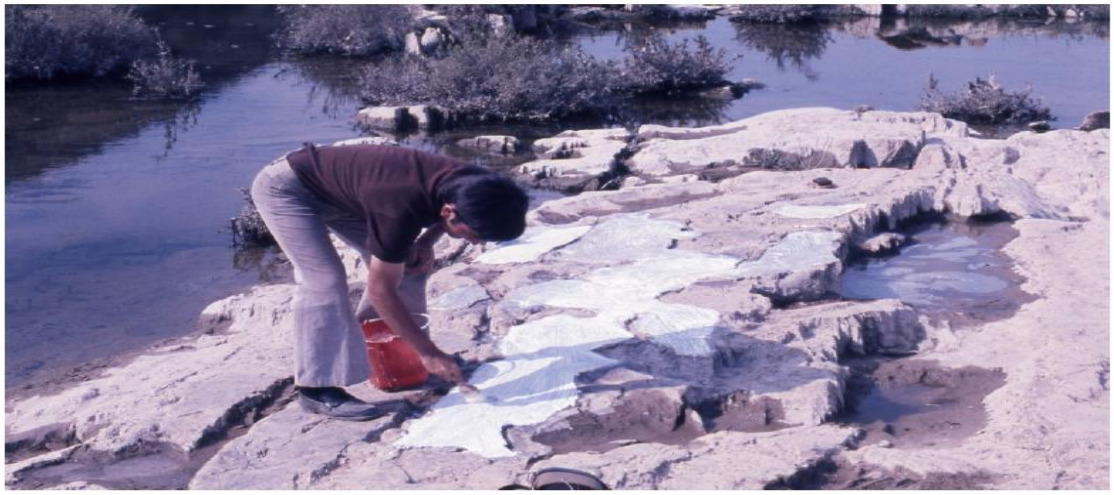


Figure 1: Molding in Fratel, 1973. Source: Gomes 2010

Figure 2: Topographic survey using metric-tape, 1973. Source: Gomes 2010

Figure 3: Emanuel Anati taking pictures in Cachão do Algarve 1974. Source: Gomes 2010

Of these stations only Gardete, São Simão and Ocreza can still be observed outside water. Periodically the waters revert far enough that expose more prints along São Simao and possible along the closer stations such Alagadouro, Lomba da Barca and even perhaps Cachão do Algarve , although this last fact has not been confirmed. In the inauguration year of the Fratel Dam 1973, the Gepp team prospected the river banks of the Ocreza, a tributary of the Tagus between the dam of Pracana and its mouth, a distance of 4km. Initially they discovered 3 panels, but in later years 1974 and 1976 a more systematic survey was undertaken, and a further 20 panels were identified. The typology of these prints inducted them into the complex of rock art in the Tagus Valley (Baptista 2001)

The more recent discoveries have been made in the early parts of the last decade. In late 2000, the work of monitoring the construction of the A23 a team of the National Centre of Rock Art (CNART) initially prospected a portion affected by the works and identified a new panel, with only one single Paleolithic engraving of a headless equine, which till today is the only one known in the Tagus Valley (Baptista 2001; Oosterbeek et al. 2010). More rock engravings were added to the rock art of the Tagus Valley Rock Art Complex, when in 2001 a new prospecting campaign carried out by the European Centre for Research of Prehistory of the Upper Ribatejo *(CEIPHAR)*. The campaign was to reallocate previously identified prints and through this they identified new panels not only in the Valley of Ocreza, but also the Valley of Carvalheiro, a tributary of the Ocreza. In Carvalheiro there are 10 vertical panels in granite rock with dimples (Oosterbeek 2003; Oosterbeek and Cardoso 2004; Oosterbeek et al. 2010), and were aligned with those identified by Jorge Monteiro and Mario Varela Gomes in the 70's upstream of the dam Pracana. As these types of prints do not feature in any other station of rock art in the Tagus it is complicated whether to include them with in the Tagus Valley Rock Art Complex. Surveys were also conducted in order to contextualise the rock art complex allowing the discovery of two painted shelters of Pego da Rainha. These shelters are situated in the quartzite ridges that dominate the valley Pracana and present 11 panels of schematic paintings, which under their current state of conservation redner them merely visible (Cardoso 2003; Oosterbeek 2003; Oosterbeek et al. 2010).

All these stations are intergrated into the Portuguese terriroty (with exception of Herrera de Alcantara station) and the yet prospected region upstream of the Cedilho dam. In 2005, a team of archaeologists undertook a research project supported by the '*Dirección*

General de Património da Junta da Extremadura' and scientifically driven by Hipolito Collado Giraldo. This research based around the Erges river valley, a tributary of the Tagus, facilitated further identifications of new sets of rock art, which by its iconography, techniques employed and its general theme included it with in the cultural complex of rock art in the Tagus Valley. Thus the river Erges became the boundary upstream of the complex (Nobre 2006).

The research in recent years has taken on a greater impetus. The deployment of the RUPTEJO program, which aims to establish a corpus of knowledge of rock art of Tagus, led to the publication of several articles and the development of several master's thesis and PhD projects on the subject. These were produced under the master's program in Prehistoric Archaeology and Rock Art coordinated by IPT/UTAD and based in Mação, Portugal. The continuing effort to study and document as well as compile a body of scientific knowledge of the rock art complex is still ongoing, and it's aims are to disperse this knowledge for everyone to access as well as preserve this wonderful gift which burdens the banks of the Tagus river.

2. THE TAGUS ROCK ART COMPLEX AND THE GARDETE SITE

The Tagus Rock Art Complex is geographically split into somewhat 40km along the Tagus on both its Portuguese sides, between the Cedilho dam and the mouth of the Ocreza River. Its limit is located upstream in the Erges River Valley which is situated in Spanish territory (the left bank) whilst its maximum reach downstream is to the Pracana dam. It is estimated to have around 20,000 plus engravings making it one of the largest prehistoric rock engraving concentrations in the Iberian Peninsula as well as one of the largest in Europe. However there are some disagreements by various authors as to how many engravings actually exist. In any case with each new study of the complex being undertaken, the number of prints that fit the typological as well as technical characteristic of the Tagus Rock Art will and is enlarging the possibilities all the time (Baptista et al. 1978; Baptista 1986)

The technique employed to produce these engravings was mainly through pecking. This consists of striking the rock surface, using a lithic instrument, which extracts small chips that break off upon impact. Such percussion technique can be direct or indirect (using a direct mobile firing pin or indirectly, with one fixed and one movable firing pin) thus the series of peckings are formed (Baptista 1986). It is thought that the large amount of quartz and quartzite pebbles that are abound in the region may have been used as raw material. All panels are arranged horizontally along the rock surfaces. These rocks arranged at various levels along the banks of the Tagus have suffered the effects of erosion by the river for thousands of years, which gradually smoothened the platforms making them ideal for recording images (Farinha 2005; Santos 1985; Oosterbeek 2008; Àrca *et al.* 2001).

Prior to the rising of water levels due to the construction of the Fratel and Cedilho dams, researchers were able to observe that the rocks were aligned along the banks on three main levels: the first was immediately next to the river suffering direct action and covered by a thin layer of mud made it practically impossible to detect any petroglyphs that it may be hosting. The second level would occasionally be covered by fluctuating water levels, which was enough to allow for the occurrence of polished surfaces without generating an accumulation of sediments on the rock. Thus this level would host most of the rock engravings that form the rock art complex. Finally the third level would rarely be touched by water, allowing conditions for lichens to cover almost its entire

surface, thus acting as “camouflages” for any pictures that may exist on its surface (Serrão *et al.* 1972a, Serrão *et al.* 1973)

According to terminology taken from the traditional bibliography regarding the Tagus Rock Art, the engravings are categorised into three groups: geometric-symbolic, zoomorphic and anthropomorphic motifs (Serrão *et. al* 1972a; Serrão 1981; Santos 1985; Querol *et al* 1975a). The geometric shapes and their construction and meaning can only be construed from the mental and cultural structure of their authors (Serrão et. al 1972a). Some of these examples are circular shapes, oval, spirals, meanders, straight lines and curves, along with other numerous irregular shapes undefined, all of which have some sort of relationship with each other or associated with zoomorphic or anthropomorphic motifs (Baptista 1986). The zoomorphic images are quite varied from deer, goat-like, equine, canine, bovine, snakes and a bird, of which the deer features quite predominant amongst the complex. The animal representations are usually present with the head completely filled with a dense perforation whilst the body submits a continuous line (this line sometimes breaks down in the belly forming what some authors call a ‘life line’), and filled with dense pecking. Associated with animal motifs are usually geometric symbols mainly circles and spirals, but rarely are they associated with anthropomorphic figures (Baptista 1986; Serrão et al 1972a; Querol 1975a). Anthropomorphic figures can be subnatural, semi-natural, schematic or stylized and can sometimes be associated with other figures and geometric symbols. Some authors can even allude to the sex of anthropomorphic representations depending on the type of motifs or features are present within the structural composition of the figure. Gomes (1897) infers female representations whilst Baptista (1986) mentions the gender of a figure through the absence or presence of certain traits. At the station of São Simão it is possible to observe what seems like a figure holding a dead deer on its shoulders (Querol et al. 1975; Oosterbeek et al. 2012), this amongst others gives us a small indication of the vastness of topical depictions that exist and await discovery in this Rock Art Complex.

There are a range of other types of motifs and representations that cannot go without mentioning. Some of these are idols stelae, dimples and even representations of weapons, which arise quite isolated in their depictions. Narrative scenes are quite rare but do feature and their meanings are quite obscure and at the very most uncertain to us,

therefore any form of interpretation made with such assurance is quite dangerous and could suffer a precedence of inconsistencies concerning this wonderful complex of imagery (Baptista 1986; Jorge 1986).

Below are some representations of the different motifs from the Tagus Valley Rock Art Complex that give us an idea of the variety and different styles of depictions.

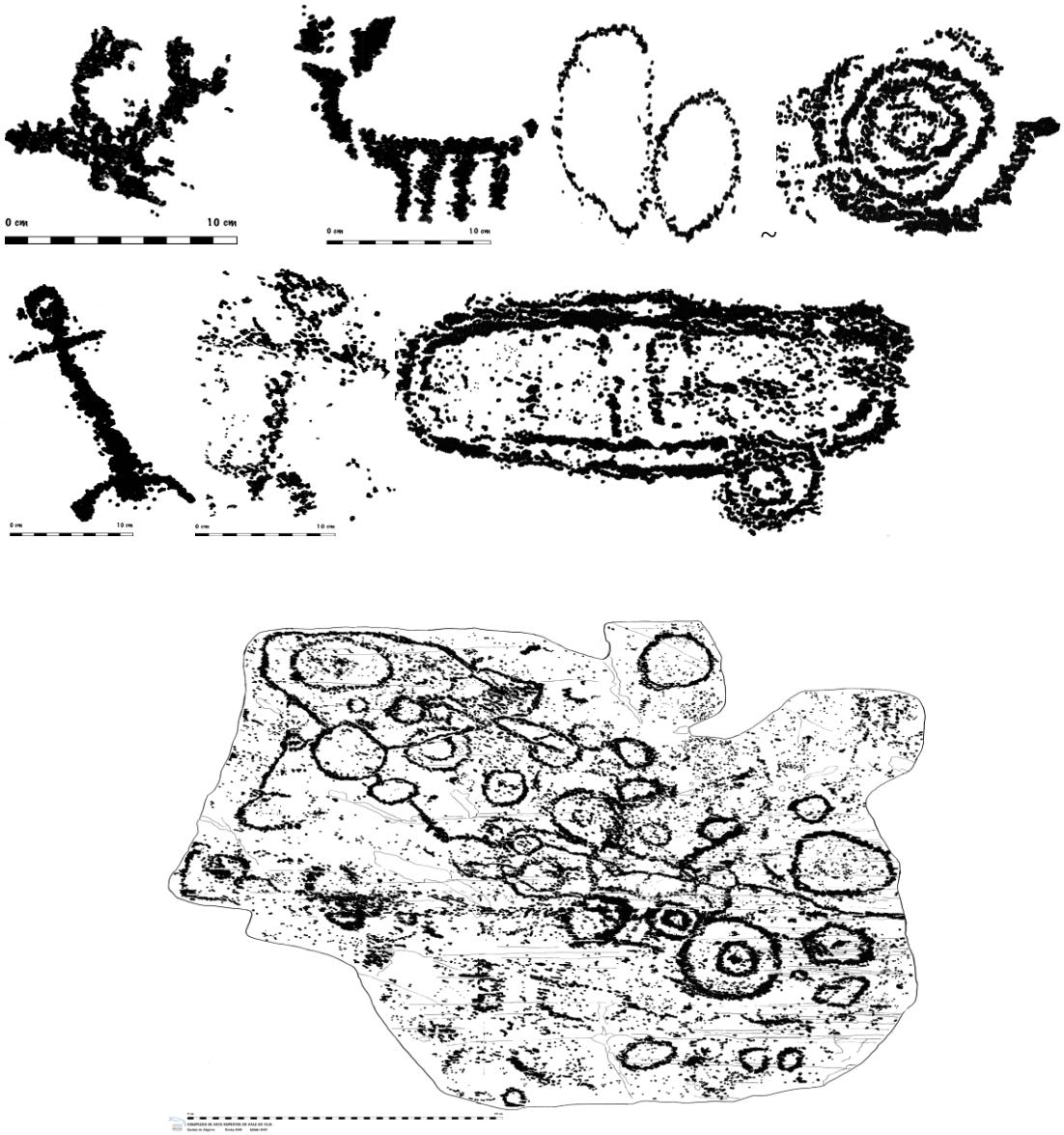
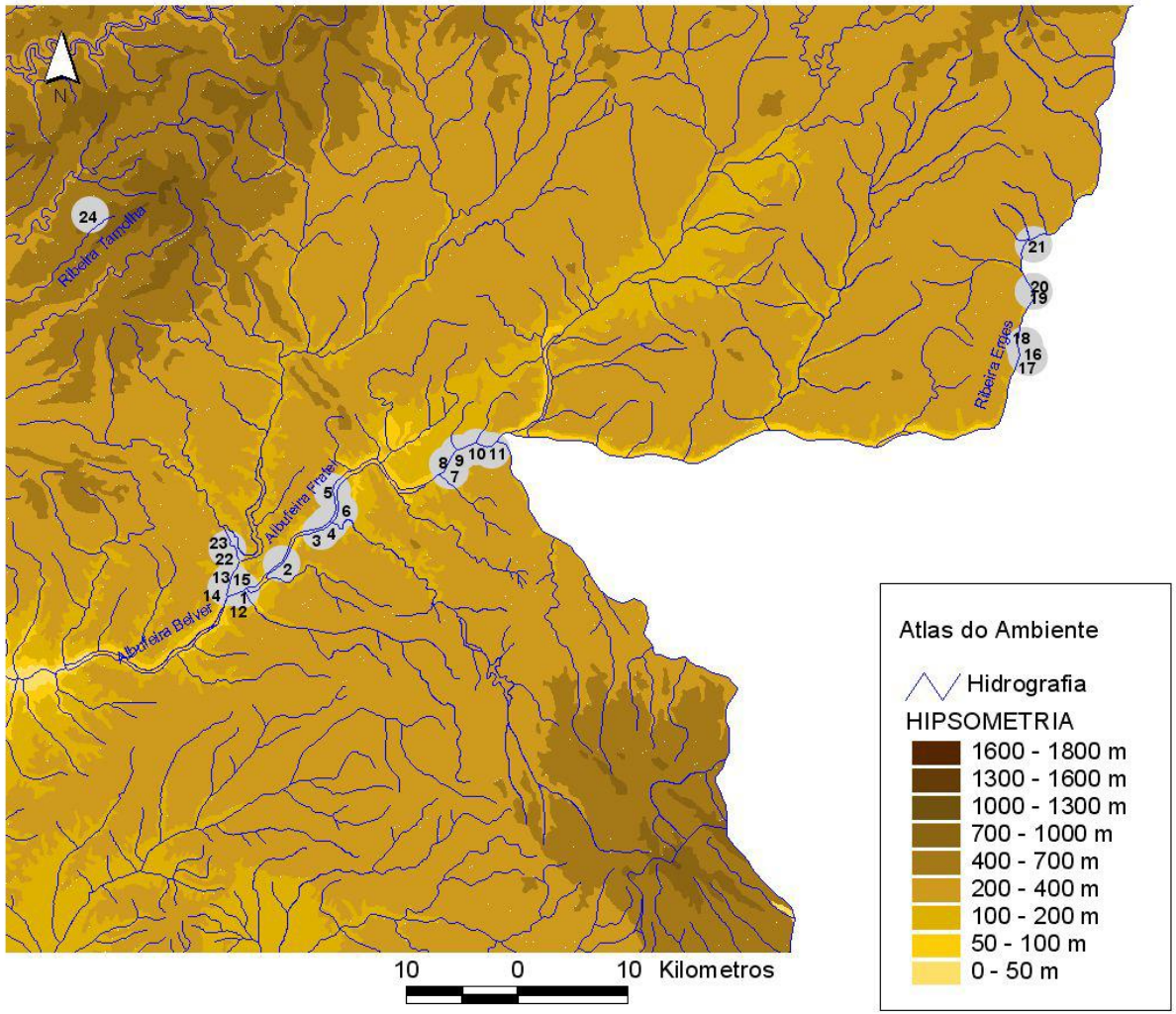


Figure 1: AL36, F11B, CAL72, CAL16, SS92, AL39, CAL28, CAL68D. Representations of anthropormophs, geometrics and zoomorphs that can be found in the Tagus Valley Rock Art Complex. ITM Archive 2013

a. Geographic framing

The rock art sites of the Tagus Valley are located along the banks of the Tagus River both the left and right margin and administratively occupy the municipalities of Mação, Nisa, Vila Velha de Rodão and Herrera Alcantara (now in Spanish territory) alongside the other Portuguese tributaries, Sorraia, Erges, Almonda, Alviela, Jamor, Trancão and Zêzere, constituting the watershed of the Tagus river in Portugal (Baptista *et al.*1978). The Tagus Valley complex is born near Albarracin, in Spain and flows into the Atlantic Ocean near Lisbon, Portugal. It has a length of around 1100km and a basin of 80000 km². The watershed of the Tagus cuts along the Iberian Peninsula with a dominant east – west orientation. It is bordered to the north by the river Douro and Mondego, to the east by the river Ebro, Turia and Jucar and in the south by the basins of the river Guadiana and Sado.

The Tagus Rock Art Complex is one of the largest open-air rock art manifestations in Western Europe and the river itself is the largest in the Iberian Peninsula. Along its Portuguese territory the river bathes in important cities such as Abrantes, Vila Nova da Barquinha, Santarem, Vila Franca de Xira and Lisbon.



1	Gardete – Tejo
2	Silveira Tejo
3	Chão da Velha – Tejo
4	Ribeira de Nisa – Tejo
5	Fratel – Tejo
6	Cascalheira do Tejo - Tejo
7	Ribeira do Ficalho – Tejo
8	Cachão do Algarve – Tejo
9	Lomba da Barca – Tejo
10	Alagadouro – Tejo
11	São Simão – Tejo
12	Rocha dos Cervídeos – Ocreza
13	Rocha do Cavalo – Ocreza
14	Rocha dos Dois Veados – Ocreza
15	Rocha dos Antropomorfos – Ocreza
16	Vale do Erges – rocha 1
17	Vale do Erges – rocha 2
18	Vale do Erges – rocha 3
19	Vale do Erges – rocha 4
20	Vale do Erges – rocha 5
21	Vale do Erges – rocha 6
22	Abrigo 1 Pego da Rainha
23	Abrigo 2 Pego da Rainha
24	Rochas 1-2-3 de Figueiredo – Sertã

Figure 2: Hypsometry of the Tagus river in the Iberian Peninsula. Source: ITM Archive 201

Geological and Geomorphologic framing

The Tagus River in Portugal is geologically in a confluence of three main morpho-structural units. The old Massif or also known as the Hesperian Massif with rocks of Metamorphic Complex namely schist and quartzites series of Precambrian and Paleozoic; the Limestone Massif in Extremadura mainly composed by Mesozoic formations, by the Cenozoic fluvial deposits and the Quaternary sedimentary basin of the Tagus (Rosina 2004).

The Old Hesperian Massif represents more than two thirds of the surface of the Iberian territory occupying the central and western Iberian Peninsula. It forms the western end of the Hercinian European Chain being an ancient Pre-Cambrian and Paleozoic formation (Ferreira, 1981). The litology is composed of metamorphic, sedimentary and igneous rocks, namely schist, shales, quartzite, amphibolites, conglomerates, marls and granites (Rosina 2001)

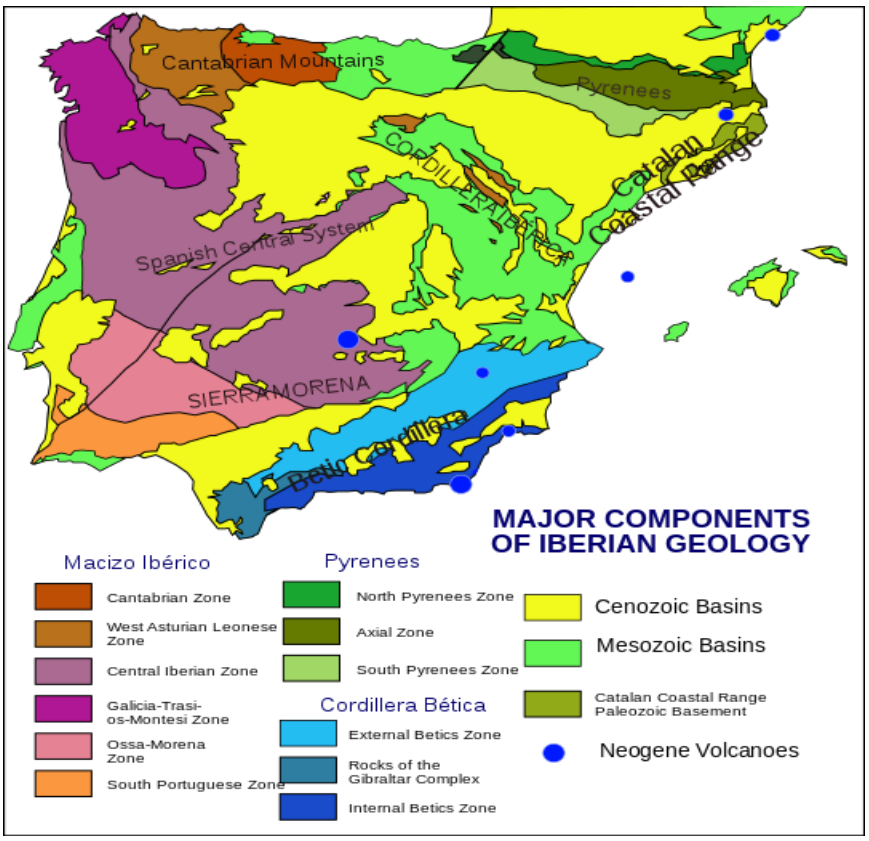


Figure 3: Geological Units of the Iberian Peninsula. Source: Ignacio Melendez Hevia 2004

The Estremadura Limestone Massif is composed by Mesozoic formations whose origins are associated with the extensional episodes that led to the opening of the Atlantic Ocean during the Mesozoic Period. We can observe the presence of Triassic sandstones and conglomerates, and Jurassic limestone formations superimposed on the Tagus river basin. The combination of these rocks is also a separate unit by the peculiarity of its morphostructural tectonic framework, because it registers the greatest extension of limestone outcrops in the Middle Jurassic from the Portuguese territory (Rosina 2001).

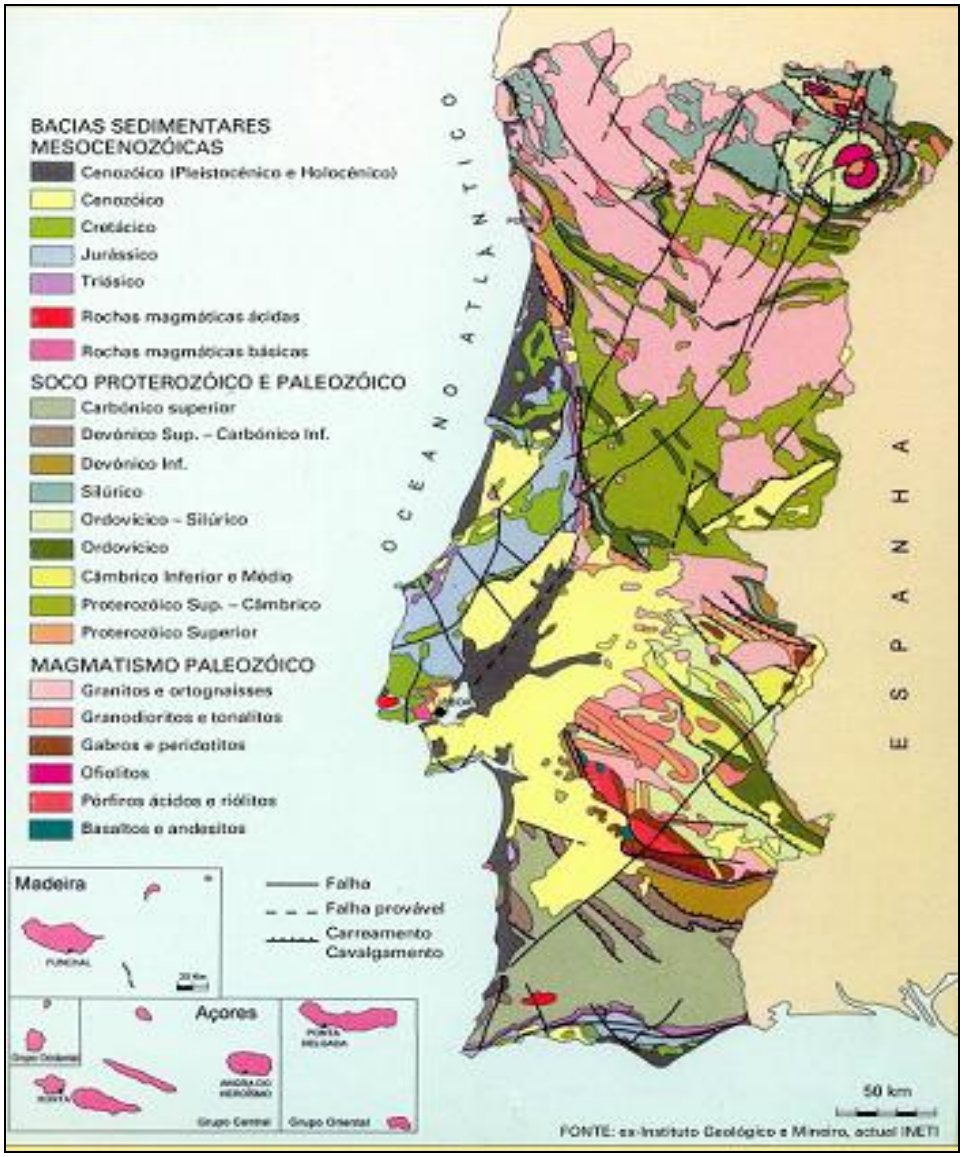


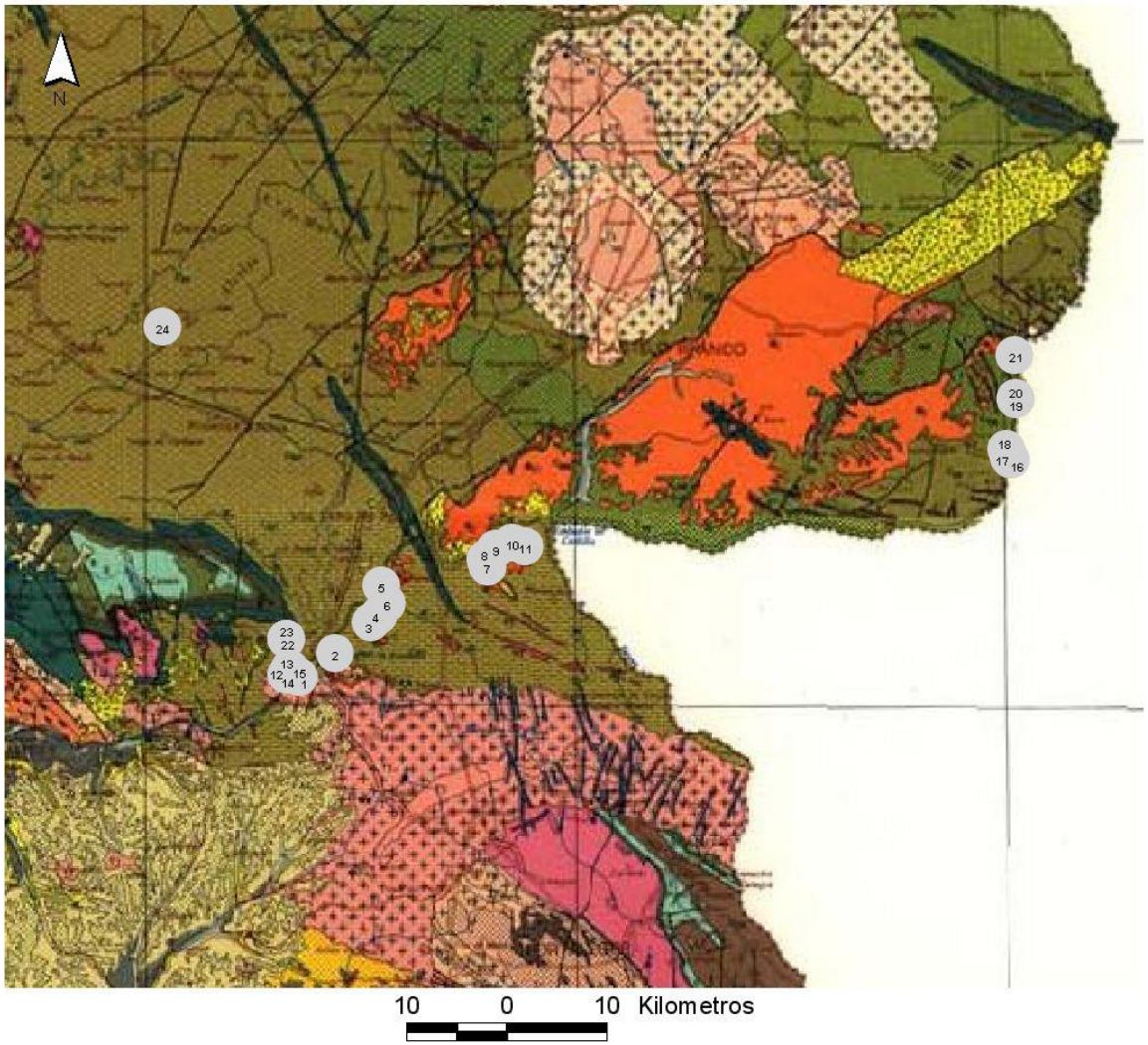
Figure 4: Geological map of Portugal. Source: www.mindat.org

The sedimentary basin of the Tagus-Sado is composed of two river basins. However in terms of their geological unit, its structural and morphological characteristics consist of

the same lithological features. The Tagus sedimentary basin was developed in full continuity of the Sado basin and its area is quite extensive, the Tagus Cenozoic Basin occupies 10,000 km ^{2} of about 25,000 km ^{2} of the river basin in the Portuguese territory (Rosina 2001).

The deposits of the Tagus Valley consist of diverse types: alluvial deposits, Colluvial deposits which exist through material transported by gravity, and of fluvial terraces, whose formation is linked to the combination of climatic oscillations with eustatic-tectonic phenomena (Rosina 2004).

In the Tagus River, there have been identified six fluvial terraces (T1 to T6). In the site of Gardete there are no fluvial terraces present because of the rock substrate, which is less soft than the other areas of the Tagus River where the fluvial terraces have developed (Martins *et al.* 2009).



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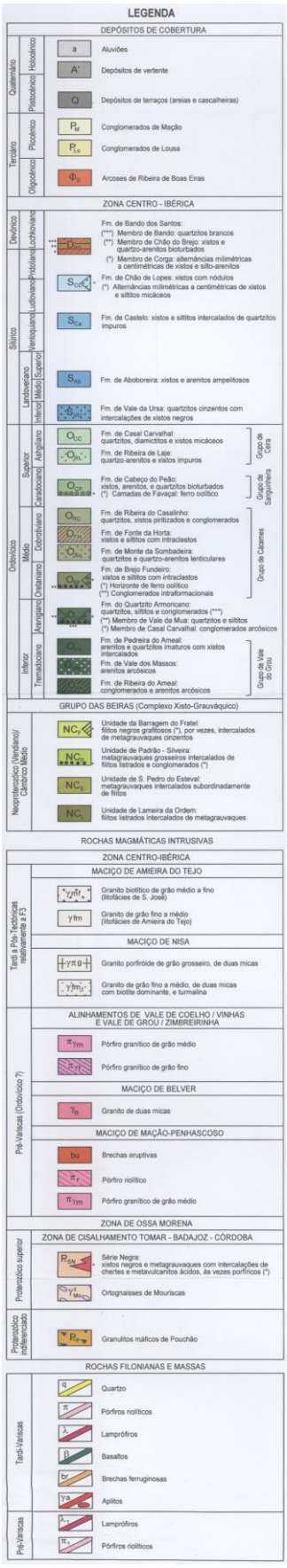
21	Vale do Erges – rocha 6
22	Abrigo 1 Pego da Rainha
23	Abrigo 2 Pego da Rainha
24	Rochas 1-2-3 de Figueiredo – Sertã

Figure 5: Geological map of the Tagus basin with the main corpus of Rock Art sites. Source: Oosterbeek et al. 2012.



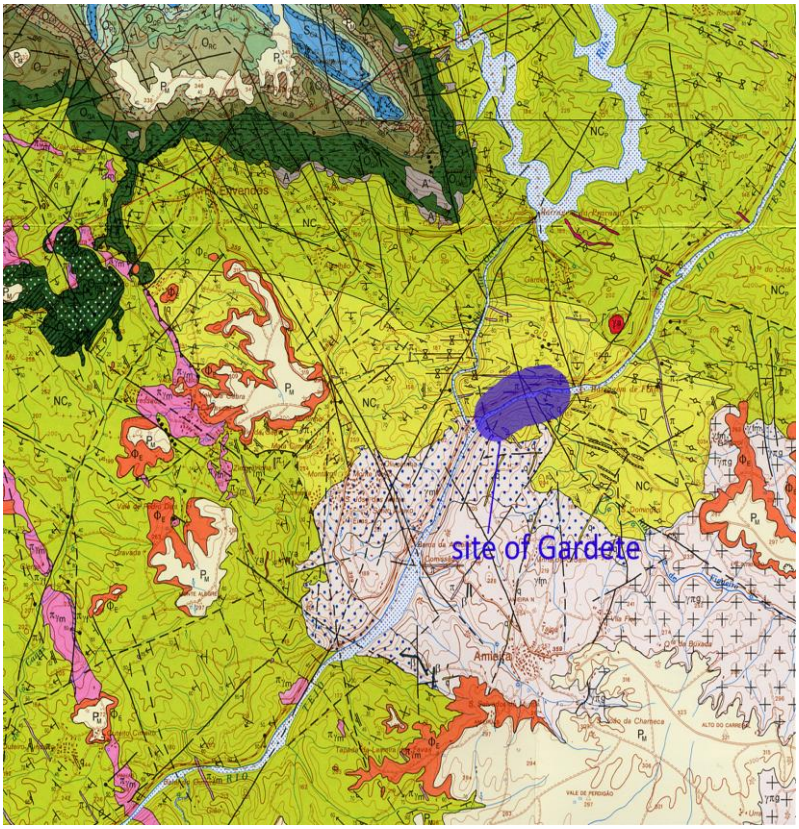


Figure 6: The geological Unit in which the site of Gardete features. Source: Romão 2006.

The geological unit in which the site of Gardete as is classified in the Geological map of Portugal (28-A, Mação) is the Fratel Dam Unit. It belongs to the so called Beiras Group which consists mainly of schist's and greywacke. (NCf) This unit has an orientation of WNW-ESE. The unit is characterized in general by a sequence of phyllites and black metasiltstone sometimes graphitic interspersed with grey and black metagreywackes. This unit has a dominant lenticular geometry both in pelitic and metagreywacke lithologies. In general the primary sedimentary structures present in the lithologies of this unit are obliterated, in particular at the top of this sequence due to intense thermal action associated with contact metamorphism, produced by the intrusions of plutonites of the Amieira do Tejo and Nisa (Romão, 2006).

The engravings in the site of Gardete feature mainly on the North bank of the Tagus River outside of the Fratel Dam. There are no engravings as far as it is known, that are on the other South bank of the Tagus River along this stretch from the Fratel Dam to the mouth of the Ocreza tributary.

Figure 7: A view of the West bank of the Tagus River along the site of Gardete. Facing away from the Fratel Dam. Source: Sara Garcês 2013

b. Chronological and Interpretative Models

The interpretation of the Tagus Rock Art Complex has been quite an intense discourse. It will remain this way as trying to stamp theory, as a fact is almost impossible with Rock Art. Therefore, during its rediscovery in the early 70's and the continuation of its study today, there have been interpretations and chronologies that have been accepted as a working framework to understand the rock art complex. It is these chronologies and interpretations we will work with to understand the motifs and possible meanings of the Gardete site itself. We have presented here the main chronological interpretations that have been made over the years.

Orlando da Veiga Ferreira in 1973 attempted to interpret the chronology of the rock art complex and found his inputs rejected strongly by the scientific community. His observations of the engravings of Fratel and the erosion of rocks purported a claim that if some figures could date from the Neolithic period, than most were created during the middle ages up until contemporary times (Ferreira 1973). Of course his questioning of the authenticity of the pictures being from prehistoric periods was immediately denied and for the right reasons too.

Eduardo da Cunha Serrão who led the team responsible for the research and exploration of the Tagus rock art complex based his chronological interpretation on comparisons with other European rock art complexes. Based on stylistic and technical comparisons, looking at the Spanish Levantine Rock Art and Valcamonica complexes he hypothesised a timeline that stretched from the Neolithic to the Bronze Age (Serrão 1978). The oldest engravings would date from the Neolithic, continuing into the Chalcolithic, and a simmering down of production in later periods after (Serrão 1972). He focused mainly on circles and zoomorphic images and paralleled these with European examples, which were part of the zoo-heliolátrico (animal–sun worship) shrine cults, where the circles were representations of suns. In the following year, inspired once again by circles he claimed that the Tagus complex be part of a dispersal area which was then called "Galician-Portuguese rock art".

Emanuel Anati in 1974 proposed a more elaborate chronological interpretation than what was being formulated preceding it. Inspired by the periodization of the so-called 'Galician-Portuguese' he defended the timeline that stretched from the Neolithic to the Iron Age. The main mantel for deciding such a timeline was based on climatic

factors (a note to be considered is that these climatic factors have never been proven in the region), conditioned the rise and regression of the water levels. For these factors, he proposed two phases of production. The first corresponding to the Boreal period, he considered hot and dry and was between 7000 B.C. to 5500 B.C. The second stage would be located in the Sub-Boreal period between 3000 to 2000 B.C belonging to the late Neolithic (Baptista 1986, Caninas and Henriques 1985, Oosterbeek 2008, Serrão 1978). The first phase of Anati's description belonged to the advanced phase of the Epipaleolithic, characterised by the depictions of animals in grand sizes, sometimes with the body traversed by transverse and oblique lines. The figures representative of the second phase belonged to the 'Late-Neolithic' and according to the author had obvious figurative parallels, stylistic and conceptual with the megalithic art in the Iberian Peninsula (Anati 1975).

In subsequent years António Martinho Baptista along with Eduardo da Cunha Serrão and Manuela Martins hypothesised a new chronological interpretation. Based on their study of the site of São Simão they proposed the division of the Tagus Rock into three phases.

The first phase is pre-megalithic characterised by subnaturalist, naturalistic and subdued motifs, beginning in the first half of the fifth millennium B.C. The second and third phase are described as the more flamboyant and rich in motifs dating to the fourth and third millennium B.C during which the megalithic culture of the Peninsula developed (Baptista et al 1978a, Caninas and Henriques,1985, Jorge, 1983, 1987, Oosterbeek, 2008). The attribution of the second and third periods to the megalith is itself quite uncertian, as megaliths are indeed widespread in the region, but very poorly known in respect of this (Baptista 1986). António Martinho Baptista infers that the Tagus rock art does not extend beyond the Neolithic. He emphasises the fact that the appearance of geometric types, which is normally attributed to later periods has been proven to be older than the supposed megalithic culture as can be found in the post-glacial Iberia. The first phase which is attributed to the pre-megalithic is said to be dominated by the hunter mentality. Large representations of zoomorphs, sometimes in an X-ray type representation, with some associations applicant with the spiral shapes. The second phase changes the concepts into more figurative with the inititation of schematism, evident through the representations of the anthropomorphs. The third forms the end of third millenium BP with the appearance of geometrics in abundance cirles and derivatives (Baptista et al 1978, Baptista 1981). More recently,

Baptista and his team discovered in Ocreza river (Tagus tributary) a Paleolithic engraving, in the form of a small horse. This was quite striking as it resembled the ancient Pleistocene art of the Côa Valley, i.e, more than 22,000 years BP. This discovery has forced him to retreat on their chronology, yet there seems to be no continuation of engravings from the time of the Ocreza horse to the Neolithic. Therefore with revised time scaling a fourth epoch has been attached to the Tagus Rock Art Complex, if only a minor blip in its history.

phase 1 - pre-megalithic - segmented body of large deer and equine from Fratel

Phase II - Anthropomorph supporting a dead deer, megalithic phase from S. Simao

Phase III - megalithic period detail of a composition of circles from Cachao do Algarve

Figure 8: Depiction of engravings representing the three different phases according to Baptista. Source Baptista, Serrão, Martins, 1978

In 1980 Mario Varela Gomes and Jorge Pinho Monteiro defended their theory in IV National Congress of Archaeology in Faro. Their interpretation was more different in that it considered a long "cycle" of thematic and stylistic development covering six distinct phases (Baptista 1986, Caninas and Henriques 1985, Gomes,1980, 1987, 1989, 2001, 2002, Jorge 1983, 1987, and Gomes & Monteiro 1980).

1st

The first phase is described as the "sub-naturalist" period. Owing much of its inception to the the hunter-gatherer groups, which followed the tradition of the figurative representation of the Paleolithic tradition. The phase is charaterised mainly by large animals representated very realistically, amongst them the most depicted are the deer. The author denotes that those responsible had a concern to integrate into the world where it was imperative to understand the natural cycles of the animals in which they hunted (Gomes 2007). Furthermore this period is divided into two stages, the old and the evolved displaying the abilities of the responsible societes to adapt and evolve within the complex socio-religious activites (Gomes 2007). The main difference being the particularities of the anatomical details with several scenes of sexual associations (Monteiro & Gomes 1980). Another distinct feature identified by Gomes was the 'Frozen Movement' in some animal depictions, which he associated with the material culture of the societies responsible for the art (Gomes 1987).

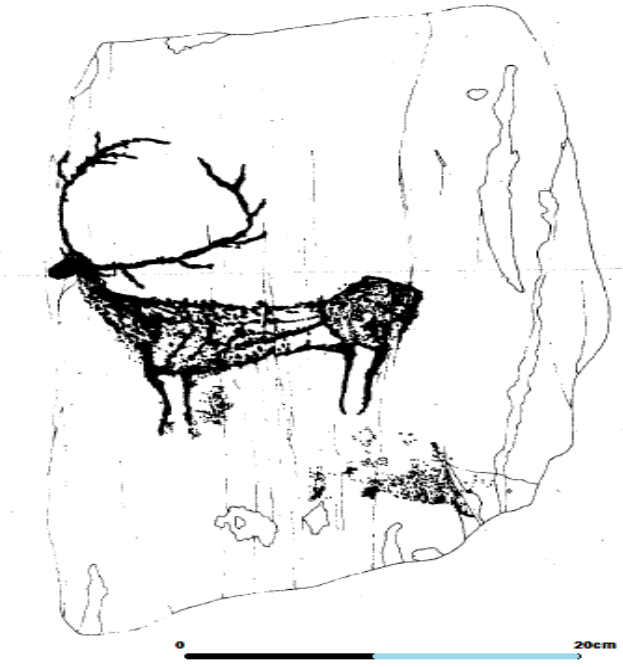


Figure 9: Rock 59 of Cachao the Algarve (Period I) This figure was overlaid with spirals and circles of periods V and VI. Source Gomes 1989

2nd

The second phase is described as the "Stylised-static" and is assigned by the increasing stylisation of zoomorphic imagery. The animals are essentially of deer and sheep and are often associated with each other composing of scenes where they appear static, with elongated bodies and striped. This new phase is a natural evolution of the previous with no marked ideological change, therefore the authors note that its possible geographical location kept it isolated from any technical innovations (Gomes 1980, 1987). Initially this was considered to be within the Neolithic but revised consideration now places it between the Epipaleolithic and Neolithic (Gomes 2007). In Gomes 2007 the author identifies two different stages within this phase, the initial and the more complete.

3rd

This phase is known as the 'Stylised-dynamic. It presents visible differences from the previous styles. By its name, it indicates the dynamism potrayed in the imagery with a vast repertoire of figurative associations with zoomorphs aligned sometimes with anthropomorphs. The translation of this period is a continuation of the previous two with importance given to the hunter groups with slight technical innovations in style being the marked transition. The representation of an improved corpus of hunted species indicates the developed nature of the responsible society, from horse, deer, bears, birds and even domesticated dogs. The interesting aspect of this phase is the closeness of the engravings to the banks of the river which is suggestive of the 'would be' excellent hunting grounds (Gomes 1987, 1989). Gomes further delineates the phase into periods, the initial and the full (Gomes 2007). The three phases seem to correlate with the established cronostylistic evaluation of the current levantine art as a whole, and furthermore, it presents the notion that little environmental or climatic changes occurred in this time span. Gomes (1987, 1989) further highlights the cognitive change in the minds of these people to show self awareness through representation of the human figure in similar circumstances to the animals; an act in which he mentions demonstrates the socio-religious capacity of the hunters in relation to the rock art.

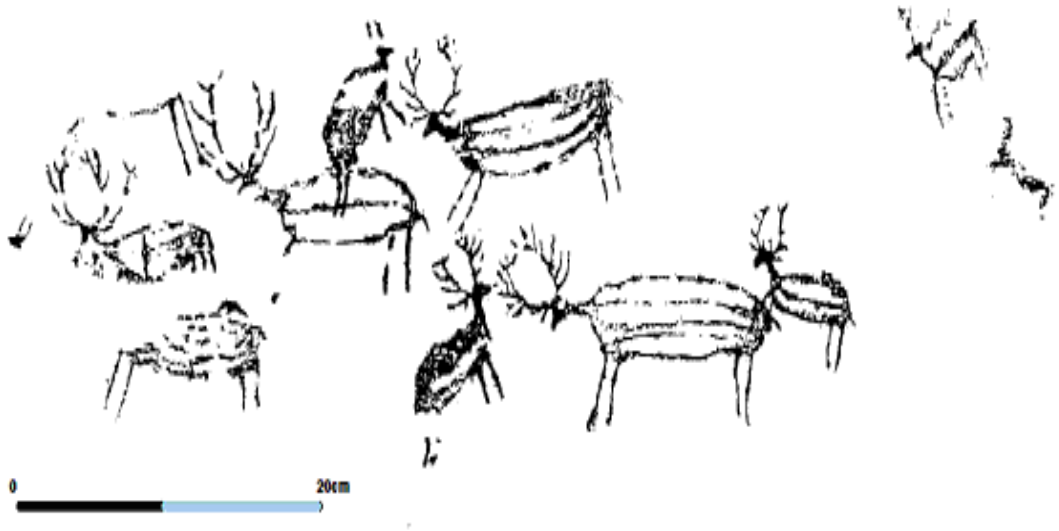


Figure 10: Central area of the rock 49¹ Fratel. Observable a group of deer in the style of stylized static (period II) overlapped by another style dynamic (period III). Source: Gomes 1989.

4th

The fourth phase is named as 'Southern' due to the influx of migrating metalurgical cultures settling in the South and Southwest of the peninsular. Its time periods are slotted within the Final Neolithic and Chalcolithic around the III millennium BC. The change marked in this phase is quite distinct in that its almost an iconographic renovation in the sense that schematism takes complete dominance over the imagery. The figures both animal and human are reduced to the essential features without individualising specific traits, and the scenographic entity is lost. The representations are now accompanied with a major iconographic change and geometric implementation, all in essence accentuating the notion of schematism (Monteiro & Gomes 1980). Gomes also emphasises two periods within this phase, the early and the late, with the early being situated in the Late Neolithic, following somewhat scenic

depictions much like the earlier phases, with the later period situated in the Chalcolithic being more idiomorphic in character. The whole phase sees the anthropomorphic and geometric symbols take prominance over zoomorphs. What is interesting about this period is the way in which the transition of what can be said as a complete sacred superstructure takes form, the use of geometric circle and soliformes are aligned to the so called solar cult, with parallels being made to the mobile art of the megalithic cultures of the Alentejo in the southern area of the Chalcolithic peninsula (Gomes 1987, 1989). This phase sees much influence coming into play, with the innovations of the Copper Age, a deep cut across the ideological fabric happens with new contacts, which can be seen in the destruction of overlapping previous engravings from former periods. The technique of representation also is modified at this point, playing further into later phases. Depthness and a wider elaboration on the engraving are given emphasis which follows through in the later phases (Gomes 1983, 1991).

5th

This phase is described as 'Atlantic' and is evidently full of new iconographic innovation mainly tagged to the appearance of metallic weapons. The iconography represents a clear change or transition of the society, which presents a social structure, a heirarchy based on a greater specialisation and the focus on trade and metallurgical activities (Monteiro & Gomes 1980). The period is defined by a new wave of symbolic representation which is purported to come from influences such as that of Megalithic Britian and Ireland, and in many respects retrieves much of the art of Iberian Megalithic and the Atlantic coastline cultures. All in association with trade relations, exploitation of metals without much change in the historical context of the moment. Such events can also be viewed in the present Scandinavian context as well as in the British Isles and Canary Islands the repetoire includes spirals, concentric circles, mazes, wavy lines with perhaps overlaps or associations with pictures of from the previous periods (Gomes 1980, 1987, 1989, 2002, Jorge 198, 1987).

Figure 11: Rock 39 of Fratel. Spirals and circles (periods V and VI) overlapping the precedent figures that include a soliform (period IV). Source: Gomes 2010

6th

The final phase of the Tagus rock art complex is simply known as ‘Lines and Circles’ named after the vast imagery represented without what is judged to be any formal context or meaning, and labelled as a mere exercise of recording without any spiritual context. This period represents a transition between the end of the II millennium and the beginning of the I milenium BC going into the early Iron Age. The reason for the lack of emphasis of a scenic or representative context is said to be the effect of the ethnic and cultural inflows that came in waves at the dawn of the Iron Age which put an end to the Tagus (Gomes 1987, 1989).

A seventh period has been adopted which represents the historic period. Consigned to the so called ‘leteriformes’ and begins from the Roman period to the present moment. These representations are mainly votive or commemorative with religious symbols or inscriptions and with some of the poetic kind (Gomes 2001). A period “0” has been

added to the Tagus Rock Art complex with the discovery of the headless horse attributed to the Paleolithic, from the Ocreza valley, which is situated in the Solutrean and is limited to soley the engraving of the Ocreza (Gomes 2001, 2007).

The last two chrono-stylistic interpretations of Baptista and Gomes are respectively known as ‘short chronology’ and ‘long chronology’ and are the most widely accepted of today. They both present commonalities and differences but both give emphasis to the megalithic recovery cycle and a sense of unity within the complex. As Oosterbeek 2008 pointed out certain rocks are like “fossil directors” in which guide us to interpreting each phase of style with in the complex.

c. The Gardete Rock Art Site

The site of Gardete was given its name as most of the Tagus Rock Art Complex sites are given their names, by the nearest local village which happened to be a small village called Gardete. There has not been much written on Gardete itself apart from a few invidivual mentions by various authors refering to specific images or rocks, etc. Therefore, the chapter will give a brief overview of Gardete as an introduction, and further detailed information will be present in the following chapters of this thesis.

Figure 12: Location of Gardete with fratel dam and River Ocreza marked as further indicators of its vicinity. Source: Google Earth 2013

Figure 13: Image of Fratel dam facing the site of Gardete. Source: Sara Garcês 2013

Figure 14: View from the banks of Gardete looking into the direction of the Ocreza River. Source: Alja Zorz 2013.

Figure 15: A view of the main nucleus of rocks facing the Fratel Dam. Source: Alja Zorz 2013

Gardete is located in between the Fratel Dam and the mouth of the River Ocreza. There are decorated rocks scattered all over the length of this stretch of the river with two large rocks, one 800 m downstream from the Dam Fratel and the other near the Ocreza confluence of the Tagus. The site belongs to the parish of Fratel in the Municipality of Vila Velha de Ródão and the district of Castelo Branco. To enter the Gardete site, it can only be done so by foot from a small resting place located on the north side of the Fratel dam see figure 10, then following the path leading down to the railway along the Beira Baixa (which was an old Portuguese province) which leads to a towpath that borders the Tagus (Gomes 2004).

The team from the Museum of Macao and the ITM 2013 managed to locate the main nucleus of rocks from which Gomes 2004 based his article upon. Figure 13 shows the the location of the main nucleus of rocks which the majority of the molds held in the ITM originate from.

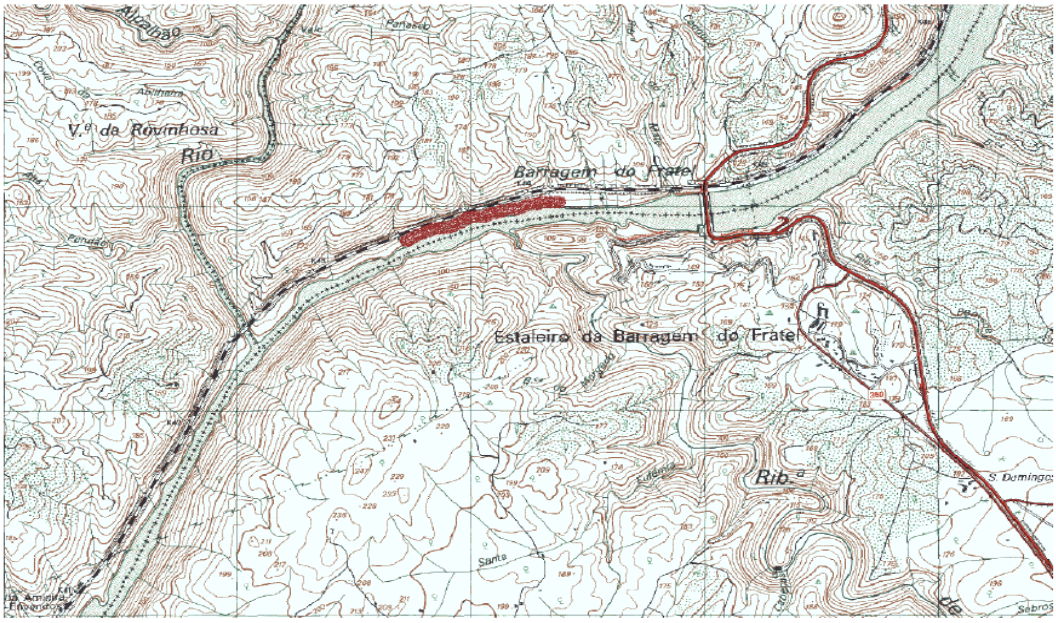


Figure 16: Marked in red is the main nucleus along the Tagus River for the Gardete rocks. Source: Gomes 2010

However the team of 2013 from the museum of Mação and the ITM, have conducted prospections along the Gardete site, which are still ongoing at present, and have encountered further rocks which seem to have already been discovered, but yet to be published. Therefore the following map is the result of the prospections conducted in 2013 and provides an update to that of M.V. Gomes figure 13.

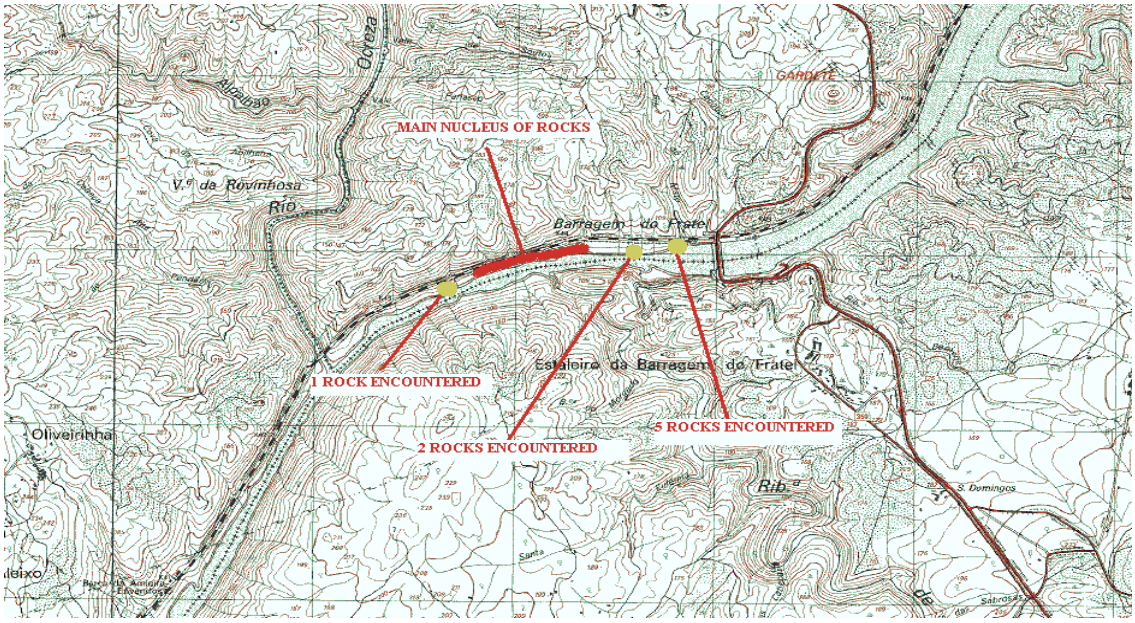


Figure 17: Museum of Mação snd ITM 2013 (August) prospection of rocks encountered outside of main nucleus. Source: ITM 2013

As mentioned already the prospections in Gardete are ongoing and potential for further discoveries are very likely. Gardete seems to be teeming with engravings from the Fratel Dam and possibly beyond the mouth of the Ocreza River. The farthest engraving encountered by the 2013 team beyond the dam Fratel towards the Ocreza was a concentric circle shown in figure 15. It has been found by itself within a corpus of rocks that do not present any engravings. The closest sets of engravings the team encountered were 5 rocks shown in figure 10. From initial observation, this set of engravings could possibly be larger than what has been encountered at present, but due to the hazard of the rising water levels through the opening of the dam, prospection can only be carried out at opportune times when water levels are low. Between the main nucleus and the initial set of rocks near the dam, are two further rocks consisting of circles.

Figure 18: Concentric circle encountered by the 2013 Museum of Mação team at Gardete. Source: Sara Garcês 2013

Figure 19: Anthropomorphic figure from the initial sets of rocks encountered near the Fratel dam. Source: Sara Garcês 2013

Gomes in the 2004 article focuses mainly on Rock 11, which is a very large rock made up of what the author analyses as 212 figures. It is one of the rocks of this site with the highest quantity of images therefore making it a very important rock. The most paramount of important points about Gardete is that it is one of the only sites in the whole of the Tagus Rock Art Complex that remains above water levels, once the construction of the dam Fratel submerged most of the rock art complex under water. The chronology given to the Gardete site places it with in the period between the Late Neolithic and the Late Bronze Age perhaps falling into the Late Iron Age (Gomes 2004) which falls into Gomes 5th and 6th phases of the authors chrono –stylistic evolution of the Tagus Rock Art.

Rock 11 can give us an indication of what to expect from the Gardete site, as it contains around 212 images that have been classified thus far, there are also other pieces of information one can assume by analysing rock 11. Gomes mentions the fact that the author of these images may have considered the natural surfaces of the rock, its contours, its fractures and cracks as a template to draw the images, and also taking into consideration the orientation of the rocks as somewhat an important factor too (Gomes 2004). What is also interesting and quite indicative of what Gardete seems to tell us, is the way in which different styles have been utilised in creating the engravings. Most have been produced by pecking with once exception of a filliform image classified as a scrape present in Rock 11. However within the pecking there can be distinguished 5 different variants which have been attributed to the chronological progress of the production in Gardete (Gomes 2004).

Rock 11 seems to have corpus of imagery that engulfs a wide variety of styles and subject matter. In Rock 11 itself there are the following types of imagery present: anthropomorphs, circles with a central point, concentric circles, semi-circles, Bucranio (representations of horns of bulls or aurochs), serpentiform, footprints, meanders, spirals, crosier, dimpled and dimpled lines, scraping and stains. Rock 11 is dominated by ideograms which compose 62% whilst pictograms make up 15% of the imagery. It suggest that here they focused more on the schematic art and as mentioned earlier in the chronology of the Tagus, maybe this displays the negation of scenes in preference to more schematic forms. In this instance the absence of engravings from the early phases of the Tagus according to Gomes 2004 corresponds to the periods which expanded the sanctuary of the Tagus as Holy places, a phenomenon that occurred from the Late Neolithic. In all Gomes suggest that Gardete may have represented the totality of the universe, where the rocks emerging from the debths of the water indicated the path to the supernatural world of spirits and deities (Gomes 2004).

As mentioned before, there has not been much said about Gardete and all we have are a few references with one complete article focusing on on Rock 11 of Gardete. According to Gomes 2004, the following engravings encapsulate the type and style that is present in Gardete based on Rock 11. In the following chapters, there will be an indepth study of the collections held in the ITM regarding the Gardete site. Using

these materials, a comparison will be made to what is published in Gomes 2004 and other articles in order to understand the level of information that is available about Gardete at present.

Figure 20: Anthropomorphs of Rock 11 in Gardete. Source: Gomes 2004.

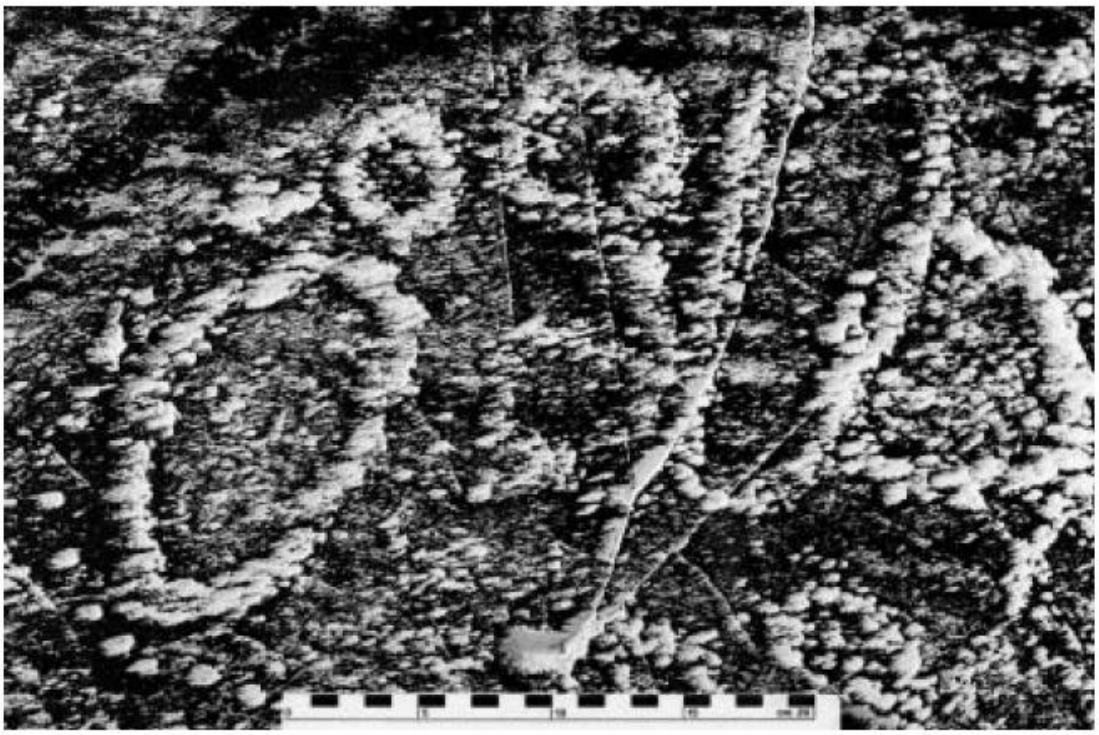


Figure 21: Footprint overlapping trapezoid of Rock 11. Source: Gomes 2004

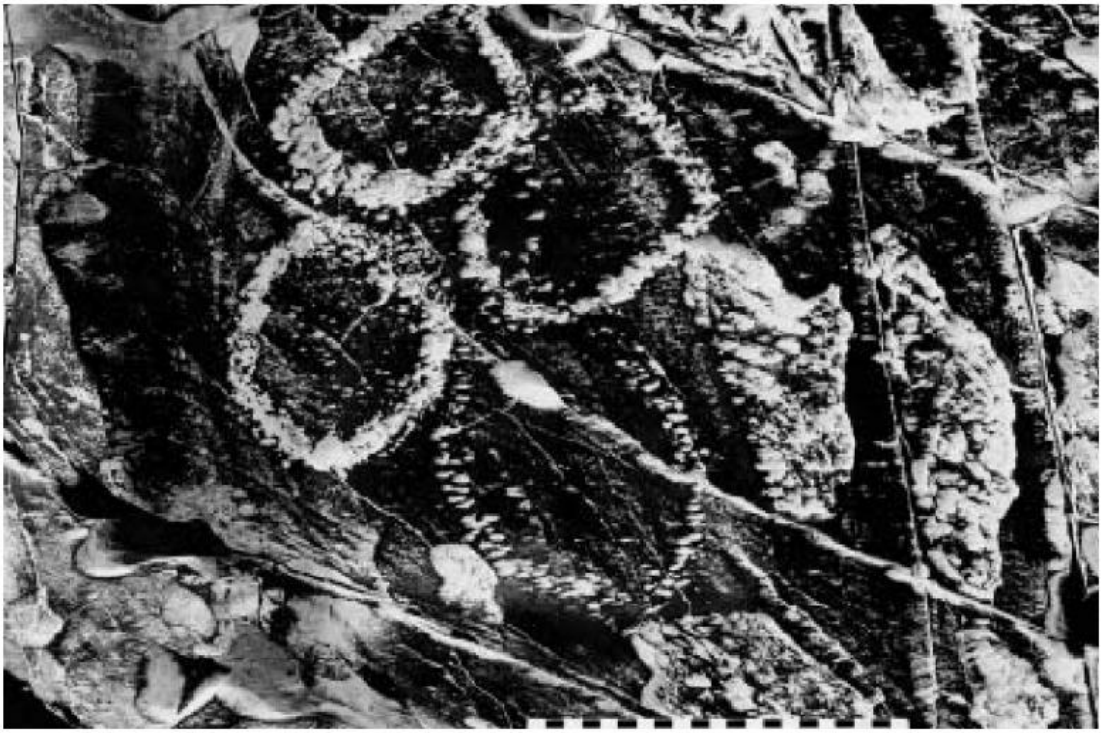


Figure 22: Joint circles and ovals in Rock 11. Source: Gomes 2004

Above are a few pictures and images of the variety of styles that can be found in Rock 11 of Gardete. What is even more interesting about Gardete is if you refer back to figure 9, there is the possibility of finding many more engravings along the stretch from the Fratel dam to the mouth of the Ocreza and even beyond perhaps. As for now, the molds held in the Rock Art Laboratory in the Instituto Terra e Memória in Mação, Portugal and the pictures and information that can be taken from articles such as Gomes 2004 and the authors doctoral thesis 2010 will contribute towards the analysis of this site.

3. METHODOLOGY

This section will explain the methodology adopted for the recording of the engravings, as well as how these moulds held in the ITM were used subsequently to study the Tagus Rock Art.

a. Bibliographic Revision

The first major task undertaken was to select as much literature regarding the Tagus valley Rock Art Complex. This literature was going to form the basis of understanding the development that has been made regarding this rock art corpus. One must remember that it has been almost over 40 years of research and study with several Masters Thesis being performed about this complex in recent years. As mentioned already in the history of research, the construction of numerous dams submerged almost most of the Tagus Rock Art under water, therefore making it unavailable to the audiences of today. In the case of the site of Gardete however, it never suffered this disastrous event and can be viewed at certain times of the year when the rocks are visible above water level. This is somewhat a consolation in the grand picture of the destruction of the complex, but for those who seek to study and understand the art; this is a 'saving grace'. Regardless, the site is available during just some parts of the day as a result of the dynamics of the Fratel dam when it is dumping offloading water in order to create energy.

There is a lot of literature regarding the Tagus Valley Rock Art therefore each reading needed to be thoroughly analysed and scrutinized for its valuable content, and for what in some cases may have been a misinterpretation or conjecture to which over the years have been rebutted or reframed. For researchers this was a huge task and even larger for the fact that in this case, it is predominantly Portuguese ladened literature and study, and this has to be translated as accurately as possible and in detail into English. This proved to be quite time consuming but absolute necessary for without this task, there would not have a clear understanding of the different views and methods applied, and the evolution in the study of the Tagus in terms of interpretations and chronologies.

Once the sorting through a bulk of literature was acheived, it became clear what was the of the main themes, the main arugments, the main propositions, the main intent and trend of thinking by various authors whom have given a large amount of their time in studying this complex. In particular, the focus on Antonio Martinho Baptista and Mário Varela Gomes whom as has been covered already, are responsible for the two most accepted theories in the chrono-stylistic evolution in the production of the Tagus valley Rock Art Complex from its inception to its most recent entries. One also must remember the early authors on the subject such as Eduardo da Cunha Serrão who gave researchers the beginning foundations of what is now attested as a fascinating and engaging field of research, and for the early team of GEPP who spent long and hard working days capturing as much information as possible during times of hardship in the countries political scene.

The literature also proved absolutely essential and from the present point of view, vital for the students who undertook their Masters Thesis on the various sites that make up this complex. This is because of the publication of images and information that are not in the possession of the rock art laboratory at the ITM regarding the various individual sites. However this also added another nuance in that the names, codes and descriptions in some cases change over times in different publications, and this turned out to be like little puzzle pieces that one must put together. In terms of Gardete, One is very grateful for the information contained in certain articles and the Doctoral work of M.V.Gomes, for the author publishes a lot of information and images about Gardete that are absent at the rock art laboratory of the ITM or in other publications.

A final mention must be made to a methodology was adopted to reading through the literature here at the ITM. The team devised a bibliographic recording sheet, which basically entailed the main themes and an abstract regarding each piece of literature that was read. This would then act as an easy and accessible reference point to refer back to when information was required regarding specific aspects of the Tagus. This proved to be very time efficient and very effective in condensing a bulk of information down to sizeable reads.

b. Tracing of the Latex Moulds

i. The Latex Moulds

The only concrete preservation of the Tagus Rock Art complex comes from the substitute of Latex moulds and pictures taken of the Tagus engravings, before the submersion of almost all the sites due to the completion of the Fratel dam. During the 70's when the rediscovery of the Tagus and subsequent studies were being taken, the imminent destruction of the Tagus was looming over the then team responsible. With little time to act upon, the team contacted French rock art specialists Andre Leroi-Gourhan, Annette Laming-Emperaire and Michel Brezillon, who were using methods of molding to capture a negative of the images as well as applying this to other archaeological contexts. The material known as latex or revultex (being its commercial name) is a pre-vulcanised liquid rubber with a small percentage of ammonia which prevents the coagulation of the material. After a thin layer has been applied on the surface of your desired product, by simple evaporation of water and ammonia, you are left with a film of vulcanized rubber which records a negative of the product surface (Baptista et al. 1974, Querol et al. 1975)

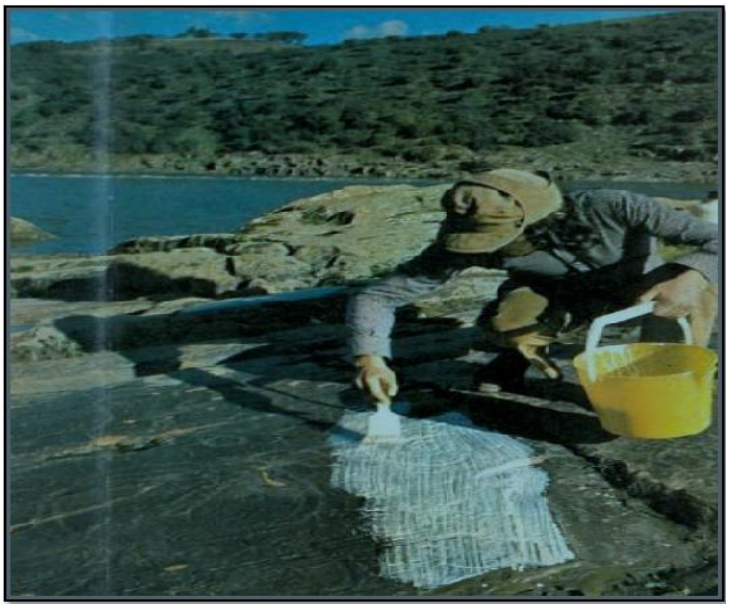


Figure 1: António Martinho Baptista applying latex over engravings in the Tagus Valley. Source: (Photo published by Caire (1973 apud. Açafa Online n.4, 2011)

Figure 1 is an actual photo of the application of this material to the surface of an engraving. Attention now turns to how the application of the actual liquid solution works.

Application Process

According to Baptista et al. (1974) and Querol et al. (1975b) the application process can be described as follows: the first objective was to clean the surface of the rock that was to be molded, by simply cleaning with a brush or water, depending on the gravity of dirt upon the surface. In the colder periods during the year, they applied a thin layer of latex to the surface, and considering its adhesive properties would attract the dirt once peeled away from the surface rock. After the cleaning process, the first real layer of latex would be applied to the surface, being coated evenly to avoid any inconsistencies and air bubbles that would be detrimental to the fidelity and resistance of the mold. The first layer is the most important as it will contain the negative of the image desired, and once dried successive layers will be applied on top to further solidify and add consistency to the mold. After a couple of layers have been added, tarlatan (which a thin, starched, open-weave muslin fabric) is applied around the sixth of seventh layer so that it can be well integrated into the product. This adds further durability and resistance to the mold to prevent deforms in the mold. Another three to four layers of latex will be applied making a total of around 9 layers to complete the process of one mold. The mold is removed gently from the surface of the rock and then catalogued. As they were working in teams, they were able to get up to 15 to 20 moulds produced per day.

Each mold was catalogued and registered with the relevant information. On the back of each mold was stored specific information that would allow for identification of the mold and its associated site. A reference number which normally contained an abbreviation agreed upon for each site, with a number referring to the rock and a number for the mold signifying the statistical number of moulds made. Figure 10 is an example of an actual mold from the site of Gardete that will contain this information. Normally the orientation of the geographic North would be put placed on the back of each mold, but for some reason most moulds do not hold this information. The registration process was completed with around 4000 sets of photographs taken

during day and night to act as a support for the mold, alongside a campaign to survey the entire corpus of rock art to mark their geographic positions. As a whole, the studies and work spent on the Tagus in those remarkably important years gives an impression of what it was or could have been like, and for the benefit of future studies to be conducted without the primary observable engravings themselves (Baptista et al. 1974, Serrão 1978).

Figure 2: Mold from Gardete. Marked with information that identifies its location (G) and the mold number (M) to represent the quantity of molds produced until that moment. Sometimes one single rock will be systemised by a single letter (A) indicating multiple molds upon one rock set or could be indicative of another facet ??which is only conjecture to our guess.

Physical defects and issues that may occur with the moulds

Before explaining the procedure of tracing the moulds, there are a few important factors to consider about the current state and preservation of the moulds. This is relevant to the study of the Tagus because these moulds are sometimes all that one has to base the research work upon. In the case of Gardete, the advantage is rather strikingly different to other sites. As mentioned already Gardete can actually be viewed above water level at certain points during the year, therefore as a backup to the information stored on the moulds and pictures of the engravings, one is able to visit Gardete and see for them selves the actual engravings. Of course natural weathering and human action may have altered the state of the engraving but much of it will still resemble its original inception one hopes. Going back to the moulds, there are evident problems and issues that one may face. A brief mention must be made of some of the prevalent factors that can deter one from accurately studying the sites, other than the fact that the real site may be under water and inaccessible.

Firstly the accuracy of the mold or the engraving decreases slightly upon completion of the mold. By its natural state, the water evaporation advertently reduces the size of the mold. The moulds undergo this continuous reduction overtime and slowly are in effect non representative of the actual dimensions of the engravings in reality. In some of the thinner moulds, the engravings are barely visible and the surface is completely smooth, rendering the mold practically unusable for study. This happens due to the flattening of the relief during events like storage etc.

The storage of the moulds evidently presented many problems and created many new ones upon the moulds. The idea was to have the moulds rolled individually to save space and to not allow the surface to be visible or venerable for alteration by natural or human disturbances (Baptista et al. 1974). Only a few ever were, and the most troubling of problems is the presence of fungi, which form in two ways on the moulds. The first is covering a large surface of the mold destroying the information that is concealed within it space, and the second is be between the layers latex eventually breaking to the surface causing damage and tears to the moulds (Silva 2011).

Figure 3: A: Fungi on the mold surface (AL-8 M-1122) B: Fungi between layers (AL-33 M-1133). Source: Silva 2011

The first case seems to result from the storage conditions, years of storage stacked upon each other in humid conditions, with the addition of a flood that occurred in the storage space, led to added moisture, a perfect catalyst for the growth of fungi. The

second seems to be the result of the presence of water from imperfect drying. The misapplication of latex to form the layers formed air bubbles with in the mold. This leads to a reduction of strength and an accumulation of moisture, generating an environment for the development of fungi.

The application talc powder on the moulds was to further protect it from atmospheric conditions as well from any adhesive agent it may come into contact with (Baptista et al. 1974). It may seem like a positive thing to do but in fact it has led to some negative outcomes. The talc has engrained itself in the layer of the moulds surface and is impossible to remove, thus in some cases adding to the difficulty in visualizing the engraving itself.

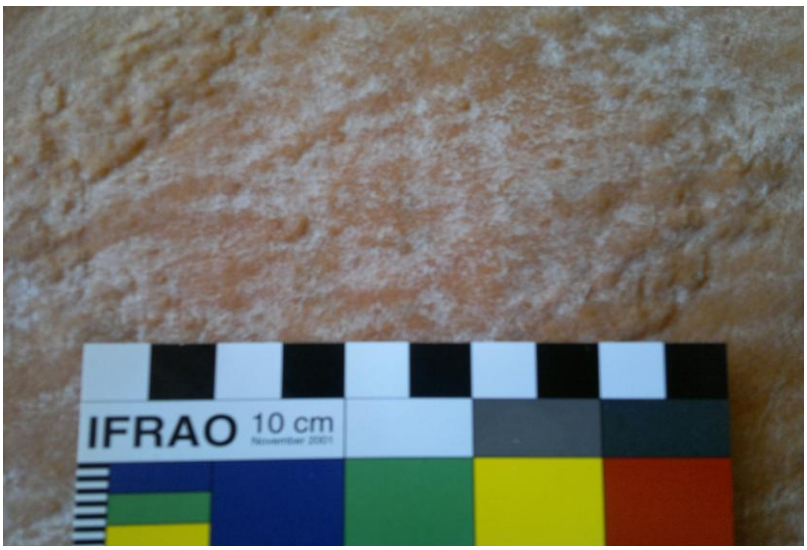


Figure 4: Talc engrained within the latex. G11, M-498. Source: ITM

Furthermore one is able to observe spots of yellow paint, which is explained possibly by the use of yellow paint used to indicate the number of rock panels (Baptista et al. 1974) and may have spilled onto the mold imprinting itself.

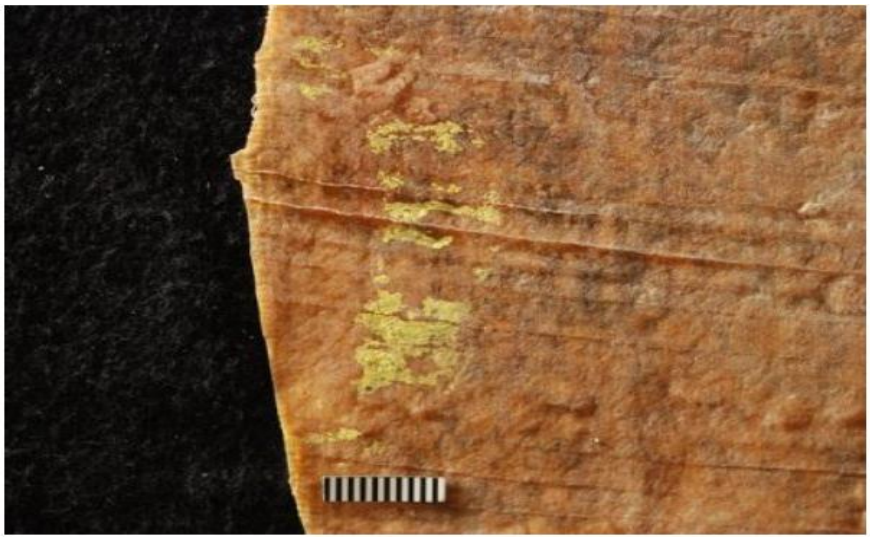


Figure 5: Ink stained mold, AL-36C M-1136. Source: Silva 2011

The passage of time is a very testing factor to the durability and conditioning of the moulds. The withdrawal of latex will increasingly create tension in the edges of the mold, therefore at a certain point tearing away from the surface. This reveals the tarlatan layer and on thinner moulds this can actually lead to the complete destruction of a mold.

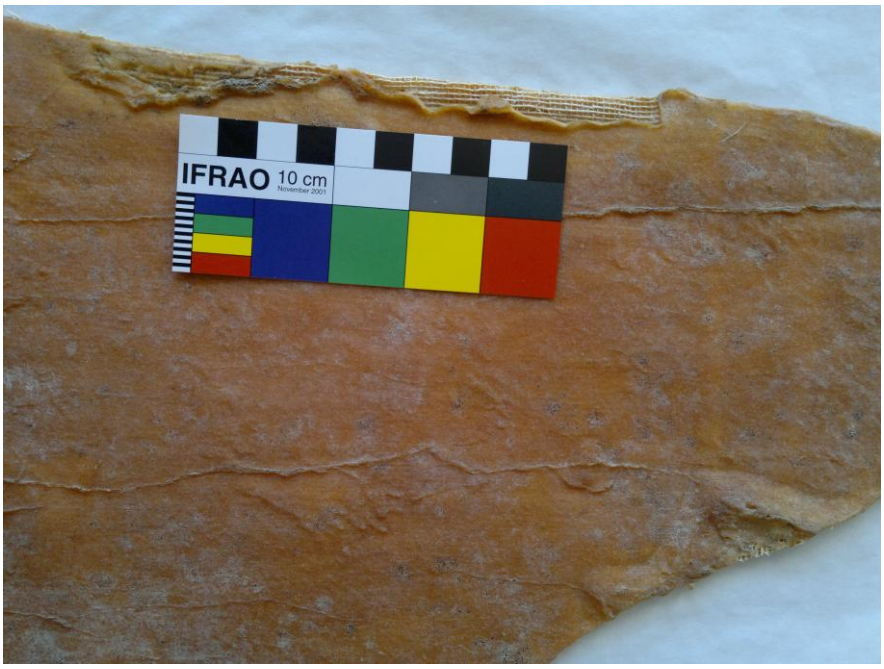


Figure 6: Mold from the Gardete site with Tarlatan defect. Source: ITM

These factors we present here show the difficult in some instances to study the rock art complex using the moulds. Therefore it is imperative that studies such as this one and studies made in previous years are conducted and continue to do so, before the loss of more information on this rock art complex. One must remember that, for the time being the moulds act as secondary evidence of the engravings existence, but they are not ever lasting and are prone to deteriorate. For this reason, researchers compel them selves to the continuous study of the Tagus Rock Art.

ii. The Tracing Method

The methodology for tracing the moulds is based on the methodology published in Abreu & Jaffe (1996) and Abreu *et al.* (2010) for the surveying of rock engravings. This involved performing direct decals and the procedure to do so is as follows:

Firstly there are a set of materials that must be used to produce the direct decals. They are listed below (figure 15). The letter after each item in the list below signifies its location in figure 15.

- Rolls of crystal plastic (100m) with 0.8mm of thickness (A): create our tracing sheets
- 1.5 meter ruler (B): To create the border for our plastic sheets and also to aid in cutting
- Scissors (C): To cut our plastic sheets
- Black permanent marker (thick tip) (D): used for the margins of the sheet and mold as well as recreate the pecking of the engraving, also to insert mold information
- Red permanent marker (fine tip) (E): used to highlight the fractures that are present on the mold
- Blue permanent marker (fine top) (F): used for any inconsistencies such as fungi or tarlatan etc
- Reusable adhesive (blue tack) (G): to attach the mold to the table if necessary and to secure each plastic sheet down
- Table lamp with yellow light (H): used to aid us in visualizing the engravings

- Ethyl alcohol 96% vol. (I): the solution is used in little amounts to erase any mistakes
- Cotton/Cotton buds (J): depending on the size of the mistake we dab them in the alcohol solution to erase mistakes

Figure 7: list of materials required for tracing. Source: Santos Da Rosa 2012

The first step is to create the plastic sheets in which will be used to produce the decals. The crystal plastic rolls are wide enough to create two rectangles 84cm x 59cm side by side with a 4 cm gap in between to separate them. This in actuality is efficient for later scanning the plastic sheets using an A0 sized scanner. The Plastic sheets in which are used to trace correspond roughly to 8 A4 size papers

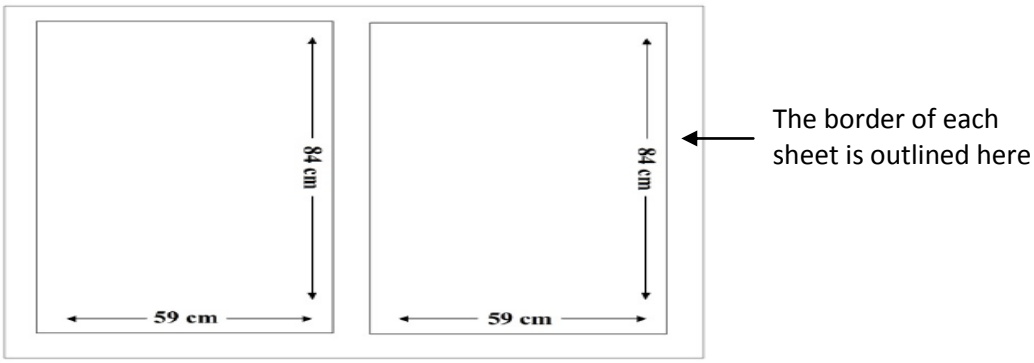


Figure 8: Plastic sheets for the utilization of decal. Source: Santos Da Rosa 2012

Once the individual plastic sheets are produced, one needs to place the sheet over the mold for tracing. There are two cases that one may encounter. The first is that one may be working on a mold which is big enough for one sheet. The second is that mold may be larger than one sheet; therefore additional plastic sheets will be required. They will be placed upon the mold in a systematic order, left to right and top to bottom. One must bear in mind here that work is performed on each sheet individually and only proceed to add another sheet, once all information is captured from the mold onto the previous sheet. Each additional sheet will be separated from the sheet that it is overlapping by 1cm from the margin. Using the blue pen a mark is made at the end of each margin on an additional sheet, as well as indication of what sheet number it is. All this helps one later to reassemble the sheets to recreate the mold more efficiently.

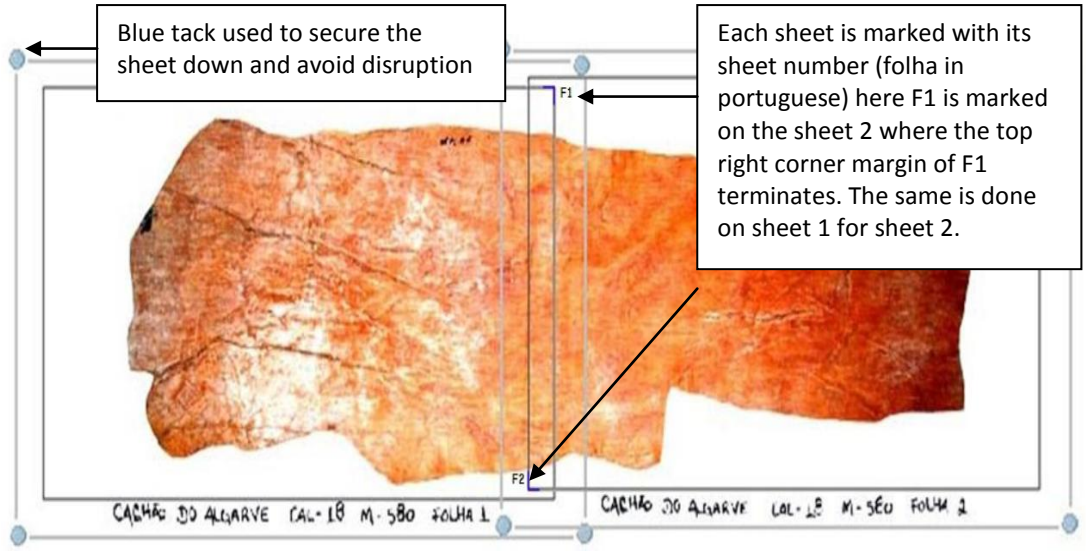


Figure 9: multiple sheets utilised to cover a larger mold. Source: Santos Da Rosa 2012

So the actual decal is performed in the following way. The first thing to do is input all the necessary information on the plastic sheet including its sheet number. This information is obtained from the back of each mold (figure 2). One also must note here that where one finds the orientation of the rock marked, it is essential to mention this on the plastic sheet usually near the top left or right hand margin or within the actual rock information at the bottom.

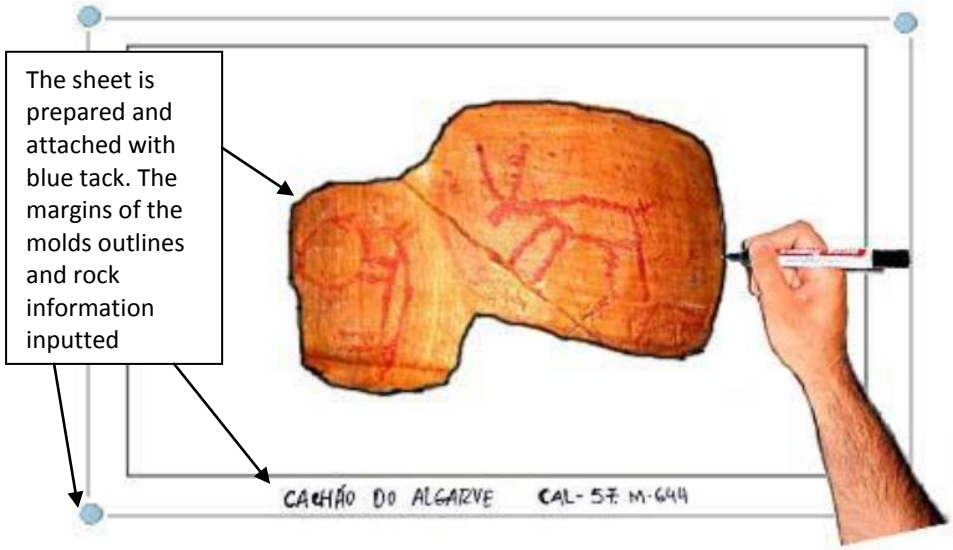


Figure 10: The initial set up for decal. This is taken from Cachao do Algarve with the rock number CAL 57 and mold number M – 644 displayed. There is no orientation displayed here as most of the Cachao do Algarve moulds are without an orientation mark. Source: Santos Da Rosa 2012

Once one arrives at this stage, must then proceed to mark all the inconsistencies present on the mold itself. One first starts by highlighting the border around the mold, so that its location is fixed onto the sheet. The sheet even though it is attached to the table using blue tack, sometimes can move slightly or bend slightly therefore distorting the original position one started with. Using the red marker pen one beings to go over the fractures present both natural and post depositional, whether in storage or due to handling. Sometimes it is easy to get into the habit of marking every line as a fracture or sometimes one may mistake natural facets of a rock as a pecking. Therefore this process is quite important for it identifies the rest as anthropic works according to the researcher's judgment. Once this is complete, the next step is to mark

a series of “X” using the blue marker pen over the defaults such as tears, erosions, fungi, talc powder etc.

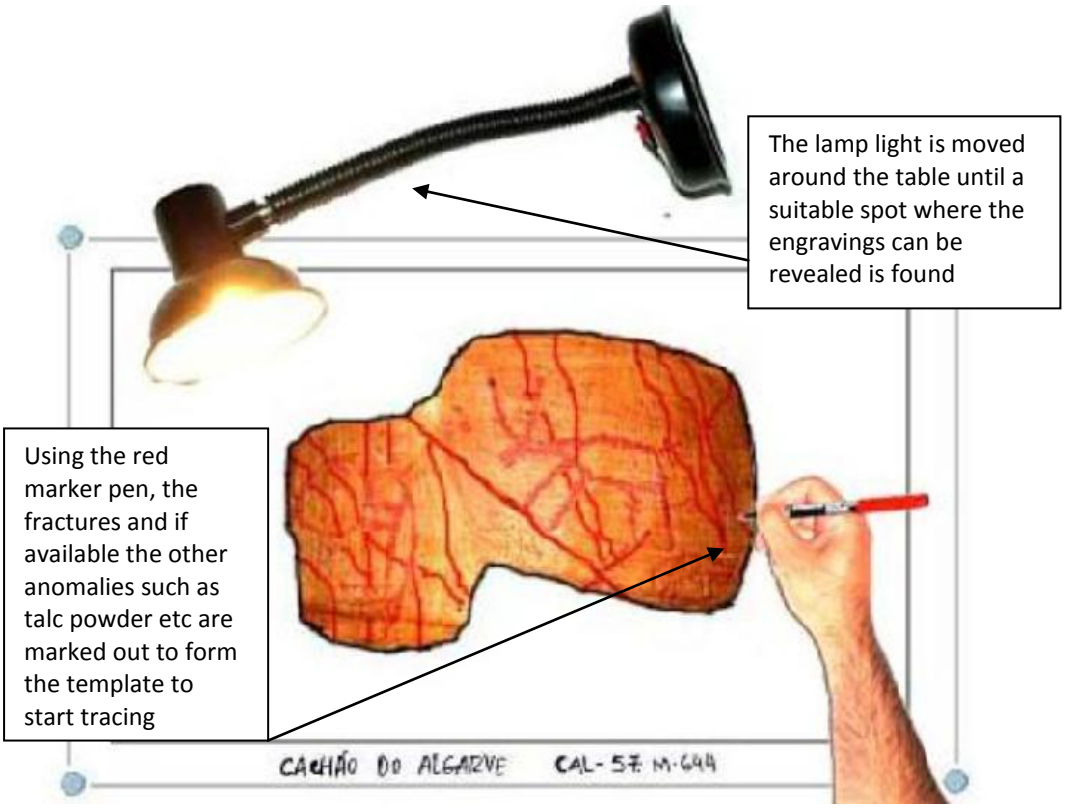


Figure 11: Template of the mold created with highlighted fracture marks and other anomalies if available. Source: Santos Da Rosa 2012

At this stage, the preparations of the plastic sheets are completed. Now one must create the decals, using the black marker pen. This is where the table lamp light comes into handy, and note doing this researchers use yellow light instead of white, because oblique light tends to create shadows that highlight the reliefs of the prints more evidently. White lights do not create adequate shades so therefore researcher’s avoid using them. The light is absolutely essential for the work, for without using this form of artificial light one will not have the means of visualizing as much as possible, and in all likelihood the work would probably progress much slower. The laboratory in the ITM is also set up to aid researchers in achieving the best results; normally the conditions for producing decals are with all the curtains drawn and with no room light. This ambience works better for the shadows that are created by manipulation of light of the table lamps.

Once there is a good vision of the engravings, the black marker pen is used to recreate the pecking motion. Holding the pen in a vertical position, each poke like motion is a simulation of the way in which the engraving was most likely created. This action helps one understand the technical aspects as well as other aspects, such as the probable time in which it took to create one image or figure. Of course this is not the realistic time but by the action of tracing, one is given some idea about what it may have been like. In this respect too, one is able to highlight or resurface some anomalies or interruptions within a figure or image, that may have not been recorded properly or may have suffered due to weathering or other natural causes. This is where stylistic and typological information becomes convenient because sometimes the researcher's can judge what an image would have looked like using the data and research study before suffering some alteration. One also has to take very good attention with marking a natural depressions as a pecking, this sometimes occurs so the researcher has to be very attentive to this fact and make sure they are marking only what is truly a pecking.

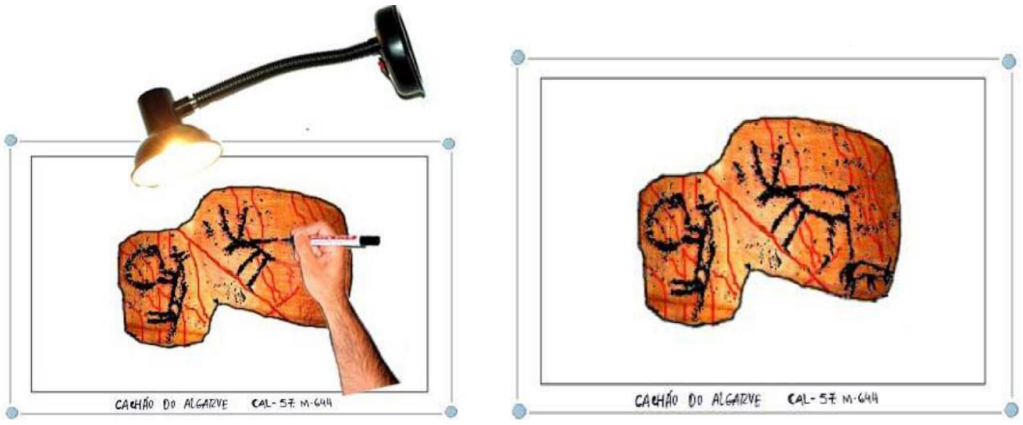


Figure 12: progress of tracing and the completed tracing. Source: Santos Da Rosa 2012

Once the completion of a mold has been achieved, each tracing is recorded correctly with all the information present onto a diagnosis sheet for entry into a database. This is what will be discuss next.

iii. The Diagnosis Document

Once the decal was complete, one then proceeded on to diagnose the mold. The information to be collected was as much as one can extract about the mold and the engravings themselves. In previous years, the diagnosis sheet was made up of more pages than it is at present. The team at the ITM felt that all the information should be collected in an efficient and understandable way, which would then make other aspects much easier such as storage and handling etc. To view previous versions of the diagnosis document refer to masters theses of Santos Da Rosa (2012), Silva (2011) and Garcês (2009).

The usefulness of the diagnosis document is to give present and future researchers all the information about a certain rock or mold, and to be able to access this information efficiently. The document has been devised over many years by the Museum of Prehistoric Rock Art and the Sacred Tagus Valley alongside the Instituto Terra e Memoria (ITM) and improved all the time, through the studies that have been conducted on each site of the Tagus that bring about new concepts or figures, but ultimately configured to meet the most common images, aspects and problems faced with the moulds. This is a standard diagnosis document that most researchers from the ITM will use when studying the Tagus Rock Art moulds.

FICHA DE DIAGNÓSTICO DOS MOLDES DAS ROCHAS DO COMPLEXO DE ARTE RUPESTRE DO VALE DO TEJO

Mação

Projecto FCT: PTDC/HAH/ 71361/2006

Projecto RUPTEJO
Laboratório de Arqueologia Rupestre – Instituto Terra e Memória
Museu de Arte Pré-Histórica e do Sagrado do Vale do Tejo

Nº da ficha		Ficha de Diagnóstico - Moldes do Tejo

Localização	
Nome do sítio	Foz de Niza
Rocha número:	
Molde número:	

Dimensões do molde				
Comprimento (máximo)				cm
Largura (máxima)				cm
Orientação (norte)	sim		não	

Estado Conservação	
Estragado	
Péssimo	
Mau	
Razoável	
Bom	
Muito Bom	
Excelente	

Informação sobre o levantamento				
Fotografia	sim		não	
Decalque em plástico	sim	x	não	
Nº de plásticos usados	1			

Estragos no molde			
Rasgões		Desgaste	
Pó de talco		Dobras	
Fungos		Ressequido	

Esquema/croqui do molde em relação à quadricula

Rascunho simples de algumas das figuras mais relevantes					
Figura nrº	Figura nrº	Figura nrº	Figura nrº	Figura nrº	Figura nrº

Figure 13A: Front page of the Diagnosis of the rock and mold sheet. Source: ITM Archive

Catálogo das figuras						
Nº Fig.	Tipologia	Folha nr°	Dimensões		Picotado	
			Comp.	Altura	D	DP
1			cm	cm		
2			cm	cm		
3			cm	cm		
4			cm	cm		
5			cm	cm		
6			cm	cm		
7			cm	cm		
8			cm	cm		
9			cm	cm		
10			cm	cm		
11			cm	cm		
12			cm	cm		
13			cm	cm		
14			cm	cm		
15			cm	cm		
16			cm	cm		
17			cm	cm		
18			cm	cm		
19			cm	cm		
20			cm	cm		
21			cm	cm		
22			cm	cm		
23			cm	cm		
24			cm	cm		
25			cm	cm		
26			cm	cm		
27			cm	cm		
28			cm	cm		
29			cm	cm		
30			cm	cm		

Tipologia	
1	Antropomorfo
2	Zoomorfo
3	Linha Simples
4	Linhas combinadas
5	Figura circular
6	Semicírculo
7	Círculo concêntrico
8	Espiral
9	Figura ovalada
10	Soliforme
11	Podomorfo
12	Ferradura
13	Serpentiforme
14	Idoliforme
15	Escutiforme
16	Comiforme
17	Pegada de animal
18	Covinha
19	Ramiforme
20	Armas
21	Objectos
22	Ornamento
23	Meandro
24	Mapa
25	Pontos densos
26	Pontos dispersos
27	P. densos e dispersos
28	Indecifrável
29	Outros

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Sobreposições		
Figura	sobrepõe	Figura
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	

Associações		
Figura	associada à	Figura
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	

Observações

Figure 13B: Back page of the Diagnosis of mould and rock sheet. Source: ITM Archive

Every aspect of this diagnosis document is now highlighted to explain the purpose of each section:

Front Page (Figure 13A)

Número da ficha/Number of sheet – one numbers each diagnosis sheet in numerical order in case one may need to use more than one sheet to diagnosis a single rock.

Localização/Localisation - here one inputs the information regarding the site, the rock and mold. This is for identification purposes and to make sure one is working on the correct rock and mold when in the diagnosis process.

Informação sobre o levantamento/ Information about the survey – the information inputted here is regarding the work done on each rock, whether one has taken photographs of the rock, made a decal, and how many plastic sheets were used to trace one rock

Dimensões do molde/Dimensions of the mold – inputted here are the dimensions of the mold and also importantly if there is any orientation to the Geographic North indicated on the back of the mold.

Estragos no molde/Damage to the mold – the options listed here are the most common types of wear and tear found in the moulds. A list here is made according to the mold present being worked on what is present at that time

Estado Concervação/ State of Conservation – the list of options in this table again are determined through the most common types of conditions the moulds are found to be in.

Esquema/croqui do molde em relação a quadricula/Outline/sketch of mold in relation to the grid – in this section one should draw a representation of the finished state of the decal. If more than one sheet is used the drawing in this section is exactly how it is laid out during performance of the decal. One also inputs here the sheet numbers on the margins of each sheet so that one has a working picture for later reassembling the

tracings. One must note here that it is not an artistic sketch but a rough sketch of what is the final product of the decal.

Rascunho simples de algumas das figuras mais relevantes/simple sketch of some of the most relevant figures – normally in this section a drawing of the figures that are either rare or the most important in terms of context i.e. anthropomorphic and zoomorphic images and sometimes anything that one is not able to determine or decipher.

Back Page (Figure 13B)

Catálogo das figuras/Catalog of the figures – this is the most important part of the diagnosis sheet. It is here where one records all the information that can be extracted from the decal. The numeration of the figures is to allow each figure encountered in a mold to go in order when they will be catalogued. One also puts down what the figure is according to a typology that has been set for the most common types in the Tagus. A note of which plastic sheet it features in if there is more than one and one takes the dimensions of each figure. The pictado/perforated request is to signify whether the figure is densely perforated or whether it occurs in a dispersed manner

Tipologia/ Typology – there are 29 different categories in which to assign a figure or image. This list has been compiled through experience of studying the Tagus and research on the Tagus. Therefore this list makes for quite an accurate assumption on the most common types of figures that will occur at any site. When one encounters a figure that one can not assign to in the list, it is put down as outros/others. Then one should make a note and description of this figure whether on the front page or as will be discussed later in another section.

In the middle of the back page of the diagnosis document, there is a gird like table. This functions as a review of all the figures and the quantity of each type. The numbers 1 to 29 represent each typology and below in each block one enters the figure numbers that represent that type.

Sobreposições/ Superimpositions – sometimes one might find that one figure overlaps another figure. This is where one inserts the information for such occurrences, making note of which figures feature in such action

Associações/Associations – again this is where one inserts the figures that are represented together in some way or deemed to be associated to each other in some respect. If more than two figures are involved one should put down which figures are associated with which in that cluster

Observações/Observations – this part is taken to make note of any further anomalies or comments that one may have to make about the condition or types of figures encountered. A note is also made here for any future researcher who may be handling the mould whether there is a risk in deterioration of this mould.

At the bottom of every sheet it is normally signed with the date of completion and the author responsible for completing the diagnosis. Normally this is all cleared through a supervisor who is working in the laboratory at the time.

Each aspect of the diagnosis sheet is taking into consideration what information is the most important to know at first when dealing with a mould. The diagnosis sheet over the years has been improved and the present version for researchers at the ITM, is the most effective and efficient diagnosis sheet on the Tagus to date. Below is an actual diagnosis document from Gardete as an example of how this may look in reality.

MUSEU DE ARTE PRÉ-HISTÓRICA Mação

FICHA DE DIAGNÓSTICO DOS MOLDES DAS ROCHAS DO COMPLEXO DE ARTE RUPESTRE DO VALE DO TEJO

Projecto FCT: PTDC/HAH/ 71361/2006

Projecto RUPTEJO
Laboratório de Arqueologia Rupestre – Instituto Terra e Memória
Museu de Arte Pré-Histórica e do Sagrado do Vale do Tejo

Nº da ficha	

Ficha de Diagnóstico - Moldes do Tejo

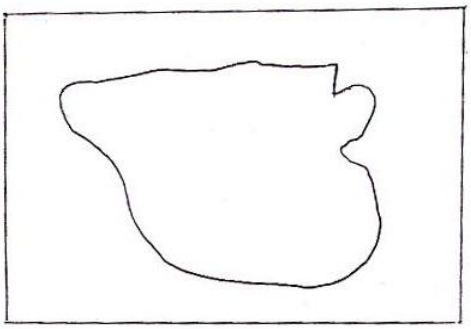
Localização	
Nome do sítio	GANDETE
Rocha número:	11
Molde número:	498.

Dimensões do molde					Estado Conservação	
Comprimento (máximo)	66	cm				
Largura (máxima)	50	cm			Estragado	
Orientação (norte)	sim		não	X	Péssimo	
					Mau	
					Razoável	
					Bom	X
					Muito Bom	
					Excelente	

Informação sobre o levantamento				
Fotografia	sim		não	
Decalque em plástico	sim	X	não	
Nº de plásticos usados	1			

Estragos no molde			
Rasgões		Desgaste	
Pó de talco	X	Dobras	
Fungos		Ressequido	

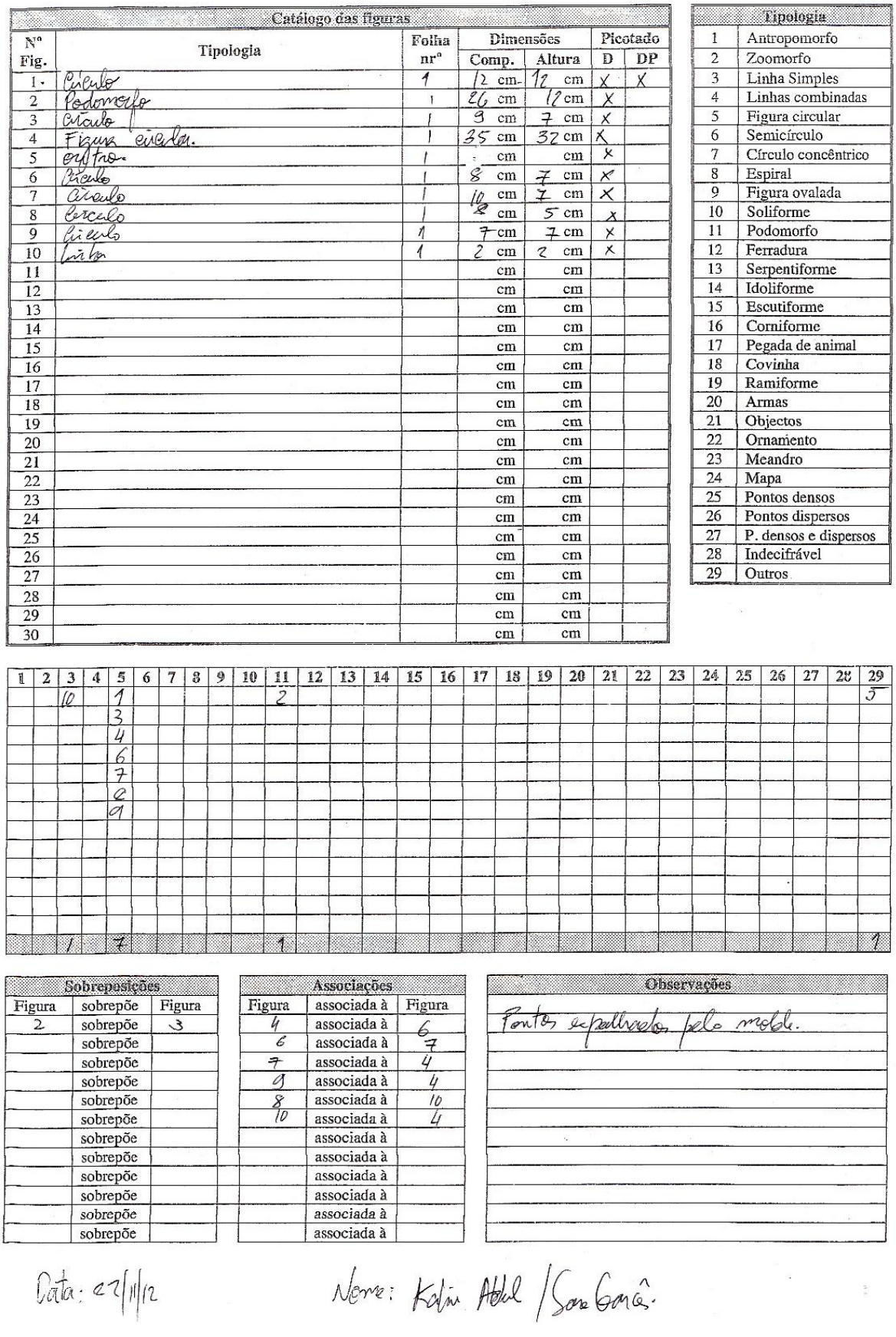
Esquema/croqui do molde em relação à quadrícula



Rascunho simples de algumas das figuras mais relevantes

Figura nr° 5	Figura nr°	Figura nr°	Figura nr°	Figura nr°	Figura nr°
7					

Figure 14A: Front page of G 11, M498 diagnosis sheet. Source: ITM Archive



Catálogo das figuras

Nº Fig.	Tipologia	Folha nrº	Dimensões Comp.	Dimensões Altura	Picotado D	Picotado DP
1	Circulo	1	12 cm	12 cm	X	X
2	Podomorfo	1	26 cm	12 cm	X	
3	Circulo	1	9 cm	7 cm	X	
4	Figura circular.	1	35 cm	32 cm	X	
5	Circulo	1	cm	cm	X	
6	Circulo	1	8 cm	7 cm	X	
7	Circulo	1	10 cm	7 cm	X	
8	Circulo	1	8 cm	5 cm	X	
9	Circulo	1	7 cm	7 cm	X	
10	Linha	1	2 cm	2 cm	X	
11			cm	cm		
12			cm	cm		
13			cm	cm		
14			cm	cm		
15			cm	cm		
16			cm	cm		
17			cm	cm		
18			cm	cm		
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23			cm	cm		
24			cm	cm		
25			cm	cm		
26			cm	cm		
27			cm	cm		
28			cm	cm		
29			cm	cm		
30			cm	cm		

Tipologia

1	Antropomorfo
2	Zoomorfo
3	Linha Simples
4	Linhas combinadas
5	Figura circular
6	Semicírculo
7	Círculo concêntrico
8	Espiral
9	Figura ovalada
10	Soliforme
11	Podomorfo
12	Ferradura
13	Serpentiforme
14	Idoliforme
15	Escutiforme
16	Corniforme
17	Pegada de animal
18	Covinha
19	Ramiforme
20	Armas
21	Objectos
22	Ornamento
23	Meandro
24	Mapa
25	Pontos densos
26	Pontos dispersos
27	P. densos e dispersos
28	Indecifrável
29	Outros

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
		10		1						2																		5
				3																								
				4																								
				6																								
				7																								
				8																								
				9																								
		1		7						1																		1

Sobreposições

Figura	sobrepõe	Figura
2	sobrepõe	3
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	
	sobrepõe	

Associações

Figura	associada à	Figura
4	associada à	6
6	associada à	7
7	associada à	4
9	associada à	4
8	associada à	10
10	associada à	4
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	
	associada à	

Observações

Pontos espalhados pelo mobb.

Data: 27/11/12

Nome: Katia Abdul / Sara Garcia.

Figure 14B: Back page of G 11, M498 diagnosis sheet. Source: ITM Archive

Once one has finished diagnosing each mould for a site, the forms are then collated into one folder which will then represent the entire collection for that site. This systematic way of recording has been done for every site that has been studied for the Tagus. These sheets provide researchers with an in depth and a quick way of extracting information about the different sites of the Tagus. The next step for recording and further analysing the moulds is to work digitally with them. This is something that is covered in the next section.

iv. Digital Tracing Treatment

The digital process in researching rock art has added tremendously and in a lot of ways helped improve the analysis and accuracy of rock art. Researchers are able to make images clearer and define exactly where the engravings or paintings are, removing any inconsistencies or even identifying images or engravings that one can not see with the naked eye. Photo editing softwares also professionalize a photo or in this case a tracing, so that it is more viable and aesthetically pleasing to illustrate in a publication, and to compile into a database.

The main objective of digitally working on the traces is to make them presentable for publication and to remove all the unnecessary detail from the tracing itself. One always hope to achieve a clearer image of the figures represented on each tracing, by removing all the colours until you are left with a clear figured coloured in black with a clear white background. All the necessary information such as rock number and mold number should be inserted into the picture or the file will be saved using these details. The orientation of north if available on the tracing should be indicated too. The IFRAO scale is a universally accepted scale for rock art researchers and its insertion into the digital picture will help scale the image down to a universally recognized measurement. Digitally editing tracings is also very helpful for putting together multiple sheets into one complete picture. As mentioned before, some moulds may be very big and require multiple sheets to complete the decal. Therefore in Photoshop one is able to combine all the sheets to produce one image. The following is a demonstration of how the Photoshop process works and what exactly is achieve by digitally altering and enhancing the tracings.

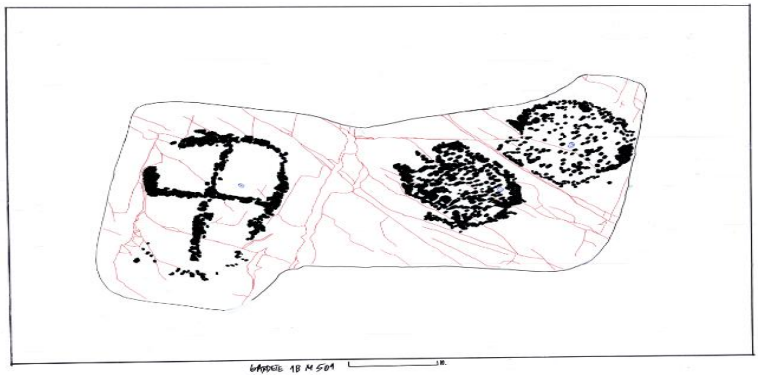
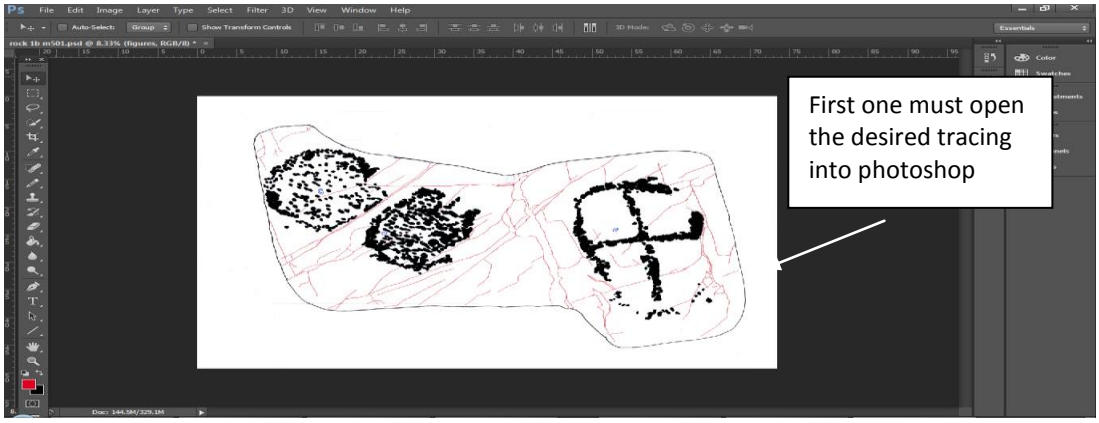
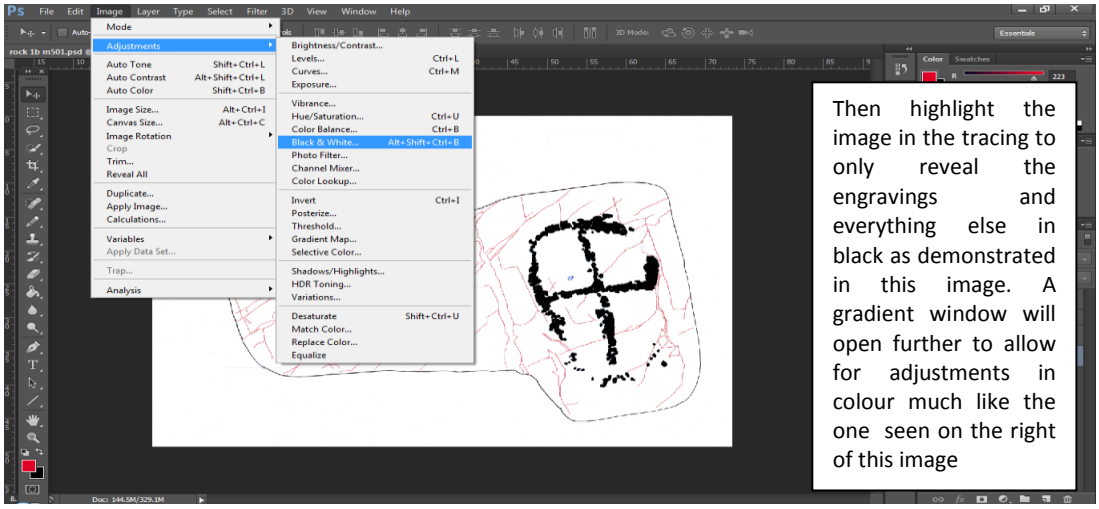
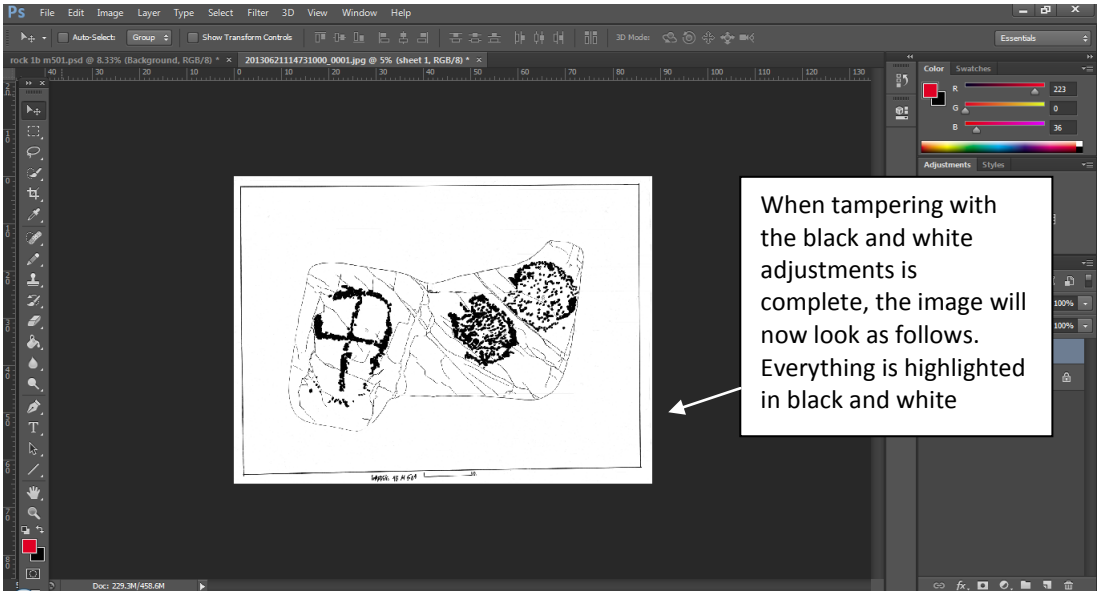


Figure 15: A decal of rock Rock 1B M501.

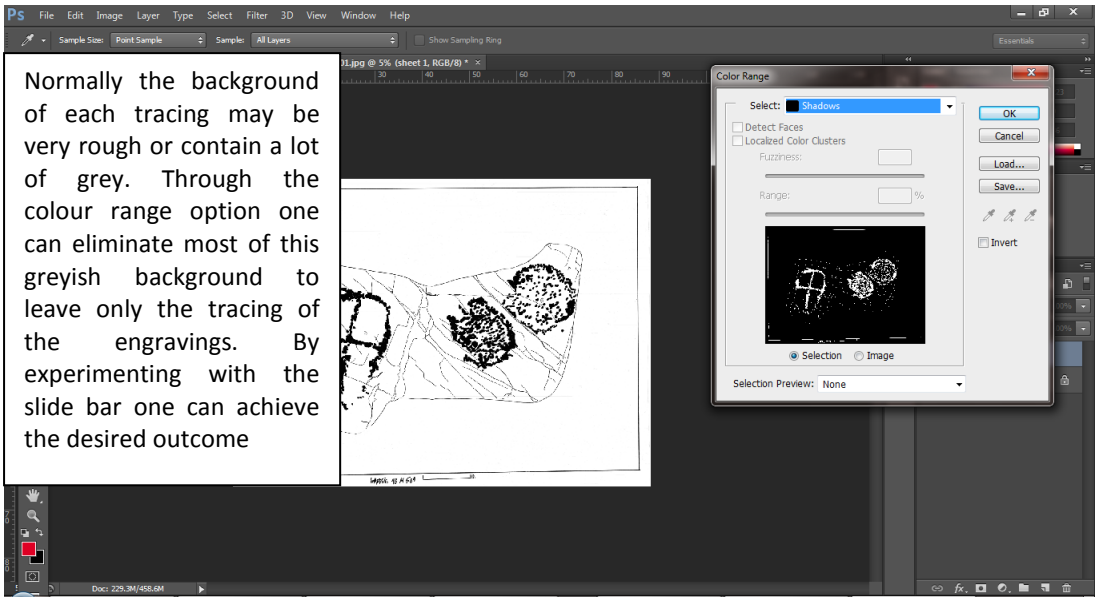
The next set of images will be in a sequence of images with annotations to guide you through the steps required in order to complete one set of tracings in Photoshop, these steps should be followed for all sheets that make up an individual rock if there is more than one:





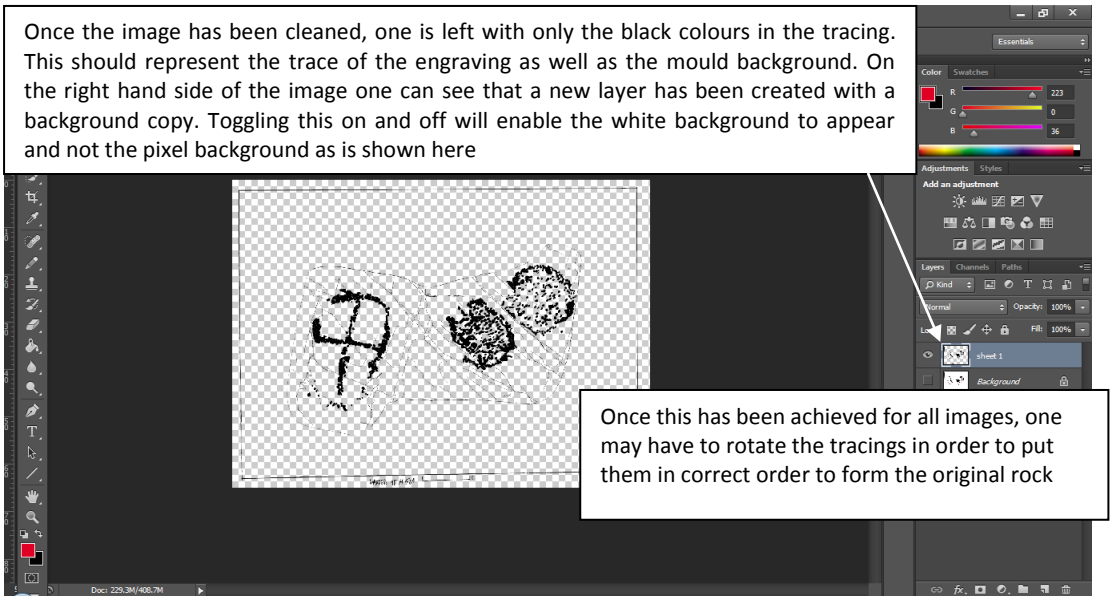


When tampering with the black and white adjustments is complete, the image will now look as follows. Everything is highlighted in black and white



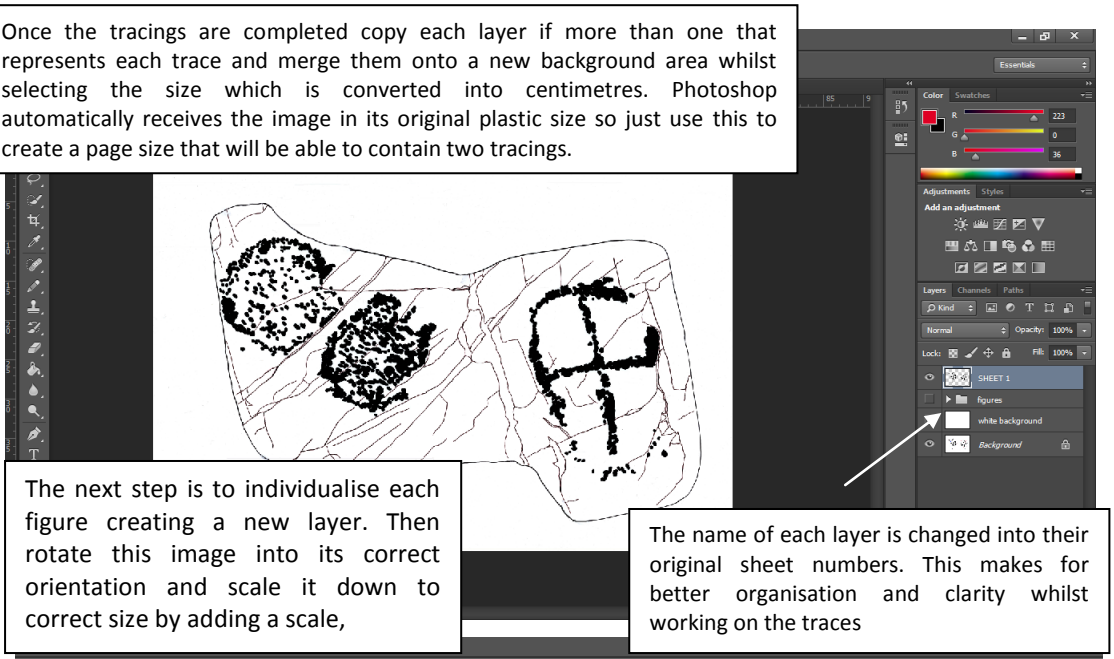
Normally the background of each tracing may be very rough or contain a lot of grey. Through the colour range option one can eliminate most of this greyish background to leave only the tracing of the engravings. By experimenting with the slide bar one can achieve the desired outcome

Once the image has been cleaned, one is left with only the black colours in the tracing. This should represent the trace of the engraving as well as the mould background. On the right hand side of the image one can see that a new layer has been created with a background copy. Toggling this on and off will enable the white background to appear and not the pixel background as is shown here



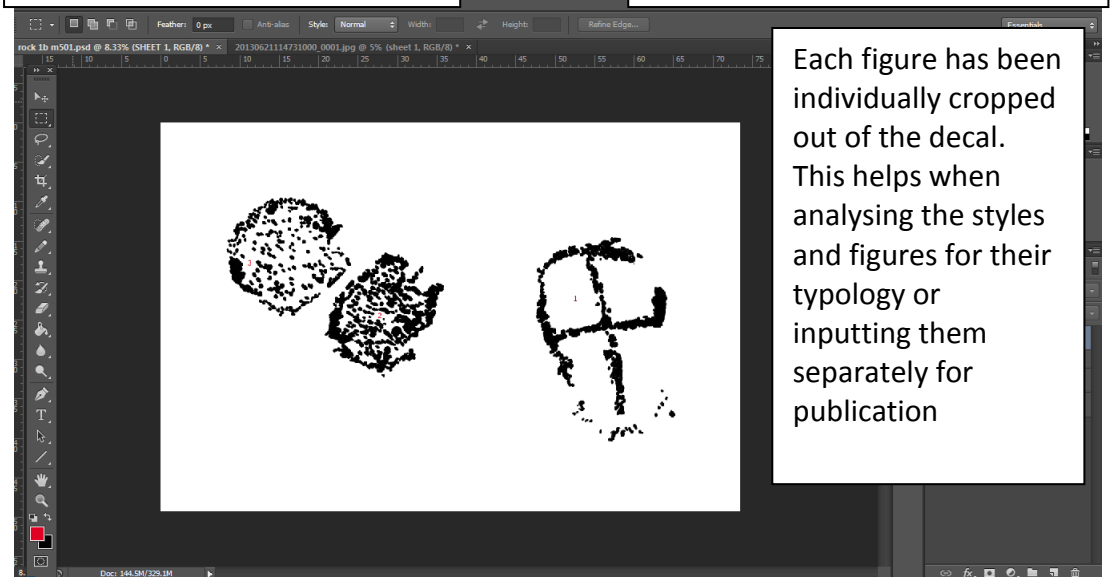
Once this has been achieved for all images, one may have to rotate the tracings in order to put them in correct order to form the original rock

Once the tracings are completed copy each layer if more than one that represents each trace and merge them onto a new background area whilst selecting the size which is converted into centimetres. Photoshop automatically receives the image in its original plastic size so just use this to create a page size that will be able to contain two tracings.

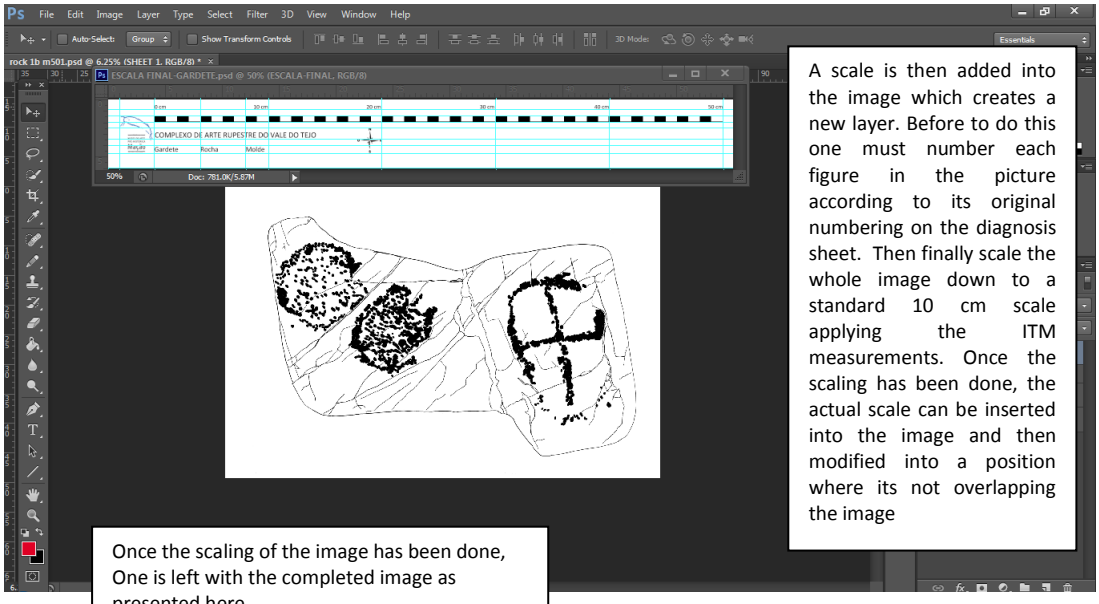


The next step is to individualise each figure creating a new layer. Then rotate this image into its correct orientation and scale it down to correct size by adding a scale,

The name of each layer is changed into their original sheet numbers. This makes for better organisation and clarity whilst working on the traces



Each figure has been individually cropped out of the decal. This helps when analysing the styles and figures for their typology or inputting them separately for publication



A scale is then added into the image which creates a new layer. Before to do this one must number each figure in the picture according to its original numbering on the diagnosis sheet. Then finally scale the whole image down to a standard 10 cm scale applying the ITM measurements. Once the scaling has been done, the actual scale can be inserted into the image and then modified into a position where its not overlapping the image

Once the scaling of the image has been done, One is left with the completed image as presented here.

Figure 16: A sequence of digitally altering our images on Photoshop from Gardete Rock 1B. Each tracing will go through this treatment.

At the end of each digitally altered image, one saves them in image formats “jpeg”, “Gif” and “Psd”. Each contains its identifying information and systematically saved in order of rock number.

v. Photography of the moulds

The treatment of the moulds is conducted in multiple ways. Mentioned above are two processes in which one undergoes recording the moulds and a third way to ensure accuracy and backup for the database is to take photographs of each individual mold. In addition to simply recording the moulds, researchers are also trying to ensure their security and longevity, because the moulds are not in perfect condition and susceptible to wear and tear, the potential is there to lose them for the purpose of study. So therefore it is essential to capture them in as many ways as possible.

The equipment required in order to achieve the photographs of each mold were:

- Camera
- Tripod
- Laptop/PC
- In-house camera software
- Adobe Photoshop CS6
- 3 table lamps with yellow light

- IFRAO Scale
- Black background

The room was set up much like the way in which they were to trace the moulds. The staff completely darkened the room by blocking all natural forms of light. Then proceeded to lay out a black cloth on the floor to act as a support and provide a contrast against the moulds. It also helped to define the moulds better. Then three table lamps using yellow light were placed on the floor as mentioned before they provide better and adequate shades, around each individual mold until one could capture the highest amount of detail from each mold. The maneuvering of the lamps is essential to this task, as without good shades and light emission, the camera will not be able to capture enough detail. Normally in previous research projects conducted on the Tagus, the camera would be automatically set up to a projector and a laptop whilst taking pictures, see Silva (2011) and Santos Da Rosa (2012). In this way they were able to control as much of the lens activity and frame motion of the picture so that they can capture more accurate pictures whilst have greater stability and being more time efficient. In this case, individual pictures were taken and viewed off the camera screen and then later transferred them onto the computer to both enhance and edit or simply to save them with the appropriate file name. Once this has been achieved, all images are transferred into a database stored under the Gardete name for preservation and for future reference.

c. Typological Analysis

Classifying a group of rock art or engravings may seem like researchers are restricting or generalizing a form of expression to a standard parameter of rules and limits. However adopting this view is a minimalist stance and this is not the purpose of what typology is supposed to represent. For instance in this case, the Tagus through out its study and through all the aforementioned authors who devoted themselves to studying the Tagus, there can be observed a common occurrence in figurative expression and stylistic denotation that is burdened upon the representations. Rationally if this type of occurrence is prevalent in a region or area, then one must assume that there is present in the corpus of rock art a typology in which something is to be represented. Hence the typology set out in the ITM diagnosis sheet (refer to figure 22B) is based upon the

recurring presence of what the museum of Mação staff deem common types with in the Tagus rock art complex.

In many respects the decades of research in rock art have been focused on the description of morphology in paintings and in the engravings and this view is one way of describing a rock art complex. However it is not as simple to give simple descriptions of shapes etched or painted on wall that explains what is inherent in the production of rock art, and therefore, as in previous studies conducted on the sites of the Tagus like to rely on the guidelines and parameters incepted by Collado (2006) that have been adapted to the context of the Tagus. This typology was created through the study of the authors doctoral thesis on the site of Molino Manzanez (Alconochel-Cheles, Badajoz, in Spain) and from the study of 4,707 figures present there, and giving sufficient basis for such a framework.

Even though most of the terminology used in assigning the Tagus rock art follows much of what previous authors have dictated themselves, a major difference is resided in the terminology of Geometric/Symbolic which is used idiosyncratically by previous authors regarding the Tagus, but in this case, the researchers of the Tagus rock art will follow the term Ideomorphic. Set by Collado (2006) this term is more coherent with the wider range of representantations to which it refers. In a chapter separate to Gardete's own typology there will be the analysis using the 40 rock moulds held in the laboratory of the ITM the typology of Gardete. As for now the main characteristics of each category are defined that will be used as a framework to study the Tagus sites.

a. Anthropomorphic figures

Integral to this category are all those figures by their external appearances and irrespective of their original inception can be identified as human figures. The representations must include the torso and the upper and lower extremities regardless of whether they include the head or not (Collado 2006;135) . Excluded from this category are all objects which are valued to be anthropomorphic in the traditional literature i.e cruciforms, ancoriforms T shaped figures, Y shaped figures etc. These latest figures have a tendency to be interpretation from a subjective perspective and

have thus been classified into the ideomorph category (Collado 2006). There are two major subtypes classed in this category based on the representation of the torso:

Subtype 1: *Anthropomorphic linear body (ALB*): The torso is defined by a vertical line starting from the upper to the lower limbs regardless of the form. Usually the line exceeds the upper extremities to form the head and the lower extremities which results in the representation of a male (Collado 2006)

Subtype 2: *Anthropomorphic circular body (ACB*): The torso is defined by a vertical oval shaped form from which the head is sometimes generated. The upper and lower extremities may differentiate within this general type.

From the ACB subtype, there are further subdivisions which preside on the appearance of the circular body and how it is represented for example it may appear compartmentalized within a vertical axes crossed by one or more vertical lines (Collado 2006; 139) amongst other variants.

Collado (2006) also categories the main features that dictate the anthropomorphic figures as the following:

Upper Extremities

- horizontal
- conserved partially or missing
- upward angle
- downward angle
- upward arc
- downward arc
- zig-zag
- jar shaped

Lower Extremities

- Conserved partially or missing
- Horizontal

Head

- preserved partially or missing
- straight (torso extension)
- round (filled by pecking)
- circular (unfilled)

Anatomical details

- Fingers indicated
- Feet indicated
- Phallus indicated
- Breast indicated

A fact that is quite interesting about the Tagus corpus is provided by Gomes (2010) in the form of a table listing the anthropomorphic representations in the different sites of the Tagus (Figure 17).

	SS	AL	LB	CAL	FIC	F	FRN	CHVM	CHVJ	G	OC	total	%
antrop. semi-nat.	1	1	1	4	-	9	-	1	2	1	-	20	7,94
antrop. esquemáticos	54	7	9	32	3	80	-	7	3	33	4	232	92,06
Total	55	8	10	36	3	89	-	8	5	34	4	252	100,00
%	21,83	3,17	3,97	14,29	1,19	35,32	-	3,17	1,98	13,49	1,59	100,00	

Figure 17: Anthropomorphic figures of the Tagus Valley. Source: Gomes 2010

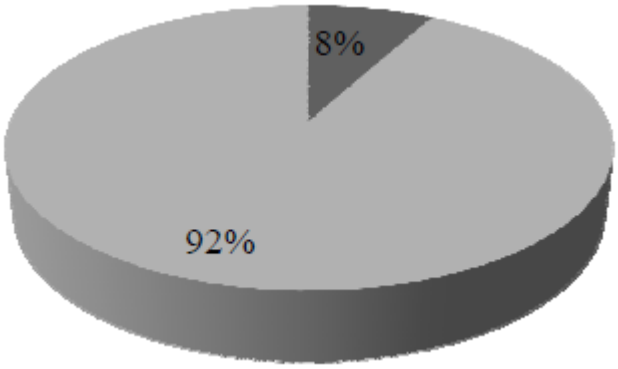


Figure 18: 92% schematic, 8% Semi-Naturalistic of anthropomorphic figures in the Tagus valley. Source: Gomes 2010

Figure 26 tells researchers that the anthropomorphic representations in the Tagus are dominated almost completely in the schematic format. Figure 17 is very interesting for Gardete researchers because it has the quantitative representations of anthropomorphic for each site in the Tagus Valley. Highlighted in the red rectangular box is the site of Gardete. According to Gomes (2010) Gardete has more schematic representations of anthropomorphic than semi-naturalistic. One must take note that

the moulds held in the laboratory of the ITM may not constitute the whole site of Gardete, therefore a discussion will be made on this matter in a later chapter which is based on the typology of Gardete itself.

b. Zoomorphic

The same principle is applied to this category in that it is also integrated into its own subtypes and only includes figures that can be identified as animals with certainty (Collado 2006). Three subtypes are included in this category;

Subtype 1: *Zoomorph naturalistic (ZN)* : Animals represented in a high degree of realism from the Paleolithic fauna.
Subtype 2: *Zoomorph subnaturalistic (Z*S): Animals represented with a lesser degree of realism but still maintain form.
Subtype 3: *Schematic Zoormorph (S*Z): All zoomorphic representation formed in a more abstract and less realistic manner, without detailing anatomical and displaying the most basic features of the animal.

The schematic zoomorph is further divided into four groups:

- *Schematic Zoomorph Torso Circular (SZTC):* Zoomorphic bodies created in a circular form
- *Schematic Zoormorph Torso Straight (SZTS):* Zoomorphic bodies created in a straight line
- *Schematic Zoomorph Torso Oval (SZTO)*: Zoomorphic bodies created based on an oval shape
- *Schematic Zoomorph Torso Rectangular (SZTR):* Zoomorphic bodies created in a rectangular form

As with the anthropomorphic classification there is a list of criteria that may occur to identify the nuances such as pecking form, shape, position of the limbs and the anatomical details that help identify the species represented (head, neck, ears, horns, sex, etc) and the attitude in the representation (Collado 2006).

Fllled Anatomical

- Partial: picketed or filiform
- Total: picketed or filiform
- Circular

Head

- conserved partially or missing
- straight (following the line of the neck)
- at an angle (an angle with the line of the neck)

Ears

- With or without ears

Neck

- no indication of neck
- simple (defined with a single line)
- double (defined by a double line)

Antlers

- linear
- curved
- branched

Limbs

- conserved partially or missing
- static straight legs
- straight lined legs
- legs indicating curved motion
- circular formed legs

Sex

-indicated or not indicated

Gomes (2010) provides with another graphic chart that details the number of zoomorphic representations present in each site throughout the Tagus valley.

	SS	AL	LB	CAL	FIC	F	FRN	CHVM	CHVJ	G	OC	total	%	
javali	-	-	-	1	-	1	-	-	-	-	-	2	0,68	
veado	11	5	2	11	1	38	-	3	3	-	-	74	25,08	
corço	1	2	-	1	-	2	-	-	-	-	-	6	2,03	
auroque	3	-	-	-	-	1	-	2	-	-	-	6	2,03	
cabra montês	12	6	3	6	-	27	-	13	3	1	2	73	24,75	
camurça	-	-	-	-	-	1	-	-	-	-	-	1	0,34	
cavalo	2	-	1	1	1	3	-	2	1	-	1	10	3,39	
lobo	1	1	-	1	-	4	-	-	-	-	-	7	2,37	
cão	-	1	1	-	-	9	-	-	-	-	-	11	3,73	
raposa	-	-	-	-	-	2	-	-	-	-	-	2	0,68	
urso pardo	-	-	-	-	-	-	-	-	2	-	-	2	0,68	
gato bravo	-	-	-	-	-	1	-	-	1	-	-	2	0,68	
mangusto	-	1	-	-	-	-	-	-	-	-	-	1	0,34	MAMÍFEROS
texugo	2	-	-	-	-	-	-	-	1	-	-	3	1,02	200 (67,80%)
abetarda	-	-	-	-	-	-	-	1	1	-	-	2	0,68	AVES
grou	-	-	-	-	-	-	-	1	-	-	-	1	0,34	3 (1,02%)
colubrídeo	32	4	1	18	-	18	-	2	-	8	-	83	28,14	
viperídeo	2	-	-	1	-	2	-	-	-	-	-	5	1,69	RÉPTEIS
lagarto	1	-	-	-	-	-	-	-	-	-	-	1	0,34	89 (30,16%)
esturjão	-	-	-	-	-	2	-	-	-	-	-	2	0,68	PEIXES
peixe ind.	-	-	-	-	-	1	-	-	-	-	-	1	0,34	3 (1,02%)
Total	67	20	8	39	1	112	-	24	12	9	3	295	100,00	

Figure 19: representation of species within the Tagus valley. Gardete totals 9. Source: Gomes 2010

The above graphic displays the total number of zoomorphic representations currently known in the site of Gardete, highlighted in red. These graphic charts are very useful for conducting research as mentioned before; the ITM may not hold all the moulds in the laboratory, so researchers are able to compare that with what are the total numbers of figures held by other authors of the Tagus.

c. Idiomorphic

This is the final category in the typology in which the Tagus researchers will adopt. These are the idiomorphic representations and these represents the most numerous in terms of prints produced and are often unclassifiable in terms of pure formal criteria (Collado 2006). It comprises anything representation of geometric, abstract or irregular in character and is devised into the following subtypes:

Subtype 1: *Open linear structures (OPS*): a representation of an image that does not define its borders

Subtype 2: *Closed linear structures (CLS):* All representations that define their boundaries regardless of its shape, e.g. an enclosed polygon whether empty filled or compartmentalized.

Subtype 3*: Points*: all motifs that are formed by a juxtaposition of negative points punched into a line which itself does not amount to anything neither lead to an enclosed space

Subtype 4: *Undefined*: all motifs that do not morphologically fall into the previous subtypes

Collado (2006) defines each subtype by a list of types that fall under its parameters. However we have chosen to stick with the most common types that have occurred within the Tagus corpus, and those defined and created by the ITM. As this thesis is part of a bigger project and a continuous study of the different sites of the Tagus, previous projects have already helped define and maintain these guidelines that researchers are to follow, therefore the categories of the subtypes are not in the manner of the previous two categories i.e. anthropomorphic and zoomorphic as the idiomorphic present themselves less heterogeneous and morphologically different in nature. The following subtypes are thus listed as:

Open linear structures

- spiral and its variations
- line
- horseshoe
- serpentine
- horn-shaped
- semi circle
- others

Closed linear structures

- circle and its variations
- square
- oval
- sun form

- human footprints
- animal footprints
- idol form
- escutiform
- dimple
- others

Points

- group of dispersed points
- group of dense points
- group of dispersed and dense points

Undefined

- indecipherable

The typology set out here will be exposed in the chapter that discusses the typology of Gardete. It will either comply with this typology mentioned here or add further to the improvement and knowledge of the corpus of rock art of the Tagus. Research will seek to confirm the general trend that has been established through previous studies of the Tagus by applying this typology and affirming its functionality and compatibility.

To help summarize and actualize the typology for the Gardete site, for this thesis a database was created listing all the information about the moulds and figures. This acted as a reference collection which proved to be much efficient and time saving. Below is an example of the database of the Gardete rocks.

rock no.	mold no.	dimensions of mold	no. of sheets	orientation	number of figure	Anthropomorph	Zoomorph	Idiomorph	indecipherable	others	pecking	Superpositions	state of mold
1A	506	49 by 31	1	no	1			Circle with perforated interior			D & DP		reasonable
1B	501	61 by 42	1	no	1			circle with cross			D		reasonable
					2			circle (filled)			D & DP		
					3			circle (dispersed filled)			D & DP		
1C	473	29 by 22	1	no	1			circle with cross			D & DP		reasonable
2A	486	20 by 19	1	no	1			circle			D & DP		reasonable
					2			simple line			D & DP		
2B	488	25 by 16	1	no	1			simple line			D		reasonable
2C	485	31 by 21	1	no	1			Footprint			D & DP		bad
3	474	104 BY 110	4	no	1			circle			DP	8 &27	reasonable
					2			Circle with exterior trace			D		
					3	yes					D & DP		
					4			circle			D		
					5			circle incomplete			D		
					6								
								circle with central point and exterior trace			D & DP		
					7			circle			D		
					8			Circle with exterior trace			D		
					9			circle			D		
					10			simple line			D		
					11			circle			D		
					12			circle			D		
					13			oval			D		
					14			Circle with exterior trace			D		
					15			semi - circle			D		
					16			circle			D		
					17			circle			D		
					18			concentric circle - 2 ring			D		
					19			circle			D		
					20			circle incomplete			D		
					21			circle			DP		
					22			circle			D		
					23			circle			D		
					24			Footprint			D & DP		
					25			concentric circle - 2 ring			D		
					26			circle			D		
					27			simple line			D		

Figure 20: A sample of the database created for the Gardete rock

4. ENGRAVINGS OF THE GARDETE SITE: TYPOLOGY CLASSIFICATION AND TECHNIQUE ASPECTS

This typology will utilise the 41 cast moulds of the Gardete Rocks in the ITM collection and the 8 rocks encountered in the ITM 2103 prospection of Gardete. Gomes (2010) has a typology that will not be utilised in this thesis as the ITM researchers have developed their own parameters over the past few years and the thesis of Gardete will follow in this line of research to maintain the tradition. Collado (2006) is the guideline in which the typology of Gardete and the previous thesis's regarding the Tagus rock art sites have followed. An important mention has to be made here concerning the different attributes of Gardete between the ITM and Gomes (2010). For example, if one looks at Gomes (2010) Doctoral Thesis, one will see that the author's rock 11 consists of more than 201 figures, where as at the ITM rock 11 only consists of 9 figures. The mould has in fact has classified rock 11 as rock 14A, B, C, D E and F.

Analysing the typology of Gardete site, brings to the surface the technical aspects of the engravings as well as their style and morphological characters. Following the previous Master Thesis's regarding sites of the Tagus, in completion of the Gardete classification; researchers will be able to determine what features are exclusive to Gardete and what features are homogenous identities to all studied sites of the Tagus.

The complete typology of Gardete is given in another section of this Master Thesis. Please refer to the 'Catalogue of Figures' for all the information regarding the engravings of the site of Gardete including the decals made for each rock. The typological analysis set out here, is purely a systematic work on the quantity of representation, their styles as well as focusing on the superimpositions of engravings.

In the next section of this thesis, there will be a discussion on the results and analysis presented in this section. This will be followed by a breakdown of the results as well as comments in relation to the Tagus Rock Art Complex itself.

Below is the graphic table that summarise the number of prints and their quantities according to which typology they classify as;

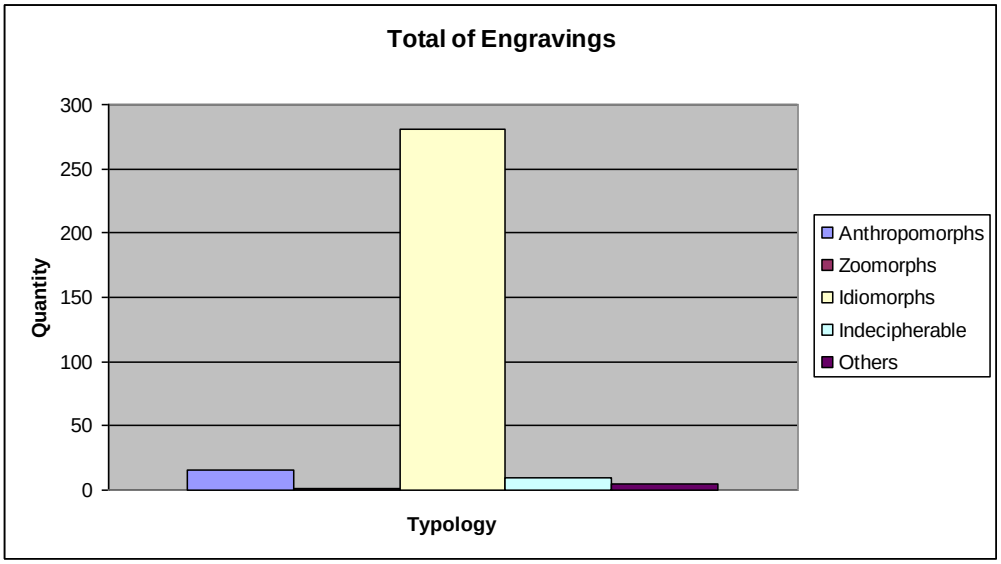


Table 1: Displays the total quantity of representations in each category, including 2013 ITM Prospection prints

	Total	Anthropomorphs	Zoomorphs	Idiomorphs	Indecipherable	Others
ITM Collection	301	14	1	271	10	5
2013 Prospection	12	2		10		
	313	16	1	281	10	5
		5%	<1%	90%	3%	2%

Table 2: Breakdown of Gardete engravings

Pecking Technique

The pecking technique observed in the prints of Gardete, all fall under one pecking method. With a lithic tool (see Santos Da Rosa 2102, especially the author's experimental section for an indication of the possible styles of pecking action) the rocks were struck in a vertical motion directly or indirectly using a secondary object, possibly a hammer tool, in two variations. The first action forms the desired print completely forming a dense pecking; therefore the image is almost always completely filled with pecking making it hard to identify the individual pecks within an engraving. The Dispersed pecking formed by the same technical process differs from the first through the production of points predominantly separate (the distance separated by mere millimetres from each other) from which it is possible to trace much clearer the

technical elements involved. i.e. the style, shape, size, and possible force employed in production of each point

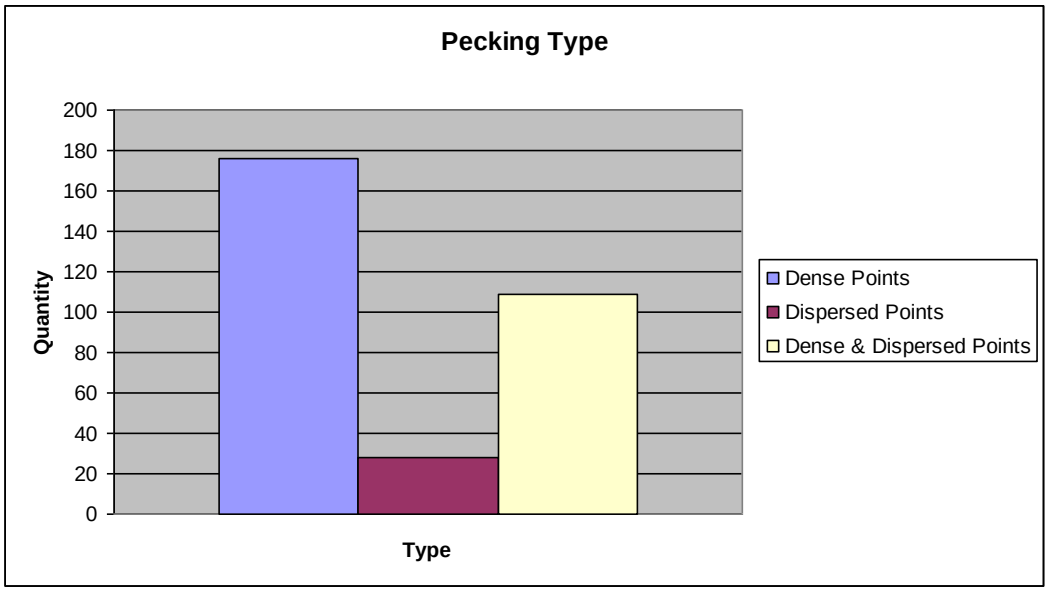
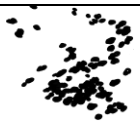
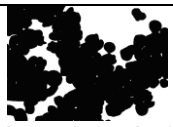


Table 3: Table of the three main pecking types

	Total	Dense Points	Dispersed Points	Dense & Dispersed Points
ITM Collection	301	174	26	101
2013 Prospection	12	2	2	8
	313	176	28	109
		56%	35%	9%

Table 4: Breakdown of Pecking types

The common types of pecking that feature in the different attributes given to the pecking style can be seen in a general form in the following table.

Dense Peckings	Dispersed Peckings	Dense and Dispersed Peckings
 G3:M474 – FIG 2	 G14E:M627- FIG 3	 G1:M506 – FIG 1
 G7:M502- FIG 10	 G14D:M628- FIG 1	 G14A:M470 –FIG 38

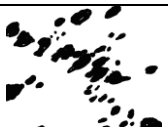
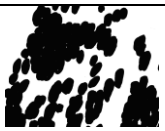
 G14A:M470 –FIG 19	 G14F:M885- FIG 2	 G14A:M470 – FIG 18
 G6:M507 – FIG 9	 G4:M484 – FIG 13	 G14A:M470- FIG55

Table 5: Various types of pecking forms that appear in Gardete

Through observing the complete collection of engravings that can be found in the site of Gardete, an interesting repetition can be extracted. Most, if not all of the engravings, have one of the following styles of pecking that make up the complete image. This would be suggestive of the capacity of representation that was required if not limited to the abilities of the authors. These questions can be answered with future research but for now, it is a point worth noting.

a. Anthropomorphic Figures

There are 16 (5% of total engravings) samples in this category consisting of both the ITM collection and the 2013 ITM prospection Together. There are two subtypes that are with in the framework of typology assigned to the Tagus, but only one can be observed within the anthropomorphic prints in the site of Gardete.

The form of pecking that appears amongst the anthropomorphic representations is given in the table below.

Total	Dense	Dispersed	Dense & Dispersed
16	12	0	4
	75%		25%

Table 6: Type of pecking styles within anthropomorphic engravings

Anthropomorphic linear body (ALB): The torso is defined by a vertical line starting from the upper to the lower limbs regardless of the form. Usually the line exceeds the upper extremities to form the head and the lower extremities which results in the representation of a male (Collado 2006)

Out of the 16 known representations 10 (63%) figures fall under this subtype with certainty. They can be further divided by their style of representation, below is an example of each style of represented types that are present in the Gardete site.

Style 1:

Fig 1

G3:M474 – FIG 3 - This style consists mainly of the circular head whether filled or empty. The torso is a straight line with variations in whether there are lines protruding out from its torso to form legs and hands, or what could be an exterior instrument or object etc.

Style 2:

FIG 2

G18:M508- FIG 5 - This type has the same general appearance as style 1, however with the difference in its extension of the torso to the upper extremities but without the circular form. of the head and the appearance of legs. The figure appears to be an anthropomorphic figure through the gesture of the legs in an inverted V shape as well as the elongated arms. T

The next sets of anthropomorphic figures are included into this typology but with a reasonable doubt as to whether they are truly anthropomorphic figures. The reason they have been included as part of this category is due to the fact that many authors class this style of representation as a primitive form of representing the anthropomorphic figures, namely Gomes (2004, 2010). In the case of Collado (2006) typology, these figures would not classify as anthropomorphic figures.

Anthropomorphic figures ?

Style 3:

FIG 3

G7:M502-FIG 3 - This type is the 'm' type representation of the anthropomorphic figure. There are slight variations within this form but mainly on the elongation of the torso or the bulkiness of the figure itself. There are no representations of the legs or the heads in this type which gives reasonable doubt to its association as an anthropomorphic image. However some authors regard this as a semi-naturalistic mode of representation

b. Zoomorphic Figures

Out of the the 313 engravings identified in the site of Gardete, there is only 1 (<1%) zoomorphic engraving that has come to surface along this stretch of the river. It falls into the subtype 3 category for representations of zoomorphic engravings.

*Zoomorph subnaturalistic (Z*S): Animals represented with a lesser degree of realism but still maintain form.

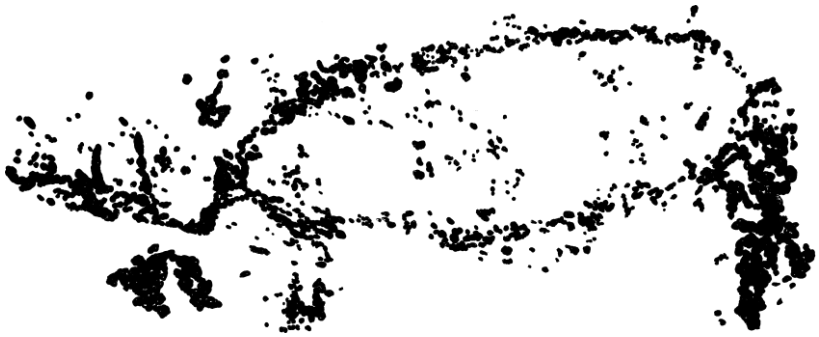


Fig 4: The only representation of an zoomorphic image from Gardete. G22D:M1605 – FIG 1

Not a great deal can be said about the zoomorphic representation that is present in Gardete, other than what it represents, which is a deer. The interesting aspect about this particular representation is that it is the most common type of representation of the deer that is found within the Tagus Valley (Garcês 2009). This would consist of the oval

shaped body with the head and neck completely pecked, in this case the fractures of the rock or of those present on the moulds obscure this from view. The pecking technique employed here seems to be a mixture of both dense and dispersed pecking.

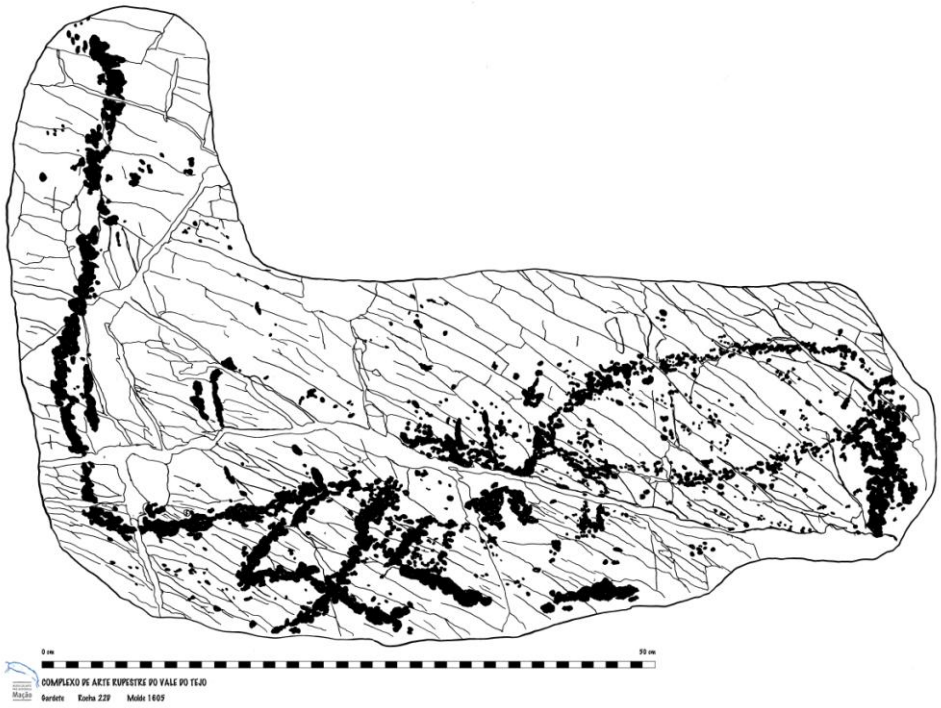


Fig 5: Decal of G22D:M1605 displaying the only deer figure represented in the site of Gardete

c. Idiomorphic

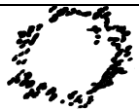
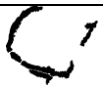
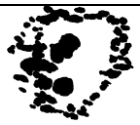
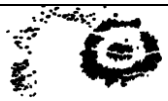
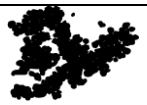
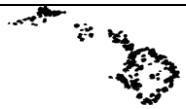
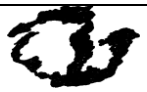
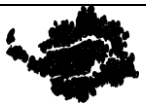
This category makes up the majority of the engravings that can be visualised at the site of Gardete. Included in this category for the purpose of the typology is the 'Indecipherable' and 'Others' typology which gives the Idiomorphic category a total of 296 engravings and 95% coverage in terms of Engravings. It would be a tedious task to go through each type that forms this category as the complete typology for each engraving type has already been accomplished in the 'Catalogue of Figures' at the end of this Thesis.

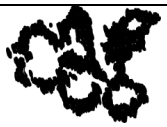
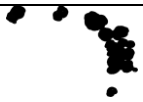
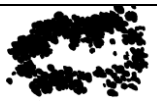
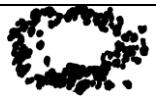
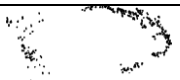
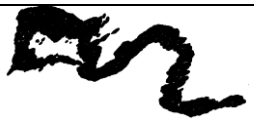
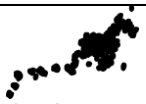
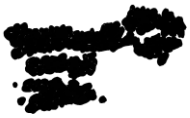
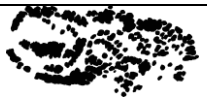
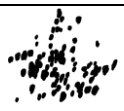
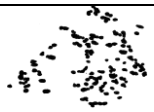
Type	Total	D	DP	D & DP
Circle	84	58	7	19
Circle incomplete	16	15	1	3
Circle with perforated interior	17	5	2	10

Circle (filled)	16	6	1	9
Circle (dispersed filled)	6	2	4	4
Circle with central point	9	7		2
Circle with central point with exterior trace	4	2		2
Circle with exterior trace	33	14	3	16
Circle filled with exterior trace	4	1		3
Circle with crossing line and exterior trace	2			2
Circle with cross	2	1	1	
Concentric circle - 2 rings	7	3		4
Cup marks	1	1		
Dumbbells	6	3		3
Circular compositions	6	4		2
Sun-shaped	1	1		
Semi-circle	8	5	1	2
Oval	9	1	2	6
Oval (filled)	2			2
Simple lines	14	9		5
Serpent form	11	6		6
Combination of lines	2	2		
Footprint	9	3	1	5
Dispersed points	5		5	
Dense points	3	3		
Dispersed and dense points	4			4
Indecipherable	10	10		
Others	5			6

Table 7: List of Idiomorphic representations and their pecking types

The most dominant type is the circular form. Out of the 296 engravings classified into this list 207 engravings (70% in total of Idiomorphic engravings) are produced using circular forms. The most dominant type of pecking form is the dense pecking which comprises 55% of all images in this category. As there are too many figures in this category to display here, as mentioned already, the complete typology is listed in the 'Catalogue of Figures' at the end of this Thesis. For now a few samples from the 28 different typologies identified will be previewed to give some indication as to what forms of representations are made for each type listed in the table.

TYPE			
Circle	 G22E:M574-FIG 1	 G9:M509 – FIG 2	 G2A:M486 – FIG
Circle incomplete	 G3:M474 – FIG 22	 G14B:M633- FIG 25	 G7:M502- FIG 16
Circle perforated interior	 G15:M625- FIG 7	 G6:M507 – FIG 5	 G9:M509 – FIG 6
Circle (filled)	 G4:M484 – FIG 11	 G14B:M633- FIG 24	 G14A:M470 – FIG 37
Circle (dispersed filled)	 G1B:M501 – FIG 3	 G14A:M470 – FIG 18	 G14C:M630- FIG3
Circle with central point	 G22C:M511- FIG 3	 G14F: M885- FIG 4	 G19:M482- FIG 1
Circle with central point with exterior trace	 G3:M474 –FIG 6	 G20A:M483- FIG 1	 G7:M502- FIG 10
Circle with exterior trace	 G3:M474 – FIG 2	 G12:M499- FIG 3	 G4:M484 –FIG 6
Circle filled with exterior trace	 G14A:M470 – FIG 4	 G14A:M470- FIG 45	 G17:M510- FIG 2
Circle with cross	 G1B:M501 – FIG 1	 G1C:M473 – FIG 1	
Concentric circle - 2 rings	 G9:M509 – FIG1	 G7:M502- FIG 6	 G3:M474 – FIG 18
Dumbbells	 G7 :M502- FIG 11	 G10:M500 – FIG 1	 G14A:M470 –FIG 23

Circular compositions	 G18 :M508- FIG 14	 G14A:M470 – FIG 50	 G14C:M630- FIG 5
Sun-shaped	 G7 :M502- FIG 13		
Semi-circle	 G14A:M470 – FIG28	 G14B:M633- FIG11	 G15 : M625- FIG 11
Oval	 G22A:M480- FIG 1	 G19:M482- FIG 2	 G14D:M628- FIG 1
Oval (filled)	 G14A:M470 –FIG 38		
Simple lines	 G14A:M470- FIG 63	 G13:M504 – FIG 2	 G20C:M475- FIG 2
Serpent form	 G4:M484	 G14A:M470 – FIG 7	 G22C:M511-FIG 14
Combination of lines	 G14B:M633- FIG 3	 G14A:M470 – FIG 16	
Footprint	 G6:M507 – FIG 7	 G11:M498- FIG 3	 G3:M474 – FIG 24
Dispersed points	 G14A:M470- FIG 59	 G5:M506 – FIG 1	 G14C:M630- FIG6
Dense points	 G14A:M470 – FIG 21	 G22C:M511-FIG 5	 G22C:M511-FIG 13
Dispersed and dense points	 G14A:M470 – FIG 48	 G16:M497- FIG 1	 G20B:M490- FIG 1
Indecipherable	 G14B:M633- FIG 27	 G22C:M511-FIG 15	 G22D:M1605-FIG 4

Others	 G14A:M470 – FIG 31	 G14A:M470- FIG56	 GB14:M633- FIG 18

Table 8: Samples of types of representation in a given group

A special mention has to be made regarding specific images that fall into the category of Others, Indecipherable and Circular Compositions. The shapes represented and forms are quite uncommon in respect of Gardete for they seem to represent a collective vestige of symbols, for example lines and circles combined with further circles inside etc. The meanings of these shapes and forms can only be conjectured upon; however their attention is worth noticing as they present a puzzle that one day researchers may come to understand. With in Gardete, also the footprint representations seem to feature more times than any other site along the Tagus. This gives Gardete a special signature which if anything adds to the lure of these symbols that blanket the banks of this part of the Tagus River.

5. SYNTHESIS OF TYPOLOGY CLASSIFICATION AND TECHNIQUE ASPECTS OF GARDETE

From the analysis given in the previous section it is possible to make general conclusions purely based on the material that has been studied about Gardete. Out of the 313 engravings identified at the site 56% of the engravings are produced in dense pecking form. This is relation can actually be seen in much of the engravings and a preference to highlight fully or depict with volume the representation could be something to consider as a factor. A summary of all the typology of Gardete is presented in the following table.

Type	Total	%	D	DP	D & DP
Anthropomorphic *(ALB)*	16	5%	12		4
Zoomorph sub-naturalistic *(ZS)*:	1	0,30%			1
Circle	84	27%	58	7	19
Circle incomplete	16	5%	15	1	3

Circle with perforated interior	17	5%	5	2	10
Circle (filled)	16	5%	6	1	9
Circle (dispersed filled)	6	2%	2	4	4
Circle with central point	9	3%	7		2
Circle with central point with exterior trace	4	1%	2		2
Circle with exterior trace	33	115	14	3	16
Circle filled with exterior trace	4	1%	1		3
Circle with crossing line and exterior trace	2	0,60%			2
Circle with cross	2	0,60%	1	1	
Concentric circle - 2 rings	7	2%	3		4
Cup marks	1	0,30%	1		
Dumbbells	6	2%	3		3
Circular compositions	6	2%	4		2
Sun-shaped	1	0,30%	1		
Semi-circle	8	3%	5	1	2
Oval	9	3%	1	2	6
Oval (filled)	2	0,60%			2
Simple lines	14	4%	9		5
Serpent form	11	4%	6		6
Combination of lines	2	0,60%	2		
Footprint	9	3%	3	1	5
Dispersed points	5	2%		5	
Dense points	3	1%	3		
Dispersed and dense points	4	1%			4
Indecipherable	10	3%	10		
Others	5	2%			6

Table 1 Synthesis of typology classification and techniques aspects of Gardete figures

The circular forms of representation appear the most along this part of the Tagus River that makes up the site of Gardete. This feature may be representative of its chronological interpretation and this will be discussed in the discussion section of this Thesis.

a. Stratigraphy and Associations patterns

In terms of patterns and associations there is no significant repetition of imagery that would indicate an intentional symbolic reproduction of some kind that it's meaning is lost to modern viewers. The associations of images are quite vast in Gardete and out of 41 rocks almost 80% have associations. Figure 6 will display a typical rock with the type of association that most features in Gardete.

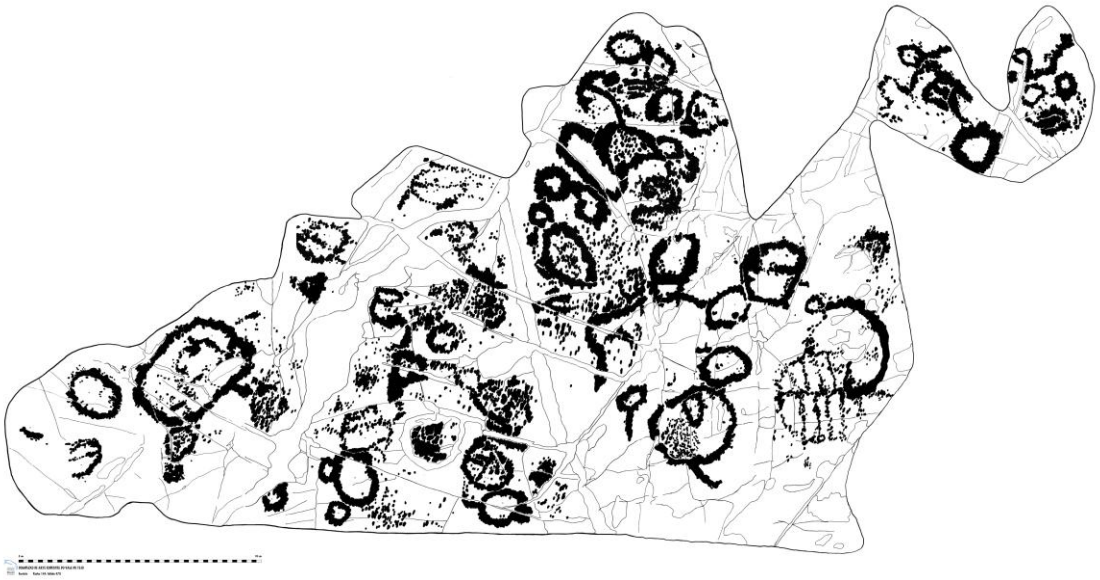
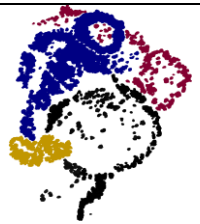
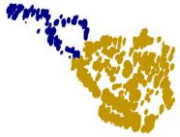
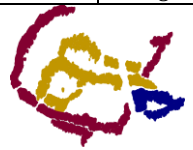
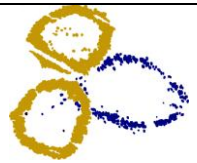


Fig 1: G14A:M470. Representation of typical associations that feature in Gardete.

The associations of circular forms are the most dominant type to feature in Gardete. Rarely is an anthropomorphic image associated with another anthropomorphic image or zoomorphic figure, which is suggestive again of its chronological periods. As is possible to see in the above decal, circular compositions which are classified under the 'Others' typology have their own associations with its own makeup. The most interesting aspect is the superimpositions, in which it is possible to see all the rocks which have superimposed engravings in the 'Catalogue of Figures' at the end of this Thesis. There are 28 recording superimposed imagery in the site of Gardete. Only one anthropomorphic image is associated with other engravings making the total for the superimposition of circular forms around 96%. In the table below is listed all the types of superimpositions available in Gardete, and once again, there seems to be no special pattern except for the fact that circular forms overlap circular forms. This is something that can be expected as 95% of the engravings are made up of idiomorphic representation.

Rock Number	Superimpositions		Comments
G3:M474	 FIG 8 with 27		A circle with an exterior trace has a line that imposes itself upon it. Whether this is to represent or change the original image can only be discussed without certianty
G4:M484	 FIG 10 with 16 with 27		Three circles impose upon themselves which is quite interesting to see, as this can also represent what some figures have been categorised as circular compositions
G6:M507	 FIG 9 with 10	 FIG 18 with 19 with 20	Circular representations again feature. The most interesting superimposition here is the circular compostion Fig 9 with 10, that can be viewed as refilling ro correcting a part of the composition
G9:M509	 FIG 3 with 4	 FIG 5 with 6	Interesting to see a concentric circle being stamped on top of a circle.
G11:M498	 FIG 3 with 4		A Footprint is also stamped on top of a circle. This is one of two occurrences where a footprint either overlaps or is being overlapped by a circular form

G12:M499	 FIG 3 with 1 with 4		The so called phantom figure. Questionable whether the circle with exterior trace that it is overlapping may have also been an anthropomorphic however it seems to be filled at the end with another. These compositions with anthropomorphic images do not appear with exception of this particular case
G14A:M470	 FIG 2 With 3 With 4  Fig 13 with 16	 Fig 18 with 19 with 20  Fig 18 with 22	Circles upon circles. This is the typical representation in overlaps that can be found in Gardete
	 Fig 26 with 27  Fig 28 with 29	 FIG 43 with 44	An interesting composition of geometric lines that are superimposed by a circular ring
G14B:M633	 FIG 21 with 25 with 26		This is a composition of forms that have an anthropomorphic being stamped on top.
G14C:M630	 FIG 3 with 2	 FIG 9 with 10 with 11	Circular forms that eventually form a composition

G14F: M885	 FIG 1 with 2		Two circles with exterior traces
G17:M510	 FIG 3 with 4		A circle that imposes itself on another circle
G18:M508	 FIG 3 with 4	 FIG 14	These compositons are the most interesting; Fig 14 is a composition of circles which is formed with overlaps. Whether this is something that was added over time or done at once is not possible to be determined.

Table 2: Complete list of all the superimpositions of Gardete.

b. Special Dispersion of the engravings

Having analysed the rocks of Gardete and prospecting on the site itself, it is possible to say that there is seems to be no relationships with images and their space. As far as can be said, the dominant representation is that of idiomorphic engravings and they are spread on the rock surface randomly, and no trace of pattern can be seen. Anthropomorphic images are normally represented alone or with idiomorphic images and sometimes they feature within overlaps as can be seen in Table 10. In general the prints seem to be dispersed on spaces of the rocks that are available for pecking.

The main corpus of engravings is the collection of G14 moulds, where this set of engravings form the most prints on rock in Gardete. Upon this entire rock the most dominant form of representation is the idiomorphic prints and very few are anthropomorphic and no trace of zoomorphic depictions. The dispersal of the engravings appear to be completely without any specific pattern, except for the forms that appear to culminate in compositions, generally made up of circular forms.

The other interesting note to mention about the dispersal of engravings is that they would appear to be made in sets along the banks of the Tagus River in the site of Gardete. Whether they happen to only contain two or three engravings at each time, the next set of engravings would be found a couple of metres further along the river. This feature is quite interesting in relation to the level of intensity in which the engravings appear, as the main corpus is then surrounded left to right by much smaller sets of engravings that number for example only two or four. This feature is quite interesting and hopefully with future research conducted, there can be some correlation made to see if this manner of organising the rocks has some purpose.

6. DISCUSSION ABOUT GARDETE TYPOLOGY AND SITE

a. Anthropomorphic figures

This section will discuss some aspects regarding the way in which the typology was conducted, and also focus on some general observations and considerations regarding the site of Gardete and its general setting within the Tagus Valley Rock Art Complex.

The one aspect regarding typology that can always be scrutinised is the notion of categorising symbols and images according to what they seem to represent or appear as. For instance in the case of Gardete and in general the Tagus Rock Art Complex, the anthropomorphic image can be interpreted in many ways, given that the author who is inspecting sets out their criteria for doing so. As the ITM researchers are inclined to adhere as much as they can to the typology of Collado (2006), the typology for anthropomorphic images was laid out in terms of what truly appears as an anthropomorphic representation. As an exercise, observe the three types of styles that have been attributed to be an anthropomorphic image in this Thesis for the Gardete site.

´

Style 1	*Style 2*	*Style 3?*
		
G12:M499- FIG1	G18:M508- FIG 10	G7:M502- FIG 3

Table 1: Three styles of representation in anthropomorphic figures of Gardete.

Style 1 is more representative of an anthropomorphic figure due to the presence of a head, arm, torso and what seems to be the depiction of one straight leg with the other possibly missing or not depicted. *Style 2* embodies features that incline it towards appearing more as an anthropomorphic than anything else, as it has the torso, the arms curving downwards and the split inverted 'V' form to represent what looks like legs. The first two styles could be classified as anthropomorphic figures with certainty, and plausibly would be agreed upon by most authors. The troubling part to typological analysis comes with *style 3?* If the criteria for an anthropomorphic image are embodied in *styles 1* and *2*, then could

one classify *style 3?* as an anthropomorphic representation. Analysing this style briefly, it could be said that there is present a torso or in fact more accurate to say a line that can be deemed to depict the torso of a figure. The arm much like style 2 is present, but is this enough to constitute an image as an anthropomorphic figure? How can one be sure if they are following the correct protocol when in fact misinterpretation or omission or absence of consideration can be serving the authors whom produced the original engravings injustice?

Examples of *style 1* can be found in other sites of the Tagus Rock Art Complex and that certifies its association with being an anthropomorphic figure even more. For example;

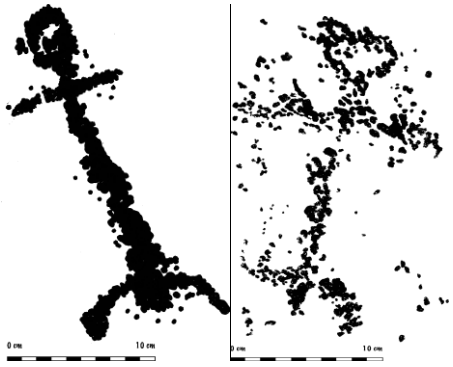


Figure 1: SS92 and AL39, anthropomorphic figures that share the same characteristics as *style 1* of Gardete

This is something that the research of Gardete had to take into consideration as there were interpretations of typologies that simply could not be accepted or had to be adapted to. The following image below gives an example of the differences between Collado (2006) and Gomes (2010) and what obstacles researchers may have to consider.

GOMES (2010) COLLADO (2006)

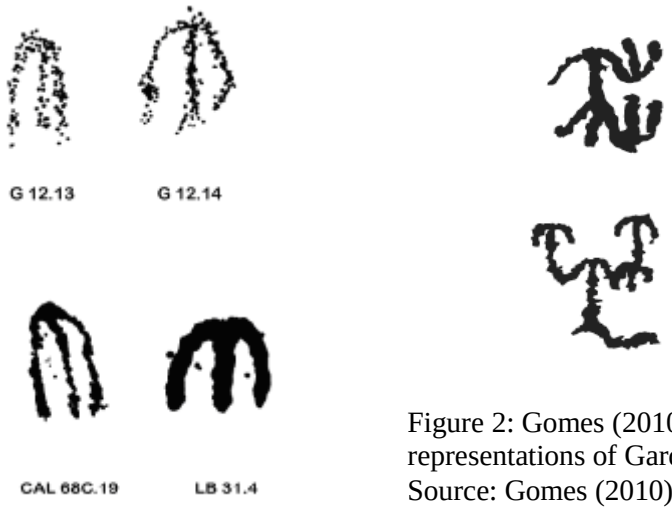


Figure 2: Gomes (2010) and Collado (2006) representations of Gardete *style 2 and 3?*
Source: Gomes (2010) and Collado (2006)

Gomes (2010) classifies the following as schematic representations of anthropomorphic images and clearly has identified *style 2* and *style 3?* as part of the corpus of representations. Collado (2006) does not have an anthropomorphic image close to *style 2* or *style 3? per se* however, the authors anthropomorphic representations always tend to have some external accoutrements of some kind that elaborate more the figure or symbol. For this reason, to tread on safer grounds, *style 3?* was considered a questionable anthropomorphic representation, and only with a more concrete and solid typology, in time, the discrepancies such as these should be resolved.

Another interesting difference worth noting about the different typologies of both authors regarding anthropomorphic figures is the various representations of *Anthropomorphic Circular Body (ACB).* For instance;

Collado (2006)

GOMES (2010)

Figure 3: samples of representations of *Anthropomorphic Circular Body (ACB).* Source Collado (2006) and Gomes (2010)

As these kinds of representations have been regarded as anthropomorphic figures whether schematic or semi-naturalistic, to choose the more likely anthropomorphic image just by the eye, one would say it would have to be Collado's (2006) set of figures. According to Gomes (2010) the typology in which this research Thesis has classified similar types that appear in Gardete, the author considers to be schematic depictions of anthropomorphic figures. Of course this is down to each authors own interpretation and criteria, however it must be said that where there is a doubt or an uncertainty, one must tread on safer grounds and classify this type of representation under the appropriate idiomorphic typology. For instance, in the Catalogue of Figures at the end of this Thesis, similar depictions to those of Gomes (2010) have been classified under the typology 'Circle with crossing line and exterior trace' and/or 'Circle with perforated interior'. Please refer to the catalogue to visualise the different conceptions of this type that have been classified adhering more to Collado's (2006) criteria as well as adopting the ITM's own parameters.

The issue raised here, is the biggest concerning the typological aspect for anthropomorphic images, as they tend to be the most important representations in terms of direct human involvement with the engravings, as well as emphasise some characteristics about the chronology and culture and society.

An interesting note to make about the anthropomorphic figures is their representations with other types when they appear. It is usually an idiomorphic image and the most common type is a circular form, in this case the 'circle with an exterior trace' typology. This appears on 95% of the moulds in which an anthropomorphic figure is present. Mentioned already in Chapter 4 that there does not seem to be a special pattern in particular with the Gardete site, when looking at the moulds, this association does appear a lot in other sites of the Tagus Rock Art Complex too, so there could be some relation that would need to be studied further.

b. Zoomorphic figures

As there was only one representation of a zoomorphic image, it is interesting to look at it from another angle. It does not seem to belong to Gardete as Gardete is swarmed with idiomorphic representations, yet in the wider picture of this one zoomorphic representation alone, its surrounding sites seem to have deer representations as an important theme. For example the terminus of the Tagus Rock Art Complex, is within the tributary of the Ocreza, where there are a few broken engravings of what appears to be a deer. Its schematic representation is almost alike with that of Gardete, as mentioned already; the deer

figure seems to have a general representation that correlates with much of the Tagus Corpus. Going East beyond the Fratel Dam, you have the deer figure represented in abundance, Fratel, Alagadouro, Cachão do Algarve and São Simão to name a few of the sites, all feature the deer, whether alone or in a scenes that are interpreted as hunting scenes or mating scenes etc. Nevertheless, the point here, is that firstly the majority of the deer's are represented in the Tagus in this manner that has been depicted in Gardete and secondly, one has to consider, why Gardete seemed to have been 'neglected' so to speak, when it comes to zoomorphic representations? What is interesting about these questions is that the growing knowledge on these sites of the Tagus will eventually monopolise some of these hidden truths to force them selves to submit to the data that is compiled, one can hope of course.

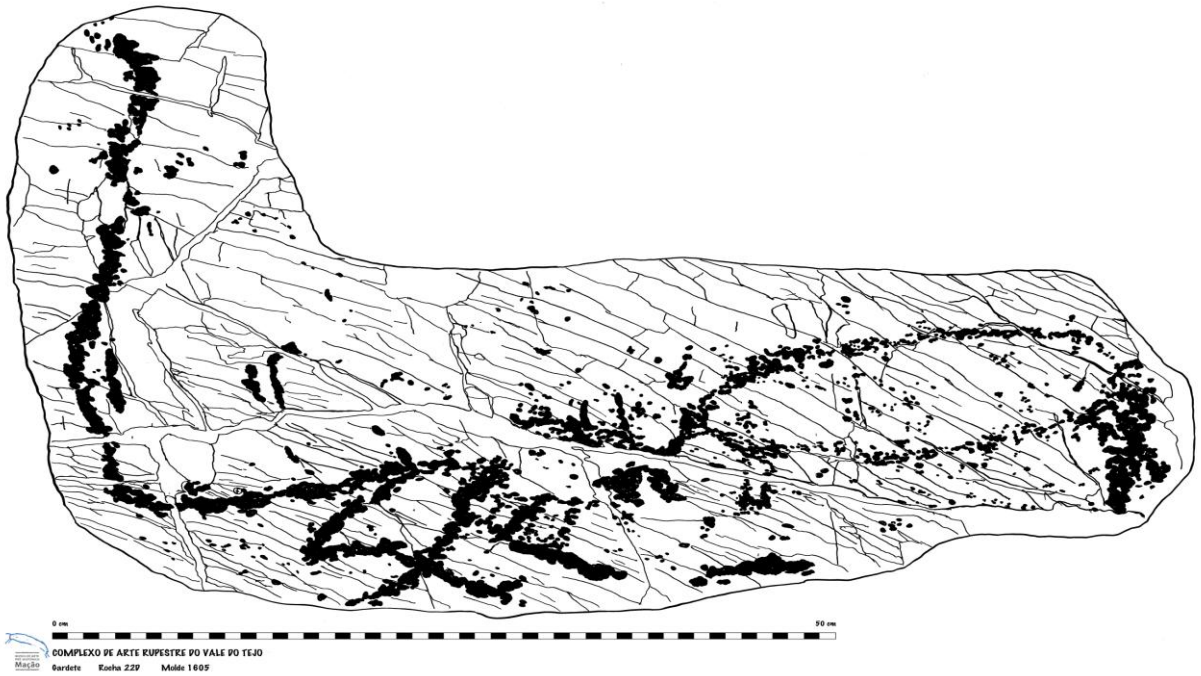


Figure 4: Decal of G22D M1605

With this one zoomorphic representation, it is possible to already see an association in the greater picture of the Tagus Rock Art Complex as a whole. There is a tendency in for zoomorphic images to appear with idiomorphic images of this type. This research Thesis has classified them as 'Indecipherable' but this only adds to the mystique of this pattern association. These symbols or combination of lines and shapes could represent something holistic in terms of the whole composition being one representation of something. However, it is still very curios for rock art researchers to know why such occurrences happen frequently much like the way in the site of Gardete, many idiomorphic representations are near to or coupled with an anthropomorphic figure.

c. Idiomorphic figures

These symbols that make up the idiomorphic category are outspoken in the site of Gardete. They total 95% of the engravings that are known to be present on this site. As mentioned already, it is quite logical that they will feature themselves associating with their own types or other idiomorphic types as well as feature with anthropomorphic and zoomorphic figures. However as pointed out already, they also happen to share this in common with other studies sites of the Tagus and this particular aspect is quite interesting to further analyse. The most interesting of idiomorphic representations have to be the circular compositions as well as the forms labelled as 'Others'. Here are a few to understand why they present a pleasing thought to mention.

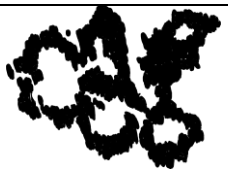
 G14A:M470 – FIG 31	 G14A:M470 – FIG 29	 G11:M498- FIG 2
 G14C:M639- FIG 1	 G14A:M470 – FIG 50	 G14C:M630- FIG 5

Table 2: Samples of circular compositions and circular forms from the 'Others' typology

What these images represent is very interesting as they seem to be compositions of circular forms that eventually make up a representation of possibly multiple symbolic representations or one composition either aesthetically pleasing or executed for a purpose. The circles with symmetry tend to feature in the Tagus Rock Art Corpus, and are sometimes associated with zoomorphic or anthropomorphic figures. The meanings and possible interpretations can only be conjecture, but there curiosity factor will always enthral the eye of the beholder.

d. General considerations regarding Gardete

During personal communication with George Nash and Sara Garcês (August 2013), the discussion regarding the location of the main core sites of the Tagus Basin in Portugal struck an interesting thought. The core sites of the Tagus are or were named after the velocity of the river current. Cachão do Algarve, Cachão do São Simão and Cachão do Boi which is now commonly known as Fratel, are the three biggest sites of the Tagus Rock Art Complex. Their names come from the fact that they have very high speed river currents which in fact creates a very interesting ambience with its sounds. This water element seems to have a pattern, for example as hinted at slightly in Chapter 4, the location of the main nucleus of rock engravings with in individual sites, tend to have a relationship with the water or set up of the river. In terms of the Gardete site, directly in front of the main nucleus of rocks is a tributary of the River Figueiro that leads into the Tagus. Slightly further down there is the tributary of the Ocreza with its rock engravings and River Nisa eastwards on the other side of the Fratel Dam. There has to be some consideration given to the landscape element as too often, researchers are caught up with the actual engravings them selves, and lose track of what information the landscape holds that can be more valuable and informative than the engravings themselves. These are just a few observations that should be considered as something to think about when approaching the Tagus Rock Art Complex.

CONCLUSION AND FINAL CONSIDERATIONS.

This investigation of the site of Gardete is a contribution to the previous research projects that have been conducted on the Tagus Rock Art sites. Gardete was analysed in order to advance the knowledge and expand the corpus of information that is currently known about these sites, for their typological vestiges as well as the technical and production processes of implementation.

The analysis of 41 Latex moulds held in the ITM from the site of Gardete yielded 301 engravings coupled with the 2013 ITM (August) prospection a further 12 engravings, giving the site of Gardete a total of 313 engravings. These were categorised into three broad categories, anthropomorphic, zoomorphic and idiomorphic images. The idiomorphic representations including the 'Indecipherable' and 'Others' typology totalled 95% of the engraved prints in Gardete, with the circular forms being the most dominant type of represented idiomorphic image accounting for 70% appearance within the idiomorphic typology. The pecking style that features the most within Gardete is dense pecking and this accounts for 56% of all engravings in Gardete. This feature is actually found to be the same with the other sites of the Tagus Rock Art Complex that have been studied, signalling the importance of the lithic implement in which was used to produce these prints.

The signature of Gardete would be the presence of 'footprint' as it appears more times in Gardete than any other site along the River Tagus. What this presents can not be suggested but it is obviously a representation that seemed to be more inclined for the Gardete region than any other site of the Tagus Rock Art Complex.

Through the process of analysing the latex moulds of the rocks and the positioning of the engravings, there seemed to be no special pattern appearances. The one aspect of associations and overlapping that featured the most out of the 28 occurrences was the representation of circular forms which overlapped upon a neighbouring circular form. This formed 96% of the superimposition record and therefore can be deemed significant. However if one is to put this in the context of Gardete, it would make it less probable that it should not happen considering that 94% of the engravings are idiomorphic representations. The one zoomorphic representation of a deer presents a pleasant appearance in a region where it is isolated to one depiction. Specifically concerning Gardete it would seem like an accident with regards to the typology that is the most dominant.

Gardete also seems to fall within the chronological time frame interpreted by Mario Varela Gomes as Period IV, V and VI, and A.M. Baptista as phase II and phase II. In these periods are present the

greater importance and dominance of idiomorphic representations and less of the scenic prints which are completely absent from the Gardete record.

This data and its results will be compiled and integrated as part of the continuing study on the Tagus Rock Art Sites. For future researchers, this work and previous ones like it will help expand the knowledge and growing study of the Tagus Rock Art Sites.

FINAL CONSIDERATIONS

The first thing that became evidently a challenge, as the research into Gardete advanced, was the difference between sources regarding the material of Gardete. This was not something that handicapped the project, but made it more challenging, even so more interesting in certain aspects. In particular, the only other author who gave a lot of insight and obviously studied much of the site of Gardete, is Mário Varela Gomes, and in the authors 2010 Doctoral Thesis, Gardete in all its early study is available to the researchers and readers of the Tagus Rock Art Complex.

However with in this presents a small obstacle in that as already mentioned the collection of the ITM was classified and attributed differently to the only other nucleus of research regarding Gardete being the Doctoral Thesis of Gomes (2010). There was also the other issue which became a slight nuance and that was the in accuracy of some of the decals that were produced based of the moulds at the ITM. This led to some prints needing to be redone in order to serve the accuracy of the research. A part from sorting and correcting the differences and inaccuracies in both the issues mentioned above, the rest of the information regarding the site of Gardete was down to visiting the site itself, recording and observing the materials available to researchers, and all this accumulated in forming what is now this Masters Thesis project.

The one mention regarding the line of research adopted for this project that can be scrutinised to some extent, is the lack of experimentation and depth of analysis in which the research was conducted. The site of Gardete has to be regarded as one of the most resourceful and available of the Tagus Rock Art sites today, because of its access availability above water levels during periods of the day. Santos da Rosa (2012) produced a really well conducted experimentation on reproducing the prints of the Tagus engravings, this to some effect deterred or gave the absence of need to re-emphasise this production of research in this particular project. The information already ascertained from the experimentation work Santos da Rosa (2012) conducted could only be used as much as it could be applied to the current

knowledge and to the studied techniques and methods employed for the Tagus. Therefore this project did not emphasise the experimentation as the major theme, but the continuation and contribution to the research projects of the individual sites of the Tagus Rock Art Complex.

As parameters of research have already been set up for the study of the sties of the Tagus Rock Art Complex, this thesis was a continuation with in this wider project. Therefore the area of study was quite strictly framed in that it was a contribution to the quantitative analysis of the site in relation to the surrounding sites of the Tagus. The need to also set up a typological database for the complete configuration and organisation of the Tagus sites was also important, and thus this has been accomplished within this thesis. Throughout this process, it became evident where the site of Gardete places itself within the chronological framework and being able to achieve this is a positive aspect for the work conducted. This will eventually be carried out with future projects on different sites and hopefully one day arrive to a point, where the ITM RUPTEJO project have conducted a complete and thorough analysis of the sites available to them.

The site of Gardete is also very interesting for the reasons that have been mentioned in this Master's Thesis project, and in particular for the potential of further prospection to discover engravings that are unknown to researchers at present. The ITM prospection team of Gardete 2013 came across rocks that are not published in any article available to the public, and this kind of information really opens up a wider scope for understanding much more about the stylistically and morphological aspects of the Gardete site. It also gives an indication of the use of space along the banks of the river, as the prints seem to be appearing in sets of rocks, whether in groups or in fact singular as has been identified in the prospection. The rocks that are left blank sometimes may puzzle the researcher, in that their surface seems to be perfect for the production of engravings, yet they are left untouched. In respects to this, the engravings can sometimes be features on rocks that have a rugged surface yet they seem to have the contours that play a role in the choosing of its use for engravings. This can be seen on some of the rocks that have engravings in Gardete. The ITM and Museum of Macão Team of the future, who will reinitiate the prospection in Gardete hopefully will come across further engravings farther down stream towards the mouth of the Ocreza or even beyond and this will add to the growing corpus of knowledge and understanding that has been ascertained through this and other studies of the sites of the Tagus Rock Art Complex.

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