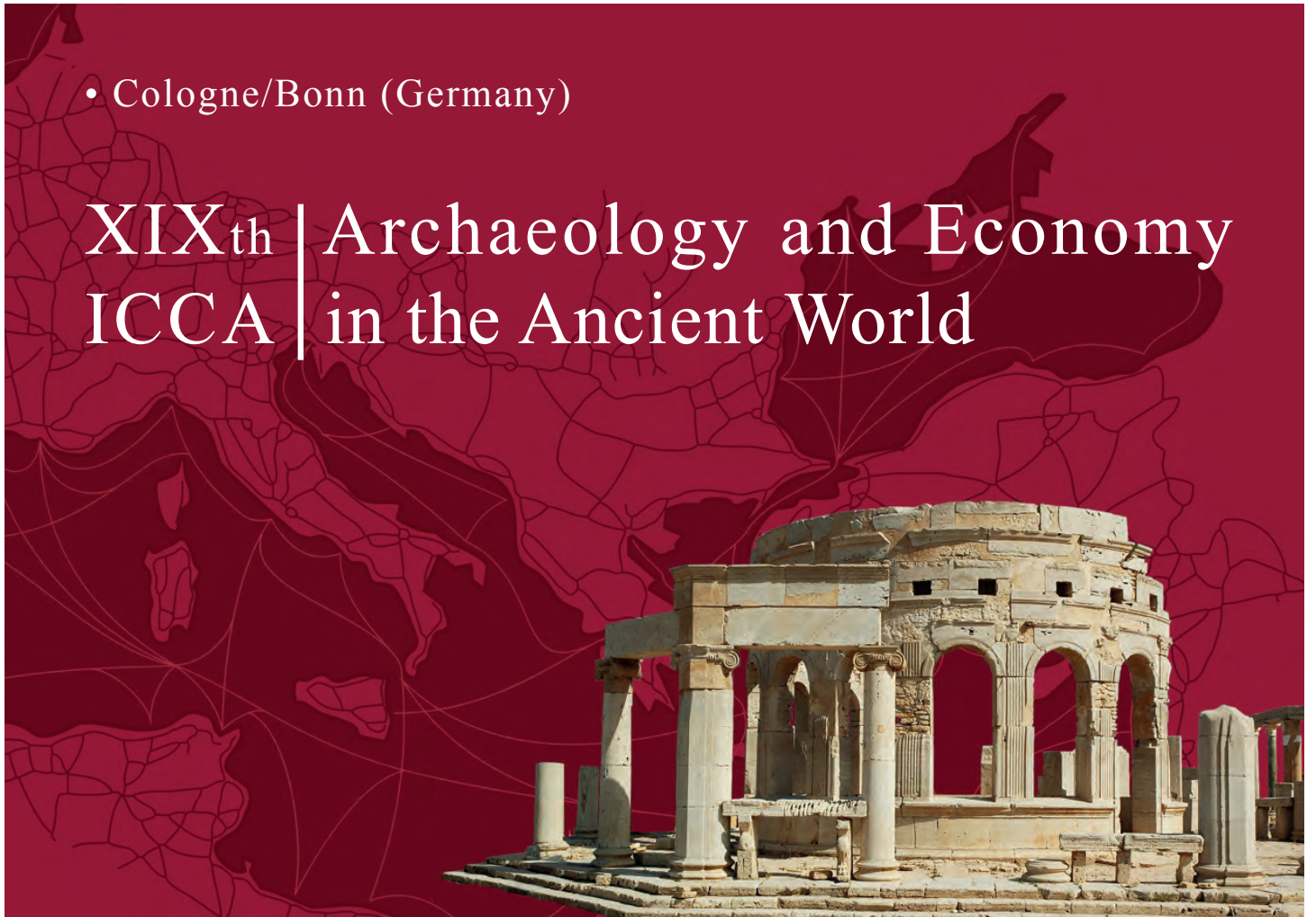




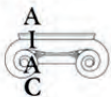
19th International Congress of Classical Archaeology
Cologne/Bonn (Germany), 22 – 26 May 2018

• Cologne/Bonn (Germany)

XIXth | Archaeology and Economy ICCA | in the Ancient World



ABSTRACTS



ASSOCIAZIONE INTERNAZIONALE
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19th International Congress of Classical Archaeology
Archaeology and Economy in the Ancient World
22-26 May 2018
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ABSTRACTS

keynotes | panels & papers | posters | workshops

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14. Oscar Bonilla Santander (Universidad de Zaragoza), Ancient mining landscapes in the Iberian System (Spain)

The Iberian System is located in the center of the Iberian Peninsula in the region named in ancient Celtiberia. The region has important mineral deposits of iron, copper, lead and silver that were exploited from the Iron Age until the present time. The mountainous territory was organized by the Roman state in republican time and during the high empire for the exploitation of the mining resources of the territory transforming radically the productive landscapes.

Large-scale production begins in the second century BC. after the conquest of the territory by the Roman state with the creation of new fortified mining villages that will manage the production of metal for long distance commercialization. With the restructuring of the territory in time of the emperor Augustus and the concession of the title of municipality to the cities of Turiaso, Bilbilis, Calagurris and Clunia the production continued until the beginning of the second century AD. when the mining towns that structured the mining operation were dismantled.

15. Mátyás Bajusz (University Babes-Bolyai), Roman quarries on the north-western border of Dacia Porolissensis

The scientific research of stones, as prime building material and the provenience of these have been almost totally neglected throughout the scientific research of Dacia province. Only three or four researchers could be enumerated starting from the end of the 18th century and 19th century who were intrigued to study and note the most important quarries of the region. Currently I am studying the stone as the base building material in Dacia and the process of its mining. My actual project is to map all the quarries serving the settlements and fortifications of the north-western border of Dacia Porolissensis, and based on the location of each site I am trying to model the possible roman routes of the transportation of the mined stone. In addition to these my interest is widened to the social background and human resources of the process of quarrying. Concerning the aforementioned area, I managed to identify 18 quarries of four different kinds of stone. The situation is complicated by the fact that a certain percent of the quarries are currently active, or have been used throughout the centuries, so during the research has rise a need for the methods of geology and ethnography too.

Panel 4.2 Mining Landscapes

Organiser: Frank Hulek (University of Cologne) and
Sophia Nomicos (University of Münster)

Thursday | 24 May | 09:00-16:30 | HS VII

Panel abstract

The economic importance of raw material exploitation, especially metal mining, for communities in antiquity has long since been addressed, but only during recent decades have scholars increasingly focused the material remains. These include not only the primary mining remains such as underground workings, process residues and installations for beneficiation, but also habitational sites and infrastructural remains that emerged in the course of exploitation.

In view of the fact that mining can contribute or even stimulate changes of a given economic system of a society, a perspective beyond technological aspects in order to better understand these interrelations seems necessary. Consequently, taking into account also the secondary structures, such as agricultural installations, burial sites, sanctuaries or infrastructural remains may display the networks that contributed to the success of ancient mining operations. Also, the occupation of raw material deposits by foreign communities has left traces in the literary and archaeological record. Such operations necessitated the introduction of new technologies as well as administrative measures. To identify and describe

indications of this process in the archaeological record by, for example, addressing questions of technological transfer seems a promising approach. Moreover, on a landscape level the question of the ecological imprint and thus of the sustainability of raw material production in antiquity may be addressed.

The intention of this panel is to provide an insight on existing and emerging research on landscapes that were distinctly transformed by mining. It aims, furthermore, at discussing how mining could affect not only the natural but also the cultural landscape. By focusing on select case studies the intention is to identify the material characteristics of such areas, to highlight and explain differences and to discuss possible recurring infrastructural and organisational patterns.

Paper abstracts

1. Effie Photos-Jones (University of Glasgow), Μιλτωρύχοι & φαρμακοτρίβες: the elusive mineral medicinals 'industry' of the Greco-Roman world

Unlike the production of metals, ceramics, textiles or glass, the industrial minerals industry of antiquity, the rocks and minerals that were extracted, processed, traded and dispensed across the Greco-Roman (G-R) world, remains largely un-explored. As pigments, mordants, cosmetics, washing powders or medicines, they were integrally associated with the daily lives of the people of antiquity, across social, cultural and economic strata; and yet as an 'industry' they are elusive. Dioscorides (*De Materia Medica*, Book 5) and Pliny (*Nat Hist* Book 35) suggest that the same minerals served as pigments and medicines, or medicines and mordants and no effort is made to draw a line between different applications. *Pharmacotribes* (those who grind drugs or colours, Demosthenes.48.12; Aelian *Natura Animalium* 9.62) seem to have provided the same materials to both painters and doctors. Could that be true? Was it a case of one mineral deposit quarried, ground-up, packed in ceramic containers, shipped and dispensed to different minerals merchants? Did it undergo a single treatment or different ones, each targeting a specific market? It is suggested that the lowly status of the *pharmacotribes* or the *miltorychoi* (those who dig for μίλτος, Pollux.7.100) should not detract from the fact that the industry may have been more nuanced and there may have been a wealth of empirical knowledge which is currently invisible. To investigate the industry requires a broad-based approach taking in not only the archaeology, geology, mineralogy or geochemistry of the minerals but also their ecology, i.e. the microorganisms (bacteria, algae, fungi) which live in their immediate surroundings and affect their properties. This is because, unless the minerals have been heated to high temperatures, these microorganisms are likely to follow the minerals to their final destination, for example as medicines. Furthermore, as regards mineral medicinals, an additional parameter needs to be investigated, namely bioactivity. This is a quantifiable parameter, defined broadly as the effect (positive or negative) of a substance (in this case the G-R mineral and associated microorganisms) on a living organism (plant, animal or human). To illustrate these points we draw examples from our long-term work on Melos, W Cyclades, one of the key industrial minerals producers (alum, sulphur, Melian Earth) in the Roman world (Photos-Jones and Hall 2014; Photos-Jones et al 2016), and also our current work on the bioactivity of the *miltos* of Kea, NW Cyclades (Photos-Jones et al, in review).

2. Thomas Faucher (University Orleans/IRAMAT-CEB, CNRS), Ancient gold production in the Eastern desert of Egypt: Samut as a case study

In order to verify the intensity of the Carthaginian exploitation of its territorial resources and to define its pattern of exploitation in Iberia, we have developed a survey in the hinterland of the Barcid colony of Qart Hadasht (Cartagena, Murcia, Spain).

The selected area, between Trujillo and Carrasquilla's Ramblas (Campo de Cartagena), as a result of its geo-physical features and the dominant resources, had also allowed us to evaluate the Carthaginian attitude towards the use of certain resources such as salt, silver and other metals mining, agriculture, fishing, or stone quarries.

The preliminary results that will be presented at this conference will show the compatibility of mining

with other economic activities, focusing specially in the Carthaginian period and the subsequent Republican Roman exploitation of the landscape.

3. Hannah Friedman (Texas Tech University), Feeding the Miners in Faynan. The Discovery of a New Floodwater Farm at Jabal Hamra Alrbieg

The Wadi Faynan in Southern Jordan is in many ways a unique archaeological landscape. Multiple cultures were drawn to the region due to its plentiful copper ore. The landscape then is a palimpsest of mining activity, from cold working of copper in the Chalcolithic through to the modern period as a tourist/ ecological attraction. The Roman and Byzantine period saw one of the most intense periods of exploitation in the region with a large investment of resources by the Roman State. Moreover, the area is very well preserved giving unequalled access to past mining infrastructure.

This paper will present some of the results of the Barqa Landscape Project (BLP). The BLP has been focusing our archaeological survey on the little investigated south of the Faynan valley to gain a more complete understanding of human activity across the landscape. Our studies have located a new floodwater farm at the isolated Jabal Hamra Airbeig, 5km south of the center of Roman activity, Khirbet Faynan. The farm lies adjacent to the route leading to the Umm alAmad mine; famous for having the largest underground gallery in the Roman Empire. It also is removed from the center of metallurgical activities in the Wadi Faynan, measurements of pollutants such as heavy metal toxins were found in much smaller amounts than those recorded at other farms utilized by the Romans. In this presentation JHA will be discussed as a possible communications and supply site for the metallurgical industry taking place in the rest of the Faynan valley during the Classical Period.

4. Beatrice Cauuet (University of Toulouse, CNRS), The impact on territories of gold and tin mining in Gallia from Iron Age to Roman time

Recent archaeological researches had broad to light many new informations on the mining practices for gold and tin metals throughout Gallia, especially in the Iron Age. The mining was either done on reef lodes than on alluvial deposits for both metals. Some of the works are rather superficial even if spread on large areas, others especially in rock mines are much deeper and wider. All these extractive activities have been taken place in the mountains areas of the country, as Brittany, Massif Central and Pyrenees. Their impacts are mainly on the landscape and the territory occupation, as well as on the resources in wood or water. They also revealed new occupied areas with population and economy not considered in the History until then. With the Roman period, part of these mining activities were either stopped or pursued depending of the regions, the nature of the deposits or the general economical politic of the moment. We will go through the main aspects of this thema.

5. Raphael Alexander Eser (Humboldt-Universität zu Berlin) - Fabian Becker (Freie Universität Berlin), New insights into an old iron mining landscape: Elba Island

While the ancient mining of iron ore and its further processing on Elba Island is an undeniable fact, the duration of iron production and its impact on the island's landscape is still not clear. Modern research assumes different beginnings for the exploitation and smelting of iron from the 9th to the 5th c. BCE. In contrast, the end of iron production is dated exactly to the late 1st c. BCE and linked to written sources such as Pliny's senate decree on abolishing mining in Italia (HN 3,138) as well as a presumed lack of wood.

Our paper presents recent archaeological results of an interdisciplinary research project on ancient iron mining and smelting on Elba. On the basis of new data and the current state of research, several aspects are discussed: 1) chronology and topography of iron mines and smelting sites; 2) handling of the necessary resources as well as transport on and around the island; 3) economic role of the Elban iron. New radiocarbon dates and so far underestimated archaeological finds indicate a new chronology of iron production from the 6th c. BCE to the 2nd c. CE. The topo-chronological evaluation shows a concurrent acceleration of smelting even in remote areas of Elba in order to make use of the local wood and water resources as well as already existing maritime trade routes. The continuation of Elban iron

production after the presumed date of the senate's prohibition is contrary to current opinion that Roman imperial Italia obtained iron only from the provinces.

6. Norbert Hanel (Universität zu Köln) - Bärbel Morstadt (Ruhr-Universität Bochum), The Igesiente. Archaeological and historical landscape studies of the mining area in Southwest-Sardinia from the Early Iron Age into Late Antiquity

Sardinia was famous in Antiquity for its silver, lead, copper, and presumably zinc deposits. The metal abundance is considered to be the main reason for the Phoenician, Punic, and Roman interest on this island in the first millennium BC until Late Antiquity. Nevertheless, the exploration of Sardinia as an important mining region in these periods has scarcely been done, neither with the use of the ore-resources, the installation of the mines, the smelting and working places, the transport and trade of the ores, nor the therewith connected administrative and socio-historical aspects.

In a three-year-project, the development of the local infrastructure (e.g., roads, settlements, sanctuaries) in correlation with the ore deposits, and the smelting and working places of the chaîne opératoire, in combination with the historical background from the 1st millennium BC until the Late Roman period in the Igesiente – the most rich in ore-region in Sardinia – shall be systematically explored and set into a broader context. Evidence is available by archaeological, literary and epigraphic sources and shall be combined by newly created data by different methods.

7. Nerantzis Nerantzis (University of Lille 3), The organization of mining and metal production in Aegean Thrace from the Archaic to the Roman period

The significant metal deposits of the North Aegean had been renowned in the ancient world as briefly mentioned in myths and historical accounts. Long before the arrival of the Greeks in the Thracian littoral, the processing of minerals to produce copper, lead-silver and collection of alluvial gold was common among the native populations. With the gradual establishment of Greek colonies and emporia in the Archaic period, an increase in mineral exploration and metal production is manifested by relevant archaeological findings. Interdisciplinary research in this region was initiated in the early 1980s when several mining shafts and metallurgical sites have been located across Mount Pangaeon and the Lekani mountain range. In recent years renewed interest on the study of mining landscapes in Aegean Thrace combined with new excavation projects brought about important new information. This paper discusses the issue of mining and metallurgical activity across this region from the Classical to the Roman period in the light of recent archaeological data. The ongoing excavation project at Pistyros (Pontolivado), a Thasian emporium west of the Nestos estuary has yielded large volumes of metallurgical slag. Initial examination has confirmed that these residues derive from the reduction of iron ores in furnaces and forging of the blooms as well as copper and lead/silver extraction dating to the Classical and Hellenistic periods. While the evidence for mining exists at various localities in the Lekani, presumably in Thracian territory, secondary processing and manufacture of objects was achieved within this Greek fortified emporium. In this context, accessing, controlling and negotiating mineral resources among the indigenous Thracian populations and the inhabitants of the Greek settlements are fundamental in understanding the organization of metals production in the North Aegean.

8. Eva Steigberger and René Ployer (Bundesdenkmalamt, Österreich), Noricum. Economic Factor Alps

The presentation deals with the cultural landscape of Noricum before and during the Roman Empire. Mining as a major economic factor changed the landscape significantly and makes it possible to discern large-scale structural pattern of trade towards the South and Italy and towards the North and the Limes. Wealth in a region with only small-scale agriculture had to come from other sources and the influx of money developed a need to luxury. The remains still visible in the landscape of the region combined with finds lead to an identification of those economic roots. The Archaeology Department of Austria's Monuments Authority organized projects with new results towards the understanding of the economic factor Alps, that shall be presented and show, how iron, salt, marble and their trade defined the inner alpine region of Noricum for centuries.

9. David Quixal Santos (Universitat de València), Metallurgy in the Eastern Iberian Peninsula during the Late Iron Age (3rd - 1st centuries BC)

In this paper we will focus on the mining and metallurgy in the Eastern Iberian Peninsula during the Late Iron Age (3rd to 1st centuries BC), concretely in the interior of the province of Valencia (Spain). In this area we have documented three huge territories controlled by three important Iberian oppida: Kelin (Caudete de las Fuentes), Edeta (Llíria) and La Carència (Torís).

We have compiled abundant information about the processes of exploitation and transformation of the metal from the 4th/3rd centuries BC to the Imperial period. The main activity was the siderurgy, but we have also many evidences of working with other metals such as lead or bronze. We have documented surface and gallery mining, presence of reduction and forging slags in numerous sites, existence of metallurgical furnaces and a big number of tools. We will also present all the new discoveries from the siderurgic furnace of Los Chotiles (Sinarcas), which has been excavated during the summer of 2017.

10. Victor Martínez Hahn Müller and Roald Docter (Ghent University) - Carmen Ana Pardo Barriónuevo (University of Almería), More than silver. Rural Exploitation at Qart Hadasht / Carthago Nova hinterland

In order to verify the intensity of the Carthaginian exploitation of its territorial resources and to define its pattern of exploitation in Iberia, we have developed a survey in the hinterland of the Barcid colony of Qart Hadasht (Cartagena, Murcia, Spain).

The selected area, between Trujillo and Carrasquilla's Ramblas (Campo de Cartagena), as a result of its geo-physical features and the dominant resources, had also allowed us to evaluate the Carthaginian attitude towards the use of certain resources such as salt, silver and other metals mining, agriculture, fishing, or stone quarries.

The preliminary results that will be presented at this conference will show the compatibility of mining with other economic activities, focusing specially in the Carthaginian period and the subsequent Republican Roman exploitation of the landscape.

11. F. Javier Sánchez-Palencia Ramos (Instituto de Historia, CSIC) - Brais X. Currás (University of Coimbra), Roman Gold Mining in Lusitania: Territory and Society

The systematic study of the territory carried out during the last years with the support of remote sensing techniques has revealed an important mining area in Lusitania. It is, undoubtedly, one of the most important gold mining regions of the Roman Empire. The aim of this paper is to present a synthesis of the principal gold mining Lusitanian landscapes. We will focus on Aurifer Tagus, one of the most famous gold-bearing rivers of Antiquity, referred as such in the classical sources since the end of the Republic. The Alva valley and the Cavenes del Cabaco will complete the picture of the Lusitanian mining landscapes.

From a perspective that insists on the non sector-based character of ancient mining, we will present Lusitanian mines not as an isolated element but from a broader and more inclusive focus, considering its social and economic component as one of the many dimensions that define the landscape. We will pay attention to the role of mining within the broader framework of the political transformations from the Augustan Principate and we will take into account its relation with the role played by the army in the organization of the territory. We will also analyze the agricultural landscapes associated with the mining landscapes.

12. Linda Gosner (University of Michigan), Imperial Mines and Local Industries: Communities of Practice and Cross-Craft Production in Roman Mining Landscapes of Southwest Iberia

The landscapes of the Iberian Peninsula were famous in antiquity for their abundant metals, and scholars have long recognized the contribution of mining in this region to the Roman imperial economy. Studies of the economic role of mining—and other large-scale extractive industries—often focus on big questions: how much was extracted and where did it go? Recently, however, archaeological research on mining landscapes has allowed scholars to consider the impacts of Roman imperial mining on local economic organization.

In this paper, I examine subsidiary industries in the mining landscapes of the Iberian Pyrite belt in southwest Iberia during the early Empire, including the role of potters, smiths, carpenters, and basket-makers in supplying the tools necessary for underground copper mining. Roman mining stimulated pre-existing local industries (ie: esparto grass basket-making) but also brought about the import of technological traditions (ie: Hellenistic water-lifting devices) for use in novel ways. Here, I consider the contributions of craftspeople in subsidiary industries to the operations of Roman mining, as well as the ways that mining stimulated cross-craft production across industries through the sharing of resources, equipment, and ideas. I shed light on how large-scale mining altered local economies and labor organization, and ultimately, how economic interactions in mining landscapes stimulated the formation of diverse communities of practice among inhabitants.

13. Regula Wahl-Clerici, Territorium metallorum Tresminas/Jales: Reflexions on the profit of a goldmine in the 1st and 2nd century AD

The possession of mines or other soil resources is usually recognised as basis for either private or public wealth. By going deeper into the matter, it becomes quickly obvious that the situation is much more complicated and depends on further parameters. These reflections and the researchers curiosity were at the beginning of scrutinising the question about the profit of the Roman goldmines in the Northwest of the Iberian Peninsula in the 1st and 2nd century AD.

Most discussions on the profit of mines in antiquity are connected to the extensions of the deposits and such factors as the, often falsely, evaluated quantity of extracted material and the speculative percentage of its gold-content, in short of the quantity of ore.

Such an understanding of the matter caused to the proposition to approach the topic by a wider range of single valued factors. These are based on modern evaluations of a newly detected deposit and its probable profit. They include not only the quantity and quality of the ore, the difficulties of the exploration and the costs of the extraction of the metal from the ore, but also such decisive factors as the actual need of the product and therefore its price (see e.g. the increase of the price of Lithium in the last years), the political and economical situation of the country, the infrastructure needed for the exploration and the difficulties of its setup, just to refer to a few.

The results of the archaeological investigations on the Roman goldmines in the Northwest of the Iberian Peninsula and especially in the territorium metallorum Tresminas / Jales in the North of Portugal in the last decades allow to discuss a new approach to the concept of profit in the 1st and 2nd century AD. A new understanding of its highlights underlines as well the significance of a so far only sparsely considered and simultaneously very important sector of Roman economy.

Panel 4.3 From the Quarry to the Monument. The process behind the process: Design and Organization of the work in ancient architecture

Organiser: Adalberto Ottati (Pablo de Olavide University, Seville) and
Maria Serena Vinci (Université de Bordeaux Montaigne)

Saturday | 26 May | 09:00-13:30 | HS V

Panel abstract

The project and the organizational aspects of the work represent the first fundamental steps to reach a good final product within the economical and constructive complex system of a building's setting up. It deals with processes hardly decipherable and that we can understand only after an accurate observation and analysis. The skilled workers are a crucial element, guarding the technical knowledge and expertise about extractive and constructive working processes that guarantee the successful work-out of the "cantiere di costruzione". Within this context, the discussion will focus on two main topics: - Quarry marks or notae lapidinarum - Carving lines in architecture and on artifacts The complexity of the ex-