



Book of abstracts

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Table of contents

XVIIIe congres UISPP Paris.pdf	1
VIII-1. Mapping the past. From sampling sites and landscapes to exploring the "archaeological continuum"	3
Geophysical Explorations of the Classical Coastal Settlement of Lechaion, Peloponnese (Greece), Apostolos Sarris [et al.]	4
Innovative Strategies for the Protection and Conservation of the Cultural Fabric of the Historical Town of Rethymno, Crete., Apostolos Sarris [et al.]	6
A matter of identity – dealing with a new "archaeological continuum" in a Danish periphery, Mathias Broch	8
The case study of the "Colle Santoieri" settlement: new archaeological evidences for the analysis of the ancient landscape of Abruzzo., Guglielmo Genovese [et al.]	10
Decoding the ancient Karst landscape: minor features, fortifications and linear earthworks in the Mali Kras plateau (south-western Slovenia), Federico Bernardini [et al.]	12
Identifying fossil cave entrances with ERT at Sierra de Atapuerca caves (Burgos, Spain), Lucía Bermejo [et al.]	14
Direct push sensing for buried prehistoric landscape mapping: electrical cone penetration testing, electrical conductivity logging and video imaging., Jeroen Verhegge [et al.]	16
INTENSIVE CAVE PROSPECTION IN THE MIDDLE IBERIAN CHAIN: ARCHAEOLOGICAL IMPLICATIONS, Mario Gisbert [et al.]	17
Landscape archaeology and multicultural settlement complex in Ulów (SE Poland), Barbara Niezabitowska-Wiśniewska	18

Mound landscape continuum. Mapping barrows (and more) in the Bialowieża Forest in large and small scale., Michał Szubski [et al.]	19
Magnetic method in the study of environmental context of settlement: case studies from Fayum Oasis (Egypt), Tomasz Herbich	20
Archaeological continuum around the sanctuary of Mars Mullo, Vincent Bernollin [et al.]	21
A view from the hills. Investigating late prehistoric phases in the longue durée of the Potenza Valley (Le Marche, Italy), Wieke De Neef [et al.]	23
New look at the old problem. Archaeological surveys in mountain areas of At-Tafileh region (southern Jordan)., Piotr Kołodziejczyk [et al.]	24
Site and off site prehistoric evidence in Maremma Area (Southern Tuscany). Analysing the archaeological continuum to explore prehistoric landscape, Giovanna Pizziolo [et al.]	25
An integrated approach to the construction of cultural landscapes in Southwest Angola: the case of Huíla, Daniela Matos [et al.]	27

VIII-1. Mapping the past. From
sampling sites and landscapes to
exploring the "archaeological
continuum"

Geophysical Explorations of the Classical Coastal Settlement of Lechaion, Peloponnese (Greece)

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The geophysical survey at Lechaion was carried out under the framework of the Lechaion Harbor and Settlement Project (LHSP) that aims to study the settlement and its harbor during its habitation. Lechaion was the western and most important seaport of Corinth due to its proximity to the city. Long fortification walls connected the city with the port and the naval dockyard. The basilica of Saint Leonidi which is considered the largest paleochristian church in Greece is sited at the ancient harbor,.

The geophysical results were mainly correlated to a system of parallel N-S roads crossing the site verifying a number of features that were originally suggested from various historical aerial and satellite images. Around the lagoon features follow the direction of the modern shoreline, suggesting that its shape has not changed significantly since the ancient times. Magnetic values were more pronounced closer to the lagoon, showing a denser occupation in this section, probably related to more coastal type of activities. The most striking target of the GPR survey was a three aisled basilica oriented in a E-W direction. Its orientation follows more strictly an E-W direction compared to the NE-SW orientation of the Leonidis basilica to the NW, which is built between the inner basin of the lagoon and the sea.

To the north of the central lagoon, an area of more than 100x100m has been clearly differentiated from its surroundings suggesting a region of high deposition intact from other geological processes. The 2D sections of the ERT indicated a three-layer stratigraphy composed of a 2m deep superficial conductive clay horizon saturated with saline water, followed by a 5-9m thick resistive layer (silty clay) sitting on a bedding which slopes towards the NE. The correlation of the ERT data with the lack of GPR reflection signals may suggest that this region could have comprised an outer harbour that has been silted by the continuous sea currents. This was also supported from the GPR data that indicated a series of extensive linear concave features extending parallel to the NE coastline that could be explained as traces of depositions from past incoming sea waves that may have modified the coastline in different historical periods. Furthermore, the geophysical data did not provide any substantial evidence of communication

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between the outer port and the western lagoon.

The joint employment and interpretation from diverse satellite and ground based techniques proved their efficiency in reconstructing the cultural dynamics of coastal archaeological sites in Eastern Mediterranean.

Keywords: coastal geophysics, port, magnetics, ERT, GPR, Lechaion, Greece

Innovative Strategies for the Protection and Conservation of the Cultural Fabric of the Historical Town of Rethymno, Crete.

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The protection and conservation of historical monuments and archaeological sites constitute a basic ingredient of our societal values. Focusing in this direction, STORM (Safeguarding Cultural Heritage through Technical and Organisational Resources Management) project, funded under the scheme of EU Horizon 2020, is aiming towards the development of a mechanism, consisting of both methodological approaches and a knowledge sharing and collaborative platform, for the protection of the European cultural assets. Focusing on one of the pilot case studies of the project, the Historical Town of Rethymno in Crete, GeoSat ReSeArch Lab of FORTH and EFARETH are collaborating to study and monitor the various climatic and anthropogenic hazards that threaten the cultural fabric of the site.

Various non-invasive and non-destructive approaches have been initiated for the study and monitoring of the specific hazards that threaten the selected historical pilot site and the estimation of the risks imposed to the preserved monuments. Photogrammetric imaging & laser scanning, 4D terrestrial geophysical surveying, pXRF analysis and monitoring through crack meters and weather stations have been selected as the most appropriate methods to encounter the environmental hazard, the structural failures, the fracturing and deformation of the monuments, the intensity of the weather incidences and the weathering of the buildings and conservation materials.

In parallel, various GIS based spatial analyses and modeling approaches have been carried out aiming towards the mapping of various types of hazards such as seismic, coastal flooding, landslide, salinization, etc., with an ultimate goal to be combined with the exposure and vulnerability of buildings resulting to an integrated evaluation of the risks imposed on the standing monuments.

Data collected from the various sensors installed on site, the application of geophysical and imaging techniques and GIS modelling will feed an integrated platform offering information visualization and exchange to the authorities involved in Cultural Heritage protection in order to

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assist decision making towards damage prevention, protection and preservation of the cultural fabric.

Keywords: Historical Rethymno, protection, monitoring, geophysics, GIS modelling, photogrammetry

A matter of identity – dealing with a new ”archaeological continuum” in a Danish periphery

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Western Jutland is the western most part of Denmark and sparsely populated. The region is a periphery in both geographical and economic terms. A situation, which in relation to the Danish law for rescue archaeology has resulted in limited knowledge from archaeological excavations. The Danish project *An aerial view of the past – Aerial Archaeology in Denmark* [Translated] has since 2008 tried to close the gaps in the ”archaeological continuum” in Western Jutland using remote sensing methods and targeted geophysical or metal detector surveys. These endeavors have resulted in an abundance of new knowledge, and simultaneously brought about new issues concerning future preservation prospects. Danish law does not allow for a protection of the newly discovered prehistoric sites, as no traces are visible in the modern landscape. Leaving rescue excavations as the only ”preservation option”. The heritage sites are thus largely at the mercy of the local landowners and farmers.

The situation is of national relevance, especially in the light of a continual flow of new metal detector finds from previously unknown sites. In response, an initiative with representatives from local museums, Danish universities and the *Danish Agency for Culture and Palaces* has chosen a number of ”super sites” [translated] with the hope of raising funding to protect and investigate these sites. The ”super-site-protection” is to be supplemented by state-of-the-art research, which contradicts the heritage protection perspective to some degree and seem to point towards the same ”excavation-preservation-option” mentioned above – only with a larger budget. Even though the endeavor is laudable, the perspective seems of short term and does not propose an alternative preservation strategy that can deal with the new archaeological situations the ”archaeological continuum” signifies.

In a few decades, the photographic records may well be the only record of past activities in these areas, and for some reason this is not enough to cause politic changes. In addition, ridicule of the non-destructive methodologies by Danish peers does not add to the future prospects. This paper will highlight the issues related to the current state of praxis in a Danish context and visualize the consequences of unnoticed gradual destruction of cultural heritage in a peripheral part of Denmark. The paper will conclude with a discussion of how this situation can influence local and regional heritage related identity formation, and what can and must be done to ensure a long-term protection of a Danish ”archaeological continuum”.

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Keywords: remote sensing, nondestructive archaeology, landscape archaeology, periphery, identity, preservation strategy, Denmark

The case study of the "Colle Santoieri" settlement: new archaeological evidences for the analysis of the ancient landscape of Abruzzo.

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In 2017, the operations of the archaeological survey project led by the Chair of classical archeology at the University of L'Aquila led to the discovery of an unpublished archaeological site.

The "Colle Santoieri" area, presented in this work, is located in the "Sirente Velino" Natural Park.

The discovery is part of the results of Superequum Survey Project, a research project that aims to investigate the archaeological area of the ancient Superequum.

The current phase of research has led to a first GPS mapping of the site and to the photographic documentation of the accessible structures.

The dense woodland covering the whole area has precluded the observation of the site through remote sensing technologies, but on the other hand it preserved many of the structures in their original disposition.

The geographic location and its planimetric configuration emerged from preliminary investigations in this paper allow the site to be included in the wide scenery of fortified highland settlements in Central Italy.

This site is part of a unique kind of landscape, defined by features like small urban centers, in a capillarly widespread and arranged according to a decentralized model imposed by the geographical features of the Apennines Mountains.

Thanks to the analysis of construction techniques and to comparisons with the structures of already known sites in the same area, it is possible to advance the hypothesis of a dating the "Colle Santoieri" settlement in the pre-Roman period.

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The ultimate goal of the archaeological team efforts will be the reconstruction of the most probable aspect of the ancient landscape around the settlement. In addition, the research will investigate the relationship between the "Colle Santoieri" site and the near settlements of the same period.

Keywords: Abruzzo, Landscape, Settlement

Decoding the ancient Karst landscape: minor features, fortifications and linear earthworks in the Mali Kras plateau (south-western Slovenia)

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The recent identification of early Roman military fortifications south of Trieste (north-eastern Italy) has led to an international effort aimed at investigating the surrounding ancient landscape. Our attention has been drawn to the Mali Kras plateau located at the Italian-Slovenian border, where the remains of two protohistoric hillforts, Mali Kras and Socerb, were already known. In absence of stratigraphic excavations, they are attributed to Bronze and Iron Ages. A cemetery, associated to Socerb hillfort, has been dated to a time span between the 6th century BC and the 1st century AD. LiDAR remote sensing of Mali Kras plateau has allowed to identify several unknown archaeological features, ranging from approximately square structures (30 x 30 m) to a rhombic enclosure (300 x 180 m) and very long linear earthworks associated to stone mounds, possibly towers remains. The elaboration and digitalization of high-definition remote sensing data compared to historical cartography, field surveys, targeted small-scale excavations and thermoluminescence dating have been performed in order to try decoding the complex archaeological palimpsest. The investigated features have proved difficult to date since little, if any, dateable material has been found. However, the square structures are associated with a few fragments of protohistoric pottery that, when typologically significant, point to a Bronze Age chronology. These structures, located in strategic positions, could have exercised a territorial control over the surrounding landscape or been related to breeding activities. The rhombic enclosure, located about 200 m south-east of the defensive wall of Mali Kras hillfort, shows a plan and a building technique compatible with those of 2nd century BC Roman camps, but archaeological evidence collected so far does not support such a chronology and a pre-Roman origin is plausible too. Thanks to LiDAR remote sensing data, the existence of long linear earthworks, generally close to or developed around protohistoric hillforts, is being recorded in several parts of nowadays Slovenia. At least two long dry-stone walls and related possible remains

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of towers protect the south-eastern sector of Mali Kras plateau in correspondence of the most accessible entrance to the area. The preliminary data suggest these walls could correspond to protohistoric linear boundaries built to protect the area under direct control of Mali Kras and/or Socerb sites.

Keywords: Karst, southwestern Slovenia, landscape, LiDAR, field surveys and small scale excavations, minor features, fortifications, linear earthworks

Identifying fossil cave entrances with ERT at Sierra de Atapuerca caves (Burgos, Spain)

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The Sierra de Atapuerca sites (Burgos, Spain) consist of various caves filled with sediments that bear outstanding archaeo-palaeoanthropological remains (Bermúdez de Castro *et al.*, 1997; Carbonell *et al.*, 2008; Ortega *et al.*, 2014). Identifying the development of this multilevel karstic system is therefore crucial for understanding these sites formation processes as well as for excavation planning strategies.

To this end, geophysical prospecting has already been applied at Sierra de Atapuerca, revealing interesting information that has been verified by test pits. In particular, the ERT (Electrical Resistivity Tomography) method has proven to characterize this karst environment successfully, especially because of the high resistivity contrast that exists between the sediments that fill the caves and the limestone host rock (Ortega *et al.*, 2010; Bermejo *et al.*, 2017).

In this work, we present the results of the systematic ERT surveys carried out for the last years over all the passable areas of the range that contains this karstic system and in relation to all of its levels. More specifically, we present the profiles related to ancient cave entrances.

All these entrances have in common to be filled with sediments and covered by vegetation, fact that makes them indistinguishable in the field. The location of some of them has been possible thanks to previous topographic and geomorphological studies, whereas the rest were unknown to present.

The interpretation of these 2D ERT profiles has allowed indentifying the geometry of 3 known

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entrances. Besides, these profiles have unveiled the location of 3 other unknown entrances and their morphologies.

Keywords: Electrical Resistivity Tomography; Sierra de Atapuerca sites; karst geomorphology; geophysics applied to archaeology

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Keywords: Electrical Resistivity Tomography, Sierra de Atapuerca sites, karst geomorphology, geophysics applied to archaeology

Direct push sensing for buried prehistoric landscape mapping: electrical cone penetration testing, electrical conductivity logging and video imaging.

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Prospecting stone age landscapes relies heavily on reconstructing the natural fossil landscapes which contain the lithic artefact scatter sites. Invasive sampling methods such as test pitting and coring are widely used to this aim. These methods rely on a direct observations of the sediments by physical exposure and by bringing soil samples to the surface respectively, resulting in a large workload and a heavy financial burden. Therefore, non-invasive paleolandscape survey methods such as remote sensing, marine or near surface geophysics have been developed in recent years. These are characterized by a decreasing resolution as the burial depth increases. We have investigated possible contributions of rapid and minimally invasive direct push sensing to map more subtle traces of deeply buried prehistoric landscapes, where fully non-invasive methods fail. Geotechnical cone penetration testing was used in combination with direct current electrical conductivity logging and in situ camera imaging and validated through outcrops, coring or near surface geophysics. Case studies will be demonstrated from the polder (embanked estuarine floodplain) region, the sand belt and the loess belt of Belgium.

Keywords: Prehistoric landscapes, Buried landscapes, Cone Penetration Testing, Camera CPT, Electrical Conductivity logging

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INTENSIVE CAVE PROSPECTION IN THE MIDDLE IBERIAN CHAIN: ARCHAEOLOGICAL IMPLICATIONS

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The Iberian Chain goes across the Iberian Peninsula from North-West to South-East. It shows a great variety of lithologies of different ages, in which the limestones occasionally generate mesa relieves. Due to its karst landscape and lower altitude than the Pyrenees, The Iberian Chain provides many potential archaeological and palaeontological cave sites. Here we present an intensive cave prospection work of a huge area of 28 Km². The work has been divided into three main points: 1) prospection of the area and cave location; 2) topography of the cavities; 3) searching for pieces of evidence of use for historical and/or prehistorical periods inside cavities; and 4) generation of a database for potential future archaeological interventions. Following these steps, we have located 26 caves between 935 and 1601 m.a.s.l. (meters above the sea level) and we have taken the GPS-coordinates and made the topography of all of them. In addition, archaeological remains were also geo-located inside each cave in the same position where they were found. We have created a dataset with different categories such as: kind of archaeological remains, potential chronology attribution, and possible function of each cave. Based on these characteristics we have found funerary sites, potential settlements, livestock enclosures and storage places. All these new sites help to fill the gap of a less explored mountain landscape than others territories where prospection and excavations field works are more common.

Keywords: prehistory, caves, karst, topography, speleology, paleontology.

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Landscape archaeology and multicultural settlement complex in Ulów (SE Poland)

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The multicultural settlement complex, located to the east of Ulów (SE Poland), is in the centre of Middle Roztocze. This mesoregion comprises the central section of the Roztocze macroregion, which is an arched hill, 14-28 km wide, running from NW to SE for 180 km. Artefacts and sites were discovered in the course of excavations and field works in the vicinity of Ulów, have been dated from the about 12,000 years ago to the 17th-18th century. They are associated with the Late Palaeolithic, the Mesolithic, the Neolithic (the Lublin-Volhynia, Funnel Beaker and Corded Ware Cultures), as well as the Bronze Age and the early Iron Age (the Mierzanowice, Trzciniec and Lusatian Cultures), the Roman Period and the Migration Period (the Wielbark Culture), the Middle Ages and the modern times. All discovered archaeological sites are located in an area of about 2.07 square km (about 207 hectares). Outside this cluster, within a 2-5 km radius, there are no traces of prehistoric settlement, or they are limited to single artefacts, mainly fragments of pottery, which was confirmed by repeated field works (surface surveys). Furthermore, before archaeological examination in Ulów started, it was generally believed that the area of Roztocze had been inconvenient for prehistoric settlement. The resulting discovery of a multicultural complex of sites in the vicinity of Ulów, comprised a small area, combined with the lack of remains of prehistoric settlement outside this complex, raised the following question: why did the people of nearly every archaeological culture known on the Polish territory choose this area for their settlements? In 2014 the project entitled "Roztocze – the ancient *terra incognita*? (Settlement micro-region in the area of Ulów in Middle Roztocze in the prehistory and its background. Interdisciplinary studies)", financed with funds from the National Science Centre (Poland), was started. The principal aim of the research was the reconstruction of prehistoric settlement processes in this area. As part of the project, archaeological, anthropological, paleobotanical and geophysical analyses and radiocarbon dating were conducted, together with complex environmental and paleoenvironmental research and analysis of LiDAR data. These studies made it possible to determine the natural conditions in the vicinity of the settlement complex in Ulów in the prehistory and their impact to the formation of the settlement enclave surrounded by the vast areas devoid of settlements.

Keywords: landscape archaeology, multicultural settlement complex, Ulów, SE Poland

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Mound landscape continuum. Mapping barrows (and more) in the Białowieża Forest in large and small scale.

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The Białowieża Forest is one of the largest forested areas in Poland. In total it occupies nearly 1,500 km², of which 42% is placed in Poland and the rest is in Belarus. It is considered as a primeval forest because almost entirely area is protected, in different ways, since the sixteenth century. This unique situation results in very good preservation of archaeological features visible in the terrain relief. However, until recently, dense woodland was almost inaccessible for standard prospection methods like field survey or aerial archaeology. Technology development of airborne laser scanning (ALS) changed this situation and provide new data to analysis currently forested landscapes.

Ongoing project "Cultural and natural heritage of the Białowieża Forest", led by prof. Przemysław Urbańczyk, which aims at interdisciplinary examination of archaeological features of this area made a perfect opportunity to investigate forest landscape in large and in small scale. We mapped hundreds of anthropogenic features with preserved own form using ALS. One type of features however dominates figures – almost 90% of all are mounds. They occur alone, in clusters, in different size and shape. How can we distinguish sepulchral barrows from well preserved traces of modern exploitation of forest resources (production of charcoal, wood distilling, potash production)? How we can date such features without excavating? How this landscape had appeared when barrow cemeteries were created?

We believed that answers for those questions might be in spatial analysis combined with environmental approach. In discussed area we have unique opportunity to investigate very specific, insular and isolated landscape. In small scale we observe complexes of different mounds from prehistory to modern times indicating continuing occupation of landscape making almost a palimpsest of features. This small-scale study provide data to identify and try to understand this kind of sites also in regional context.

Keywords: Barrow landscape, ALS, forest archaeology, spatial analysis

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Magnetic method in the study of environmental context of settlement: case studies from Fayum Oasis (Egypt)

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Research at two Greco-Roman sites located on opposite sides of the Fayum oasis well illustrates the potential of geophysical methods in paleoenvironmental studies. One site, Philoteris (Medinet Watfa), was located at the edge of the desert, and agriculture was possible here only thanks to water supplied by channels. The other, Al-Qarah al-Hamra, was located on the north-eastern bank of Lake Karanis, covering the lowest part of the oasis.

Surface investigations, satellite image analysis and magnetic studies (DAI project) have allowed to accurately reproduce the plan of channels in Philoteris. Magnetic studies have shown, however, that one of the channels, dug to the depth of 4 m in the bedrock, was not used. The study showed a lack of magnetic Nile mud deposits, present in other channels. The crisis in water management in this part of Fayum in the 4th century is confirmed by written sources.

The settlement in Al-Qarah al-Hamra was found due to the presence of pottery fragments on the surface. The site lies on a flat area covered with a layer of sand, with no traces of architecture on the surface. The magnetic map (UCLA and Groningen University project) gave a clear plan of the settlement. In the north-eastern part (further from the lake), a strip of disturbances was registered. Analysis of the magnetic image allowed to hypothesize that the settlement was destroyed as a result of a sudden increase in the lake's water level. The zone of disturbances corresponds therefore to the accumulation of mud material from buildings washed out with water. Archaeological sounding confirmed that the settlement was destroyed by flooding. Ceramics from the settlement do not exceed the 4th century.

The lack of water in Philoteris and the flooding of Al-Qarah al-Hamra – both registered by magnetometry - are probably a consequence of the same phenomenon. Water was supplied to Philoteris from an artificial reservoir (fragments of the dam are still preserved), fed with water from the Nile. A cataclysm (earthquake?) probably destroyed the reservoir. This stopped the supply of water to settlements located significantly above the level of the Karanis Lake (such as Philoteris), and simultaneously caused an increase in water level in the lake, leading to the destruction of settlements located at the lake shore (such as Al-Qarah al-Hamra).

Keywords: Ancient Egypt, Greco, Roman period, Fayum oasis, magnetic method

*Speaker

Archaeological continuum around the sanctuary of Mars Mullo

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Through the intensive and extensive application of a wide variety of exploratory methods and analytical techniques, we can measure the impact of the sanctuary of Mars Mullo Allonnes, (Sarthe, France) on the detected evidence within its landscape.

A complete analysis of all the aerial coverage, associated with the vectorisation of the different land registries ("Cadastre napoléonien", "plans terriers") gives us a good vision of the evolution of the landscape.

Since the digging of a big roman thermal establishment in 1840, a long tradition of archaeological surveys around Allonnes has been going on. During the last twenty years, scientific excavations and different rescue operations has allowed the characterisation of the human occupation from the Bronze Age to the medieval period.

Magnetic prospections over several areas of the district complement our actual knowledge of the landscape.

Different orientations of land have been observed: at the Celtic period, they follow the physical and relief constraints. Then, a quite regular spatial organisation is integrated into the Roman roads distributions, but seems to follow an older implantation. The medieval occupation impacts the landscape to a very low level, in function of the type of agricultural exploitations. The antic sanctuary possessions are transmitted to the new Christian religious administration for a long time, until the French Revolution. So, in this area, landscape fossilizes the oldest organisations until the 1960's.

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Keywords: sanctuary, aerial photos, geophysics, land registries, magnetic survey, landscape

A view from the hills. Investigating late prehistoric phases in the *longue durée* of the Potenza Valley (Le Marche, Italy)

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This paper discusses the merits and challenges of an integrated approach of field walking survey, geophysical prospection, and soil studies for the reconstruction of the ‘archaeological continuum’ and its landscape setting in the Potenza Valley (Le Marche, Italy). It builds on a substantial history of interdisciplinary research in this area carried out within the framework of the Potenza Valley Survey project of Ghent University between 2000 and 2015. Here we present a new phase in the ongoing studies of this river valley between the Adriatic coast and the Apennine inland, in which we focus on late prehistoric settlement and land use.

Artefact surveys in the Potenza valley and parallel-running river basins in Le Marche indicate that site distributions in this region undergo radical changes in the transition between the Bronze and Iron Ages. However, the dynamics behind these developments and the effects on the socio-political and -economic structure of these Metal Age communities remain obscure, as only few pre-Roman settlements in this area have been studied in detail. As a related result, little is known about the detectability of late prehistoric remains by non-invasive techniques, as well as the potential to study long-term processes through the analysis of large-scale prospection data, in these river valleys and the gently rolling hills between them.

Our present research therefore puts the spotlight on selected micro-regions to extract more information about changing late prehistoric settlement and land use in the *longue durée* history of the Potenza Valley. We use a combined toolkit of re-surveys, geophysical prospection techniques, aerial photography, and pedological work to get a better understanding of the occupation of these areas. In this presentation we illustrate our work with a case study of the lower Potenza river valley, where previous work has established continued human activity between the Bronze Age and the Middle Ages. We put emphasis on the challenges posed by landscape formation processes and palimpsest situations to the reconstruction of the ‘archaeological continuum’.

Keywords: Landscape archaeology, remote sensing, geophysical prospection, late prehistory, Italy

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New look at the old problem. Archaeological surveys in mountain areas of At-Tafileh region (southern Jordan).

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During the survey and excavation project started by the authors in the 2014 on the mountain area of At-Tafileh directorate (southern Jordan) a several problems related to older documentation and new data appeared. Above mentioned field works provides us to conclusions that all data collected with use of modern technologies (mobile GIS and GPS) should allow us to make a map of the area with marked sites, settlement traces, megalithic elements, architectonic relics and other finds. As a result of the field work, an analysis of environmental changes within the micro-region are also conducted – with particular emphasis on the area typed for future excavation research (using standards from such disciplines as: landscape archaeology, geo-archaeology and paleo-hydrology) and thanks to the participation of a specialist on geology and geoarchaeology in the project. One of the most difficult questions are related with the issue of description and classification of areas on which surface material is identified. It seems that they can not be treated as separate archaeological sites, but rather as zones of human activity in the context of economic (farming? pastoral ?) activities. The above-mentioned approach causes documentary problems and leads to the incompatibility of some archaeological data registration systems (eg. MEGA-J). On the other hand, the lack of such approach of describing the cultural situation in the region may be the cause of its false archaeological image. It is possible that this area was not abandoned in some periods (eg. Early Bronze Age) as previously thought, but rather it was simply an arena for the activities of semi-nomadic groups. They did not leave standard traces of settlements and also their economic activity have not been observed properly so far. This observations can lead us to a new look at older methodologies, research results as well as at the outcome of new projects. As a result of such approach and discussion, a new image of southern Jordan between Neolithic and the Middle Ages may occur. In our paper we would like to present the preliminary results on the aspects of adaptation and sustainability of pre- and protohistoric societies living in southern Jordan and the problem of the methods and methodology of the archaeological research in mountain areas.

Keywords: Survey, mountain areas, Jordan, social changes, environment impact, Transjordan, Levant, methodology

*Speaker

Site and off site prehistoric evidence in Maremma Area (Southern Tuscany). Analysing the archaeological continuum to explore prehistoric landscape

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In this contribution we intend to discuss some problems and hypotheses on the reconstruction of prehistoric peopling process within the landscape of the Grosseto area (Southern Tuscany, Italy) starting from the interpretation of site and off site archaeological evidence. The study area consists of alluvial plains spanning from Ombrone river (North) to Uccellina Mountains (South). The area was characterised by strong coastal changes until 2800 BP. Then a progressive transformation led to the formation of fresh water, lake or little basins which afterwards gave place to marshes. The present alluvial plains seems to be the result of several reclamation activities, which occurred during the last four centuries.

Our ongoing research is addressed on the reconstruction of prehistoric landscape highlighting what we consider to be those features of the prehistoric past that are still observable in the present in the dynamic of continuity and changes of the landscape. The off site information have been collected mainly through archaeological survey undertaken on different land units in particular related to shorelines and to foothills of Uccellina Mountain area.

From an archaeological point of view the evidence found in the area mainly refers to prehistoric funerary activities which took place in natural settings on the surrounding hills of the alluvial plain. Moreover different productive activities are testified in the Uccellina Mountain and nearby areas. Thus a lack of information relating to settlement activities led us to undertake archaeological surveys in order to fill some gaps in the archaeological records. We use geomorphological settings to focus our surveys on areas with high potentiality in preserving prehistoric evidence. Moreover we face other archaeological biases. Actually we have devoted particular attention to the individuation of micro-relievs related to the Holocene prehistoric landscape. This research has been developed in a GIS environment using a multi-scale dataset and different types of sources, archaeological excavation and survey data, historical cartography and aerial photographs. The distribution of archaeological finds, mainly lithic artefacts, represents our off site information and it is used as complementary data to reconstruct the archaeological continuum of the Maremma landscape. Different questions rise up related to the meaning of this artefacts distribution on the present day field surfaces. How can we assess this information?

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The project is in progress and the next step of our research will be oriented in acquire off site environmental sampling in order to add other proxy data to explore prehistoric landscape.

Keywords: site and off, site analysis: prehistoric landscape: field survey, prehistoric peopling process: Southern Tuscany: coastal changes

An integrated approach to the construction of cultural landscapes in Southwest Angola: the case of Huíla

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Human behavior is influenced by multiple variables that tend to structure around basic notions of a perception of "landscape" mediated in a broad relationship by "culture". Over time and space human groups have shaped the environment according to their adaptive strategies, not only as mere reaction to the territorial conditions (environmental, climatic and others) but as a concomitant process of culturally informed perceptions of its surroundings regulating collective structures that define cultural identity, ethnicity, social spaces and/or ritual-mythical references. The archaeological record is full of examples that show how humans are remarkable for their capacity to create complex social and technological structures over time and in different environments. Thus, cumulative culture seems to be the ultimate adaptive strategy of humankind. Southwest Angola is a mosaic of biotopes of transition between desert, savanna and tropical rainforest and has undergone cyclic environmental changes shaping the landscape perceived today. The province of Huíla is an area of peculiar geomorphological characteristics that have allowed preservation of remains of past human societies under transitional conditions of *refugia*, spanning from the Plio-Pleistocene to the past millennium. This is a privileged region to analyze the processes that underlie the construction of cultural landscapes over a continuum of time in the evolution of human species, the establishment of hunter-gatherer societies and the persistence of forager communities among pastoralists and colonizers.

The African Archaeology research line at the Earth and Memory Institute/Polytechnic of Tomar/Centre

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of Geosciences of Coimbra University and its partners propose an approach to these territories and cultural landscapes integrating the Geosciences in the anthropological research driving this archaeological inquiry. We aim to approach the aspects of hunter-gatherer activities and technological innovations that indicate dynamic developmental processes towards social stabilization in this specific ecological niche of Huíla. While in the Kwanza Sul and Namíbe provinces we have conducted research on cultural landscapes dominated by rock art and burial features, the richness of the Karst system of Huíla reveals great potential but remained only superficially studied.

Keywords: Cultural landscapes, Adaptation, Paleoenvironment, Geoarchaeology, Southwest Angola