

**CaSEs Research Group**  
**Department of Humanities**  
**& Institut d'Història Jaume Vicens i Vives**

**Jornades UPF de Arqueologia**  
***Trends in Multidisciplinary Archaeology***

*Universitat Pompeu Fabra*

*Campus Ciutadella – Auditori Mercè Rodoreda*

9<sup>th</sup> of January 2018

Born within the *beaux-arts* and raised inside the humanities and the social sciences, archaeology has long emerged from its original antiquarian purposes. Current archaeology routinely crossbreeds with a variety of other disciplines to accomplish its duty of shedding light on the human pasts. Research on earlier societies is nowadays conducted with a number of colleagues from very diverse fields. A relentless flux of inputs from anthropology, sociology, biology, geology, botany and, more recently, chemistry, statistics, and the so-called new technologies, has put archaeology at the forefront of multidisciplinary research in the new millennium.

During the Jornades de Arqueologia 2017, we aim at gathering open-minded scholars, actively conducting multidisciplinary archaeological research with no limitations in time and space. 'Trends in Multidisciplinary Archaeology' wants to offer a broad and dynamic perspective on the variety of research topics and approaches that are characterizing archaeology as a uniquely global science.

Participation to the Jornada is free.

**Program:**

**09.30 Opening and welcome / Bienvenida**

**09.45 Keynote** by G Fiorentino (Università del Salento, Italy)

*Isotopes in Archaeobotany*

**10.30 C Lancelotti** (Universitat Pompeu Fabra)

*Raindrops: reconstructing past water management practices for drought-resistant crops*

**11.00 Coffee break / Pausa café**

**11.30 S Biagetti, J Alcaina Mateos** (Universitat Pompeu Fabra)

*A 'world' of possibilities: remote sensing techniques in the archaeology of drylands*

**12.00 A Rodriguez, J Blat** (Universitat Pompeu Fabra)

*PaisArque Web App: una nueva aplicación web para el análisis de modelos 3D de monumentos, contextos y objetos arqueológicos*

**12.30 J Alcaina Mateos, C Lancelotti** (Universitat Pompeu Fabra)

*Modelado de los usos antrópicos del espacio a través de la geoestadística*

**13.00 A Pecci** (Universitat de Barcelona)

*El vino en los materiales arqueológicos. El alcance del análisis de residuos orgánicos para el estudio de su producción, transporte y consumo*

**13.30 Lunch break / Pausa comida**

15.00 A Dominguez Nodar (Universitat Pompeu Fabra)

*(Re-)instating Papyrology into Archaeology*

15.30 E Bortolini (Università di Bologna)

*Explaining change: evolutionary approaches to archaeology and anthropology*

16.00 C Camus (IMF-CSIC)

*Is Feminism compatible with Multidisciplinary Archaeology? Challenges and possible directions.*

16.30 J Caro (IMF-CISC)

*Nuevas perspectivas para el estudio del reparto de recursos y la desigualdad en sociedades de cazadores-recolectores*

17.00 **Coffee break / Pausa café**

17.30 J Ruiz-Pérez, U Lombardo, M Madella (Universitat Pompeu Fabra)

*Arqueología de la Amazonia precolombina: 10.000 años de poblamiento y antropización del paisaje*

18.00 M Madella (Universitat Pompeu Fabra)

*Modelling and simulation in Archaeology*

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**Abstracts (as per talks schedule)**

***Isotopes in Archaeobotany – G Fiorentino***

In recent decades the analysis of stable isotopes in plants has become a useful method to infer natural and anthropogenic effects on the growing conditions of plants. This talk presents a review of the state-of-the-art regarding the use of stable isotopes in plant macroremains. After providing a brief theoretical and methodological background, I will concentrate on the most common applications developed so far: reconstruction of climate and crop growing conditions, and crop provenancing. Finally, I will discuss current methodological challenges, and potential new directions for research.

***Raindrops: reconstructing past water management practices for drought-resistant crops – C Lancelotti***

Irrigation, river floods or permanent water sources are often deemed necessary for cultivation to be practised in drylands. However, there are modern examples that testify to the existence of successful rain-fed cultivation systems, even in hyper-arid environments. Quantification of the extent of these practices in the past has the potential to dramatically change our understanding of human adaptation and agriculture. RAINDROPS, an ERC starting grant starting in January 2018, will investigate cultivation practices that support human resilience and adaptation in drylands, by developing an innovative and reliable methodology for the identification of water management practices from archaeobotanical remains. By establishing a protocol for the accurate identification of rain-fed cultivation, RAINDROPS will pave the way for the investigation of this practice in the past. Highly controlled data on phytolith ratios, and carbon, oxygen and silicon isotopes from macro- and micro-remains from experimental fields of finger millet [*Eleusine coracana* (L.) Gaertn.] and sorghum [*Sorghum bicolor* (L.) Moench] will be validated with ethnographic evidence before being applied to selected key archaeological case studies.

***A 'world' of possibilities: remote sensing techniques in the archaeology of drylands – S Biagetti and J Alcaina-Mateos***

Earth Observation is playing a major role in current archaeologies. Remote study of cultural, environmental, and geomorphological evidence is increasingly becoming a critical part of any research project focused on the interaction between men and the surrounding environment. In recent years, Earth Observation is making its way in the arid lands of North Africa and Middle East. Here, several regions that have always been hardly accessible due to logistical reasons, have turned into war scenarios or unsafe places. However, those areas are favored settings for remote sensing-based investigation of both anthropic and natural phenomena, due to extremely low vegetation cover and urbanization. In this presentation, we will show how multiple-resolution imagery (e.g., Corona, Landsat, ASTER, Worldview) can support the reconstruction of past cultural trajectories, complementing data collected from the field and implementing the knowledge of currently inaccessible heritage. Results of Earth Observation will be calibrated against previous fieldwork seasons, in order to minimize misdetections and false positives. Ultimately, we will draw upon our current research in central Sahara to discuss issues and future steps in the use of remotely sensed techniques for archaeology.

***PaisArque Web App: una nueva aplicación web para el análisis de modelos 3D de monumentos, contextos y objetos arqueológicos – A Rodríguez and J Blat***

En esta comunicación presentaremos la webapp del proyecto PaisArque (<http://paisarque.upf.edu/>) que permite almacenar, anotar, asociar documentación, realizar medidas y compartir reconstrucciones 3D de yacimientos, monumentos, objetos arqueológicos de forma sencilla.

***Modelado de los usos antrópicos del espacio a través de la geoestadística  
– J Alcaina-Mateos and C Lancelotti***

El estudio arqueológico de los espacios domésticos ha estado tradicionalmente centrado en la dispersión de los artefactos y su relación con las estructuras identificadas. No obstante, otros proxies arqueológicos (tales como los datos arqueobotánicos o las muestras físico-químicas) han demostrado un amplio potencial explicativo en la interpretación de estos contextos. En este sentido, los métodos de análisis estadístico y modelado desempeñan un rol esencial para responder las preguntas de investigación arqueológicas, configurando una parte fundamental en este tipo de estudios. En la presente comunicación se presentaran diferentes ejemplos sobre el análisis de datos físico-químicos procedentes de contextos arqueológicos y etno-arqueológicos, enfocándose tanto en la identificación de señales antrópicas específicas como en el modelado geoestadístico y de usos del espacio.

***El vino en los materiales arqueológicos. El alcance del análisis de residuos orgánicos para el estudio de su producción, transporte y consumo – A Pecci***

La investigación realizada durante los últimos años ha permitido establecer técnicas confiables para la identificación de residuos de vino o sus derivados en los materiales arqueológicos. Los marcadores del vino pueden ser identificados a través de análisis con diferentes técnicas, entre las cuales ha demostrado de ser particularmente útil la cromatografía de gases acoplada a espectrometría de masas. La aplicación de estos análisis ha permitido identificar trazas de vino relacionadas con las diferentes fases del ciclo de vida del vino: su producción, preparación, conservación, transporte y su consumo. En la presente comunicación se muestran ejemplos de casos de estudio relacionados con el ciclo de vida del vino en diferentes épocas, haciendo especial hincapié en ejemplos italianos de la época etrusca, romana y tardoantigua, y mostrando algunos casos de estudio en la Península Ibérica.

***(Re-)instating Papyrology into Archaeology – A Dominguez Nodar***

Even if the papyri that form the hundreds of collections housed mainly in European and American institutions come ultimately from excavations conducted for the most part in Egypt, the interest that these ancient artifacts have generated among scholars has almost always been of a textual type, with little or no regard for the archaeological circumstances of their finding. It is true the very beginnings of papyrology at the turn of the 20th century were closely connected with archaeology, and that Flinders Petrie, one of the first excavators of papyri, was also the first professor of Egyptian Archaeology at University College London. However, his pioneering methodology in the excavation of ancient sites was not subsequently implemented in papyrological practice; quite on the contrary, papyrologists were just contented with the acquisition of texts coming from Antiquity, and in particular from the Greco-Roman world, eager to recover what had always been one of the most important cultural references of the Western world. Only in the last decades have papyrologists realized the archaeological nature of the papyri, as remains of ancient books and part of the material culture of the civilization they study, and, at the same time, the possibilities that the new approaches and techniques the archaeologists operate now with offer for the development of their own research.

***Explaining change: evolutionary approaches to archaeology and anthropology – E Bortolini***

Over the past 30 years there has been an increasing cross-fertilisation between anthropology, archaeology, and population biology. This collaboration generated a novel approach under the broad name of Cultural Evolutionary Theory (or Dual Inheritance Theory) that uses/adapts theory and quantitative methods developed in biology and human population genetics to understand and explain the processes of cultural transmission underlying the distribution of cultural variants that we observe in the archaeological and anthropological record. This cross-disciplinary perspective is therefore useful to investigate mechanisms of change over time in the frequency of cultural elements, the differential rate of adoption of new technological innovations, the spread of information through the movement of people, and coevolutionary processes involving both cultural and biological aspects of past and present human populations.

***Is Feminism compatible with Multidisciplinary Archaeology? Challenges and possible directions – C Camus***

This presentation first aims at presenting the challenges related to multidisciplinary and the inclusion of a feminist perspective in the field of Archaeology. Indeed, feminist theories have been employed in archaeology for more than forty years, but have not made inroads in all areas of the field. Secondly, concrete examples will be provided to demonstrate how taking a feminist standpoint provides a different way to look at archaeological data and how it improves our understanding of the past.

***Nuevas perspectivas para el estudio del reparto de recursos y la desigualdad en sociedades de cazadores-recolectores – J Caro***

La presente comunicación muestra una serie de instrumentos metodológicos para explorar los procesos de reparto de recursos y generación y mantenimiento de la desigualdad entre los seres humanos, a través de la construcción de una clasificación sistemática de prácticas de reparto en sociedades de pequeña escala. El reparto de alimentos es considerado como un rasgo característico de las sociedades humanas y no humanas, así como una de las formas más importante de cooperación por parte de la comunidad científica. Asimismo, el estudio de las causas que producen la desigualdad en el reparto de recursos en las sociedades humanas, así como los mecanismos que la acentúan o la atenúan, ha sido clave en el desarrollo de las Ciencias Sociales.



***Arqueologia de la Amazonia precolombina: 10.000 años de poblamiento y antropización del paisaje – J Ruiz-Pérez, U Lombardo, M Madella***

El territorio que actualmente alberga el bosque tropical más extenso del mundo, la Amazonia, ha sido poblado durante miles de años antes de la llegada de los europeos a Sudamérica. El descubrimiento de numerosos asentamientos precolombinos ha llevado a los arqueólogos a preguntarse cómo se adaptaron las poblaciones prehistóricas que habitaron esta región y cuál ha sido el impacto de sus actividades sobre el paisaje. La gran cantidad y heterogeneidad de los sitios arqueológicos investigados hasta la actualidad – como lomas monumentales, campos elevados, terras pretas do índio, montículos funerarios, concheros o geoglifos– prueban la diversidad cultural que ha caracterizado la Amazonia prehistórica y el alto nivel de modificaciones del paisaje llevadas a cabo por generaciones de personas. El trabajo realizado por arqueólogos, paleoecólogos, antropólogos y geógrafos durante las últimas décadas no solo ha hecho cambiar el paradigma sobre el poblamiento de Sudamérica sino que también ha contribuido a descartar la concepción popularmente arraigada de la Amazonia precolombina como un paisaje prístino.

***Modelling and simulation in archaeology – M Madella***

Computer modelling and complex systems simulation have dominated the scientific debate over the three decades, providing important outcomes in biology, geology and life sciences, and resulting in the origin of entirely new disciplines such as bioinformatics, geoinformatics and health informatics. Until recently, however, social sciences continued to consider impossible to reproduce “inside a computer” what past societies did and believed, because of the perceived complexity of social structures.

This scepticism was largely due to anthropocentrism. Human behaviour may be complex, however many other systems being studied by scientists are as intricate as social structures. Furthermore artificial intelligence has shown how the appropriate interconnection of very simple computational mechanisms is able to show extraordinary complex patterns, and now that access to distributed supercomputing (grid technologies) has become affordable, it is no longer possible to justify not applying these methods to the Humanities and Social Sciences.

Archaeology is particularly well suited for modelling and simulation. It is a data oriented subject, with a strong focus on the collection of objective material data for the study of

past human societies. Furthermore, it is a discipline which has a long tradition of attempting to bridge the divide between the Social Sciences and Humanities on one side and the Natural and Formal Sciences on the other. Finally, it deals with events in the past and therefore provides the possibility of comparing the results of a given simulation with the facts that are known to have occurred.

The long-term perspective makes archaeology the approach to understand social and environmental transitions, which represent key aspects to better understand human behaviour. The most poignant questions about human societal systems are related to the transitions between phases of equilibrium. Therefore, the study of these transitions is extremely interesting in order to move forward with our current understanding of human behaviour at macro, meso and micro-level. In that respect, ancient societies present a great opportunity to build a virtual laboratory in which to model, explore and simulate different hypotheses and theories about social and environmental transitions.