

creativity and fluidity, and approaches that focus on stages as a heuristic?

In this paper, I address these issues by outlining an approach to the ceramic chaîne opératoire that incorporates network analysis. Network analysis visualises and analyses the structure of relations between data. Using this approach, I want to explore the structure of the ceramic chaîne opératoire, how individual observations fit into these structures, and how we can exploit such structures to compare various production processes. Throughout this paper, I draw on a study of the transition from Funnel Beaker Culture to Corded Ware Culture in the Netherlands during the third millennium BC. This study incorporates macroscopic analysis, petrography, and provenance analysis of ceramics.

5 IRON AGE POTTERY PRODUCTION IN THE PYRENEES: THE CASE OF STUDY OF BALTARGA, Cerdanya

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Abstract format: Oral

Typochronological and technological approaches have long played a major role in the studies of ceramic materials, in addition to a wide range of more recent interdisciplinary methods which are currently applied worldwide. However, there is a total lack regarding the Iron Age handmade productions in the Pyrenees, despite these constitute the main pottery group in this region.

This study reports the results of first typochronological analysis of handmade ceramics from the Late Iron Age occupations of Baltarga, in Bellver de Cerdanya, spanning from the fourth century to the first century BC, where handmade potteries constitute around 70-80% of the total ceramic production recorded.

The studied assemblages exhibit a high variety of shapes, morphologies and decorations which may reflect non-standardized domestic production modes. Similarities with handmade potteries from southern Gaulle were also noticed and further discussed. This pioneering typochronological study in Baltarga represents a first step towards the standardization of this important group in the Iron Age pottery production of the Pyrenees.

6 INDUS POTTERS FROM THE MID-3RD MILLENNIUM BC IN OMAN AND THE UAE? RESEARCH STRATEGIES, METHODS, AND RESULTS

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Abstract format: Oral

Ceramic styles and technology have long been mainly used to track interaction within eastern Arabia and surrounding regions during the prehistoric period. The discovery of new sites and ceramic forms require supplementary scientific techniques as well as new interpretive models. The cumulative results of long term research on the trade and production of selected ceramics during the 3rd millennium BCE will be presented with a focus on the Umm an-Nar Period. Samples presented in this study were collected from more than 30 sites in Oman, UAE, Pakistan and India and were analyzed using stylistic and technological approaches as well as petrographic and chemical compositional analysis (Instrumental Neutron Activation Analysis - INAA). By combining the scientific analysis with the study of clay recipes, shaping, finishing, it is now possible to identify; 1) vessels imported from two or more geographical regions of the Indus Civilization; 2) Indus pottery and Umm an-Nar domestic pottery produced by Indus trained potters; 3) the local production of other domestic pottery styles that have not been noted in the past. The main focus of this presentation will be on pottery from central Oman (Salut, Bat, and Amlah) and the eastern region of Abu Dhabi Emirate (Hili).

7 CERAMIC ASSEMBLAGE OF NEOLITHIC SETTLEMENT WUTAISHAN (NORTH-EAST CHINA): CLASSIFICATION AND INTERPRETATION

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Abstract format: Oral

In 2017 and 2018, excavations were conducted in Wutaishan site, in Jilin province, North-East China. It provided a large Neolithic ceramic assemblage from 5th millennium B.C.. This corpus is remarkable by its quantity (116.699 of sherds for 1210kg) and decoration diversity - with over 40 variations. This research was carried out by using descriptive statistical analysis on all the sherd, classifying the potteries according to the chaîne opératoire concept and analyzing petrographic samples.

Throughout the initial sorting phase four major groups have been defined through naked eye observations of the ceramic paste and the decorations. The 1st group (92% of the total sherds), is characterized by superfine inclusions in the paste and twisted incisions patterns, the 2nd group (5%) is defined by a dense concentration of fine inclusions in the paste and a impressed lines patterns, the 3rd group (2%) is uniquely defined by a shell inclusions paste and added cordons patterns, and the 4th group, dating from the Bronze Age period, is identified by a dense concentration of coarse inclusions.

In order to test this typological hypothesis and understand the nature of the variations (technical, stylistic or functional), potteries were classified by technical groups and 25 samples of cylindrical jars were used to carry out a techno-petrographic analysis. Preliminary results show that the Wutaishan site contains a heterogeneous ceramic assemblage originating from at least four distinctive social group from different areas.

8 LBK SOCIETY AND CERAMICS IN SOUTHERN POLAND: AN EXPERIMENTAL AND TECHNOLOGICAL EXAMINATION OF TEMPERED VESSELS

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Abstract format: Oral

The study presented will investigate the role of organic temper in ceramic vessels in the Linearbandkeramik culture (LBK) in southern Poland (5500-4500 cal. BC). According to the literature, a social change occurred at the beginning of the middle LBK, when organic inclusions (e.g. bone, chaff) were substituted with ceramic additives and quartz inclusions. This change in raw material selection has been traditionally related to symbolism and tradition, an interpretation difficult to see in the archaeological register and which cannot be considered valid without examining other possible hypotheses. This study revolves around a central question: Why were organic inclusions substituted by mineral and ceramic additives in the Middle and Late LBK periods in Southern Poland? The methodology employed combines experimental archaeology and laboratory tests typically designed for engineering materials (e.g. three-point bending test) with the objective of evaluating all the possible interpretations to explain this change. As a result, relevant insights were obtained about the production process of prehistoric pottery and the technological properties of different ceramic 'recipes' determining the vessel's function. Importantly, the dichotomy between modern specimens tested in the laboratory and the archaeological sherds studied in archaeology will be presented, evaluating how this can be approached to obtain representative results.

9 LATE NEOLITHIC POTTERY FROM A NW IBERIAN DOLMEN: PRODUCTION, USE AND REJECT

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Abstract format: Oral

This contribution will present the results of the study of the Late Neolithic pottery documented during the excavation of the "Dolmen 4" of the Guidoiro Areoso islet, that is located in Arousa bay (Pontevedra), one of the most important archaeological areas in the Prehistory of Galicia. The site was in constant use from 4600 BC to 800 BC, which includes diverse funerary and ceremonial uses. This study, focuses on the reconstruction of the vessels's "life" (their manufacture, use and reject), has two basic methodological blocks: one is based on the archeological features of the pottery and another that focus on analytical work.

The archaeological part of the study includes the analysis of the morpho-technical features of the pots, their spatial distribution at the site and the type of context in which they were found. The analytical work included archeometric techniques like XRF, XRD, FT-IR-ATR, thermochemistry and solid's colorimetry, allowing us to complete the information about the first steps of the pots biography related to their manufacture.

The results of this research will provide us a better understanding of the funerary ritual of this megalithic burial from a material and sociocultural point of view. In addition, a comparative study with other sites in the NW Spain will allow us to start the characterization of the Late Neolithic pottery of the region, a matter that is still poorly addressed.

10 LIFE-CYCLE OF ANGOSTO CHICO INCISO VESSELS. DIFFERENT METHODS IN THE ANALYSIS OF A PARTICULAR STYLE FROM QUEBRADA DE HUMAHUACA (ARGENTINA)

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Abstract format: Oral

Ceramics are part of the material dimension of practice, inserted into a process by which human objects and agents are reciprocally constituted. In this way, both daily activities and everyday objects are socially significant. Therefore, it is necessary to focus on a broader aspect of social life that goes beyond "the symbolic". In this sense, a comprehensive ceramic analysis that integrates stylistic, technological and functional aspects is relevant to understand social, symbolic and ideological dimensions in everyday activities of the groups that developed and consumed ceramic vessels. Within this framework, the interrelated analysis of functional, technological, morphological and iconographic aspects allows understanding how a particular way of doing was configured and use.

Angosto Chico Inciso was considered one of the local late pre-Hispanic ceramic styles of Quebrada de Humahuaca (North of Argentina), although its foreign origins and the great variety within the style was soon evidenced. Recent petrographic studies have shown that these vessels present both a local and foreign manufacture. In this paper we present the analysis of Angosto Chico Inciso ceramics recovered in a sector of Quebrada de Humahuaca, considering diverse approaches to determine the stylistic variety within this group of vessels, their technological traits and the function they could have had in different pre-Hispanic moments. Stylistic studies that consider iconographic and morphological aspects, technological and use-wear analysis were carried out in 38 fragmented vessels from Esquina de Huajra, Pucara de Volcán, and El Poblado sites, covering pre-Inca and Inca occupations. Studies determined the production and use of Angosto Chico Inciso vessels as early as the 13th century, both in domestic and public contexts. These vessels correspond to local and non-local manufacturing. Stylistic and technological studies have revealed the presence of two modalities of Angosto Chico Inciso that correspond to the two different manufactures.