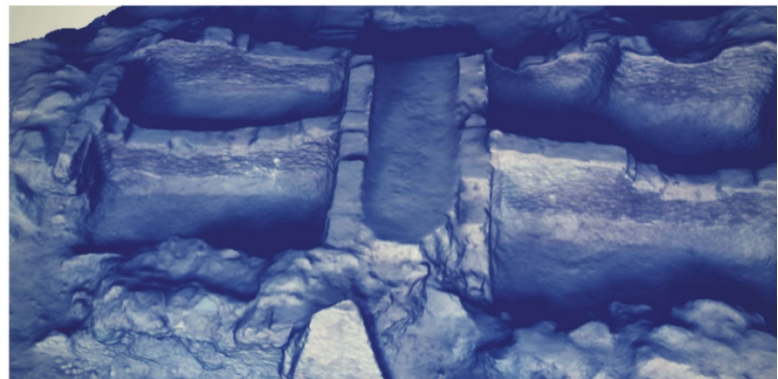
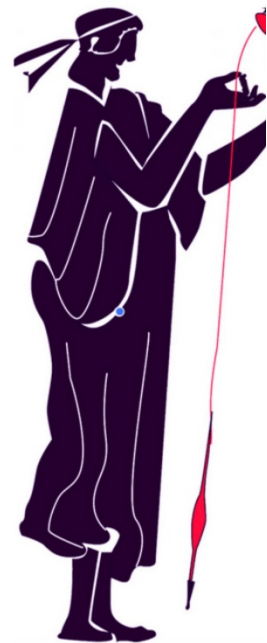


VII PURPUREAE VESTES

International Symposium

GRANADA, SPAIN, 2-4 OCTOBER 2019

Abstracts



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**VII PURPUREAE VESTES
INTERNATIONAL SYMPOSIUM**

"Redefining textile handcraft. Structures, tools and production processes"



Granada, Spain, 2-4 October 2019



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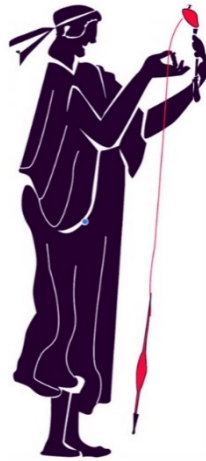
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GENERAL INFORMATION

**All the symposium sessions will take place in
the Faculty of Philosophy and Letters
University of Granada**

Secretary to accreditation opens at 8.00 h every day

Program includes cultural visites and meetings at other places:

*Museo Arqueológico de Granada
Archaeological site of La Alhambra
Carmen de La Victoria*

**Organization offers a lunch in the coffee-shop of the faculty every day after the
morning session**

Fellowship dinner (also included): *Carmen de la Victoria*; 3, Thursday at 20:00 h.

ABSTRACTS



PAPERS

Áreas de actividad textil y unidades domésticas: consideraciones sobre la organización de la producción de tejidos a inicios de la Edad del Bronce en el Este de la península ibérica

Ricardo E. Basso Rial

En esta comunicación se presenta una serie de consideraciones sobre la organización de la producción textil en el Este de la península ibérica durante los momentos iniciales de la Edad del Bronce (2200-1750 cal BC). El desarrollo de intervenciones arqueológicas durante las últimas décadas en un gran número de yacimientos ha sacado a la luz, en prácticamente todos ellos, una gran cantidad de artefactos que han sido identificados como instrumentos de trabajo textil, fundamentalmente pesas de telar. A pesar de que estos objetos suelen aparecer aislados o muy fragmentados por su frágil composición, el hallazgo de un considerable número de contextos de notable fiabilidad donde han sido documentados en buenas condiciones de conservación, permite realizar importantes valoraciones sobre las formas de organización de la producción de tejidos. La inferencia de áreas de actividad de diversa naturaleza —producción, almacenamiento, desecho, etc.—, su relación con otras áreas de producción y consumo, así como los espacios que ocupan dentro de los propios yacimientos, nos ofrecen una información sustancial a la hora de caracterizar la producción textil dentro del marco de la producción subsistencial de las unidades domésticas.

Producción textil y aristocracia en la *Libisosa* iberorromana

Héctor Uroz Rodríguez

El Sector 18 de la fase iberorromana de *Libisosa* (Lezuza, Albacete) se encuentra dominado por un edificio oligárquico de grandes dimensiones en excelente estado de conservación, motivado por su destrucción instantánea en el contexto de las guerras de Sertorio (82-72 a.C.), circunstancia que refiere tanto a elementos estructurales como del patrimonio mueble. Al margen de determinados objetos de prestigio y de importación, relevantes y variados, signo de una aristocracia local en avanzado estado de romanización y con acceso a todo tipo de bienes (ánforas, vajilla de bronce, imitaciones de barniz negro), el registro material recuperado es mayoritariamente ibérico. Se trata de cerámicas y utensilios metálicos que ponen de manifiesto un ejercicio de los diversos procesos de producción, que atañe al almacenamiento de alimentos y su comercio, especialmente el vino, y, en general, al universo agropecuario, e incluso a actividades metalúrgicas. Pero su inclusión en la presente reunión se explica por la contundente presencia de huellas de actividades textiles y de tratamiento de la materia prima: dos importantes acumulaciones del peculiar tipo de pesas de telar documentado en el yacimiento (una de ellas posiblemente fosilizando un telar de bastidor apoyado en un tabique de tapial) y una cuba de plomo de borde circular, de 1,40 m de diámetro exterior, con una profundidad de 0'65 m y orificio en el fondo, que contaba con una infraestructura propia con una cavidad inferior para aplicarle calor, y que encuentra paralelos claros en la *officina lanificaria* VII, 12, 17 de Pompeya. Todo ello nos sirve para reflexionar sobre la funcionalidad de determinados elementos asociados y, al mismo tiempo, sobre el control en estas sociedades de la producción de las telas (o al menos de determinado tipo de tejidos) por parte de las élites como mecanismo diferenciador o para su redistribución posterior.

Desde el taller de púrpura de Lobos 1 (Fuerteventura, Islas Canarias), ollas de cocina para una empresa económica con una larga travesía atlántica

Helia M.^a Garrido Chacón; M.^a del Carmen del Arco Aguilar; Mercedes del Arco Aguilar; M.^a Isabel Fernández García

Las investigaciones arqueológicas efectuadas en el taller de púrpura de la isla de Lobos (Fuerteventura) han proporcionado un amplio registro cerámico y materiales diversos de época altoimperial y de tradición republicana. Frente a lo que sucede en otros talleres de púrpura, entre los primeros destaca un amplio elenco de cerámica común que explicamos debido a la naturaleza de la empresa económica, a realizar en un espacio lejano al de residencia habitual que supondría la necesidad de un avituallamiento bastante complejo en el lugar de origen o en las etapas de desarrollo de una ruta marítima entre Gades y el Archipiélago Canario, en el que se realizarían estancias consecutivas para la producción de MURICIDAE, como actividad prioritaria. Se seleccionó para ello un conjunto cerámico que cubriría las necesidades de los murileguli de Lobos. Además de los recipientes contenedores (ánforas) que portarían una parte de los suministros alimenticios, podemos señalar que fue cargado en los barcos un interesante repertorio de cerámica común, como distintos elementos de la vajilla, al uso, de cocina y mesa, como *ollae*, *caccabi*, *patenae*, *opercula*, *lagoenae*, *urcei*, *mortaria*, *gutti*, *catini*, entre otros, además de producciones de barniz negro, *sigillata* y *lucernae*.

Presentamos los resultados del estudio efectuado sobre *ollae* y *caccabi*, recuento y distribución en el yacimiento, NR-NMI, determinación tipológica y caracterización, con el fin de apurar los focos de abastecimiento y la temporalidad del taller.

Púrpura romana en El Olivillo (Cádiz) y Lobos (Canarias): comparativa de los patrones de fracturación y arqueología experimental

Ramón Cebrían Guimerá; M.^a del Carmen del Arco Aguilar; Darío Bernal Casasola; Juan Jesús Cantillo Duarte; Mercedes del Arco Aguilar; José Manuel Vargas Girón

El descubrimiento de una factoría de púrpura romana de cronología Altoimperial en el islote de Lobos (Fuerteventura, Islas Canarias), con unas extraordinarias condiciones tafonómicas que conservaron intacto el registro arqueológico tanto artefactual como faunístico, ha permitido la generación de una metodología de estudio mensurable que intenta inferir desde el propio registro los distintos aspectos de la cadena operativa de extracción de la secreción hipobranquial de los MURICIDAE (base del tinte púrpura) mediante análisis taxonómicos, de contabilización, biométricos y morfológicos que otorgan datos cuantificables y comparables con otros yacimientos similares como son el NR (número de restos), NMI (número mínimo de individuos), IF (índice de fragmentación) y las CM (categorías morfológicas de los ápices), relacionando estos datos para la comprensión de las distintas estrategias de trabajo fabril de estos talleres. Las similitudes de los registros arqueológicos de Lobos con el área de Gades, desde un punto de vista tanto cronológico como tecnológico y en sentido amplio de su problemática artesanal nos han llevado a aplicar esta metodología, en muestras arqueofaunísticas del Testaccio haliéutico de El Olivillo: una inmensa escombrera pública situada a la entrada del Puerto Exterior de la bahía gaditana, el cual se generó entre los siglos I a.C. y I d.C. como resultado del descarte de residuos de la industria pesquero-conservera, fundamentalmente ánforas e ictiofaunas arqueológicas, entre las cuales también se han podido excavar dos concheros, residuos de la producción tintórea. Además, se ha acometido un procedimiento de arqueología experimental sobre los MURICIDAE característicos de ambos contextos (*Stramonita haemastoma* y *Hexaplex trunculus* respectivamente) con el fin de plasmar sus similitudes y diferencias e inferir distintos aspectos del proceso tecnológico desde los registros estudiados. Presentamos en esta comunicación los resultados alcanzados y las vías de progreso para la continuidad de la investigación.

Textiles and dyes of the European Scythians: Recent investigations of finds from the 4th century BC burials in Southern Ukraine

Margarita Gleba; Ina Vanden Berghe; Marina Daragan

Clothing has been regarded as one of the main identifying criteria for the Scythians – nomadic peoples who roamed the steppes of Eurasia during the 1st millennium BCE – in Greek and Persian iconography and written sources. Leather, felt, and textiles surviving in Scythian burials of southern Ukraine provide a rich source of information about the materials and techniques used by the Scythians for the construction of their clothing. Traces of colour furthermore indicate that this clothing was colourful – information that cannot be gained from representational arts. The paper presents the first results of textile and dye investigation of textiles recovered from numerous Scythian burials in southern Ukraine dated to the 4th century BC. The new data are placed in the wider context of European textile and dye cultures of the 1st millennium BC and compared to the better-known Eurasian Scythian finds.

Le projet ArchéoMartres: Approche inédite d'une collection textile hors du commun, mise au jour sur le site gallo-romain des Martres-de-Veyre (France, Puy-de-Dôme)

Catherine Bréniquez; Fabienne Médard; Paloma Lorente

Depuis le milieu du XIX^e siècle, la commune des Martres-de-Veyre (France, Puy-de-Dôme) est connue pour la remarquable qualité des vestiges archéologiques qu'elle recèle. Les premières découvertes d'importance sont fortuites. Liées à la construction d'une ligne de chemin de fer et à l'extraction d'argile pour le compte d'une tuilerie, une nécropole gallo-romaine mixte apparaît dès 1851. Elle livre les vestiges les plus spectaculaires connus à ce jour en Europe, grâce à l'exceptionnelle préservation des matériaux organiques: cercueils de bois intacts, défunts aux traits reconnaissables, vêtus, coiffés et chaussés, accompagnés d'un mobilier funéraire rarement retrouvé (vanneries, fruits, offrandes alimentaires, végétaux, etc.).

A la faveur de cette qualité de conservation jusqu'ici non expliquée, le site est mondialement connu, notamment en matière de textiles. Ses collections sont citées aux côtés des pièces les plus prestigieuses, notamment égyptiennes. Toutefois, la plupart des auteurs n'en ont qu'une connaissance indirecte, limitée aux deux pièces maîtresses que sont une tunique et une ceinture intégralement préservées.

Aujourd'hui un projet collectif de recherches associant les compétences d'une vingtaine de spécialistes issus de différentes institutions offre l'opportunité de reprendre l'ensemble de la collection. Le programme de recherche vise ainsi à étudier cette nécropole du Haut-Empire, à la lumière des progrès d'une archéologie pluridisciplinaire. Des archives et des inventaires inédits autorisent des avancées notables dans la connaissance de plusieurs dossiers. Les textiles, estimés à une centaine de fragments inédits, y tiennent un rôle de première importance; exceptionnels, non par la nature des pièces, mais par leur rareté archéologique, ils constituent un axe prioritaire.

Dishing the dirt on the archaeological finds (tools and lead tesserae) from a Roman workshop in Savaria (Upper Pannonia)

Judit Pásztoçkai-Szeőke

The archaeological excavations of a workshop in the suburb of Roman Savaria (H) yielded an abundant corpus of textile tools and inscribed commercial lead tags. Tools in general are a very useful source for the textile technologies applied locally by the

workers. The tags were used as labels for valuable garments entrusted by clients to the care of this workshop for refurbishing (e.g. mending, cleaning, re-dyeing) them.

The archaeological finds both from this workshop and from another similar one from the Roman colony of Siscia (Hr) not just allow us to study the local wardrobes, and help to trace the cultural biography of different garments, but also the local practice for treating clothes in the local Pannonian culture.

Based on the recent research on these two workshops, the proposed paper would argue for the functionality of some textile colours beside just being socially symbolic and also emphasize the interdependence and vital importance of corporeal and sartorial hygiene in densely populated regions, such as urban areas or military camps and the tragic consequences of the absence of hygienic practices in the past.

Women Speak. Textile Tools on the Gravestones in Roman Pannonia as a Sign of Romanization

Zofia Kaczmarek

Romanization as a concept of a spread of Roman culture beyond its original borders is one of the most discussed ideas in historiography. For over one hundred years since its first use, not only the term has been criticized, but also the idea itself. It was pointed out that the research concerning Romanization focuses only on the elites and their material culture, excluding in this matter other inhabitants of the provinces. Among many other objections the androgenic perspective in Romanization studies was put forward.

In Roman Pannonia a new, absent in previous periods, custom emerges – spinning implements appear among grave goods in female graves, they are also depicted on female funerary stelae. Such practice was not unheard of in Roman Italy and other provinces. Moreover, according to Roman tradition the woman who spins wool, *lanificia*, is an ideal *matrona*. One can suppose that is why the Romans were keen to display this female virtue in the funerary context.

It became a paradigm that textile production gives us insight not only into economic life of the Ancients, but also into private life or lifestyle. It is also accepted that it mirrors women's activity. The careful analysis of epigraphy and iconography of funerary stelae in Roman Pannonia combined with the analysis of the find context of the spinning implements helps to introduce female perspective into Romanization research and thus allows women to gain their voice in the discussion.

Woolen textiles from nomadic elite burials of Arzhan-1 (Southern Siberia, 9th-8th c. BC)

Svetlana Pankova; Elena Mikolaychuk; Ludmila Gavrilenko; Leonid Marsadolov

The Arzhan-1 mound in the Altai-Sayan mountainous region (Republic of Tyva, Russia) is an elite burial complex of pastoralists of the initial Scythian period (late 9th – early 8th c. BC). Excavations in 1971–74 yielded textile finds including fragments of polychrome woven fabrics and braided details made of wool. They represent the earliest collection of textiles survived from the Altai-Sayan region.

This paper presents all textile fragments from five central burials of the barrow. They are represented by weft-faced tabbies and twills as well as textiles made in weft twining technique and different kinds of braids. In some cases the fabrics and braided articles are combined, most of the fragments are finished by decorative hems and seams.

One of the main questions which most interest researchers is where were the textiles found in Arzhan-1 made: were they woven in the nomadic environment of Sayan-Altai or were they made in another region with more advanced textile traditions? Considering the exclusive character of the burials at Arzhan-1 it is quite likely, although not necessarily, that they included imported fabrics.

A number of parallels to specific characteristics of the Arzhan-1 textiles have been identified from the 1st mill. BC sites in the Tarim basin (Zaghunluq, Yanghai and

Dzhambulak-Kum cemeteries) which highlight that region as a place where similar textile traditions were common.

The dyes in the Arzhan-1 fabrics included some which were certainly imported (carmine, kermes, lac) as well as others which were very probably imported (madder, indigo). Local ingredients, to all appearances, played the role of additives in mixtures of dyes.

Filare e tessere in una palafitta di quattromila anni fa: i dati degli scavi al Lucone di Polpenazze del Garda (BS)

Marco Baioni; Claudia Mangani; Margarita Gleba

Negli scavi in corso da più di dieci anni nell'abitato palafitticolo del Lucone – Sito D sono stati rinvenuti numerosi oggetti legati alla pratica della filatura e della tessitura. Si tratta di un contesto molto interessante di abitato su impalcato ligneo, posto sulle sponde di un piccolo laghetto inframorenico, datato con la dendrocronologia tra il 2034 e il 1967 a.C., lasso di tempo che corrisponde nella cronologia italiana a un momento arcaico del Bronzo Antico (BA1). Il contesto umido di torbiera conserva molti materiali in sostanze deperibili tra le quali si possono annoverare vari frammenti di tessuto di lino, intrecci e corde di vario genere: particolarmente interessante è il rinvenimento di una spoletta in osso con ancora il filo avvolto. Questa decisa presenza di tessuti ha suggerito fin dall'inizio delle ricerche (2007) una particolare attenzione alle attività di filatura e tessitura con mappatura completa di tutte le fusaiole e i pesi da telaio rinvenuti. Si segnalano anche strumenti in corno-osso e in legno probabilmente legati alla produzione di tessuti.

La tomba 2/2011 di Grandate (Como-It): Nuovi dati sulla vestizione degli ossuari nel mondo golasecchiano

Stefano Buson, Federica Gonzato, Barbara Grassi, Stefania Jorio, Mauro Rottoli, Diego Voltolini

All'interno di un ampio progetto condotto da SABAP CO-LC, Polo Museale del Veneto e SABAP Marche, con l'adesione del Comune di Como, è stato avviato uno studio dettagliato dei manufatti della Prima Generazione dell'Arte delle Situle, forma artistica che si ritrova presso i Veneti antichi (con epicentro di produzione a Este), i Golasecchiani, i Piceni e, fuori dai confini nazionali, gli Hallstattiani e le genti delle Alpi Orientali. Un'arte che diviene il linguaggio dell'aristocrazia circumadriatica e alpina a partire dallo scorcio del VII secolo a.C. Questi manufatti sono realizzati in lamina di bronzo decorata a cesello profilatore e sbalzo, secondo temi ripresi e rielaborati dal repertorio orientalizzante di matrice etrusco settentrionale/interna; obiettivo primario del progetto è la diagnosi dello stato di salute e di conservazione dei manufatti, oltre alla loro accurata analisi tecnologica.

Fra gli altri, è stato preso in esame anche il coperchio, di recente scoperta, della tomba 2/2011 di Grandate (CO) - via dei Pradei, che, grazie a queste nuove analisi, ha mostrato consistenti tracce di tessuto mineralizzato, segnalate anche sulla situla che fungeva da ossuario.

Si tratta quindi di un caso ben documentato di vestizione complessa dell'ossuario, secondo una pratica diffusa nel mondo nord italico, poco studiata per l'areale golasecchiano.

Nel contributo si presenta quindi una sintesi dei dati delle analisi archeometriche interdisciplinari, condotte nel caso specifico, e si propone una lettura storica dell'attestazione del rituale della vestizione delle urne in ambito golasecchiano

Women at work in the venetic Iron age society /Donne al lavoro nella società veneta dell'età del Ferro

Mariolina Gamba; Giovanna Gambacurta; Angela Ruta Serafini

This paper is the development of our previous contributions about textile production in the preroman Veneto. A first overlook on the social aspects of the spinning and weaving at Este was followed from a deepening on the ponderal classes of women's tools and work sets in the graves and in the shrine of Reitia at Este.

A regional dimension had a research proposed during the last *Purpureae Vestes* meeting in Italy, aimed to underline the different types of loom which can be rebuilt in the inhabited excavation.

The paper for the meeting in Granada aims to embrace a similar regional dimension. We propose to analyze the distribution of the textile indicators in the female venetic graves between 9th and 2nd century B.C.

We process diachronic and quantitative distribution maps aimed to underline different but meaningful concentration connected with local specializations and specific social roles. An articulated scenery emerges that let us speculate about the tranches of the operating chain and linked female roles.

The art of forgetting: the disappearance of textile technologies and urbanism in first millennium BCE central Italy

J. Troy Samuels

From the procurement of raw materials to the crafting and wearing of both quotidian and elite clothing, specific rhythmic systems of textile production acted to reify hierarchic and communal systems in the changing proto-urban spaces of first millennium central Italy. While the technology and synoecious qualities of these repeated activities are increasingly well understood, less thought has been given to the disappearance of these systems of textile production and their associated material culture. This paper considers disruptions in the rhythms of textile production and asks what we might learn from this act of forgetting and technological loss.

The Latin site of Gabii provides my primary case study for contextualizing the act of forgetting. Gabii provides a diachronic window into changes in textile technologies across Latium's urban boundary that have been noted anecdotally across the Italian peninsula but seldom investigated in depth. Recent excavations of multiple domestic complexes at Gabii have revealed evidence for changes in textile technologies as the site transitioned from a collection of proto-urban hut settlements to an orthogonally planned, walled "city". At Gabii, as at other Italian sites, specific textile-making tools and evidence for their attendant suite of production techniques (spools/*rocchetti*, bone tablets, and tablet weaving) are abundant in the pre-urban layers but disappear completely from all non-residual deposits belonging to the urban phases of the site.

This paper examines this point of disjunction in elite textile production. In addressing the question of why the Gabines "forgot" how to tablet-weave, I will argue that such considerations tell us much about both the generative role of tablet-weaving in proto-urban communities and the shifting social-networks of textile producers in the subsequent Gabine city. The material changes in textile production seen at Gabii after its "urban moment" can help us understand the changing roles elite men and women played as Italian communities moved from polyfocal, specialized, and household based pre-urban settlements to hierarchic cities.

Iron Age textiles from Sasso di Furbara, Italy: Preliminary results of new scientific investigation

Margarita Gleba; Ettore Pizzuti; Ina Vanden Berghe; Mathieu Boudin; Alessandra Serges; Alessandra Montedoro

The paper will present preliminary results of a new analysis of textile assemblage from the Caolino necropolis Sasso di Furbara, Italy, which is one of the largest and most important Iron Age textile corpora known from Italy. The material was found in 1953 by construction workers in a wooden monoxile boat, interpreted as a cenotaph. The majority of the textiles are of exceptionally high quality both technically and aesthetically and illustrate a range in fineness and design. One of the textiles includes one of the oldest and most complex tablet weaves found in Italy. Another exceptional characteristic of many textile fragments from Sasso di Furbara is the fact that they preserve visible colour patterns, indicating the use of dyes. To date, 110 fragments survive, which were sandwiched between glass panels when the first conservation was carried out in 1970s during the study of the material by Hubert Masurel, who published his findings in two articles differentiating the fragments into seven fabric groups, but no comprehensive catalogue of the material exists. In 2017, a new study of the Sasso di Furbara material was initiated involving conservation and full scientific investigation of the extant fragments, including structural analysis, radiocarbon dating, fibre identification, dye analysis and experimental reconstruction of the tablet weaves. The paper will present the new structural groups and results of dating and raw material analyses.

Etruscan Textile Technology: Textile tool data from the Swedish Institute of Classical Studies in Rome Excavations at San Giovenale and Acquarossa.

Hedvig Landenius Enegren

Excavations at the south Etruscan settlement sites of San Giovenale and Acquarossa, located in the Viterbese region of Lazio, were carried out by the Swedish Institute of Classical Studies in Rome in the 1950s - 1970s under the auspices of the late King Gustav VI Adolf of Sweden, himself a keen amateur archaeologist. The present paper presents select preliminary results of my study in progress of the, to date, largely unpublished textile tool material recovered at these two sites. The material at San Giovenale and Acquarossa provides an outstanding opportunity to increase our knowledge of textile technology pertinent to Etruscan settlements and to diachronically chart the development from the proto-Villanovan to the Archaic period.

The Wearing Dead. The Role of Loom Weights in the Funerary Contexts of the Greek and Indigenous Societies of Magna Graecia

Alessandro Quercia

Although loom weights are mainly documented in domestic sites and cult places of Magna Graecia, a small part of them was found also in numerous indigenous and Greek tombs within its funerary outfits. Their presence in the burials, which is by far less attested than the frequency of other textile tools (*in primis* spindle whorls), can change in number and position and it is related also with the characters and the nature of the dead.

This paper gives a preliminary and general picture on the occurrence of loom weights in the funerary domain of the Greek and indigenous societies of Magna Graecia and emphasizes some important key questions: how the presence of loom weights in the

burials should be interpreted? Does the different quantity of specimens provide clues on textile activities practiced by the dead during her/his own life? What does the attestation of loom weights in tombs tell us on the gender of the dead?

Textile production and its tools: indicators of cultural identity and interaction processes in Sicily and Aeolian islands

Gabriella Longhitano

Sicily and the Aeolian islands have been crossroads of cultures for millennia. Specifically, Indigenous communities interacted with Greek and Punic incomers who established settlements in Sicily from the 8th century BC. The results of these cultural interactions are often perceived to have stimulated changes in indigenous material culture and technologies, for example in domestic and funerary architecture, metallurgy and pottery. This paper aims to investigate the ranges of tradition of making and using textile tools among Indigenous and Greek communities in Sicily between the Early Iron Age and Archaic period. Specifically, by presenting some case studies, this paper will explore how and to what extent the impact of intense cultural interactions affected Indigenous textile traditions. Moreover, since dress and clothing are key indicators of individual and social identities across a wide range of societies, this paper will demonstrate how cultural interaction made a material impact on communicating identities through textiles. Finally, because women seem regularly to be involved in textile manufacture, it will investigate how and to what extent women played a crucial role in transfer of knowledge as well as in construction and representation of social identity through textile technology.

Written on bones: textile working in Roman Veneto from tools to human remains

Cecilia Rossi; M.Stela Busana; Alessandro Canci; Anita Radini

According to literary and epigraphic sources, the ancient Venetia (North-Eastern Italy) was one of the best cloth suppliers in Roman Empire. In the last decade the University of Padua carried out many researches on the topic: topographic evidence and sheep breeding settlements were studied at first; secondly, a systematic survey of archaeological textile tools (Pondera Project) and samples of organic and mineralized fabrics (TRAMA Project) found in the region was carried out, in order to analyze technological and socio-economical aspects. In the end, our attention has been focused on human remains (Lanifica Project), for the purpose of identifying the textile workers and their health conditions, thanks to the study of occupational markers and pathological affects produced by spinning and weaving activities. Anthropological data coming from a representative skeletal sample were therefore analyzed in consideration of the ancient tools and their ways of use, with particular attention to the drop-spindle technique and the two main types of loom in use (i.e. the warp-weighted loom and the vertical two-beam loom). In Roman times, posture, gesture and working conditions, including even air quality, were comparable to those still existing in some parts of the modern world, and could seriously impact the health.

Textile tools in funerary contexts of Roman Venetia (Italy)

M. Stela Busana; Cecilia Rossi; Agnese Lena

Textile economy, especially wool based, played a very important role in the Roman Venetia (North-Eastern Italy), thanks to the natural environment (plains, alpine pastures, coastal salt works). The University of Padua carried out many researches on the topic: after investigating topographic evidence and literary/epigraphic sources, the interest turned to archeological data. The Pondera Project was focused on a systematic survey of archaeological textile tools found in the area, recording almost 2800 items that came from settlements, workshops, votive or funerary contexts.

Recently, the Lanifica Project has carried out a deeper analysis of tools coming from graves in order to highlight the ideological meaning and the connection with the socio-economical profile of the deceased, combining grave goods and human remains. The paper will offer the results of this new research giving a wide picture of the ritual meaning of textile tools and verifying similarities and differences with the Pre-Roman customs in the same region. In addition, the topic of real or symbolic use of precious tools will be analysed even thanks to 3D scanning, realistic models and experimental tests.

La coltivazione e lavorazione della canapa nel mondo romano: riflessioni interdisciplinari, novità archeologiche e prospettive di ricerca

Daniela Cottica; Andrea Cipolato

Nell'ambito della filiera del tessile nel mondo romano, resta ancora poco noto dal punto di vista archeologico, il ciclo relativo alla produzione e lavorazione della canapa, sebbene le fonti scritte ci permettano di dedurre che questa fibra vegetale dovette essere largamente utilizzata. A partire dai dati generalmente noti, si illustrerà un caso per ora unico di evidenza archeologica che ci testimonia uno specifico stadio della filiera produttiva della canapa: la macerazione della pianta, necessaria per la separazione della fibra poi utilizzata nella produzione tessile.

Verranno quindi presentati i dati relativi allo scavo archeologico (campagne 2017-2019) di un gruppo di vasche per la macerazione della canapa in acqua corrente, parte di un più ampio sistema individuato lungo la sponda orientale del *Natiso cum Turro* ad Aquileia. Si tratta di vasche rettangolari interpretate, anche sulla base dei risultati di un mirato progetto di analisi archeobotaniche, come un sistema dedicato alla macerazione della canapa/*Cannabis sativa*. Significativamente, mentre per quest'attività artigianale abbiamo una ricca documentazione etnografica di confronto, a oggi mancavano evidenze archeologiche (o almeno riconosciute come tali) certe, relative a questa fase della produzione della canapa mondo romano.

Il rinvenimento aquileiese quindi si presenta come un elemento di novità nel più generale panorama dell'archeologia romana e come il più antico macero noto in Italia; inoltre ci offre interessanti spunti per avviare una rilettura di alcuni dati in parte noti ed in parte inediti, utili ad inserire il processo di macerazione all'interno di un più complesso sistema produttivo, del quale la ricerca futura dovrà identificare chiare testimonianze archeologiche.

Cultura tessile a Pompei: materiali tessili e contesti produttivi

Marco Galli; Francesca Coletti; Giacomo Casa

I due contributi presentano in stretta sinergia l'avanzamento delle ricerche del progetto "Cultura tessile a Pompei", che a partire dal 2014 è volto ad individuare le modalità di produzione tessile a nell'importante città vesuviana, in cui si è preservata una numerosa quantità di reperti tessili conservatisi a seguito dei catastrofici eventi eruttivi del 79 d.C. Dal 2017, I nuovi risultati delle ricerche condotte dal gruppo di lavoro sono frutto di una serie coordinata di indagini archeometriche svolte con collaborazione con i Dipartimenti di Chimica, Fisica e Biologia Ambientale della Sapienza Università di Roma affiancati dal Laboratorio LNF, INFN (Frascati). Le indagini condotte primariamente con microscopia ottica e microscopia elettronica a scansione, a cui sono seguite analisi spettroscopiche, biochimiche e cromatografiche, hanno permesso di ampliare le conoscenze in relazione alle tecniche di manifattura e alla qualità delle superfici tessili, ai materiali e al loro trattamento come pure di individuarne peculiarità relative ai processi di tintura. Inoltre, le analisi gettano nuova luce su importanti aspetti legati al degrado delle fibre e al loro differente stadio di carbonizzazione in relazione alla matrice organica.

Le indagini relative ai contesti di produzione sono state finalizzate, invece, al duplice obiettivo di individuare e di verificare la destinazione funzionale degli spazi dedicati alla manifattura tessile con la finalità di ricostruire un'articolata topografia della tessitura nella città di Pompei. Tale sistematica ricognizione delle testimonianze archeologiche è stata integrata significativamente dalla ricerca d'archivio che ha consentito di identificare nuovi contesti e di ricostruire all'interno di alcune insulae network connessi alla catena operativa delle differenti fasi del processo produttivo come pure ai diversi attori in esso coinvolti.

Textile production in Lucanian contexts

Bianca Ferrara; Luigi Cicala; Francesco Meo; Simona Passaro

The research conducted during the last years on textiles and textile production in Southern Italy is giving meaningful results regarding the knowledge of ancient cloths and their production system.

This paper will focus on textile production in a specific area of the South of Italy, Lucania, through the study of some contexts.

Three Hellenistic sites are highly significant for the analysis of textile tools. The first of them is the so-called 'Casa dei Pithoi' at Serra di Vaglio, a 4th century BC aristocratic house where about 100 loom weights have been discovered in a row along a wall of this dwelling together with traces of the burnt loom. The results will be compared with those of the a residential cluster discovered in the valley of Cuozzi at Roscigno, built during the second half of the 4th century BC, which included a stately house with rooms arranged around an open paved central courtyard, covering a surface of over 200 square meters. Both the sites will be also compared with the Square Building of the Heraion near the mouth of the Sele river where about 300 loom weights have been discovered and where the presence of some looms for the production on several qualities of cloth has been hypothesized.

The results from the Anaktorion at Torre di Satriano, an archaic aristocratic building where there presence of two looms has been hypothesized, are highly important to discover and analyse possible changes in textile production through the tools.

Another step will be the comparison of the previous results with some pieces of cloth found mineralised and calcified in a 4th century BC Lucanian burial of Paestum.

The combination of the data from all these contexts will give us a first picture of textile production in Lucania during through the centuries and will be compared with what is emerging from other areas of southern Italy.

Auratae Getty 79.AO.75.125

Mary Louise Hart

Gold textiles were made for purposes of embellishment as early as the 4th century B.C. on the Italic peninsula. Material remains have survived from well-known Etruscan sites such as the François Tomb and a variety of sites in southern Italy; Taras/Tarentum may have been an important production center for gold textiles in Puglia. The excavations of sites destroyed by the eruption of Vesuvius in 79 A.D. have also yielded finely woven ribbons as well as tangled clumps of golden wire, yet to be unraveled.

In 1979 the Getty Museum acquired as a donation a group of fifty-one tiny woven gold mesh and cord fragments. The group was measured and examined by X-radiography and by scanning electron microscopy in 1989, finding that most of the remains preserve small sections of warp faced plain weave textile fashioned from tiny strip-twisted gold wires (0.07 mm diameter) reinforced with a natural fiber. The sturdiest mesh samples (1.4 cm wide) preserve selvages on either side (some with purposeful folds and seams) and when laid end to end they could simulate a band originally measuring nearly a meter in length. In several cases evidence remains of burial accretions such as roots. A second, smaller group consists of fragmentary gold cords made from the same strip-twisted wire. One small cluster is tied into a tiny Herakles knot. It is likely, but not certain, that these two groups once belonged together.

Because the gold was donated with a group of Etruscan amber beads and its fabrication appeared to be similar to Etruscan work, the group of woven fragments was initially catalogued as Etruscan and dated to the 5th century B.C. However, recent comparisons to woven gold ribbons and clusters of gold thread from the Vesuvian region in the Museo Archeologico Nazionale in Naples have led to an interest in reevaluating the origin and date of the Getty fragments. A new technical study will compare previous observations with new insights gathered by X-radiography, further examination of samples in the scanning electron microscope coupled with alloy analysis, and fiber identification. Furthermore, detailed measurements and photographic documentation using a digital microscope will provide advanced understanding of the material structure formerly unobtainable.

Textile Production and Administrative Practices in Bronze Age Greece: The Evidence from Seals and Seal-Impressions

Agata Ulanowska

The complexity of textile production and larger scale redistribution of textiles required producers to use elaborate scheduling patterns, skills and management methods. In the Aegean Bronze Age, the organisation of textile production has been traced through archaeological discoveries of production spots, such as households, specialised workshops and dye-works, and Late Bronze Age written documents, specifically Linear B tablets from the Mycenaean palaces. However, the initial system of administrative practices based on the use of seals, which in later periods (c. 2100-1200 BCE) was complemented by writing systems, has not yet been investigated in relation to textiles. Thus, it is the focus of the research project 'Textiles and Seals. Relations between Textile Production and Seals and Sealing Practices in Bronze Age Greece' (NCN SONATA 13, UMO-2017/26/D/HS3/00145) that I am leading at the Institute of Archaeology, University of Warsaw.

The abundant, yet largely ignored evidence from imprints of textiles that are preserved on the undersides of lumps of clay stamped by the seals, provides unique information about the qualities of actual fabrics, as well as various uses of textiles in everyday life and administrative practices. An assemblage of silicone casts of the undersides of the sealings from Phaistos, Crete, which is kept in the Archive of the *Corpus der minoischen und mykenischen Siegel*, University of Heidelberg, will constitute a case study for further consideration in this paper.

Equipping professional soldiers in the Eastern Mediterranean and in the Aegean in the Iron Age: a driving factor for textile production?

Liviu Mihail Iancu

Modern warfare archaeologists and historians are more prone to investigate conflict, confrontation and technical issues than the logistical processes of ancient armies. Moreover, when they focus their attention on the logistical preparation of armies, the privileged issues are payment, food procurement and the provision of weaponry. More mundane items, like textiles, cooking equipment, shelter supplies etc. rarely find their way to the limelight.

Nevertheless, textiles and garments were very prized items for individual soldiers and a constant preoccupation for army leaders, as shown by the numerous instances of textiles taken as booty or tribute in the Bronze and Iron Age Eastern Mediterranean. Later in time, there are numerous comparanda revealing various means of providing textiles equipment to professional soldiers.

The questions that I ask and I intend to answer is if and how the army leaders of the Iron Age Eastern Mediterranean and Aegean did organize specialized processes of producing textiles in order to serve the needs of their armies composed by professional soldiers.

The sources are meager and most of them consist of Eastern administrative and annalistic texts, to which we may add a few references in Oriental and Greek literary texts and a few archaeological contexts which invite to a thorough interpretation. I should cite here prominently the Neo-Assyrian and Neo-Babylonian administrative texts, a few references from the Iliad and the Odyssey, the textile tools discoveries from the Early Iron Age Gordion etc.

The basic assumption that I try to investigate is that Oriental monarchs organized specialized, centralized systems to produce or to acquire garments for their troops, while chieftains all around Eastern Mediterranean and the Aegean were also aware of the importance of building stockpiles of garments to use as gifts in their relations with similar or subordinate warlords. The topic of the similarities and the differences between the two systems and of the possible means through which the first system influenced the second one is also addressed.

Revisiting the Lefkandi warrior

Christina Margariti; Stella Spantidaki

This paper presents the outcomes of the current study of the Lefkandi warrior textile finds, excavated in 1981 at Heroon of Lefkandi, Euboia, Greece. It is a pyre burial of a man, the so-called hero of Lefkandi. The cremated bones were inside a funerary bronze vessel covered with a bronze bowl. Most probably the double enclosure in copper, which possibly meant an environment of limited oxygen and of unfavourable conditions to micro-organisms growth, was responsible for the preservation of an impressive amount of textiles. An almost complete garment and band were retrieved and conserved in the 1980s. Additional recent finds include a second band, three textiles and several construction and decoration techniques identified, namely splicing, dyeing, tapestry, and soumak. The above in combination with the radiochronology analysis performed make this find one of the oldest examples of purple dye from murex shells in Europe and to the best of the authors' knowledge, the oldest example of tapestry identified in Europe. The paper focuses on the construction and decoration of the textiles preserved and discusses their possible association.

Connecting the north Aegean and south Balkans, 7th - 2nd century BC: a textile archaeology perspective

Bela Dimova

Between the Archaic and the Hellenistic period different, yet connected communities co-existed side by side in the north Aegean and the south Balkans, exchanging goods, technologies, ideas, and people. Over this period, they saw a series of transformations, including the consolidation and expansion of Greek city-states, the appearance of the first cities in Thrace, the rise and dissolution of the Odrysian Kingdom and the Macedonian Empire. The aim of my project is to understand how textile manufacture was affected by, and what role it played in these developments. This paper will present preliminary results from the investigation of textiles and textile production tools from sites in northern Greece and Bulgaria.

El trabajo textil de las mujeres de las élites griegas: ¿representación simbólica o práctica cotidiana?

María Dolores Mirón Pérez

La literatura y la iconografía griegas clásicas abundan en imágenes de mujeres implicadas en el trabajo textil, que llegó a ser parte esencial del discurso sobre el ideal femenino. En este sentido, cabe preguntarse si las informaciones en este sentido acerca de mujeres de las élites, e incluso de la realeza, respondían a una práctica real o a la representación de un ideal. Este trabajo intenta responder a esta cuestión, relacionándola con la realidad material de la abundante evidencia de trabajo textil en los contextos domésticos griegos de época clásica.

Dyeing technologies in the making: hellenistic dyeing workshops in the Corinthian Gulf (Greece)

Sophia Tsourinaki

Excavations in the Corinthian Gulf has brought to light four Hellenistic dyeing establishments (in Corinth, Isthmia, Khostiai and Helike), which provide us with valuable information for the preparation and finishing activities of textiles. Especially, the dyeing workshop of ancient Helike with the four carefully made cisterns, clay vats and built in basins seems to be associated with: (a) washing, scouring and fulling processes (b) dyeing with the immersion method. Associated finds (stored lime, colored soil samples and tiles preserving traces of blue and green colours) may indicate that yellow, red and blue dyes were involved in the establishment. However, a wide range of plants used as sources of dyestuffs by Hellenistic dyers still grow in Greece and information relating to them is valuable. It is not entirely irrelevant that the chemical process taking place in the dye vat did not change over time and the basic principles remained the same until the present era. In order to gain new insights into the ingredients, process and economic aspects of dyeing, the archaeological evidence in the Corinthian Gulf can be used alongside the numerous references to dyeing in the historical and ethnographic record. In order to build a detailed picture, literary sources with instructions for dyeing supplemented by epigraphic evidence on colored textiles.

Speaking textiles. A collection of textiles in the mummification deposit of the vizier Ipi at Deir el-Bahari (Thebes, Egypt, ca. 2000 BCE)

Antonio J. Morales; Jónatan Ortíz García

Within the framework of the *Middle Kingdom Theban Project* –an international mission under the auspices of the University of Alcalá (UAH, Spain)– archaeologists cleaning the courtyard of the tomb of Ipi (TT 315) have relocated fifty-six jars filled with embalming materials for the mummification of the vizier. In his campaign in 1921-22 the American Egyptologist Herbert Winlock found these materials inside an auxiliary chamber located in the NE corner of the upper courtyard of Ipi's tomb. Likely, embalmers and priests deposited the unclean equipment, bandages, oils, and salts used in the process of mummification. While a few jars, bowls, scrapers, and a mummification board (decorated with ankh-signs) were taken to the Metropolitan Museum of Art in New York, fifty-six jars and the contents of these objects were left behind in this auxiliary chamber. The identification of these materials is of great importance for understanding the mummification techniques used in the early Middle Kingdom and the assessment of the kinds of items, tools, and substances involved in the process of embalming.

The deposit of the mummification materials used for Ipi included sixty-seven jars with potmarks and other types of inscriptions, various shrouds and linen sheets (4 m. long) shawls, and rolls of wide bandages, in addition to further types of cloths, rags, and pieces of slender wrappings destined to cover fingers, toes, and other parts of the vizier's corpse. In addition, the specialists has identified what seems to be the mummified heart of Ipi, an uncommon practice that no doubt deserves more investigation. Furthermore, the deposit also contained around three hundred sacks with natron salt, oils, sand, and other substances, as well as the stoppers of the jars and a scraper. Among the most outstanding pieces of the collection are the Nile clay and marl large jars, some with potmarks and hieratic, various large bandages of 6 m. long, a shroud used for covering the body of the vizier Ipi, a fringed shawl with a length of 10 m., natron bags that were deposited in the inner parts of the vizier's body, twisted bandages used as mummy packing, and small pieces of bandages for the upper and lower extremities. The collection of materials will provide to the members of the Middle Kingdom Theban Project an excellent opportunity for the scientific analysis of the substances, components, textiles, and human remains found in the embalming cachette, as well as the technical procedures and religious acts implied in the mummification of a high-official in the early Middle Kingdom. Although the amount of textile found is similar to the collection of linen materials stored for the overseer Wah, housed at the Metropolitan Museum of Art in New York, Ipi's assemblage resulted from the mummification process itself.

A re-evaluation of Ptolemaic state intervention in the Egyptian textile industry

Nico Dogaer

The Ptolemaic kings (305-30 BC) were renowned for their wealth throughout the ancient Mediterranean. Their revenues were derived in part from industry and trade, through regulations that have traditionally been interpreted as 'state monopolies'. The so-called 'textile monopoly' was preeminent among those, given Egypt's long tradition of and reputation for linen manufacture. In recent years, the 'monopoly' paradigm for describing the Ptolemaic economy has been qualified, but no synthesis of the role of the state in the textile industry has been attempted since the middle of the twentieth century. In the meantime, an abundance of new material has been published, particularly papyri written in Demotic Egyptian, which significantly alter our view of the organization of the Ptolemaic textile industry. In this paper, a new synthesis of the role played by the state in the manufacture and trade of various textiles will be presented. Attention will be devoted to issues such as the ownership and supply of raw materials and tools, taxation, and the role played by temple weavers within the system. The

situation emerging from the sources was much more complex than is suggested by the plain designation 'state monopoly'. The royal administration intervened in different ways, not only according to the kind of cloth (mostly linen or wool), but in some cases even for specific articles of clothing. In addition, the re-assessment of the Ptolemaic 'textile monopoly' sheds light on issues going beyond the textile industry, as it has major implications for our understanding of the Hellenistic Egyptian economy in general, the nature of the Ptolemaic state, and the relation between the administration and the temples.

Cotton in western oasis of Egypt. New insights from El Deir

Fleur Letellier-Willemin

Well attested presence of cotton in archaeological contexts on sites of the Western Egyptian desert authenticates the texts by ancient authors and the new translations. Concerning cotton's origin, it seems that the problem is different in the Great Oasis, that is Kharga and Dakhla, than on the sites of Eastern desert, particularly Berenike.

Is it relevant to characterize the cotton's story in this way?

The fact that a new fiber appeared inside the Egyptian textile context has a meaning, as linen was the fiber revealing Egyptian identity. What material requirements, what human conditions authorized cotton to be used, then cultivated? What was the place of cotton, between linen and wool, in Graeco-Roman times?

We try to throw some light on the problem with observations made on the field and new processes of dating.

Textile Finds from Fag el-Gamus (Fayum, Egypt)

Anne Kwaspén; Kristin South

Brigham Young University's Egypt Excavation team has held the concession to explore, excavate, and publish the necropolis of Fag el-Gamus since 1981, and in that time a great many exciting and important textile finds have emerged. As an early Christian necropolis located on the eastern edge of Egypt's Fayum Oasis, Fag el-Gamus holds an important position in helping to elucidate the social, physical, and religious world occupied by the Late Antique inhabitants of this important province of the eastern Roman empire.

Multiple years of excavation at Fag el-Gamus have unearthed a multitude of textiles. Since the last two dig seasons, a team of textile specialists has been working intensively on the categorization, analyses and conservation of the textile finds. The textiles of Fag el-Gamus shed light on religious affiliation, economic status, and burial patterns. and can also help to date the grave finds generally to the Late Roman, Byzantine, and Early Medieval periods. This paper will present an overview of the different types of textile finds from this site, including wrappings, tunics and accessories, and will provide technical and iconographic analyses of a sampling of the textiles that have been unearthed in recent years.

Textile tools from Ancient Egypt: The case of Gurob

Chiara S. Spinazzi-Lucchesi

The archaeological site of Gurob is located at the entrance of the Fayyum oasis, in a strategic position for the control of trades with the Nile and close to the rich agricultural and faunal resources of the area. It flourished during the New Kingdom and was abandoned shortly after it, when the royal palace and harem, which were built on the site, lost their importance. It was excavated by F. Petrie at the end of the 19th century and briefly at the beginning of the 20th century. A military area prevents further investigations of the site and even recent excavations are still strongly limited.

Textile tools examined in this presentation come from Petrie's excavations and are stored in British museums, while those recently excavated by I. Shaw and M. Yoyotte are not included. Contexts of findings are therefore unknown and this represents a serious limitation of the knowledge of textile production. The site housed a royal harem and ladies from the palace appear involved in textile production; furthermore, a papyrus suggests the possible presence of a textile workshop in the site. Objects examined comprehend spindles, spindle whorls, needles, bone spatulae, parts of looms and balls of yarns. The whole corpus is not very large, especially if compared with contemporary Egyptian sites, as Kahun and Amarna. This fact is strongly in contrast with the possible presence of a textile workshop in the site, but it might be due to a selection of the materials brought by Petrie to England. Instead, the type of tools points to a production of very fine quality.

'Foreign' textiles in the papyrological record from Roman Egypt

Kerstin Droß-Krüpe

While the papyrological record is an abundant source of information for many aspects of social as well as economic everyday life in Roman Egypt, it is surprising how rarely these documents record textiles coming from other parts of the Roman Empire or even from beyond its borders. Literary sources as well as the archaeological record inform us about various 'foreign' textiles in this region, so that the papyri form an interesting contrast that is worth further examination. Key questions addressed include: What 'foreign' textiles do appear, are there chronological or geographical peaks?

Spinning North and South. The great divide in textile craft technologies in Meroitic Sudan and Nubia (1-550 CE)

Elsa Yvanez

This paper will present a broad overview of spinning practices in ancient Sudan during the Classic and Late Meroitic period (1-550 CE). It will call upon different types of archaeological sources, focussing its attention on the textile fibres and the tools used for their transformation into thread.

The Meroitic textile industry has been known for quite a long time now, and is magnificently illustrated by the well-preserved textiles found in the northern part of the kingdom, in Nubia, mainly on cemetery sites. The past two decades have seen a great renewal of interest for the excavation of settlement sites in Central Sudan, which shed light onto previously little known aspects of textile production in the political core of the Meroitic territory. Many textile implements were notably discovered within occupation layers, especially spindle whorls. They document the organisation of textile craft, and provide interesting counter-points to the preserved fabrics. Interestingly, the thousands of spindle whorls dated to this period in Sudan present a sharp divide: the Nubian ones

are generally made of turned wood while the ones from Central Sudan are made of ceramic.

This material difference could have had various justifications. Is it the visible marker of different spinning technologies? Did it reflect different textile traditions? This paper will explore these questions, while presenting ongoing work on the spinning tools discovered in Sudan.

Textile production in the monastic environment in Egypt (4th-8th centuries ad): raw material supply

Maria Mossakowska-Gaubert

This paper focuses on raw materials used for textile production in Egypt at the Byzantine and Early Arab periods within the monastic context. An investigation of the economic life and material culture of monks and nuns is closely connected with studies of the economic life and material culture of the lay population at this time. Furthermore, the sources relating to the monastic environment – literary and documentary texts (Greek and Coptic) as well as archaeological evidence – provide us with some information unavailable elsewhere regarding lay craftsmen and customers.

The issue of provision of raw materials leads to the question of flax growing as well as goat, sheep and dromedary breeding in monastic communities. Compared to wheat or barley, there are relatively few records of flax being grown by monastic communities. Wool production in the monastic context has never been investigated. What is more, archaeological excavations of monastic sites bring also textiles made of cotton, and a supply of this raw material/ or finished textiles is an open issue.

Monks, particularly anachoretic and semi-anachoretic ones living in small communities, were obliged to purchase the raw materials for their own production of textiles in the market or these had to be supplied by customers placing their orders.

A Bundle from the Past: Early Evidence of Madder Dyes from the Levantine Chalcolithic

Naama Sukenik; Uri Davidovich

In 2016, archaeologists from the Israel Antiquities Authority and the Hebrew University of Jerusalem re-excavated the "Cave of the Skulls" in Nahal Ze'elim (Wady Seyial) in the Judean Desert, more than 50 years after its initial discovery. In the course of excavation, a closed bundle of linen textile tied by rope was found, preserved for thousands of years due to the arid climate in the region. The bundle dates to the Chalcolithic period based on both radiocarbon and microscopic analysis, the latter showing that the textile was made by a splicing technique characteristic of Levantine Chalcolithic textiles. Although the bundle is still kept closed in the organic material storage facility of the Israel Antiquities Authority, visible through its edges and from X-ray imaging are several objects that were wrapped within it. These include a long bead necklace still strung on linen thread, a unique decorated belt made with white and brown/red linen threads, and reddish strings. This bundle is similar to two other bundles found by Aharoni in 1960 in the same cave, while the belt finds a close parallel in another cave excavated by him in the same ravine. The unique findings raise many questions regarding their deposition within hard-to-access cliff caves, and also enable new insights about technological innovations and traditions during the Chalcolithic period. The analysis by HPLC-DAD of the red/brown fiber identified organic molecules, purpurin and pseudopurpurin, that are characteristic of *Rubia spp* (Madder) which was used for thousands of years to provide a red dye. On the other hand, the chromatogram profile is not similar to *Rubia tinctoria* L., which is characterized by relatively high concentration of alizarin and was grown as an agricultural plant in Israel in Roman times. Our results

constitute the earliest evidence for the use of dyestuffs in the Levant and as of today, also the earliest reported use of madder in the Old World.

Phoenician and Punic Garment Terminology

Nahoum Ben-Yehuda

The following Hebrew Bible pericopes, which mention garments, may be dated to The Ramesside Period (XIX and XX dynasties – 1300-1077 BCE).

“He tethers his donkey to a vine, his mare's foal to a choice vine. He launders his garment (Hb = *lʿbuš*) in wine, his robe (Hb = *sūt*) in “blood” of grapes.” (Genesis 49:11)

“And when Moses had finished speaking with them, he put a veil (Hb = *masweh*) over his face.” (Exodus 34:33)

The correlation between these pericopes was first identified by Biblical exegete Abraham ibn Ezra (1089 Tudela – 1167 Calahorra).

Parallels to these two Biblical terminologies (hapax legomena) in their Northwest Semitic context have subsequently been identified in various forms in Phoenician and Punic – *swt*, *suwt*, and *swyh*.

Phoenician and Punic inscriptions, some of them originating from the 9th - 4th centuries BCE, from provenances including Sam'al (*Yadiya*), Carthage, and Byblos mention these terms. Comparison of these contexts will assist in the clarification of these garments and their development throughout the ages.

Contemporaneous sculptures and stelæ provide cross-linking as support for identifying these garments.

Weaving a river valley biography. An examination of the relationships between textile production, social dynamics and natural resources in Bronze Age Kouris Valley (Cyprus).

Giulia Muti; Luca Bombardieri; Giulia Albertazzi

Past and current research in the Kouris Valley (Limassol district, Cyprus) has allowed identifying sites with Early Cypriot (EC), Middle Cypriot (MC) and Late Cypriot (LC) phases of occupation. Evidence for different textile activities carried out at domestic and specialised levels has been recognised in settlements (Sotira-Kaminoudhia, Erimi-Laonin tou Porakou, Episkopi-Phaneromeni, Erimi-Pitharka, and Alassa). This paper aims to define the relationship between textile activities with and within their environment and the diachronic development of neighbour sites located in a distinct area, as a river valley is.

With the term ‘environment’ we do not exclusively refer to a geographical or ecological ‘context’ but to the broader idea of ‘being-in-the-world’. Our theoretical framework will also be drawn from a critical approach to the so-called new materialisms, increasingly applied within the more comprehensive social sciences, including archaeology. This approach emphasises the materiality of the world and challenges the privileged position of human agents over the environment. While this shift in perspective may be problematic in the archaeological discourse, it potentially provides a middle ground between fieldwork, science-based and social archaeology.

These theoretical concepts will be extremely beneficial to investigate not only the relationship between the Kouris Valley communities and the landscape and natural resources, but also the complex array of social dynamics between people, nature, and objects. More specifically, they will facilitate an analysis of material productions with and within their environment: matter equally interacts and directs human agency, both enabling and provoking different responses from the early *homo faber*.

The characterisation of a possible central role of textile manufacture within the valley economic dynamics and the development of productive strategies will thus stimulate

new reflections on social transformations culminating in the appearance of the first urban centres on the island, in which work strategies, production, network and the relationship with resources are constitutive elements and catalysts. The focus on textile production will be the *fil rouge* to follow for retracing the complex biography of a Bronze Age river valley.

Χρυσός, el color del oro: “los tintes azafranados” y sus referencias en las fuentes escritas

M^a Julia Martínez García

La terminología del amarillo en las fuentes griegas y latinas es muy extensa. En este artículo analizamos aquellos términos que asocian este color con el oro, χρυσός, o con el brillo de este metal. Trataremos las diferentes plantas que produjeron tintes semejantes a los obtenidos con el azafrán: amarillo y amarillo anaranjado, para imitar los hilos de oro o el color del ámbar, materiales considerados caros y suntuosos en las sociedades antiguas, donde hubo una tendencia a relacionar el color de cualquier objeto hermoso y deseable con el amarillo.

El valor atribuido a estos metales como símbolo de riqueza, así como la asimilación del color amarillo con el poder de la estrella solar y el fuego hicieron que estas tonalidades fueran muy apreciadas entre las culturas del mediterráneo antiguo. El amarillo era un color asociado a la diosa Artemisa y fue, durante la antigüedad, uno de los más comunes en el vestido de las jóvenes vírgenes.

Muchas especies vegetales autóctonas de diversas zonas del Mediterráneo mencionadas en algunas fuentes escritas del s. I al III d. C. como, por ejemplo el P. Holm. y el P. X Leid.: azafrán, cártamo, reseda, celidonia, etc., son capaces de producir estos colorantes amarillos. El amarillo brillante, después del púrpura, fue uno de los colores más apreciados por la realeza y la aristocracia. Desde la prehistoria se considero, junto al rojo, un color especial. En época neolítica se usaba ocre amarillo y rojo para adornar el rostro y cuerpo.

La relación de los “amarillos azafranados” con el oro ha llegado hasta nuestros días y en la mayoría de las definiciones lexicográficas modernas el oro está asociado con este color, y el término “amarillo” es equivalente a la “gualda” (*Reseda luteola* L.), aplicándose también al azafrán (*Crocus sativus* L.), al cártamo (*Carthamus tinctorius* L.) y a la cúrcuma (*Curcuma longa* L.), todas ellas plantas tintóreas muy importantes desde la Antigüedad.

Plautus as source for textiles and textile economy in the Roman Republic

Falk Ruffloh

As informative the comedies written by the so-called Titus Maccius Plautus might appear in contrast with other dramatical sources from the middle and late Republic, the less concrete is known about the persona of this poet. Just as controversial as his provenance is the geographical and historical context of his stories. The context of his comedies, therefore, raises some questions that need clarification for historians to make full use of their multiple references to ancient life and its material culture. These allusions are the various mentions of textiles and textile production which seem to carry special narrative weight. The present paper thus attempts to present and contextualize these references. Special emphasis will be given to the potential insights for economic history, particularly the textile history of the Roman Republic.

El estatus profesional y social de los purpurarii: datos epigráficos y literarios

Francesca Diosono

Anche se il titolo si riferisce per brevità ai soli purpurarii, il paper esamina tutti i professionisti ed i collegia attivi nella produzione di porpora e della vendita di prodotti ad essa collegati.

Although the title refers only to purpurarii for short, the paper examines all professionals and collegia active in the production of purple and the sale of products related to it. Examining the epigraphic data helps to integrate the archaeological ones about the distribution of the processing of purple and also provides important informations on the economic and social condition as well as the origin of those who work in this field. Instead, the analysis of legislative texts helps to a deeper understanding of the organization of production once it has become a state monopoly in late antiquity.

First textiles

Antoinette; Rast-Eicher; Lise Bender Jørgensen, Willeke Wendrich

Recent excavations at the Neolithic site of Catalhöyük (Turkey) by I. Hodder 1993-2017 have recovered remains of textiles, cordage and basketry that add importantly to earlier finds at the site, as well as to our understanding of the evolution of textile techniques. The paper argues that the woven textiles found in Catalhöyük (6700-6500 calBC) are the result of a long development in the Pre-Pottery Neolithic period. Strings and basketry techniques have been used for a long time to produce a variety of objects such as rigid containers, but also flexible fabrics that may be termed textiles. One of these basketry techniques, weft-twining, leads to weaving. Several find spots in the Near East document this development. Catalhöyük is currently the earliest site where preserved woven textiles have been found and forms the starting point for our discussion of the emergence of weaving during the 7th- 5th Millennia cal BC.

Two Case Studies of Knotted Pile Technique from the Museo Egizio in Turin

Matilde Borla; Roberta Genta; Cinzia Oliva; Valentina Turina; Chiara Tricerri

Our paper will focus on the study and conservation of some textiles manufactured with the technique of knotted pile. The artefacts are part of the wide and significant textile collection of the Museo Egizio in Turin but they are from different periods and different archaeological context.

The first group belongs to the funerary equipment of Kha and Merit (c. 1425-1353 B.C.), which represents one of the richest group of textiles of the New Kingdom. The collection encompasses more than 150 items, among which are tunics, cloths, shrouds and some furniture textiles in knotted pile technique, we are going to talk about. The textiles include two blankets, found on the bed of Merit, and three seats cover, which are woven with additional loops in the weft (S. 8519, S. 8520, S. 8521, S. 8632, S. 8633), while two more seats cover, one of which was upon the seat of Kha (S. 8528, S. 8529) are decorated with polychrome lotus flowers and geometric bands in tapestry technique with additional loops. All the objects present technical features of knotted pile in unbleached line; but while the stool covers are executed in tabby weave, both the bed covers are in full basket weave, with some irregularities in the weaving quite peculiar. There are several examples of textile woven in basket weave in pharaonic times, they belong mostly to the New Kingdom and they are often used in connection with knotted pile technique, maybe because basket weave would provide a firmer anchorage for the loops, which are darned in by hand after the weaving was finished.

The bed cover (S. 8632) we are going to present is realized in irregular basket weave, the pile are knotted with "*Ghiordes knot*" and presents still intact both selvages and a starting border with inserted wefts; the warp fringes are degraded and mostly missing, even if it is still possible to see how they have been knotted and twisted together. All the textiles were in very poor condition, due to the natural decay of cellulosic fibres and display condition. They all underwent conservation, which included cleaning and mechanical consolidation.

The second artifact restored (Inv. S. 17310-17311) is a rare and original *taqueté façonné* woven with woolen warps and wefts, characterized by a double-sided pattern and where the decoration varies from front to back based on the alternation of the colors of the wefts. There are two color variants: ecru/red for the border and ecru/violet for the central field. The technique of *taqueté façonné* is found in numerous late-antique textile finds found in the Egyptian and Syrian areas, dating back to a chronological period between the 4th and 8th centuries A.D., but the knotting is particularly unusual: rows of knots obtained with an supplementary weft of ecru wool are present along the whole height of the textile, inserted in the weaving phase every 24 passages of the *taqueté* weave. The find, therefore, is strongly characterized by the coexistence of two executive techniques, each with its own purpose: one of more decorative weaving and one close to the world of knotted rugs. The pattern with small stylized roses obtained from the colored weft of the *taqueté* characterizes the "external" side (what was seen while using the textile), while the long "bows" of the wool knots are on the "inner" side (perhaps that had a practical function of thermal insulation and comfort). All the peculiarities of this ancient textile such as the refined decorative motif, the knotting and the difficulty of finding technically similar finds in scientific literature, have been the reasons to start an in-depth diagnostic campaign on the find, together with the conservation treatment. This textile is showed in the new temporary exhibition *Archeologia Invisibile* (from 13/03/2019 to 06/01/2020) at the Museo Egizio. The purpose of the exhibition is to illustrate the principles, tools and results of the meticulous work of reconstruction of information and knowledge made possible today by the application of science and, also, by the conservation treatments as the *taqueté* conservation case-study. The main goal we set is to explain the particular knotted pile technique of this kind of artwork. It is possible to see the *taqueté* mounted on a specific transparent support made *ad hoc*. A facs simile of the knotted pile weave has been created so that visitors can perceive the object also through a tactile path.

Weaving on the ground: positive and negative evidence towards a reconstruction of the prehistoric horizontal loom

Kalliope Sarri

The horizontal ground loom is considered to be one of the earliest loom types. It is technically very close to the back-strap loom as it is easy to set up and transport and its construction requires only a few affordable materials: short wooden beams and posts and some sticks, very suitable for environments with a rarity of wood and nomadic communities. It is therefore still in use in many parts of the world, where rich ethnographic evidence for the development of the weaving technology is at hand. As for the other early loom types (the back-strap and the two-beam loom), the horizontal ground loom does not leave any remains in the archaeological record and, consequently its first appearance and spatial distribution, particularly in absence of ancient illustrations, are almost impossible to testify.

In many prehistoric cultures of the Aegean area an abundance of spindle whorls is observed but no loom-weights until the final phase of the Neolithic period (4.000 BCE). This shows that an earlier type of loom, different than the warp-weighted loom was in use, one of them probably being the horizontal ground loom. As neither of the earlier loom types leaves traces, it seems difficult to estimate which of them (the back-strap or the two-beam type) was used first and before the invention of the warp-weighted loom. Technological features, however, within an evolutionary perspective, on one

hand, and the absence of loom weights, on the other hand, provide some hints for the reconstruction of the ground loom in certain prehistoric contexts. In addition, some enigmatic clay artefacts, which can be interpreted as ground loom components (heddle rod jacks) make a reconstruction plausible. In this presentation, we are going to trace the existence of the ground loom in the Neolithic contexts in the Aegean, the Balkan and the Near East based on selected archaeological contexts and ethnographic parallels.

Twill textile cultures of Europe and beyond from the Bronze Age to 400 BCE

Karina Grömer; Margarita Gleba

Appearance of twill weave and therefore the evolution of multi-shaft looms represents one of the most significant technological developments of the Bronze Age, coinciding with the expanding use of sheep wool and subsequent development of sheep with fleeces that allowed spinning fine yarns resulting in high thread counts. Twills became ubiquitous in Central Europe and Central and Western Mediterranean by the first millennium BCE, yet technical variations across this vast geographical area are not well understood.

Twills define some important border lines between the European Textile Cultures recently defined by the PROCON project, in particular, the presence of twills and tablet weaves in Central Europe (Hallstatt culture areas), the Central (Italy) and Western (France and Spain) Mediterranean is contrasted with the use of weft-faced tabbies and tapestry in the Eastern Mediterranean (Greece) and the Near East.

The paper will present the first synthesis of recently collected data on the various twill cultures of Europe, with particular focus on the connection between Italy and the Eastern Hallstatt regions but also integrating new finds from Spain and France. For a supra-regional approach, the recently published finds from Siberia and Central Asia will be considered in order to understand the spread of twill technology across Eurasia.

Waterproofing material from a 2nd century AD barge from Lyon: looking for the roman know-how to caulk with pitched textiles.

Laure Meunier; Marc Guyon

Lyon Saint Georges 4 is a roman barge from the 2nd century AD, coming from Lyon (France). Her conservation operation is engaged since January 2014 in the laboratory ARC Nucléart in France, used to deal with shipwrecks. The project is led by an archaeologist, Marc Guyon (Inrap) and a conservator, Laure Meunier (ARC Nucléart). Due to conservation requirement, she had been completely dismantled. This was a unique opportunity to remove 26 meters of caulking material for further study after conservation process. The waterproofing of the boat is made with caulking textiles. This represent the most important batch of roman textile in Europe, and we just began to work on it with Dejlja Garmi (Isieta).

Textiles became essentially from the place between the bilge and the side. First, they look like a piece of wood, because of the important impregnation with pitch. After a more detailed examination, textiles can be seen. The challenge was to find a technique to unfold them, without losing the know-how information still contained. A new issue appear with the research of a respectful unfolding technique: how can we answer to historical questions with these new data?

All these textile will give exceptional information on roman techniques, of caulking of course, but also for textiles. Already more than 2 square meters are unfolded, and there are still 23 meters waiting for to be done. There is a great potential here, to make a referential corpus of roman textiles. This is what is planned shortly.

New techniques for the non-invasive analysis of purple textiles and their depictions

Joanne Dyer

Discerning so-called “true” or shellfish purples from mixtures of red and blue colourants to create similar hues remains a challenge in the investigation of textiles and painted surfaces alike, particularly when the removal of samples is limited or impossible. This work presents recent advances in non-invasive imaging techniques that allow such mixtures to be identified and mapped, thus differentiating these from instances where “true” purple colourants have been employed.

The preliminary identification of one of the most commonly used combinations of colourants, madder and indigo, to create these purple shades in both textile dyeing and in their painted depictions, will be considered. Two techniques will be described, each optimized to detect madder and indigo, respectively. In addition, post-processing techniques, which allow these images to be combined to yield “maps” of mixtures of these colourants will be presented with the aid of relevant examples of both textiles from Late Antique Egypt and Graeco-Roman portraits from the Fayum. The findings are supported and corroborated by non-invasive spectroscopic techniques.

The ability to survey textiles and painted surfaces with this combination of highly accessible, portable and non-destructive imaging and spectroscopic methods may not only allow more extensive investigations into the production of these colourant mixtures but also shed further light onto the existing relationships between dyers and pigment makers in the ancient Mediterranean.

Ancient Textiles – Modern Hands: Citizen Science and Crowdsourcing in Historic Textile Research

Ines Bogensperger; Julia Galliker

Advancing the field of Late Antique Egyptian textile studies requires research methods that overcome evidentiary problems. European and North American collections contain hundreds of thousands of fragments discovered in the late 19th and early 20th centuries. The vast majority were recovered from non-scientific excavations and lack contextual and find spot information. Many fragments demonstrate high technical standards, but we know little about the social, economic and technical environment of production.

To address this shortcoming, the aim of the “Texts and Textiles in Late Antique Egypt” research project is to examine ancient production by combining textile research with papyri from the same period. Many papyrus documents refer to textiles but have not been systematically interrogated in relation to surviving fragments. Synthetic treatment of the evidence reveals a highly specialised sector of textile production in the ancient economy with a well-established network of professional craftsmen.

While this interdisciplinary approach has produced new findings, we saw the need to expand the original project to incorporate applied knowledge about ancient textile craftsmanship. Experimental archaeology has been a fruitful methodology to advance research, but studies are generally limited to a small number of practitioners with similar training and experience.

By launching the citizen science project “Ancient Textiles – Modern Hands”, we recruited participants from the broad international community of textile weavers and fibre artists and “crowd-sourced” experiments for research. The challenge was to reproduce an ancient spiral design drawn on the papyrus P.Mich. inv. 5143c in the University of Michigan collection using ancient textile techniques. Thanks to strong interest from the practitioner community, we collected hundreds of samples from textile artists around the world. The material is now being presented to the public through a website, Facebook page and a travelling exhibition program in Europe, North America and beyond.

In this paper, we share our experience and findings from this community-based research project. Our goal is to help bridge the gap between theoretical study and practical knowledge, as well as to discuss our lessons learned. "Ancient Textiles – Modern Hands" has become a conduit to make research more accessible to the general public while bringing greater appreciation for the skill and artistry of practitioners. Overall this project provides a means to appreciate our shared textile heritage and to integrate academic research with present day society.

POSTERS

Tejidos suntuosos con oro en la Península Ibérica. Reflexión a partir de los nuevos hallazgos en Augusta Emerita (Mérida, Badajoz, España)

Carmen Alfaro; Macarena Bustamante; Dolores J. Yusá; Sofía Vicente; Rafael Sabio

La producción de hilos de oro en la Antigüedad fue una actividad que parece no estuvo muy generalizada en el Mediterráneo. Sin embargo, a través del comercio se extendió el uso de manufacturas con ellos ornamentadas. El oro era un indicador más del lujo que marcaba el estatus social de una clase social elevada. En España conservamos, siempre procedentes de tumbas, algunos especímenes a los que vienen a sumarse los que ahora presentamos. Tales restos constituyen parte del reciente hallazgo de una suntuosa tumba de la que fue la capital de la Lusitania, Emerita Augusta (la moderna Mérida). En el presente trabajo se hará una revisión de los hallazgos conocidos hasta ahora con el fin de comparar las características técnicas de los mismos, una descripción de las circunstancias del descubrimiento de las piezas de Mérida y un análisis técnico de los escasos restos conservados.

Spindle whorls from prehistoric caves of South East Italy: the role of cult objects to reconstruction textile production process

Giorgia Aprile; Ida Tiberi

A partire dal Neolitico (VI millennio a.C.) alcune grotte del sud-est italiano vengono adibite a luoghi di culto e sepoltura in grado di attrarre gruppi umani provenienti dal territorio e anche da regioni lontane. Questa funzione si protrarrà per millenni giungendo sino alla fine dell'età del Bronzo (II millennio a.C.). Tra esse, Grotta delle Veneri e Grotta dei Cervi, due contesti tra i più noti della preistoria europea, sono state luogo di pratiche rituali legate a culti agrari e in onore degli antenati.

Tra le offerte dedicate alle divinità, oltre a recipienti ceramici, manufatti in pietra, osso e conchiglia (Aprile et alii 2017) sono state rinvenute circa 50 tra rondelle fittili e fuseruole riferibili a un arco di tempo che va dal Neolitico medio (metà VI millennio a.C.) alla fine dell'età del Bronzo (fine del II millennio a.C.).

Si potrebbe trattare di oggetti legati alle attività di culto realizzati appositamente per essere donati agli dei del mondo sotterraneo, ma nulla esclude che fossero strumenti funzionali caricati di un valore sacro. Utili indicatori in questo senso potrebbero essere le caratteristiche tecnico-funzionali dei manufatti rinvenuti nelle grotte e il confronto con gli esemplari provenienti dai siti d'abitato. Dimensioni, peso, forma e soprattutto il rapporto tra alcuni di questi parametri (rapporto tra peso e diametro per stabilire il momento di inerzia) possono fornirci informazioni sulle tecniche di filatura adottate e sulla natura delle fibre utilizzate, consentendo, inoltre, di integrare i dati a disposizione sullo sfruttamento delle risorse vegetali e animali non a scopo alimentare.

Materiales y técnicas de un conjunto de tejidos coptos. Diseño de un protocolo de actuación para su correcta conservación

Natalia C. Arbues Fandos; Sofía Vicente Palomino; Eva M.ª Montesinos Ferrandis; Dolores Julia Yusá Marco

La exposición "Una visión sobre el mundo de Al Fayum", tenía como objetivo la puesta en valor del Egipto romano a través de diferentes manifestaciones artísticas, resaltando la manufactura textil con la muestra de diferentes fragmentos de tejidos coptos. Los

tejidos fueron intervenidos en el laboratorio de análisis e intervención de tejidos de valor cultural del Instituto de Restauración de Patrimonio de la UPV.

La primera parte de la intervención se centró en el estudio del estado de conservación de los materiales constituyentes de los diferentes fragmentos mediante diferentes técnicas analíticas (microscopía óptica, colorimetría, pH, SEM/EDX y FTIR). En base a los resultados obtenidos, que pusieron de manifiesto el alto grado de deterioro que presentaban las piezas, se realizó la propuesta de intervención, en la cual fue fundamental la idea de proporcionar un acondicionamiento estable tanto a nivel expositivo como de almacenaje.

Artes de pesca en el taller de púrpura romano de la isla de Lobos (Fuerteventura, Islas Canarias)

M.^a del Carmen del Arco Aguilar; David Rodríguez Fidel; Mercedes del Arco Aguilar

El taller romano de púrpura de la isla de Lobos (Fuerteventura, Islas Canarias) muestra la instalación de una explotación de MURICIDAE (*Stramonita haemastoma*) donde no solo se identifican los residuos y herramientas propios de esa producción, sino un conjunto de elementos que permiten contrastar las artes de pesca que fueron usadas por *murileguli* y *piscatores*.

En el momento actual de la investigación podemos presentar una información que indica que estas, además de haber funcionado para la captura de los murícidos, cumplieron un papel en las estrategias de subsistencia de las gentes de Lobos y, quizás también, en otras explotaciones pesqueras, aún no bien definidas.

Presentamos el repertorio de artefactos dependientes de la actividad haliéutica, como anzuelos, arpones, pesas de red, agujas de coser redes; residuos orgánicos como fibras y tricomas vegetales, y otros indicios indirectos (malacofauna y material lítico) que ayudan a definir el uso de algunas de esas artes.

Textile instruments in ritual environments: fusayolas in the funerary landscape of northern Oretania

Luis Benítez de Lugo Enrich; José Luis Fuentes Sánchez

Fusayolas and weights of loom were deposited in necropolis, sanctuaries and sacred Iberian places. The interpretation of these deposits is a matter of controversy, since it is not clear if they were pieces related to the elaboration of a sacred fabric, or if they were offerings of grave goods. The solution to this enigma will come from specific studies on the material culture associated with this type of cultural expression.

This work presents the detailed investigation of the deposits of fusayolas recovered in two funerary areas of the South of the Meseta, in the province of Ciudad Real-Spain: the Iberian necropolis of incineration of Cerro de las Cabezas (Valdepeñas) and El Toro (Alcubillas), that have been studied in recent years in emergency campaigns, and whose materials allow us to increase our level of knowledge about the use of textile elements in funeral deposits dating from the V-IV centuries BC.

The study also makes a state of the matter about the findings of fusayolas and other tools of possible textile use in necropolis of incineration of the Middle Iron Age as those of Alarcos (Ciudad Real), Los Toriles (Villarrubia de los Ojos), Laminium-Las Fuentes (Alhambra), La Hidalga and El Palomar (Campo de Criptana), Casa del Galo and Huerta de Aguas (Argamasilla de Alba).

Redefining structures and patterns of Archaic Greek costume types: An experimental approach

Isabella Benda-Weber

In early Greek Iron Age the basic women's garment before the chiton was the long and narrow *heanos*. Depictions of several art forms of all regions of Greek culture show a wide range of different types according to epoch and region. Analyses by schematic drawings will pursue the question if they were based on a common basic structure with only smaller variations or if there existed several diverse garments of different origin parallel. Most of the dresses must have been sewn from several parts, but how was the pattern and where were the openings?

The *heanos* as well as the chiton were completed by other garments like capes, mantles and veils. How, when and where were they worn? Drawing analyses and some replications will thematise such problems and in some cases hopefully will lead to solutions. In any case they will visualize a very interesting and rich epoch of costume history.

Textiles de época tardorromana en Septem: evidencias arqueológicas del baluarte de La Bandera (Ceuta)

Darío Bernal-Casasola; Fabienne Médard; Fernando Villada; David Godoy

Las excavaciones arqueológicas preventivas realizadas en el Baluarte de la Bandera de la antigua ciudad de *Septem*, enclavada en la orilla africana del Estrecho de Gibraltar han permitido determinar la existencia de una importante secuencia arqueológica preislámica, centrada en época tardorromana, actualmente en proceso de excavación y estudio por parte de un equipo interdisciplinar de la Universidad de Cádiz y de la Ciudad Autónoma de Ceuta.

Las excavaciones arqueológicas desarrolladas en el año 2016 permitieron documentar niveles arqueológicos tardoantiguos, fechables en el s. VII gracias a algunas cerámicas de importación africana (ánforas Keay LXI), siendo especialmente relevante el hallazgo de restos de varias inhumaciones que habían sido calcinadas in situ. Este proceso de termoalteración, verificable en la rubefacción del sedimento sobre el cual se sitúan los restos óseos, permitió la conservación de restos de materia orgánica, que quedaron carbonizados. De especial interés ha sido la recuperación de más de un centenar de fragmentos textiles, una muestra de los cuales han sido analizados y cuyos resultados se presentan en este trabajo.

Por un lado, restos de un cordón de unos 6 mm. de diámetro medio, conformado por elementos vegetales de unos 5 mm de anchura, superpuestos y torsionados en S. El tipo de elementos más habituales son fragmentos de tejidos, que a veces se presentan deshechos y de forma pulverulenta, pero que en otras ocasiones mantienen su estructura, habiendo podido determinar que se trata de un textil compuesto por dos niveles superpuestos. La observación a través del Microscopio Electrónico de Barrido (MEB) ha permitido determinar que en el caso del cordón que se trata de un artefacto no identificable funcionalmente, realizado con una fibra natural, con múltiples similitudes con las hojas de la palmera datilera (*Phoenix dactylifera* L.). En el caso de los fragmentos de tejido, se ha podido determinar que se trata de fibras de lana.

Estos resultados son de notable interés, a pesar de su fragmentariedad, al constituir las primeras evidencias textiles en Ceuta, constituyendo una de las escasas muestras conocidas en el ámbito del Círculo del Estrecho para época antigua y ¿prácticamente? de las únicas conocidas del s. VII d.C. en el Norte de África occidental, que por el contexto arqueológico de hallazgo deberían corresponder con los momentos de ocupación bizantina del enclave por los constantinopolitanos.

Alchemy and knitting in Greco-Roman Egypt

Miriam Blanco Cesteros

A recent study on ancient textiles (Dyer J., Tamburini D., O'Connell ER., Harrison A., 2018, "A multispectral imaging approach integrated into the study of Late Antique textiles from Egypt", PLoS ONE 13(10): e0204699. <https://doi.org/10.1371/journal.pone.0204699>) analyses a stripy wool bootee found in Antinoupolis (Egypt), radiocarbon-dated on 3rd-4th century AD and nowadays hold in the Department of Ancient Egypt and Sudan at the British Museum. The analysis, which has been carried out through a non-invasive method based on multiespectral imaging exam, evinces that the different colours of the wool were obtained using a rather limited substances' palette: madder (*Rubia* sp.), weld (*Reseda luteola*), indigo (*Isatis* or *Indigofera tinctoria*) and tannins. The different fades, however, seems to have been obtained through the variation of the dye method, double-dye techniques and the use of preparatory treatments, as the analysis has shown. Accordingly, this paper explores ancient literary and technical sources – above all, contemporary sources on dyestuff and dye techniques in the Greco-Roman Egypt (namely P.Leid. X and P.Holm.)– to know what they can tell us about the substances and techniques employed to dye the wool yarns used to knit this ancient children's sock.

Shears in the Roman world: preliminary study of evidence from northern Italy

M. Stella Busana; Denis Francisci; Fabio Spagiari

Shears are a multi-purpose tool suitable for very different activities: from sheep shearing to hair cutting.

In this study all the tasks to which the shears could be adapted and the morphological characteristics necessary for the unwinding of these activities were identified. The introduction of this instrument in northern Italy has also been studied. Through the cataloging of the specimens belonging to the Romanization phase (125-49 B.C.) and to the Roman age (49 B.C.-5th century A.D.) it was possible to investigate what were the functions of the shears found in funerary contexts trying to interpret their symbolic value.

Las pesas de telar del Bronce Final del Sudeste. Distribución e identificación de un artefacto singular

Alberto Dorado-Alejos

Las pesas de telar son uno de los elementos más significativos del registro material que refieren a una de las actividades de producción doméstica más elementales durante la Prehistoria Reciente: la producción textil. Si bien, para determinados periodos cronológicos y ambientes culturales, estos artefactos se encuentran bien definidos y caracterizados como son, por ejemplo, las pesas de telar del mundo ibérico o romano, mucho más estandarizadas. No es este el caso de las producciones artefactuales de pesas durante el Bronce Final del Sudeste (BFSE). Así, en estos momentos se observa una ruptura en relación a sus homólogas argáricas, las cuales son eminentemente circulares y contienen dos vías para su suspensión. Y es que, durante el BFSE estas producciones cerámicas presentan una morfología muy particular debido a que presentan una escotadura central y, en algunos casos, presentan ciertos ideomorfos realizados a partir de la técnica incisa que, muy probablemente, indiquen a sus usuarios instrucciones básicas sobre su utilización. Con escaso recorrido en la bibliografía de este periodo, y tras la revisión de conjuntos de materiales adscritos al BFSE procedentes de sitios –ya emblemáticos– como el Cerro de la Mora (Moralada de

Zafayona, Granada), el Cerro de los Infantes (Pinos Puente, Granada) o el Cerro de la Encina (Monachil, Granada), presentamos una propuesta que pretende ser una revisión de estos útiles a lo largo de la Península Ibérica con el fin de determinar su distribución y sus posibles semejanzas y divergencias en los distintos contextos en las que han sido localizadas.

Early Iron Age woolcraft in Southern Iberian Peninsula. Regarding to a possible spool knitting from Cerro de los Infantes (Granada, Spain).

Alberto Dorado Alejos; Rafael Martínez-Sánchez; Fernando Molina González

En el decurso de las intervenciones arqueológicas desarrolladas en el marco de los proyectos del Dpto. de Prehistoria y Arqueología de la Universidad de Granada con el objetivo de secuenciar los distintos periodos cronoculturales que componen la Prehistoria Reciente del sudeste peninsular, se realizaron varias intervenciones arqueológicas en el Cerro de los Infantes. El sitio mostró una importante secuencia que se inicia, con interrupciones, desde el Cobre Pleno, continúa con una tímida ocupación durante la fase argárica y -tras un *hiatus*- continúa desde el Bronce Final hasta el periodo romano imperial, tras su constitución como *oppidum* ibérico: Ilurco. No obstante, hasta la fecha, no se ha realizado una revisión de los materiales extraídos en la campaña de 1980 dirigida por A. Mendoza y F. Molina, revisión que ha permitido identificar una posible tricotería en el Nivel 7, correspondiente con el primer nivel adscrito al Hierro Antiguo (750-550 cal AC). Su hallazgo se relaciona con un momento en el que comienzan a aparecer las primeras producciones cerámicas a torno pero en las que la presencia de las fuentes, vasos y ollas de tradición indígena realizadas a mano sigue aún vigentes. Con todo, nuestra propuesta se orienta a presentar este nuevo artefacto realizado sobre asta de ciervo y en el que se han podido identificar parte de las huellas generadas para su manufactura, así como las trazas formadas durante su vida útil para el procesado del textil.

Ritual textiles making: Redefining female handcraft in Etruria

Audray Gouy

My paper aims to present *TEXDANCE*, a new project which will be held at CTR at the University of Copenhagen, and at the University of Oxford. It will explore the relation between dance and textiles in Etruria. Indeed, in Etruscan ritual practices dance had a key role and constituted an important form of non-verbal religious communication that focusing on dance's props and textiles in particular permits to understand. In this context, *TEXDANCE* aims also to explore Etruscan society and ritual practices.

For my paper at the VI *Purpureae Vestes*, I would like to focus on the production of the textiles used in representations of ritual performances such as dance.

In the *Tomb of Fishing and Hunting* in Tarquinia, the crafting of garlands, later worn by dancers, appears to be an aristocratic adolescent girl occupation and education, and part of rites of passage to become a woman. In other representations, such as on the *Tintinnabulum* (Archaeological Museum, Bologna), aristocratic females – as identified by their clothes – are depicted weaving. These representations are often combined with male religious ritual scenes such as duels or wine consumption as if they were their pendant. In this context, and if the élite also had religious power as argued already, how can we consider the textiles made by aristocratic women that we found in representations of dance? How did these textiles religiously impact the dance, the dancers themselves, and the ritual practices? These questions will be answered through the following objectives: 1. Typology of female handcraft representations in Etruria; 2. Types of dress and textiles handcrafted in pictures and then used by performers in

representations of dance; 3. Ritual function of textiles in Etruscan dance; 4. Social and ritual function and structure of female handcraft in Etruria.

To conclude, I will highlight that Georges Losfeld has argued that some Etruscan transparent tunics originated in the Greek colonies based in South Italy, mostly from Taranto. So my aim will finally be to analyse the different origins of Etruscan dance textile props. Indeed, which textiles are Greek, and which are more widely Mediterranean? What could be the ritual power and impact of exotic and foreign textiles in Etruscan ritual practices? This implies thinking in terms of ethnic markers, circulation and trade – was there a ritual trade?

Redefining ancient Peloponnesian clay spools: a new technique of spools production in moulds

Alina Iancu

This paper is focused on the ancient modes of production of textile tools (especially spools), a subject which is neglected frequently in the field of archaeological textiles, while a bigger attention is paid, for example, to the weaving and spinning crafts and to the nature of the textile fibres.

Spools of various shapes and sizes are ubiquitous in the Greek world, being associated by archaeologists with textile crafts. This category of tools is controversial because the functionality of the ancient spool-shaped objects is highly debated among scholars, while their characteristics need more investigation. A bigger interest was paid to the Bronze Age spool-shaped objects made of clay discovered in Greece, which gives us a set of working methods useful in the study of the spools dated in the later periods, e.g.: Archaic and Classical. Moreover, despite the large number of ancient spools recovered from archaeological sites in Peloponnese and the isolated discoveries of spools during some major surveys in Arcadia, these objects have received much less attention than their Bronze Age Peloponnesian counterparts. As a consequence, the modes of manufacture, the geographical distribution, the characteristics and utility of these tools are not sufficiently known. For example, the previous lack of interest in this topic left unanswered the fundamental question if the Peloponnesian spools were used by the ancients for yarn storage, for tensioning the warp threads during the process of weaving or if they had multiple roles.

The purpose of the present paper is to investigate the physical features of the ancient spools from Elis, Greece, and to point out an ancient technique of spools manufacture quasi-unknown in the field of archaeological textiles: mould-made spools. The identification of this technique of manufacture in relation with the ancient spools from Elis, Peloponnese, brings new valuable data regarding the interpretation of the functionality and quality and the process of standardisation of these tools. The fact that the potters deliberately choose to use moulds in order to create spools instead of the traditional techniques (well-made or hand-made) indicates the introduction of an innovation in the process of spools production. This fact has complex consequences over the whole process of textile tools production and consumption in the Peloponnese and this case of study can become a valuable *comparandum* for similar discoveries in other ancient Greek regions.

A spools enigma. The Iron Age case at Arslantepe (Malatya, South-Eastern Turkey)

Romina Laurito; Federico Manuelli

Spools are peculiar textile objects traditionally interpreted as loom-weights for warp-weighted looms. They have been discovered in the Iron Age levels of a large number of sites in the Mediterranean region, from the Levant to inland Syria and Anatolia. Recently, scholars have tried to delineate the distribution, chronology and historical meaning related to the proliferation of these objects. Indeed, spools seem to spread rapidly throughout the eastern Mediterranean, in the early 12th century BC, but their exact origin and the timespan of their usage still remains debated. Moreover, their profusion all over the region during this period suggests the presence of some significant change in the textile production; but, which kind of change?

Unpublished data from the Iron Age levels at Arslantepe (Malatya, South-Eastern Turkey), shed new light on the reasons behind the appearance of these objects. The systematic analysis of hundreds of spools discovered at the site shows a clear change in the use of the textile techniques at the beginning of the Iron Age, characterized by a drop of other types of loom-weights and related to a probable increase of weaving activities.

In this poster, we will discuss the results from our analysis of the spools from Arslantepe, combining the techno-functional studies and the archaeological context investigation with experimental testing approaches, so as to inspect some aspects related to the production as well as the chronological distribution of these objects.

Textile Production in Orientalising Extremadura: The Evidence from El Palomar (Oliva de Mérida, Spain)

Beatriz Marín Aguilera; Javier Jiménez Ávila; José Ortega Blanco

The archaeological site of El Palomar (Oliva de Mérida) was discovered as a result of preventive activities in 1998. Two seasons of excavations provided important data for the knowledge of the Orientalising Period in the Spanish región of Extremadura, because it represents a pattern of settlement sited on the plain, with a developed architecture, that was absolutely unknown in these región until that date. Some general works about this site have been published, as well some data corresponding to metallurgical activities related to a bronze production workshop.

In this symposium we present the evidence related to textile crafts, mainly composed of an important collection of spindle whorls corresponding to different sizes and types.

The spindle whorls from El Palomar allow us to verify the presence of this kind of tools in the Orientalising Period (7th-6th centuries BC) in the Extremenian region, since in the 250 tombs of this period excavated in the cemetery of Medellín — the most important Orientalising site excavated to date— they have been not found.

The spindle whorls coming from El Palomar evidence, therefore, the development of textile activity in this region during the 7th and 6th centuries BC, becoming a good precedent for the much more eloquent evidences that will be provided, to the end of Early Iron Age, by the Post-Orientalising palatial complexes such as Cancho Roano.

Other applications of mordents salts and dyestuffs: from ars tinctoria to alquimia and botica

M.^a Julia Martínez García; M.^a Luisa Vázquez de Agredos Pascual

Ancient Pharmaceutical Laboratory of Santa Maria della Scala (Rome), was famous around Europe in the 17th and 18th centuries, as it was the pharmacy of different Popes. Royalty and nobility also looked for remedies for their ailments at La Scala laboratories. We have evidences of the use of inorganic salts or dyes materials as compounds in different formulations and pharmacological recipes.

This Ancient Pharmaceutical Laboratory the label inscriptions at the drug jars and box containers, point in so many cases to the mythological Greco-Roman beliefs. The physicochemical analysis and historical-cultural studies of the substances preserved in ancient European 'apothecaries' is helping to substantiate the presence and provenance of many inorganic drugs of Greco-Roman origin that were still in use in the Middle Ages and the Modern era such as "pietra divina" (composed of copper), *Terr. Lem.* (Lemnian earth), *Protosido de plomo* (litharge), *FLOR. SAMBUC* (*Sambucus nigra* L.), *Sal. Tartar. Solub.* (cremor tartare), *Gumm. Lacc.* (*Kerria lacca* Kerr) etc. The collection study represents the transition from a traditional pre-scientific framework—with many mythical and alchemical reference.

These references appears for other uses such as dyes, and mordents in Egypt Romain Papyrus Greeks (III- IV century AD) and Alchemical Greeks Books Collection recompiled around VII century AD by Byzantines authors. In Antiquity the treatises of materia medica such as of Dioscorides books and *Natural History* of Pliny the Elder does not distinguish between salts pharmacological application, and other uses suggested for same salts. In these treaties only something raw materials and their varied applications are described in the different areas. We find described in the ancient scientist writings "estiptical" salts that are very good mordants and at the same time are used for pharmacological-therapeutic purposes. Distinction will be carried out in later times. Even at the beginning of the Middle Ages, recipe compilations can highlight both uses. In this poster we want to show these coincidences and the other possible applications of dyes and salts that recommended the ancient sources for the dyeing of textiles, metals, stones, etc. Its uses in the alchemical recipes of fiber dyeing, and its subsequent evolution and reinterpretation in the beginnings of medical and therapeutic alchemy. We see that the same *medicamenta* used as mordents and dyes in textile and metals dyeing will be found in medicinal tinctures recipes, as evidenced the remains found in some containers of Ancient Laboratory of Santa Maria della Scala in Rome.

Tracing the Two-Beam Loom in Texts

Magdalena Öhrman

The discussion of the spread of the two-beam loom in the Roman world relies to a great extent on evidence from iconography. Archaeological textiles from Roman Egypt are suggestive of its use but beyond this area, neither textiles, surviving loom parts, nor weaving tools offer firm evidence for its use. Literary evidence therefore becomes particularly important.

Here, clear references to the two-beam loom occur considerably later than the first iconographic representation (ie. the frieze in the Forum Transitorium in Rome, 1st C CE) in Potamius of Lisbon (4th C CE) and Gregory the Great (late 6th C CE). However, two of the most detailed iconographic representations of the Roman two-beam loom, the wall painting in the Ipogeo degli Aurelii (Rome, 3rd C CE) and the richly illuminated Vatican Vergil manuscript (4th C CE), connect the two-beam loom explicitly with epic poetry and, as Wild has argued, with high-status contexts.

This poster explores whether the literary texts themselves permit a similar connection between weaving scenes in epic and the two-beam loom. Using an example from

Valerius Flaccus' *Argonautica*, the poster shows that motifs and working methods featured in epic from the 1st onward are consistent with tapestry weaving on a two-beam loom: through topographical details, Valerius incorporates in the inwoven motifs of the environs of Sparta several intersecting vertical and horizontal axes. The poster argues that these intersecting axes function not only within the motif described in this literary *ecphrasis*: they are also fundamental to their production as textiles. Whether working on an inset tapestry section – such as the roundels or squares commonly seen on Late Antique tunics – or on a fabric woven entirely in tapestry technique, the weaver creates the pictorial motif working vertically, adding weft levelly across the whole width of the motif either from the top (on a warp-weighted loom) or from the bottom (on a two-beam loom).

The poster discusses whether passages like this, carefully analysed with craft practice in mind, may further underpin Wild's hypothesis of an initial connection between the two-beam loom and tapestry technique at least in such high-status context as are privileged in Roman epic poetry.

Structures, tools, and processes in the production of painted shrouds in Roman Egypt

Jónatan Ortiz García

Painted shrouds from Roman Egypt are an unparalleled source of information in the ancient Mediterranean. The practice of using more or less rigid decorated textile wrappings had an important development following a tradition coming down from very ancient times. From a technical point of view, these textiles have demonstrated great potential to study how workshops and workers operated. This poster deals with the documented steps and sequence (*chaîne opératoire*) involved in creating and using a shroud decorated with funerary iconography.

Textiles in Archaic Greece: Materials and Production

Eleni Papadogiannaki

In Archaic Greece there was a variety of fabrics and colours. Women used to weave textiles elaborated by images representing scenes either from everyday life or from battles. The materials used usually were flax, wool and silk. Our evidence about materials and production of archaic textiles come from both archaeological and literary sources.

This poster focuses on Homeric poems and tries to present the way that textiles are described. The emphasis lies on the vocabulary, especially adjectives, used about textiles and their materials. This approach will perhaps lead us to some suggestions about clothing in archaic times, considering also the images woven on textiles.

Still looking for the kerkis

Anna Pavani

At *Crat.* 388b13-c1, Socrates defines the name by comparing it to a weaving tool: the *kerkis*. Which instrument does Socrates/Plato have in mind?

In this paper, I will argue that the *kerkis* does not correspond to a "shuttle", as traditionally hold, nor to a "pin-beater", as recently argued, but, rather, to a sort of "comb".

As Ademollo has pointed out in his running-commentary on the *Cratylus*, the traditional identification of the *kerkis* with a shuttle has been amply demonstrated to be wrong: passing the thread of the weft between the threads of the warp is not, as long assumed, what the *kerkis* does. The poetic sources also suggest that this identification is incorrect: as Dover explains in his commentary on the *Frogs*, the melody traditionally attributed to the *kerkis*, i.e. harmonious sounds like those of a plectrum, can hardly apply to the shuttle.

In *Textile Production in Classical Athens*, Spantidaki also argues that the *kerkis* does not correspond to the shuttle. According to her survey, the *kerkis* should be rather identified with a "pin-beater", i.e. the instrument used to separate the threads and to beat the weft into place. Relying on usually neglected sources, I shall show that the latter task was not accomplished by the *kerkis*, but, rather, by the *spathê*.

If the "pin-beater" corresponds to the *spathê*, however, what does the *kerkis* correspond to? I shall argue that only after the weft (*krokê*) is inserted through the warp (*stêmôn*) by the shuttle and beaten by the *spathê*, is it up to the *kerkis*, a kind of "comb", to divide the threads.

Textile production in Roman Piedmont (Italy); the case of Castiglione Torinese

Alessandro Quercia

Between 1996 and 1999 the excavations carried out by the Soprintendenza Archeologica del Piemonte discovered a rural settlement located in the northern part of Piedmont, among the Roman towns of Augusta Taurinorum, Carreum Potentia and Industria. The investigations unearthed the rests of a small building dated to the 1st century AD, in association with numerous artifacts, primarily pottery and glass vases. Within the materials, a group of nearly 50 truncated pyramidal loom weights were found in a pit associated with the building. A such big concentration of weaving tools is quite uncommon in Roman Piedmont, where loom weights were rarely found in sets and in association with significant archaeological contexts.

The analysis of this group of loom weights based on dimensional parameters, like as weight and thickness, gives important information on the presence and features of textile activities on the site. Also, their association with other materials almost entirely preserved in the archaeological context sheds lights on the role and the nature of the building (¿textile workshop, shop?).

Crafting the dress: from textile tools to iconography at the neolithic site of Strofilas, Andros, Greece

Christina A. Televantou; Gerasimoula Ioanna Nikolovieni

Cape Strofilas in the center of the west coast of Andros, Cyclades, is a naturally fortified location. It surveys the area from Attica and Euboea to Syros, Paros and Naxos, and controls both the sea route and the south part of the island. On the large plateau (approximately 0.20ha.) on top of the cape, are the ruins of a fairly extensive and densely constructed proto-urban settlement, belonging to the "Attica- Kephala" cultural horizon, with a predominantly maritime character. The buildings, apsidal and rectangular in plan, are impressive. Strofilas opened a large chapter on rock-art representations, which are found mainly in public spaces, open-air and internal. It also appears to have played an important role in the Final Neolithic period, in a wider network of smaller and/or similar settlements in the Aegean islands and especially in the Cyclades.

Amongst the abundant finds, spindle whorls and impressions on pottery suggest activities relevant to textile production, namely spinning and weaving. Dress making is attested not only by sewing tools, such as needles, but also by various artifacts, such as pins and a fibula.

But how were they really dressed? The data available from the iconography, such as figurines and rock art representations of people wearing garments, opens a discussion on the neolithic dress and the cycladic textile production in which the site of Strofilas will attempt to take part.

Cultura tessile a Pompei: instrumenta textilia

Pamela Ricci; Vanessa Forte

Il poster presenta i risultati dello studio in corso su un categoria fondamentale di *instrumenta textilia*, ovvero i pesi da telaio, grazie ad una ricerca ad ampio raggio svolta all'interno del progetto "Cultura tessile a Pompei". Considerando l'eccezionale quantità dei ritrovamenti nella città vesuviana si ritiene che anche questa classe di manufatti, spesso poco approfondita negli studi passati, possa al contrario fornire un'ulteriore chiave di lettura insostituibile per ricostruire il quadro della produzione tessile della città.

Lo studio dei pesi pompeiani ha dato avvio a partire dal 2017 ad una ricognizione sistematica di tutti gli esemplari di pesi in terracotta rinvenuti nel sito vesuviano, la cui documentazione, studio tipologico e analisi archeometrica hanno messo in luce importanti aspetti relativi alla distribuzione nel tessuto urbano, con particolare concentrazione in alcune *insulae*, ma soprattutto hanno permesso di individuare possibili aree o contesti deputati a svolgere funzioni nella catena produttiva tessile. Per stabilire l'effettivo ruolo che i pesi da telaio ritrovati potessero avere nella sequenza produttiva si è sviluppata una metodologia multidisciplinare che con l'ausilio dell'archeologia sperimentale integrasse lo studio di tutti gli aspetti morfologici con indagini sperimentali sulle analisi composizionali, sulla ricerca e valutazione delle tracce tecnologiche e d'uso. Infine, riguardo invece allo studio dei singoli manufatti, si sono potuti rilevare altri dati significativi; ad esempio si è constatata una significativa differenziazione a livello morfologico, sia nella variabilità dei segni impressi o incisi sulle superfici sia nella presenza anche di bolli con diverse sigle e elementi decorativi; grazie alle analisi archeometriche sugli impasti, sono stati raccolti importanti elementi sulla loro realizzazione.

Experimental approach to Getulian ostrum and purpurissum: elaboration of coloring matter and pictorial verification

Carlos Gustavo Rodríguez Díaz; Narciso Manuel Hernández Rodríguez

The *Stramonita haemastoma* is one of the main marine mollusc species from which the highly valued purple was produced in the ancient history, around the Mediterranean. We also find it on the coasts of the Canary Islands, in the Atlantic Ocean, close to the northwestern African shore. Ancient sources pointed to this area as the place where one of the best considered purple classes was produced: the Getulian purple. While archeology is currently trying to respond to the relationships that may have existed between that geographical area and the ancient civilizations of the Mediterranean, our contribution to this scientific debate has been to demonstrate the capacities and qualities for the painting of the aforementioned mollusc that, we suspect, could have been a fundamental component of the purple exported from Getulia. The field of interest is painting because we know through Pliny that there was a purple-product called *purpurissum*. The equally appreciated Getulian *purpurissum* corresponded to the purple from Getulia. The *purpurissum* in general was an expensive pictorial coloring matter used sparingly by the ancient painter, as the result of mixing *ostrum* and an inert pigment. It was called *ostrum* to the raw material extracted from the marine mollusc that the painter prepared, used and differentiated from the *purpurissum*.

Our research therefore has brought us closer to what the Getulian *ostrum* and *purpurissum* were using only *Stramonita haemastoma* as raw material. After some preliminary tests, we carried out several experiments to produce *purpurissum*, based in texts from ancient literature and experiences of modern authors such as Joseph Doumet, Inge Boesken, Otto Elsner and Ehud Spanier. Then, with the resulting product and *ostrum* whose preparation is simpler, we have performed the respective pictorial verifications, mainly with usual procedures, techniques, materials and supports in Roman painting. The purple shades obtained have been classified under the Munsell colour measurement system.

The nomenclature of the purple in the Ancient World

Carlos Gustavo Rodríguez Díaz; Narciso Manuel Hernández Rodríguez

We believe that one of the reasons for the success of the purple during the ancient history was the diversity of shades, within its hue, that could be obtained when the dyer used the raw material with different methods, techniques and materials. The high point of the expertise of that type of craftsmen with the purple happens between the first century BC and the first century AD, during the military development of Rome. It was gradually disappearing in time after the Fall of the Western Roman Empire. However, the presence of this product highlighted in the previous centuries and mainly around the Mediterranean Sea. This chronological and geographical route of the purple had its consequences in the different spoken languages of that moment. Many terms that designated those purple shades were written in the ancient documentary sources. It is logical that in view of that spatial and temporal amplitude, nowadays such words cannot be understood accurately by the scholar. To shed light on that problem, we have been inspired by the brief orderings of the purple shades or the kinds of purple that Vitruvius and Pliny wrote to give an overview of that fact. From there, we approach the purple hue from different points of view, thanks to the information also provided by other documentary sources of antiquity and the contrast of all of them with recent studies. This work has allowed us to gather a large number of words from different ancient languages whose meanings are related to the purple shades that were known. Although it was complicated, we have classified them in an approximate way taking as a reference the modern colour theory, or more specifically, the Munsell colour system with their purple subgroups.

El santuario de Onuba (Huelva) y su zona artesanal: la producción textil en un ámbito cultural

María Irene Ruiz de Haro

Con la exposición de este estudio seguimos las líneas de investigación y propuestas de una hipótesis de trabajo centrada en la visibilización en la Península Ibérica de centros culturales cananeos donde se desarrolla la artesanía textil. Concretamente de la existencia de un modelo de producción e intercambio cananeo, formando anexos constructivos a recintos culturales, los cuales se sitúan dentro de la ruta comercial mediterránea que ubicamos en una serie de santuarios dispuestos en la Península Ibérica.

Para este estudio nos centramos en el importante santuario cananeo situado en Onuba y en el estudio de su área artesanal circundante, el cual responde al mismo esquema estudiado con anterioridad en el Santuario de El Carambolo (Camas, Sevilla).

El papel del agua en las actividades textiles

Elena H. Sánchez López

De forma tradicional, los estudios sobre los usos del agua en época antigua se han centrado de forma fundamental en el análisis de los complejos termales romanos, y en menor medida, de las fuentes, principalmente aquellas más monumentales, los ninfeos. Más recientemente se han ido incorporando a la bibliografía algunos estudios integrales sobre la gestión del agua, incluyendo aspectos como su ciclo urbano, desde los diferentes sistemas de abastecimiento hasta la gestión de los desechos líquidos.

Sin embargo, la mayoría de los usos para los que el líquido elemento fue imprescindible apenas han sido objeto de análisis desde la arqueología del agua. Destaca en este sentido el escaso interés por el papel del agua en los diferentes procesos productivos (como los destinados a la producción de cerámica, salazones o aceite) y el análisis de las estructuras destinadas a su gestión en los diferentes talleres y centros productores.

El presente póster pretende abordar estas cuestiones en relación a la producción y tratamiento textil, analizando el rol fundamental del agua en los diferentes procesos, tanto aquellos destinados a la preparación de la materia prima, caso del lavado de la lana o el enriado del lino, como los vinculados a tratamientos posteriores como el teñido, el hilado o el subsiguiente lavado de los tejidos. Análisis que se completa con el examen de las estructuras ligadas a su gestión.

Textile tools from the Iron Age and Roman settlement of Gropello Cairoli (Pavia), Italy

Serena Scansetti

The poster examines evidence for textile production at Gropello Cairoli (Pavia), through the study of textile tools found during different archaeological surveys and excavations in the 20th century. Most of the findings date back to the Iron Age and Roman Age (from the third century B.C. to the first century A.D.), but the group also includes a few prehistoric tools.

Sheep shearing and spinning are very well documented activities in this site, with several shears and clay spindle whorls, coming from both burial and domestic contexts. Spindle whorls present a great variety of shapes and weights, and, with their massive presence, they contribute to understand local economy. Some clay loom weights, as well as clay spools, glass distaffs and bronze needles suggest that every step of textile industry was undertaken in the village.

Findings are at the Museo Archeologico Nazionale della Lomellina, in Vigevano (Pavia).

De los recursos ganaderos procedentes del taller de púrpura de Lobos 1 (Fuerteventura, Islas Canarias), stocks para la subsistencia de los murilegui, de su origen y aprovisionamiento”

Celia Siverio Batista, Mercedes del Arco Aguilar; M.ª del Carmen del Arco Aguilar

Los registros arqueofaunísticos de especies domésticas localizados hasta la fecha en el Taller de Lobos (Fuerteventura), que constituyen los detritus generados por una parte de la estrategia alimenticia de los *murilegui* asentados en él, muestran un espectro de taxones que contempla ovicaprinos y suidos y en el que faltan, por el momento, bóvidos, equinos o aves de corral, y tampoco parece reconocerse la complementariedad con taxones animales salvajes, salvo en el grupo de la avifauna.

Nuestro objetivo se centra en comprender las redes de suministros e intercambio de bienes de producción animal llevados a cabo por los agentes económicos que llegan al islote de Lobos. Las hipótesis que barajamos abarcan desde la carga de porciones cárnicas bajo preparaciones de salazón, salmueras o cecinas, hasta la incorporación de ejemplares vivos, la obtención de productos y la capacidad de reproducción de estos animales en los enclaves de destino. Estos suministros pudieron adquirirse tanto en el puerto de origen como en las distintas escalas a efectuar, debido a las condiciones de navegación, así como haberse surtido una vez alcanzadas las islas, ya que, para entonces, existía población, al menos con seguridad dado el registro arqueológico, en la de Lanzarote, si manejamos el uso de una entrada al Archipiélago por el NE.

Metodológicamente abarcamos la clasificación y caracterización morfológica y genética de los taxones, su contrastación con los registros insulares próximos de Lanzarte y Fuerteventura, y su comparativa con otros ámbitos africanos y del Bajo Guadalquivir. Si bien solo estamos en la primera fase de nuestro estudio, quedan ligados a los procesos de alimentación de los operarios del taller y, por ahora, el registro arqueológico nos muestra detritus óseos, restos esqueléticos que hablan del sacrificio *in situ* de los animales, con indicios de procesado de porciones de ciertas dimensiones, así como esqueletos craneales, por lo que además del consumo de eventuales salazones o cecinas, de difícil constancia en el registro, se habría practicado con seguridad el consumo de carne fresca, tras el sacrificio de reses que sabemos estuvieron, al menos en parte, en régimen de suelta, dato que conocemos por medio de las esferulitas halladas en los estudios analíticos de los sedimentos.

Indudablemente el registro muestra una selección sobre el conjunto de taxones que eran explotados en los territorios de origen o de recorrido de las gentes de Lobos y que formaban parte de su cultura culinaria y de su habitual sostenimiento. Podemos considerar que fue una estrategia planificada por las características de la empresa o también que el suministro se habría producido ya en aguas del Archipiélago, donde ese mecanismo de adaptación llevaba ya un tiempo efectuándose.

Prehistoric spindle whorls from Central Europe

Jana Staničová Charles

The poster is dealing with textile production during Neolithic and Aeneolithic periods in south western Slovakia, eastern Austria and Moravia. Data presented are based on material found previously in this area and stored at various institutions. Spindle whorls of these periods were not analyzed from this region previously.

The main site evaluated is Blatné in SW Slovakia, with more than 160 spindle whorls found. I put spindle whorls to a database made by CTR and I followed their manual for recording and interpreting textile tools. The database in MS Access containing detailed information about each object, supplemented also with photography. Besides work on actual finds, the database is complemented also by information on finds based on publications, but only in cases where complete information about textile production tools is provided. Finally, a welcome addition work in the Natural History Museum in Vienna, both with the finds, but also with the records kept there.

Sites presented in this poster are Blatné, Přešovice, Čubernice u Ohrozimi, Čechovsko u Čechovic, Jevišovice-Starý Zámek, Grešlové Mýto, Kostjelec na Hané and others. The conclusions based on this database show, with the help of diagrams and graphs, the most common type of spindle whorls, but also their weight, diameter and other information connected with description of material and context. One of the scatter charts shows distribution of various types of spindle whorls according to weight and diameter in different sites. There will also be a map that represents exact location of the sites with the most common type of shape and weight, so it will be possible to see preferred types of spindle whorls in each region. For now, we can say that the most popular shape is biconical and spherical, other parameters will be displayed on poster. The poster will also discuss the decoration on the spindle whorls, which is mostly incised. The poster should give a comprehensive view on textile production during Neolithic and Aeneolithic period and to find some differences between spindle whorls found in these two periods and among the sites.

Textile and organic residues on Pre-Roman bronze belts (cinturoni) at Ascoli Satriano (prov. Foggia/Italy)

Ulrike Töchterle; Christian Heitz

Since 1997 the Department of Archaeologies of the University of Innsbruck has been carrying out excavations in Ascoli Satriano (Puglia, Italy). The findings date from the pre-Roman period (8th - 3rd centuries BC), when the area was inhabited by an indigenous population known as Daunians. In the course of the archaeological investigations, extensive restoration measures are carried out, not only to preserve the archaeological artefacts, but also to systematically access all the information obtainable on the production and archaeological context of an object.

Bronze belts (cinturoni) are a characteristic component of pre-Roman tombs of the area. Despite the strong corrosion and contamination of their ancient surfaces, these could be used as important information carriers for manufacturing and decoration techniques as well as for the use of the objects. Particularly in the scatter of corrosion products, organic coatings or pseudomorphs of the deceased's clothing can be preserved, as observed in several cases at Ascoli Satriano: On the belt in tomb A4 of the Colle Serpente amorphous remains of leather under the stereomicroscope could be identified as belt edge trimmings and various textile structures (coarse fabric in simple canvas weave and a fine ribbed fabric). The deceased was placed on skins under which a thin layer of plant material (leaves and stems) was spread out. Very similar microstratigraphic findings were discovered when restoring the belts of tombs 05/07, 1/08 and 3/11 of the Giarnera Piccola. The complex textile remains provide important insights into the organic-material elements of Daunian costume, hitherto rarely noticed. The fact that textile production played an important role among the Daunians is not least suggested by numerous loom-weights found in their settlements.

The perception of Colors and Textiles in the Greek Ritual and its Relationship with Cult Images

Jorge Tomás García

This proposal intends to make a preliminary reflection towards a new interpretation of the Greek "sacred laws" and their relationship with the cult images. Beyond the recent works on the dynamics of rituals in the Greek context and their spaces, the subject of the representation of the divine and its dynamics will be at the center of our reflection. The last decade has witnessed a revival of interest in the subject of Greek sacred laws.

This grouping has been described as an ill-defined "category of work" consisting of quite diverse inscriptions that belong to the ancient Greek religion. Within the breadth of the concrete lexicon of sacred laws we will focus our analysis on the connections between the colors and textiles used in rituals by their active agents through the epigraphic sources. The study of the inscriptions that regulate the cult during the rituals reveals that the colors could be object of a particular attention. The color and decoration of the clothes of the priest are subject to strict regulations. The analysis of this lexical content related to the religious visual culture of Greek sanctuaries will allow us to attend the installation and visualization of a cult image in these Greek rituals.

Roman-period Textile Tools of Northern Britain

Lisa A. Venables

Our understanding of the nature, organisation and scale of textile production in Roman-period Britain has been informed mainly by the work of JP Wild. A major starting point for the subject can be found in the publication of his thesis in the work 'Textile Manufacture in the Northern Roman Provinces' (1970). In this Wild presented a broad overview of the finds of ancient textile tools and situated them within his understanding of the 'logic of construction' (the chaîne opératoire). In 1992, Bender Jørgensen revisited Wild's survey as part of her updated catalogue of the finds of tools from Northern Europe to AD1000. Pre-Roman period textile production was conceived as low level & mainly directed towards self - sufficiency but the new political situation of Roman conquest has led to assumptions that the nature, scale and organisation of textile production in the province changed and very quickly, to meet the increased needs of the new imperial military market with its garb of 'Roman' garment types.

In terms of how that was achieved Wild does not commit overly to how this was organised but views the 'industry' as neither static nor uniform, either technically or organisationally (2002). He has argued that half the households of rural Roman Britain would have contributed to the army's annual textile requirements when military occupation was at its height, favouring a shift from small-scale production at some undefined point in time to that of an 'estate production' model.

The most recent survey of categories of Roman-period textile tools, correlated against settlement types has lead the authors to conclude that, tentatively, the centralisation of wool production/textile manufacture at roadside settlements during the later Roman period (2017).

Described as 'mundane' and 'ubiquitous' the study of textile tools objects has been limited by an assumed knowledge which merits no further explanation. Ancient working lives, moreover, the lives of women in the past, appear unproblematic. Also, as the many stages of fibre processing appear to be organised along the same general principles across the ancient world (understood as the chaîne opératoire), one might argue the cross-cultural activities of textile production allows us to 'see' similarities and shared experiences but, equally, this should not be over-emphasised as the study of textile tools is important because, whilst these artefacts represent evidence for textile production, through their variability, may equally represent technological change and/or product variation (within certain parameters). Until this data is collected in a standardised format and subjected to scientific analysis, assessment of what was produced, how and where will remain speculative.

My poster presentation will discuss the methodological difficulties that I have encountered in my survey of the textile tools recovered from Roman-period settlements in North-East Britain and present the initial results of metrical data/functional parameters of those spindle whorls recovered during archaeological excavations.

Textiles and Seals: On Use of Seals with Textile Motifs in Bronze Age Greece

Katarzyna Żebrowska

The aim of this poster is to present the preliminary results of a research carried out within the project "Textiles and Seals. Relations between Textile Production and Seals and Sealing Practices in Bronze Age Greece" (financed by the National Science Centre, Poland, conducted by Dr. Agata Ulanowska) and concerning seals with textile motifs used in the Aegean region during the Bronze Age (c. 2650-1200 BC).

Hitherto, the analysis of the imagery of more than 250 selected seals and impressions allowed to re-evaluate the previously distinguished motifs and identify several recurring iconographic references to textile production, as well as the different stages of its chaîne opératoire. Among them were representations related to the type and preparation of raw materials, textile tools, and the technologies of spinning and weaving used in the process. This study also enabled the distinction and classification of repeating combinations of textile motifs present either on one or more seal faces within the investigated repertoire. Such approach permitted to deepen our understanding of how textile production was reflected in the imagery of the Aegean glyptic and explore it as a sources of textile knowledge. A group of seals bearing the motif of a sheep was chosen for the purposes of this presentation as a case study in order to investigate the ways in which these specific objects were used and check what relations, if any, existed between the depicted motif and the use of these seals.
