

Session 1

Looking back: The progress of textile research in Northern Europe and the Mediterranean

Keynote lectures:

Textile archaeology in Northern Europe.

Lise Bender Jørgensen (Norwegian University of Science and Technology)

The study of archaeological textiles in Northern Europe has seen rapid progress in recent years. An increasing number of scholars from different disciplines have been attracted to this field of research, adding new data, using new sophisticated methods, and asking new questions. Our knowledge of prehistoric and early historic textiles in Northern Europe has been filled in and fleshed out since the turn of the century, and re-examinations of old finds have resulted in several surprises. While textile studies previously tended to focus on the documentation of textile finds, tools have emerged as an important new field; scientific methods of dating, fibre and dyestuff analyses are significantly improved, and new cutting-edge methods are promising to make it possible to establish the provenance of textiles and chart the evolution of fibre-producing plants and animals. This lecture will present a survey of this development and an attempt to outline how we might proceed.

Textile archaeology in Mediterranean Europe: Progress in the 21st century

Margarita Gleba (Ludwig-Maximilians-Universität München)

In contrast to northern and central Europe, archaeological textile research in southern or Mediterranean Europe has been lagging behind until the 21st century, but the last two decades have seen it develop into a thriving field. New conservation and analytical techniques and novel interdisciplinary approaches have championed new finds and discoveries, as have numerous projects supported by national and EU research funding bodies. The last decade has witnessed a veritable explosion of publications on the subject. The regular Purpureae Vestes conference, modelled on the NESAT and scheduled to hold its eighth meeting in 2022, attracts hundreds of international researchers. CTR Anniversary conference provides a suitable forum to assess the progress made and look at the future perspectives for textile archaeology in Mediterranean Europe.

Session 2

Landscapes of textile production

Keynote lecture:

Technical, economic, and social aspects of the textile landscape with case studies from Central Europe 2000 BC-1000 AD

Karina Grömer (Natural History Museum, Vienna)

The keynote for session 3, “Landscapes of textile production” reflects our understanding of applied research on archaeological textiles and related sources. The motivation is to improve understanding of the role of textile production and textile products in the history of humankind. For pre- and protohistory in the region of Central Europe, it is a challenge that actual textiles artefacts are among those organic materials that are rarely preserved under the prevailing climatic conditions. Some of them, such as the ones from the Hallstatt saltmine will be discussed in the case studies, as well as other sources like textile tools, settlements contexts, written and pictorial sources.

In an interdisciplinary and integrative approach, textile landscapes and textile cultures are studied – such as the Iron Age, the Roman Period and the Early Middle Ages in Central Europe. On-site studies, regional and supra-regional research with big data analysis results in long-duree views and changes over time, but also on our understanding of regional differences within a certain time-slice. What are the textile techniques and the textile design principles in certain geographical regions and time periods? For this, Migration period landscapes in Europe are of interest, discussion different “textile espressions” e.g. by Bajuvarians and Avars in the 6th and 7th century AD.

Among the economic and social aspects of the textile landscape, textile production and consumption has to be discussed and the identities of the people behind. Across all periods in Central European Prehistory, it is the Hallstatt Culture that provides the most detailed information about those aspects of textile craft.

Live papers:

Textiles and Seals. New evidence for textile production in Bronze Age Greece from seals and clay sealings

Agata Ulanowska (University of Warsaw)

The ongoing research project entitled “Textiles and Seals” (2018–2021), explores the significant and multifarious relationships between textile production and seals and sealing practices in Bronze Age Greece, from the Early to Late Bronze Age (c. 2650–1200 BCE). This paper aims to present the first results of the project which refer to the three main areas of the research undertaken: 1) the range and qualities of textile products used in storage and sealing practices, as evidenced by textile imprints on the casts of clay sealings and their undersides; 2) the use of seals for stamping textile tools and possible site-specific (administrative?) meanings for this practice; 3) visual references to textile production in the iconography of seals and in graphic forms of Cretan Hieroglyphic script signs.

The discussed phenomena point to an entire network of references between textiles and textile production and the dynamics of sealing practices in Bronze Age Greece, reflected in textile production-related iconography, notation practices on textile tools including stamping seals on them, and new evidence of numerous textile impressions documenting technical uses of threads, cords, and fabrics.

A weaving workshop in the roman villa of Telhal (Sintra, Portugal)

Alexandre Goncalves and Ângela Ferreira (University of Lisbon)

The archaeological site of Telhal (Sintra, Portugal) is located in the territory (*ager*) of the roman city of *Olisipo* (present Lisbon), which was the maritime port of Lusitânia and was exceptionally well located to support and prompt navigation between the Mediterranean and the Atlantic during antiquity (Fabião, 2020).

Recent archaeological excavations at Telhal revealed a roman *villa* dating from II – IV/V centuries A.D. and focused mainly on the areas of the property dedicated to production (the *pars rustica*). These areas are usually poorly known because most excavations of *villae* target the main habitation area, where mosaic floors are usually found.

A large number of loom weights and bone needles was found in one of the excavated areas, thus suggesting the *villa* held an area dedicated specifically to weaving.

The archaeological contexts and artefacts related to the textile production that took place in this Roman *villa*, located in a region where this economic activity must have been relevant in the past, are presented.

Tools for eternity: significance of Peruvian Pre-Columbian textile production tools *Elizabeth Palacios (University of Amsterdam)*

In the Pre-Columbian Andes, the textile objects were products that transcended their status in all spheres of society. They had not only utilitarian use by symbolic. They were present in various levels of social relations, as communication media, ritual agents, or hierarchical symbol, as well as in economic and political relations. These values are represented in the objects collected since the invasion and reported in the early chronicles. The burials arrangements are important source of information about the relevance of textile production. Particularly in the case of weaving tools included as gifts or offering within the graves. Such significance cannot be ignored since it represents and acknowledges them within the individual cycle of life; moreover, such fact, of placing them along for eternity, transfer the significance of the activity, so transcend the value of the production process acknowledging the performance, the performer along the product itself. These tools capture various extents while expanding from their original purpose, as the tool becomes product, and the utilitarian becomes symbolic. This paper would explore the features of Peruvian Pre-Columbian textile production tools collected from graves, in relevant textile collections in the Netherlands, to discuss the significance of these objects in the context of representation of Pre-Columbian textiles.

Raincoats or Riches? Practically Investigating the Role of Vararfeldir in the Material Environment of the Viking Age North Atlantic *Julia Hopkin (Exeter University)*

Dynamic exchange networks across the North Atlantic Norse diaspora were central to the Viking Age economy, and much research has focussed on key trade products, including Icelandic fleece pile cloaks (*vararfeldir*). However, despite broad interest in their economic role and technical construction, few studies have investigated how *vararfeldir* were actually used, or why they were produced and traded so extensively when other materials were available.

To better understand the forces driving their production, this project compared the functionality and production requirements of reconstructed *vararfeldir* with contemporary materials, including plain textile, sheepskin, and furs. A combination of controlled experiments and public surveys examined their physical properties, sensory qualities and conceptual associations, and suggest that the demand for *vararfeldir* is unlikely to have been due to functional superiority alone but was more probably driven by a complex mixture of situational practicalities, production advantages and subjective perceptions.

The holistic approach taken in this project provided transformative insights, not just into *vararfeldir* themselves, but how their production fitted into the bigger picture of resource usage, competing trade

networks and individual experiences, emphasising the potential of open-minded, multi-perspective, contextualised investigations to broaden our understanding of textiles as societally embedded technologies.

A hidden industry? hand-knitted stocking production in late 16th century Norwich, England.

Lesley O'Connell Edwards (independent scholar)

The early modern period in England saw a great expansion in the production of knitted stockings. Norwich, the second city in the land, was noted for its production of these: even Queen Elizabeth used them. Knitting was a domestic industry, without a regulatory body, and no systematic records. Despite this, knitted stockings and knitters appear in a wide range of sources, from civic and national government records to contemporary writings and personal papers. This paper will draw on these sources to demonstrate the volume of trade in knitted stockings, uncover the lives of some of the knitters in late 16th century Norwich, discuss the types of stockings being knitted, and reveal some of the production and marketing processes of this trade.

Textile handiwork of young women at the end of 18th century in Oulu, Finland

Tiina Kuokkanen (University of Oulu)

In early modern Finland, almost every woman practiced handiwork from childhood to old age. Textile handiwork included several fields from spinning and knitting to weaving and sewing. And these fields included several steps and items. Also, in early modern society children and young adults were significant part of population, but it is challenging to find them from written sources, because they are usually produced by adults. This presentation discusses probate inventories as a source material in studying domestic textile handiwork of young women. Examined material comprises of six probate inventories, that were made to women under 30 years. Probate inventories were legal documents and the property of the deceased was documented precisely. According to previous studies, it is possible to study clothing from early modern Swedish probate inventories, because clothes were valuable property and therefore documented precisely. We know also, that if we study women from all age groups, we can use probate inventories as a source material to study domestic textile handiwork. But what if we focus to the youngest women to whom the probate inventories were done?

Recorded short presentations and posters:

What are the characteristics of tools for weaving?

Katrine Brandstrup (independent researcher) & Susanne Lervad (CTR, UCPH)

In this paper, a basic analysis of the concept of weaving is presented using the focus and perception of the weaver as a framework for delimiting its fundamental characteristics. The concept of weaving and objects relating to it are represented primarily verbally but using non-verbal methods too. The functional analysis is followed by an investigation of how weaving tools are constructed - exemplified by a case study of the looms produced in the Danish loom factory, Lervad as represented in the company's catalogues from the 20th century. The aim of this work is to contribute to the current debate by proposing a platform linking resources such as the vocabularies of Centre International d'Etude des Textiles Anciens (CIETA), Nordisk Tekstillärer Forbund (NTF), textilnet.dk and Centre for Textile Research's Tools and Textile Database.

Depositional histories: textile tools tell tales

Jennifer Beamer (University of Leicester)

Historically, scholars of prehistoric textile technology have utilized contemporary analogs to portray British Iron Age textile production; however, textual accounts are incomplete. Predicating our understanding of British Iron Age textile production technology on socio-temporally and historically disparate societies and building the concept of a technological system on those analogs, creates underlying problems in our interpretation. Fundamentally, technology is socially generated.

Exploring tool functionality through the operational sequence is imperative for considering how the variables of production influence each other (Andersson Strand and Nosch 2015). This contextualizes production in a local landscape. Studying a tool assemblage also engenders a holistic analysis, affording a deeper examination of the interrelationships between different types of craft production.

However, British Iron Age textile tools are recovered from non-production contexts. Understanding how textile tools become placed stratigraphically is conducted through depositional histories studies, which is essential to understanding behaviours of past societies. Textile tools are regarded in British Iron Age studies as a residue of domestic activities and interpreted as rubbish, leading to the unsatisfactory conclusion that textile tools only ever represent utilitarian activities. A case study example from Danebury hillfort (Hampshire, UK) shows the depth of interpretive value textile tools have when viewed in their depositional context.

The loom weights of the 3rd / 2nd millennium BC of Torre Velha 3 (Serpa, Portugal). An initial technical-typological contextualization.

Catarina Costeria (University of Lisbon), Eduardo Porfírio (University of Coimbra/Municipality of Sintra), and Miguel Serra (University of Coimbra)

The Torre Velha 3 archaeological site is located in the municipality of Serpa in southern Portugal, more precisely on the left bank of the Guadiana River. It shows occupations between the 3rd millennium BC and the 8th century AC, the most relevant happening in the Bronze Age, in which habitational and funeral contexts are recorded. Notable among these is the greatest number of hypogea identified in the Southwest of Portugal, with architectural and ritual characteristics which show connections to the argaric world.

In this poster we analyze a set of ceramic loom weights whose chronology dates back to the 3rd / 2nd millennium BC, in a typological, technological and spatial perspective, reflecting on the transformations in the technologies of textile production between the Chalcolithic and the Bronze Age in this territory.

This region presents an expressive and diverse set of vestiges related to weaving, namely textile tools, remains of fabrics and anthropological traces coinciding with its practice. With the present work we intend to contribute to the study of weaving during Recent Prehistory in the west end of Europe.

Socio-economic condition and work atmosphere of handloom weavers in Sonepur District of Odisha, India

Chandrashree Lenka and Jhulana Rani Behera (Sambalpur University)

Handloom Industry is the second largest industry next to agriculture providing livelihood to millions of weavers in India and plays a very important role in the country's economy. Handloom weaving in India is an inherited art where weavers learn to weave from their ancestors and thus this craft is practised widely in rural areas and is providing employment to a wide section of rural artisans. Despite the fact that Indian handloom industry has made a distinct place in the world, this sector has not attained proper importance as far as weaving related problems and their effects are concerned. By considering the above problems our

present study focus on the designing details about Socio-economic background and work atmosphere of handloom weavers in Sonepur District of Odisha, India. The data was collected randomly from 320 handloom weavers with the help of questionnaire cum interview scheduled method. The result of the study revealed that majority of the weavers belonged to 20-30 years of age group out of which 53% were men and 46% were women. Men weavers were found to be more educated than women weavers. Most of the respondents found to be married. 90% weavers found to work under master weavers and very few of them found to be independent weavers. Most of the respondents were working for less than 8 hours per day and took about 12-15 days to weave one saree. Information on socioeconomic class of respondents showed that 68% men and 84% women respondents belonged to upper lower socio-economic class and all most every respondent had their own loom with all facilities. This study revealed that there was no weaver's society which plays one of the major constraints such as marketing issue for the development of selling of textile. Therefore government should take necessary action to educate the weavers to create new designs and develop marketing facilities to popularize the handloom products all over the world.

Textile industry at Olynthos: revisiting the primary evidence

Bela Dimova (British School of Athens)

The ancient city of Olynthos in northern Greece plays a crucial role in our understanding of domestic economy and textile production in the Classical world. Olynthos was destroyed in 348 BCE by Philip II of Macedon, leaving a rich record of domestic life in a fourth-century city. Excavations during the 1920s and 1930s uncovered the remains over 100 houses, including over 4000 textile tools, mainly loom weights. The archival data on Olynthos have provided a good foundation for studying the spatial distribution of textile manufacture across households (Cahill 2002), but the artefacts themselves have not been studied first-hand since the 1930s (Wilson 1930). This paper revisits the textile tools from Olynthos and presents new primary data for cloth manufacture in the city. It considers their functional properties, contexts (as far as they can be reconstructed) and shapes, and discusses the place of Olynthos in relation to regional weaving traditions and historical developments.

The ancient clay spools of Peloponnesian. Questioning their function through their features

Alina Iancu (University of Bucharest)

The present paper gives a preliminary picture on the features of the ancient Peloponnesian clay spools to better understand their almost enigmatic functionality – a desideratum amplified by the fact that there are no clear ancient iconographic representations and literary sources referring to these implements, excepting a poorly preserved depiction of a warp-weighted loom on a geometric plate (see Aspris 1996, 3, Fig. 1.). Dozens or even hundreds of clay spools of various shapes and sizes were unearthed in Archaic, Classical and Hellenistic layers in Peloponnesian settlements (e.g. Pylos in Elis, Olympia, Makrysia, Corinth, Argos, Lerna, Mycenae). The proposed contribution is based on the ongoing doctoral research of the author, which comprises the study of some hundreds of clay spools from the Peloponnesian, together with relevant analogies from ancient sites located in other Greek regions – all analysed in the context of the progress reached so far in the field of archaeological textiles.

The consistent occurrence of ancient clay spools in sanctuaries or domestic and funerary contexts in Elis, Corinthia and Argolis will be highlighted, while their almost complete absence in Achaia, Messenia and Laconia will be questioned. The case of Arcadia, a region where spools were discovered in limited numbers, should be pointed out. Furthermore, the individual features of the ancient Peloponnesian spools will be discussed. Their functional parameters, including their shape, dimensions and weight, will be analysed, while the presence of manufacture marks and use traces (hand modelling, wheel traces, mould marks, stamps,

graffiti, painted decoration, black glaze, the presence or absence of piercing) will be inquired, in an attempt of elucidating their possible function within the ancient technologies of textile production.

Second chances for porous spindle whorls – 3d for comparable data in textile research

Ronja Lau (Freie Universität Berlin)

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Inventory of prehistoric and protohistoric textile tools in the northern half of France

Yann Lorin¹, Emmanuelle Leroy-Langelin³, Rebecca Peake¹, Emilie Louesdon¹, Théophile Nicolas¹, Roxanne Pénisson², Vincent Riquier¹, Bastien Dubuis¹, Elise Séhier¹, Cyril Marcigny¹ (1. Institut National de Recherches Archéologiques Préventives, 2. Université Toulouse-Le Mirail, 3. Conseil départemental du Pas-de-calais)

We would like to present our work within the research programme at inrap for the last three years, a project which plans to describe the archaeological textile furniture in the northern half of France. This concerns seven of the new French regions, several hundred sites between the end of the Neolithic and up to the Roman conquest, thousands of objects. We would like to present this ongoing project in the form of a poster, a paper or an oral communication. It will be an opportunity to propose a state of this inventory and the problems that the objects highlight. The focus will be placed on methodological approaches, production techniques for each period and the mapping of tools for the different cultural groups concerned.

Raw material supply for textile production in Egypt during the Byzantine and early Arab periods (example of monastic environment)

Maria Mossakowska-Gaubert (CTR, UCPH)

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. However, it is obvious that monks, particularly anachoretics and these living in small communities, were often 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.

Spinning in iron age Orkney: individuality of makers

Amber Rivers (University of the Highlands and Islands)

Academics researching craft production in archaeological contexts face inherent difficulties when attempting to reconstruct ancient manufacturing methods. In many cases scholars do not have the practice-based background necessary to accurately explain the technical processes involved (Cizuk 2007). Consequently, researchers of ancient textiles often place greater emphasis on categorizing or experimenting with the tools employed in textile production i.e. spindle whorls and loom weights, rather than the 'human factor' which is more difficult to qualify. Many experimental studies have used these tools to better understand prehistoric fabrication techniques and production systems (Andersson Strand 2014; Mårtensson et al 2006; Wood 2003). While these instruments are valuable in our comprehension of ancient practices, they should not be considered to the exclusion of human agency. This poster will present a study of spindle whorls from an Iron Age occupation site in South Ronaldsay, Orkney, which employed a dual approach of distribution analysis/experimental creative practice to prove that variation in tool morphology may reflect individuality of the makers rather than production of different threads.

Nettle textiles and their preservation in the European Bronze Age

Katie Sawyer (independent researcher)

Textiles, especially those made from wild plant fibres, are often neglected in archaeology. This paper examined the significance of nettle textiles and their preservation in the European Bronze Age, using experimental archaeology to recreate a small sample. Preservation of the textile was investigated through burning in a furnace at a temperature range of 250-400°C in oxidising, reducing and under ash conditions. The production of nettle textiles was time consuming and required large quantities of raw materials. Stings disappear upon drying, so the stems were not unpleasant to handle, but the activities were monotonous. Preservation through burning was unexpectedly good, carbonising at from 250-350°C under oxidising conditions. Remarkably preservation was poor in reducing and under ash conditions. Despite poor preservation on archaeological sites, nettle textiles could be identified in environmental remains, silica on tools and even in dental calculus. Nettle textiles are time intensive to produce so would have been seen as valuable objects in the Bronze Age. However, production was not highly skilled so could have involved multiple people rather than one specialist.

Landscapes of the Aegean prehistoric textile production: challenges and possibilities

Malgorzata Siennicka (University of Göttingen)

Textile production played a significant role in prehistoric Greece from the Neolithic to the Late Bronze Age, both in households and settlements, and on regional and interregional levels. Besides written documents

mentioning textiles and textile workers (Linear B administrative texts), a very few preserved textile fragments dating mainly from the Late Bronze Age, and textile impressions on clay, we are fortunately left with other plentiful objects which help us reconstruct social, cultural, and economic landscapes of textile production in the Aegean. These are textile tools, discovered in abundance at almost all archaeological sites, made of clay, stone, metal, and bone, used both by individuals, and in textile working areas. Moreover, zooarchaeological and archaeobotanical remains can demonstrate what raw materials were used in textile manufacture, and how it had changed throughout ages. In this paper, I would like to focus on challenges and possibilities in textile research of the Aegean, presenting selected examples dating from the prehistoric times.

Cotton production, in the Caribbean? Puerto Rico as a provider of raw material in the 19th century

Soraya Serra-Collazo (independent researcher)

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Textile ethnographies in Greece and Aegean textiles research

Sophia Vakirtzi (Hellenic Ministry of Culture, PhD University of Crete)

Textile ethnographies, encompassing both intentional, disciplinary ethnographic fieldwork/publications and early, amateurish activities of an ethnographic nature, may often provide valuable analogies to ancient textile craft. This presentation showcases examples of such textile ethnographies from modern Greece, and highlights how they have enriched textiles research of the prehistoric Aegean.

Session 3

Deep in the matter: textiles, raw materials and novel scientific methods

Keynote lecture:

New methods – more possibilities. Developments in biomolecular approaches to the study of archaeological textiles and leather

Luise Ørsted Brandt (Globe Institute, UCPH)

Since the Centre for Textile Research opened in 2005, scientific methods in archaeology and in textile research have evolved dramatically, enabling completely new studies of ancient textiles and leathers. One very promising research line explores the raw materials, textiles and leathers were produced of. Here, analyses of ancient biomolecules provide a strong supplement to traditional microscopy of hair and grain surface morphology. Over the past 15 years the analysis of ancient DNA has evolved immensely due to new protocols and sequencing capacities and has provided not only amazing identifications of fibres and skins, but also new information to the understanding of the domestication and refinement of animal species. Studies of ancient proteins have shown that these are less susceptible to degradation and proteomics methods have been applied to more degraded materials as mineralized textiles or skins from acidic environments. In all, biomolecular analyses provide us with the opportunity to discuss questions from the procurement of raw materials and trade, to the preference for specific raw materials and their properties.

Live papers:

Wool Production during the Scandinavian Late Iron Age and the Potential of biomolecular methods

Jonas Holm Jæger (CTR and Globe Institute, UCPH)

The separation of ovicaprines has long remained a problematic and difficult task in zooarchaeology. Species identification based on bone or tooth morphology are notoriously unreliable and as such, any large-scale studies of Scandinavian ovicaprine exploitation have been impossible. Consequently, research into the exploitation of sheep for the purpose of wool production has been largely overlooked or only studied in very broad terms. With the introduction of Zooarchaeology by Mass Spectrometry (ZooMS) it is now possible to reliably identify ovicaprine remains in a simple, fast and inexpensive manner making large-scale studies of sheep husbandry possible. Here I present the results of the ZooMS analysis of 35 ovicaprine teeth from Late Iron Age Sweden. The results from the analyses underlines the necessity for developing accurate methods for species identification and the unreliability of current zooarchaeological methods based on tooth and mandible morphology. The results questions our current understanding of our knowledge of ovicaprine husbandry and thus the production of wool during this period. The results also highlight the enormous potential of ZooMS and similar methods.

The potential of FTIR in the identification of excavated textile fibres

C. Margariti (Directorate of Conservation, Hellenic Ministry of Culture), F. Coletti (Sapienza University), S. Spantidaki (Hellenic Centre for the Research and Conservation of Archaeological Textiles ARTEX), A. Ciccola (Sapienza University), I. Serafini (Sapienza University), A. Nucara (Sapienza University), M. P. Caggia (Institute for Archaeological and Monumental Heritage (CNR-BAM), Lecce)

ATR/FTIR spectroscopy is a non-destructive method of analysis, that can also be non-invasive if applied in reflectance mode. Non-destructiveness and non-invasiveness are characteristics of crucial importance when analysing excavated textiles, which are more often than not very rare and sensitive finds.

In this work, a combined non-destructive/non-invasive approach based on FTIR spectroscopy (at ATR and reflectance and transmission modes) combined with microscopy is described, focusing on applications on textile finds from the Vesuvian area in Italy, the Hierapolis in Turkey and mineralised textiles from Greece. Since the technique is non-destructive and potentially non-invasive, it was feasible, and ethically appropriate, to analyse numerous samples in the different case studies. This allowed for very informative results, as the technique was able to detect bands assigned to characteristic compounds of the organic matter present and preserved within the fibres, thus enabling or enhancing fibre identification; as well as bands attributed to the degradation of the organic matter, thus permitting characterisation of the condition of the finds. In addition, the ability to analyse numerous fragments/areas of the finds, allowed for a better informed sample selection, consideration on the actual need for further investigations and the selection of the appropriate destructive methods of analysis.

Medieval cotton in Finland

Krista Vajanto (Aalto Nanomicroscopy Center), Sanna Lipkin (University of Oulu), and Jenni Suomela (University of Helsinki)

In the 14-15th centuries, cotton was rare luxury fiber in Finland that has previously been identified in three cases. These are ecclesial textiles from Turku Cathedral. In our research, we have found more cotton. Cotton tabby with bast fiber is in an antependium from Masku nunnery from 1440s in a mainly woolen intarsia fabric. Sometimes, cotton fibers may look like medieval silk and might be misidentified. The unexpected results were confirmed with TLM and FTIR. However, the oldest known cotton is from Northern Finland, from Valmarinniemi near Tornio where the first church of the region was established around 1330 AD. In the excavations were found textiles with metal objects. A burial of a 20-30 years old female revealed a small fragment of cotton textile, attached with a silver ring of a belt. The fibers were identified with TLM microscopy by their typical morphological features. Structures of the cotton textile were analysed with microCT-imaging (SKYSCAN 2214 with voxel size 0.7 μm), which revealed a tabby made of z-spun yarns. With this precision it is also possible to evaluate the possibilities of microCT-imaging in examination of fiber features. The method is nondestructive and can be performed on materials that contain no metal.

Advanced physicochemical scientific methods for the characterization of printed textiles from the pre- industrial period

Maria Elisavet Samoili (independent researcher)

All early fabrics were composed of natural fibers from plant or animal sources, and until the 18th century, all fabrics were constructed and decorated by hand. This paper first discusses the two primary techniques of printing on textile fabrics (which is related to dyeing) that can be classified as coloring and patterning. The red and blue textiles differ in their production, involving mordant dyeing for red and resist dyeing for blue. The paper focuses on the analytical scientific methods that are used for the characterization of printed textiles. For preliminary examination, OMs as a microscopic examination is an effective method. Subsequently,

several analytical methods are used in the identification of dyes and as most natural dyestuffs contain more than one coloring matter, methods able to separate the different components are preferable. The most popular methods are TLC and HPLC, making species identification possible (e.g. large amounts of rubiadin indicate the use of wild madder (*Rubia peregrina* L.). Pyrolysis GLC is also used while ICP-AES is chosen for the analysis of the biodeterioration of textiles. Non-destructive analytical methods are also used, that are capable of avoiding extraction and could utilize smaller sample sizes, such as FTIR, SEM, TOF-SIMS and XPS. Proper and detailed analysis of historical printed textiles can be very helpful not only in the understanding and conservation of fabrics but also in the identification of the workshop and thus, in determining a fabric's age, origin and dye source.

Recorded short presentations and posters:

Contribution of dye analysis in the study of historical textiles from Romanian collections
Irina Petroviciu (National Museum of Romanian History)

Romania, located at the confluence of the main Euro-Asian trade routes, preserves rich and varied historic and artistic textile collections that reflect the triple influence of the Byzantine, Western and Eastern worlds, grafted on a deeply individual specificity, characteristic for the 14th-20th centuries.

In the last more than 20 years, a large number of textiles from Romanian collections have been studied in terms of dye analysis: 15th-19th c. liturgical embroideries, 15th-18th c. brocaded velvets, 15th-17th c. Oriental carpets, and 19th-20th c. traditional (ethnographical textiles). A large number of biological sources were identified: lac dye, kermes, carminic acid based dyes, madder and wild madder, weld, dyer's greenweed, sawwort, young fustic, isparak, bastard hemp, buckthorn bark and berries, redwood and indigoid dyes.

The paper discusses the use of these dyes according to textiles and period and interprets these results in correlation with similar studies on European and worldwide objects. The study aims to achieve a better knowledge on textiles in Romanian collections and contribute to their conservation and valorization.

Experiments to identify bast fibres with wide-angle X-ray scattering (WAXS)
Jenni Suomela, Mira Viljanen, Kirsi Svedström (University of Helsinki)

Bast fibres are notoriously difficult to identify from each other. At the moment identification of flax, hemp and nettle is relying on combinations of microscopic methods. Longitudinal characteristics, cross-sections, microfibrillar orientation and possible presence of calcium oxalate crystals are observed with objective to achieve reliable identification for these textile fibres. These methods are based on somewhat subjective interpretation and demand for method that supplies quantitative data is substantial.

In this study flax, hemp, nettle and cotton fibre samples were measured with Wide-angle X-ray scattering to determine their ultrastructural parameters i.e., average crystallite width and relative crystalline index. Research material consisted of modern reference fibres, over hundred years old ethnographic textile samples from White Karelian area and archaeological samples from 13th century Ravattula, Ristimäki, in Finland. In addition to WAXS measurements, microscopic methods were applied to verify the identifications. Results achieved with WAXS measurements were somewhat surprising regarding the crystallinity indexes and possible detection of calcium oxalate crystals. Based on these experiments, WAXS cannot be declared as ground-breaking identification method as itself, but it is a useful tool in study of cellulose-based textile fibres. As a method, WAXS is feasible with home laboratory equipment and non-destructive for the fibre samples.

Session 4

Reuse, repair, redesign

Keynote lecture:

Revitalize, Reuse, Repair and Redesign

Ingun Grimstad Klepp (Oslo Metropolitan University)

Environmental and climate issues call for actions, and awareness of the impact of clothing in the current crisis is increasing. Solutions are sought both through new technology and through something that, throughout clothing history, has been so obvious that it has hardly been mentioned; that clothing were made to last, that they were used to the last thread and remade, sewn and used over and over again. How is the knowledge of the history of techniques and systems for reuse, repair and redesign available for today's environmental debate? What do we need knowledge about and where is this knowledge? What role does historical knowledge play and what role could it play in finding good (new) solutions? The lecture is based on the book *Lettfiks: Clothes with nine lives*, on using history as inspiration to reduce the environmental impact from our clothing consumption, and the research project *VikingGold*, on how to develop clothes with deeper roots.

Live papers:

Repair and reuse of clothing found at the necropolis of Fag el-Gamus, Egypt

Anne Kwaspen (CTR, UCPH)

Many examples of the reuse, repair and redesign of clothing can be found amongst textile finds from the Late Antique and Early Medieval periods in Egypt. This is also the case with the finds from the necropolis of Fag el-Gamus, located on the eastern edge of the Fayum. Reuse occurred frequently. Of the clothing found in the over 1200 burials excavated, only 10% was worn by the deceased, while all other tunics were reused in the burial context as wrapping or stuffing material. Reuse is not only seen in terms of function, but also in examples where cloth has been redesigned to make new clothing. This custom is mainly found in children's clothing.

Another common practice among the population buried at Fag el-Gamus is the repair of clothing and accessories. Examples range from restitched tears, to small patches stitched to hide holes, to extensive amounts of darning, sometimes resulting in tunics without a single individual thread still intact. These extremely restored garments give a clear indication of the value of a woven tunic compared to the yarns and repair work that could be produced within an individual household.

Rags and patchwork - the reuse of ancient roman textiles

Lena Larsson Loven (University of Gothenburg)

In ancient Roman society, everyone used textiles in daily life and huge amounts of textiles were produced; clothes, household products, sails, textiles for the Roman army and more. Textiles were also regularly reused for various purposes. In urban contexts, there were occupational groups, *centonarii*, specialized in dealing with discarded textiles which in turn reflects the scale and importance of this business. However, important it may have been in ancient Roman society, this is a sector of ancient textile economy which is still rather unknown and invisible as, up to date, it has not attracted much scholarly attention. This paper seeks to

discuss some aspects of textiles in Roman society hitherto unexplored which aims to a better understanding of the complexity of Roman textiles and textile economy.

Turning Old into New Again. Latvian Example

Ieva Pigozne (University of Latvia)

During the process of researching dress of the peasants of Eastern Latvia in the 19th century many examples of re-sewn garments have been discovered. It can be observed that the cloth that was originally used for one garment was often re-sewn into other type of garment or even into a garment later worn by the opposite sex. In addition, written and iconographic sources contain evidence of how worn-out garments of festive attire have been used as everyday clothing, as well as what their fabric was used for when it was no longer used as a garment. Thus, it is possible to reconstruct the life cycle of many pieces of clothing and see how few of them survived and later could be collected by the people who formed the museum collections. The presentation shows reuse of both worn-out and old-fashioned items of clothing and seeks to understand the motivation behind every case. The example of peasants from the 19th century may provide insight into practice and motivation of rural people in earlier centuries.

Cultural heritage practices of recycling

Ritu Jadwani (National Institute of Fashion Technology, India. University of Delaware, Thomas Jefferson University in Philadelphia, U.S. Founder and CEO of Namaste NYC, India, a sustainable and ethical label)

In the villages of Kutch, a village in western India, quilt making is a common cultural age-old practice among the household women. They collect left over fabric scraps and stitch them together to create one of a kind quilt, which is used as a wedding gift for their daughters. In the city of Dhaka in Bangladesh, old saris are layered and patched together to craft unique 'kantha' scarves, popularly sold in the western market. "Ralli" quilts, and cushion covers, have a similar design philosophy in the villages of Sindh of Pakistan. Darning, running, back stitch and stem stitch, adorn these colourful pieces that are treasured by the western consumers as holiday gifts. Asia, a continent with many developing countries, has been the leader in recycling and design innovation from waste for centuries now. Modern day designer mend dresses, fix jeans and blouses with running, darning and stem stitches, which were traditionally used as crafts practices. Sustainability, as they call it in the modern world, draws inspiration from the age-old craft practices of the practical first world countries. Craft stitches solve the problem of fixing clothes that might have been discarded by adorning them with embroidery, buttons, patches, and other styles. This helps transform them into beautiful pieces that are renewed with a fresh look. This paper presentation is a detailed research on modern day repair practices which are inspired by the age-old craft techniques in various parts of the world.

Darning, re-use and recycling textiles in ancient Egyptian mummification practices

Cinzia Oliva (freelance textile conservator)

The mummification treatments performed in ancient Egypt on humans and animals required a large number of textiles, in the form of bandages, shrouds and sometimes whole tunics. All of these textiles have been used not only to wrap and define the exterior aspects of the mummies, sometimes with precise decorative effects, but also to fill the body and re-create the former shape.

The poor conditions of conservation and the looting of the mummies that occurred in the past allowed conservators to gain a deeper insight into the materials used and the wrapping techniques.

This presentation will focus on traces of re-use and darning found on the wrappings and shrouds of several human mummies, which were dated to between the first Dynasty until the late period; the presence of

hemming and darning on bandages indicates a previous and different use of the textiles, like the presence of embroidery or brocaded decorative motifs in external shrouds could indicate.

Also, a different state of conservation could indicate a previous life of some of the artefacts and their position on the body a particular emotional link with the person.

Traces of re-use and mending have also been found in animal mummies, even if the smaller sizes of the artefacts make it more difficult to correctly identify the provenance and the presence of darning and stitching.

Recorded short presentations and posters:

Use and Re-use of textiles on some vessels from the tomb of Kha and Merit (TT8)

Matilde Borla (Soprintendenza ABAP-TO) and Federica Facchetti (Museo Egizio)

Our presentation will focus on the use and re-use of textiles on some vessels from the tomb of Kha and Merit (Theban Tomb 8). The intact tomb of Kha and Merit was discovered in 1906 in the necropolis of Deir el-Medina (Luxor, West Bank) by the team of M.A.I. (Missione Archeologica Italiana). The owners lived in the New Kingdom during the reigns of the pharaohs Amenhotep II, Thutmose IV and Amenhotep III (c. 1425-1353 BCE). The funerary chamber contains the richest non-royal burial assemblage housed in a museum outside Egypt. The grave goods includes the mummies and the coffins of Kha and his wife Merit, alabaster, metallic and ceramic vessels, different wooden boxes, textiles, foods. Some of the most beautiful vases are decorated on a surface previously covered on their neck by a layer of textiles meanwhile, several ceramic and alabaster containers, are sealed and carefully covered, on the top, with linen strips. We will investigate some of them in order to better understand the use of textiles combined to the study of vessels.

The RIPPING ATOPOS project: re-using and re-designing paper dresses from the 1960s

Myrsini Pichou (ATOPOS cvc Organisation, Athens)

This paper will discuss the RIPPING ATOPOS project which explores experimental ideas and practices in re-using and re-designing collection items. In the project, ATOPOS cvc organization commissions artists and fashion designers to create their own works of art or garments, either inspired by specific pieces or by using duplicates of the 1960s paper dresses from the ATOPOS collection. The project started in 2006, in the context of organizing the "RRRIPP!! Paper Fashion" exhibition with the aim to produce new objects for display. The results of the project have come in various forms and mediums; dresses, collages, installations, musical pieces, videos, web animations and more. The project proposes a new way to link art and fashion with collections as well as to create a very close and creative collaboration between an organization and artists or designers. At the same time, it investigates and proposes new ways of how contemporary creation and extant dress can be linked and how an artist or designer can interpret collection objects.

Circulating goods in eighteenth-century Spanish America

Luisina Silva (independent researcher)

Colonial Latin American society was a highly controlled environment organized according to class, lineage, and calidad. Dress was employed to show commonality, individuality, and agency. One of the most exciting characteristics of clothing and textiles consumed in the colonies was their many lives and usages. Even though there are not many surviving examples of clothing worn by the majority of colonial society, we can still recognize how garments were reused, modified, and adapted. In my presentation, I will introduce dowry letters, personal inventories, and wills that enable us to discover the many lives of garments and textiles in colonial Latin America. Such documents provide us with detailed information on the possible multilayered

and hybridity practices of fashion consumption of that period. Wills and inventories usually included the name of the article, fabric, sometimes the color, and most of the time, the condition, and the price. It was common to leave items in poor condition or worn out and the person that received them could sell or modify them for personal use. In some cases, the individual that dictated the will included precise instructions on what to do with specific pieces. Clothing was recycled, reused, and pushed to the limit of its material capacity.

Session 5

Furnishing burials

Keynote lecture:

Dressed for life and death. The complex nature of textile furnished burials

Marianne Vedeler (University of Oslo)

To what degree does the frozen image of a grave reflect the life of the living and the life of the dead? This is a central question in archaeology, as a large proportion of sources for information on prehistoric societies rests in prehistoric burials. No matter how one as a researcher chooses to interpret these sources, most scholars recognize the complex nature of mortuary practices in prehistoric and early medieval societies. Fragile and easily degradable textiles are in many ways central keys to understanding the funerary scene. They were used as grave interior decoration, as symbolic and practical shrouds on humans, animals and objects as well as for dressing the dead. They are interpreted as clothing previously used in mortal life, as symbolic representations of the world of the living but also as objects in the twilight between the world of the living and the world of the dead. Textiles used for furnishing burials are vital sources to new knowledge about mythology and religion as well as of practical everyday life in prehistory. A careful discussion of context is however a crucial prerequisite for the interpretation.

Live papers:

Wrapped in eternal care: the sensory function of Late Classical and Hellenistic funerary textiles

Dimitra Andrianou (National Hellenic Research Foundation)

For Alfred Gell (1998), what matters about objects is not how beautiful they are, but how they 'work' on (or through) someone looking, using, or touching them. Textiles, by extension, are an agency of human behavior. Funerary textiles in particular acquire biographies through their entanglement with people and places.

Late Classical and Hellenistic tombs throughout the Greek world have revealed a variety of actual, painted or carved textiles. An actual textile in direct contact with the body or inside the funerary vessel, or wrapped around the vessel, acts as a gesture of caring. Painted hangings decorating the ceilings of tombs act as canopies, framing a special space and alluding to a nuptial or heavenly baldachin. Carved pillows or painted bed-sheets on funerary beds and seats, and floor-mosaics with repetitive motifs reminiscent of carpeting allude to a homey (thus familiar) environment.

To this fragmentary but valuable material one should add the iconography of tombstones, where ribbons are shown dedicated to the tomb or wrapping the stele itself. In particular, the so-called *Totenmahlreliefs* show a variety of furniture textiles, often purposefully exhibited for their luxury.

Care, comfort and symbolism through the use of actual, painted or carved textiles in tombs worked together and were mobilized to aid the deceased, give sense to and diminish the fear of the incomprehensible Otherworld.

Linen shrouds for dangerous animals

Anne Drewsen (guest researcher at CTR, UCPH)

The Egyptian archaeology is littered with animal mummies, wrapped tightly in linen bandages, excavated by the thousands from the pharaonic period. However, even in prehistory, animals were buried in cemeteries of humans, and in one case, the elite cemetery of Hierakonpolis, over 100 different animals, from domesticated animals such as dogs, cats and cattle to wild animals such as a crocodile, a hippopotamus, a leopard, an aurochs and even two adult African elephants were buried. This took place during a relatively short period around c. 3500 BC. While some of the animals were simply buried, some were enveloped in linen shrouds – notably the most dangerous of the wild animals such as the crocodile, the aurochs and the elephants. Especially the burial of one of the elephants, from tomb 24, provides textile researchers with well-preserved material and evidence of a complete envelopment to research the time and manpower spent on production, while the corpus of animals buried in linen shrouds may provide a clearer picture of the development of rituals that became the standard for the 3000 years of the pharaonic Egypt.

'All tucked-in!' Textile furnishings and funerary beds in ancient Sudan

Elsa Yvanez (Polish Centre of Mediterranean Archaeology, University of Warsaw)

The arid climate of Sudan and Nubia has proved to be a true bounty for textile research, preserving thousands of textiles and animal skins in the desertic landscape along the Middle Nile Valley. Most of this plentiful material has been retrieved from cemeteries, which have been the focus of an intense archaeological scrutiny since the beginning of the 20th century. Graves of all periods show the existence of elaborate burial customs involving the clothing and/or wrapping of the body in textiles or animal skins. However, not every cloth was used in direct connection to the body. Evidence also shows the wrapping of artefacts used during the funerary rituals (libation vessels and other equipment) as well as the use of textiles and furs laid in the graves as a funerary bed. Actual wooden beds have been known in Nubian archaeology for a long time, but their use seem to have been restricted to a very small part of the population in elite cemeteries. When a real bed could not be provided, other installations were set to receive the body of the deceased, such as rock-hewn benches and/or layers of mats, textiles, and skins. Little attention has been devoted to this type of funerary “bedding”, despite its ubiquity and long-term usage from the Bronze Age to Late Antiquity. This paper will offer an overview of these practices as well as present detailed case-studies on the use of pile weave textiles as funerary bedding.

Dressing the Dead: early wool in Mycenaean Greece

Brendan Burke (University of Victoria) and Bela Dimova (British School of Athens)

This paper focuses on early cloth from a burial context at the site of ancient Eleon, which has been excavated as a cooperative project of the Ephorate of Antiquities of Boeotia and the Canadian Institute in Greece. An early Mycenaean (ca. 17th c. BCE) burial enclosure, called the Blue Stone Structure, contains 11 rock-lined tombs for multiple individuals below two *in situ* grave stelai. Tomb 10, excavated in 2018, contained the remains of two adults that were pushed to the side for the last interment, the burial of a 10-year-old child in crouched position. The remains of the child were draped with or covered by a textile, of which about 40 fragments have been recovered. The remarkable organic preservation is due to the tomb being capped by a monolithic stone slab and sealed with watertight clay.

Although the textile is fragmentary and heavily encrusted with soil, the uniform appearance of the warp and weft across the measured fragments suggest that they all belong to a single textile. Not only is the structure

of the textile remarkable, but a preliminary analysis indicates that this is among the earliest known examples of preserved wool in the Aegean.

Recorded short presentations and posters:

"I will carry it to the grave": textile tools and their products in Iron Age burials with two case studies from Croatia

Julia Fileš Kramberger (University of Zagreb)

The role of textile craft within prehistoric groups is elusive because of the perishable nature of the raw material, the final textile products and even the production tools. Fortunately, the burial context of mineralized textile fragments and ceramic textile tools such as spindle whorls or loom-weights not only gives insight into the physical attributes of these finds and the craft behind it but also adds them a symbolic meaning. Many studies have shown that textiles within graves served not only as clothes for the deceased but also as shrouds, furnishings and various types of containers used for covering human remains and burial goods. Furthermore, sets of textile tools within graves, their position and quantity present not only the craft itself, but also the people who used them, where in most cases these finds symbolize craft specialization, social standing and presumably gender of the deceased.

Preliminary results of analyses carried out on mineralized textile finds and ceramic textile production tools from Hallstatt period tumuli at Kaptol-Gradci and graves at the Middle La Tène cemetery of Zvonimirovo, both in Croatia, show a noticeable change from the Early to the Late Iron Age in textile production and its symbolic presence in graves, which has already been observed throughout Europe.

Textiles furnishing coffins from the 17th to the 19th century in Poland on selected examples - a cognitive challenge

Magdalena Majorek (University of Lodz)

Textiles decorating coffins occurred much less frequently than other types of embellishment. Among the textiles decorating the coffins, archaeologists in Poland most often observe the outer upholstery with ribbons on the edges, and less frequently fragments of pillowcases and mattresses. The least numerous are the internal upholstery. On the basis of selected examples from archaeological research, I will discuss the following issues concerning textiles on / in coffins: 1) factors influencing to the state of preservation, 2) methods of determining the functions of individual textile elements of coffins and the results on using them, 3) results of technological and raw material analyzes, 4) types of textiles decorating coffins both outside and inside; types of pillowcases and filling of pillows and mattresses.

In addition, I will try to answer the following questions:

- how do we know that the coffin had a textile upholstery when there are no fabric fragments?
- do coffins with textile equipment were created as a coherent composition coffin sets?
- what was the estimated cost of the coffin with upholstery?
- what was the differences in the colors of the textile coffin upholstery used in the burials of children and adults, women and men?

Revisiting the oldest textile fragment recovered from a secondary burial coffin assemblage in Banton Island, Province of Romblon, Philippines

Marites P. Tauro, Mariah Calanno and Ivan Cultura (National Museum of the Philippines)

In the 1960s, the Anthropology Division of the National Museum of the Philippines conducted archaeological investigations of the reported burial site in Banton Island, Province of Romblon in central Philippines. The site was badly disturbed but the team was able to recover wooden coffins, modified crania, gold ornaments, fragments of 14th to 15th century Chinese and Siamese jars, and a fragment of *ikat* cloth.

The textile fragment, now more popularly known as the Banton Burial Cloth measures 81 cm long and 21 cm wide, and believed to have been used as a funerary shroud, similar to the practice of the groups in the Philippine Cordilleras of wrapping human skeletal remains during re-internment for the secondary burial. Relative dating puts the Cloth from late 13th to early 14th century, making it the oldest known textile that exists in the Philippines, although its origins is still under study as there has been no evidence of traditional or contemporary *ikat* weaving in Banton Island.

The Banton Burial Cloth was declared a National Cultural Treasure and is exhibited at the Hibla ng Lahing Filipino (The Artistry of Philippines Textiles) Gallery in the National Museum of Anthropology in Manila.

Session 6

Weaving sources together

Keynote lecture:

Textile Terminology in Legal Islamic Sources – Al-Saqāṭī and his Kitāb fī adāb al-Ḥisba
Corinne Mühlemann (CTR, UCPH)

In contrast to Byzantine and Western medieval art history, there exists a notable inattention to juridical sources within the field of Islamic art history as well as the history of textile arts. By tying written sources with material and technological knowledge, I will explore the potential of legal Islamic sources illustrating how they expose the complex relations of labor, artistic creation, and patronage in the design and execution of textiles in the medieval Islamic marketplace. I will scrutinize the *ḥisba*-manual (market regulation) of al-Saqāṭī, who was the market inspector (*muḥtasib*) of Málaga by the end of the eleventh century CE. Interested in the textile terminology he uses, I will try to shed light upon the connection of weaving and poetry in early twelfth century al-Andalus through the Arabic term *bait*.

Live papers:

Sogdian textiles in pictorial representations and textual sources
Zumrad Ilyasova (University of Basel) and Alisher Begmatov (Berlin-Brandenburg Academy of Sciences)

Central Asia is known for its history of sophisticated textile production and consumption. Although early medieval archaeological textile finds are limited, some extant pieces share not only patterns but also weaving techniques common with other prevalent textiles across Eurasia. A few such examples are often attributed to Sogdiana as the place of origin.

Sogdiana, which lay in present-day Uzbekistan and Tajikistan, was home to the Sogdians, active agents in a system of transcontinental trade, often known as the Silk Road. Their vibrant textiles are attested in wall paintings or other artifacts, which have been systematically studied by mainly art historians. However, there are limitations to use these representations as historical documents.

Textual sources may provide us with invaluable information about the textiles produced and used in daily life. Although Arabic and Chinese are the main textual sources for Sogdian textiles, surviving Sogdian textual sources also contain a number of unrecognized terms that may designate textiles or related commodities. These include cotton, wool, felt, and possibly other precious textiles such as silk and pattern-woven textiles, and may serve to understand dynamic of trade network built by the Sogdians.

Women at work

Katherine Harrington (Florida State University)

Women's work, in most standard accounts of the ancient Greek world, consisted largely of domestic activities such as childcare, weaving, and food preparation. Such labour, done without pay and at home, has typically been treated as mere background noise, economically unimportant and largely unworthy of analysis in assessments of the ancient economy. Similarly, women's labour for the market economy has been undervalued and often ignored. Although the literary, epigraphic, and iconographic record demonstrate that

women of various social statuses worked in numerous professions, synthetic accounts of the ancient Greek economy often fail to consider these contributions, and the ancient economic actor is tacitly assumed to be male. Using the textile industry of 4th century BCE Athens as a case study, this paper combines archaeological evidence, with iconographic, literary, and epigraphic evidence to provide a more comprehensive account of the importance of women's labour and textile production to the ancient economy, including a new interpretation of Bau Z, a possible weaving workshop. The author weighed and measured more than 250 loom weights and spindle whorls from the building at the Kerameikos Archaeological Museum and DAI storerooms. This paper situates the results of that study within the broader context of the Athenian economy and women's roles within it.

Faith, love and charity: *aumônières*, reliquary bags and other small purses as emotional objects

Sarah Randles (University of Melbourne and University of Tasmania)

A range of small, frequently highly decorated textile pouches or purses has survived from the Middle Ages, described by a range of different names, including *aumônières*, *bourses*, reliquary purses and even *forels*. While the provenance of many is unknown, a sizeable portion have been found in church and cathedral treasuries, including several bags which are embroidered or woven with overtly secular, courtly scenes. Some of these extant bags still contain small relics, showing that, whatever their original purpose, they have been used as reliquaries at some point in their history.

This paper will approach these objects from the perspective of the history of emotions, considering them as 'emotional objects', that is things which were designed or used to represent, produce, reflect, or manage human emotions and emotional relationships, with other people and with God and the saints. This analysis of the physical forms and iconography of the bags within their contemporary religious and secular literary, visual and documentary contexts will allow new understanding of them as items which can both enhance and conceal their contents and provide their owners and donors with a means to represent and project themselves in ritualised emotional practice.

Holy Hands: gathering the threads of knitted liturgical gloves

Angharad Thomas (independent scholar)

The Holy Hands project has been undertaken with a Janet Arnold grant from the Society of Antiquaries, UK and has been undertaken since March 2020 by Dr Angharad Thomas and Lesley O'Connell Edwards, both independent researchers.

This presentation has two aims: firstly, to present the findings of the Holy Hands project, and secondly to discuss plans to extend this work into a larger study.

This research project focuses on bringing together knowledge about knitted liturgical gloves using various research methods. These include literature searches, online searches of collections, the design and testing of a protocol for examining these gloves and practical reconstruction. The work began in March 2020, as the global COVID-19 pandemic started to affect everyday lives, and it is thought will be complete by summer 2021.

The presentation will report the findings from all four parts of the study: the literature review, the database itemising all known extant knitted liturgical gloves, the protocol for their examination, and the reconstructions. It then goes on to explain how this work lays the foundation for further study of liturgical gloves, possibly adding knowledge using citizen science methods and enabling more in-depth research on these little studied but precious textiles.

Finding Meaning in the Twists and Turns of Lace

Martha Verleyen (KU Leuven)

By combining research on European myths and folklore legends with an in-depth iconological study, this paper proposes new insights in lace which can be applied to larger truths about life. [6 & 8] Current research on lace is either based on the social-cultural and even economical use or the history of it. But new academical waves such as the anthropological turn, new materialism, embodiment and more, found a renewed interest in textile as a signifier. In this context lace hasn't been fully explored yet. A close look at legends and myths uncovers signifiers of unconscious understandings of the fabric. An even closer look at the fabric itself - the movements, techniques, materials and image - shows where these signifiers come from and what they can mean. [9] The cluster of these understandings point to a paradigm of forgotten strengths: power through entanglement, detour, the possibility of combining veiling and transparency, connectedness and separation, structure and chaos, flexibility and resistance. This reflection on lace takes the knots, twists and turns of the thread into consideration and is an ode to the teeming, confused and chaotic that is all too often denied, avoided, or cut through.

Recorded short presentations and posters:

An experiment with heavy loom weights

Lorena Ariis (independent researcher)

The loom weights from the Roman settlements in the north of Piedmont are large and heavy, > 15 cm in diameter and > 1200 g in weight. They cannot be used to weight warp threads in the classic way, because they are too heavy and bulky. It was thought to experiment with another way of applying the loom weights to a weaving loom.

1/ The experiment: Exact replicas of the refractory ceramic loom weights were made, with weight, size and shape,

similar to the originals. A weaving loom was built that could be used with heavy loom weights, and a tabby with wool was woven. 2/Methodology: Making the loom weights by modeling a refractory ceramic mixture and air drying. Construction of the weaving loom, based on correlations and comparisons with the warp-weighted loom and the double-beam loom, both used in Roman times. Results: 3/ A vertical weaving loom with poles inserted in quadrangular bases, with an upper beam and a lower beam that are not fixed but just supported by pin. The lower one, is weighed down by the loom weights that are suspended by a rope. The lower beam can be positioned over a support pin during the warping phase. During the weaving phase, the beam is positioned under the support and the loom weights are positioned laterally. The entire warping is tensioned and ready to weave.

Art weaving mythology: the representation of Norse weaving in Constantin Hansen's work

Luciana De Campos (Núcleo de Estudos Vikings e Escandinavos)

The purpose of this exhibition is to analyze how Constantin Hansen (1804-1880) represented the Norse weaving of the Viking Age Scandinavia in some of his artistic works, "Nornerne" (1854, The National Gallery of Denmark, inv. No. KKSGB11523) and "Freia" (1854, The National Gallery of Denmark, Inv. No. KKSgb11490). In the first work, the three norns are presented weaving in a vertical wooden loom. In the second work, the goddess Freyja has a manual spindle, spinning. My analysis will verify the relationship between these mythical characters and the weaving/spinning during the Viking Age and their artistic

reception during the Danish romanticism. As a working hypothesis, I assume that Hansen was influenced much more by early 19th century Danish artists than by medieval literary sources, for example, by the works "De tre parcer Clotho, Lachesis og Atropos spinder livets tråd" (C.W. Eckersberg, 1808 , KMS3851) and "Parcerne" (Bertel Thorvaldsen, 1833, Thorvaldsen Museum, A366). I will use the theory of studies on weaving and gender in the Viking Age proposed by Michele Hayeur Smith; Karen Beck-Pedersen's studies of norms in Norse Mythology and Ernest Gombrich's squematta theory for iconographic analysis.

licia litterata – the 'Fabric of Letters' of Venantius Fortunatus (6 th ct. C.E. / Francia)
Enno Friedrich (University of Graz)

At the break of the Middle Age, the poet, courtier and bishop Venantius Fortunatus (ca. 530-600) composes mannered poems and letters for the illustrious in Frankish Gaul, collected as carmina – 'occasional poetry'. Among these, we have a small number of square-shaped figure poems, carmina quadrata, which celebrate the Holy Cross. One of these, carm. 5, 6a, stands out, because it is accompanied by a detailed description how the poet crafted his opus quadratus – "square piece of work". This description relies on the tested metaphor 'writing poetry is weaving textiles', but tries to outdo its predecessors in the close fitting of the analogy: between textile weaving with a loom and the making of the square-shaped poem with a frame of verses and between the warp vs. weft structure of fabrics and descending 'intexts' vs. continuous text in the poem. I will explain Fortunatus' metaphor of weaving in his work and with an eye to the materiality of the fabrics of his time. As a philologist, I hope for feedback from the experts on textile research on my reconstruction of early medieval weaving from Fortunatus' poem.

Did the Emperor have no clothes? Assessing non-textile sources for the reconstruction of Late Bronze and Early Iron Age dress in southwestern Iberia
Francisco Gomes (University of Lisbon)

Due to preservation issues, actual textile remains are rare in the archaeological record of the Late Bronze and Early Iron Ages of southwestern Iberia (c. 12th to 6th/5th centuries BCE). However, and while this hinders research on the development of textile resources and technologies, a number of non-textile elements clearly point to the importance of both local and especially imported fabrics in local political economies. This presentation aims to address the potential and limitations of these secondary sources for a reconstruction of dress and fashion during these periods, focusing on three different strands of evidence: archaeological evidence, namely in the form of new types of dress complements (buttons/ sewn decorations, brooches, belt buckles); iconographic evidence, derived mostly from the Late Bronze Age warrior stelae of southwestern Iberia; and stylistic evidence, specifically the appearance of certain decorative motifs in high-end decorated pottery which are likely derived from textile patterns. While the emerging picture is incomplete and clearly biased towards elite dress and adornment, it will be argued that the analysis of these non-textile materials can make a significant contribution to the reconstruction of local tastes, political economies and identity discourses.

Knowledge transfer in heritage cultural craft, damask weaving
Clary Jönsson (Uppsala University)

The hand weaving of damask is no longer a craft that is commonly learned and very few books on the subject have been published in the last century. Damask weaving still exists among private practitioners, but what happens to the knowledge when nobody knows how to dress a loom and weave anymore? The aim of this study is to describe and compare damask weaving from a learning perspective in order to generate

knowledge of how damask weaving is described in the literature and how the knowledge is communicated to increase understanding of the learning process and to generate a theoretical understanding of practical knowledge transfer. The method used is a literature study and open interviews with people who teach damask weaving. The study shows that the literature does not provide enough information on how to dress and weave damask. The interviews give a deeper understanding of the practical knowledge. The analysis shows that it is difficult to use only cognitive reading as interpretation from the body and hands are needed and the different steps need to be dissected in detail.

Lab O: recovering and sharing knowledge of historic canvases

Helena Loermans (LabO)

This presentation will guide you through the reconstruction of six historic painters' canvases with a diamond pattern. The textiles will be on view and are the result of interweaving art-history, science, technology, craft, and entrepreneurship.

Art History: El Greco, Diego Velázquez, Titian and Caravaggio all used a textile with a woven pattern as a canvas for their artworks.

Science: Art historians and painting conservators have focussed and published on the painted layers rather than the underlying fabric.

Technology: X-ray technology reveals the pattern of the original canvas. High quality photographs made it possible to analyse the structure. Software developed to interface with computer-aided looms was used to generate a weave draft.

Craft: The canvases were woven on a computer aided wooden handloom.

Entrepreneurship: Lab O was founded to deepen the knowledge of historic canvases, and

Results: Having access to a reconstruction of the original canvas not only is a contribution to preservation and share of knowledge in technical art history, it also triggers the visitor of a museum to have a closer examination of a layer that is often overlooked.

Spindle whorls, pins and other objects from the European prehistory

Yann Lorin (Institut National de Recherches Archéologiques Préventives)

This poster will present the parts of my work focusing on spindles and their representation in the Bronze and Iron Ages, in iconography and in ornamental furniture. It is an example of a real work mixing several disciplines (textile tools typology, ceramology, instrumentum, text). These diversified sources attest to the existence of a recurring theme in prehistoric Europe linking textiles with the world of beliefs.

Making the invisible visible: a case for the application of ethnoarchaeology and experimental archaeology in the study of Minoan dress on Crete during the Aegean Bronze Age

Jennifer Marks (Brandeis University)

The lack of physical textiles in the archaeological record leaves a considerable void in our understanding of the production and use of this material culture during the BA in Minoan Crete. Loom weaving was a craft specialization that increased during the MM period and lasted through the LM period. Despite having textile related artifacts, notably tools such as loom weights and spindle whorls, art (wall paintings and seals), and written records (Linear A and B texts), the final textile pieces are non-existent. Unfortunately, because of poor preservation, only a few fragments of textiles have survived from BA Crete and the Aegean. As a result of their deterioration, we inherently miss out on how these textiles were fabricated in antiquity. Therefore,

how do we best understand traditional Minoan garment production in Crete during these periods? Fortunately, a recent emergence in small weaving businesses (eg. Klotho) in Greece are shining light on the intangible processes of ancient weaving practices. This paper will examine such enterprises and how the practical use of ethnoarchaeology and experimental archaeology can help bridge the gap between the knowledge we have gathered from material culture remains and the iconographic representations of women's dress depicted in art. As archaeologists, we need to look above ground to gather information that the archaeological record cannot provide.

Identifying the weaving contest between Athena and Arachne on the wall of a weaving workshop at Mycenae

Laura Mazow (East Carolina University)

In the fresco aligning one wall of Room 31 in the Room of the Frescoes at Mycenae, dated ca. 1250-1200 BCE, two females face off in a contest of wills usually interpreted as divine, possibly war goddesses. Alternatively, I suggest the fresco illustrates the myth of the *Weaving Contest between Athena and Arachne*. While not the first to suggest the sword-armed figure as Athena (or an earlier divinity with Athena-like characteristics), I argue she stands here, less in her role as War Goddess, but instead emphasizing her weaving guise, with *connuli* (possibly loom weights) lining her dress hem and her *spathe* as a weaving sword. Room 31 is one of the cultic service rooms, and contained a painted platform, hearth, and bath-shaped vessel. My research on bath-shaped vessels, reports of large numbers of excavated *connuli*, and initial suggestions of this area as workshop space, suggest textile processing occurred here. Envisioning a weaving-themed painting on the walls of a textile workshop aligns with suggestions that visual decorative schemas often engage with the function of the spaces they inhabit. I suggest reconstructing Room 31 as a textile workshop within the larger cult complex at Mycenae.

Shedding light on Herdonia decorations

Francesco Meo and Tiziana Zappatore (University of Salento)

A few years ago, textiles were discovered in a 4th century BCE male burial during an archaeological excavation at Ortona (ancient *Herdonia*, South of Italy) by the Archaeological Superintendency of Puglia. They are of great interest both because of their good state of preservation and for their extraordinary decorative pattern. The conservation process and the study of the decorative techniques of *Herdonia* fabrics were recently published, concluding that embroidery as well as soumak techniques could be used to make the ornaments. According to the authors, there are insufficient data to identify the technique used for them. Starting from this publication, Tiziana Zappatore, who comes from a family of embroiderers and is a young embroiderer herself, has studied the decorative pattern and this paper will focus on its manufacture. According to her experience, a fundamental aspect to understand the workmanship of the many existing embroideries and their variations is to analyse the back of the cloth, which is extremely different from the front in the vast majority of cases. In general, studying the back of a fabric there are clear indications on the techniques used for the embroidery, since the decoration of the front is the direct consequence of passages of threads visible on the back. Herdonia fabrics are exceptionally well preserved in their back and the embroidery is also clearly visible. It allows the recognition of all the stitches and gives a clear reference to their way of manufacture. So, seven different stitches have been recognized and reproduced, as many of them are also used in modern times.

The Margrethe Hald Archives

Ulrikka Mokdad and Morten Grymer-Hansen (CTR, UCPH)

In 2010, the heirs of the celebrated textile researcher Margrethe Hald bequeathed Centre for Textile Research (CTR) a collection of material that had belonged to Hald: books, papers, diapositives and some objects from her travels, especially textiles. This collection makes up CTR's Margrethe Hald Archive and was catalogued and digitized in 2019. In September 2020 a new project about Margrethe Hald commenced at CTR. The project will shed new light on her life and work through the material she has left behind, which has since been spread across Denmark in archives, museums and personal collections.

Through a case study, it is our intention to demonstrate how combining a variety of source material, such as letters, passports, diaries, diapositives and photos, can lead to new insights into textile objects.

Starting from a textile object in CTR's archive, a large piece of dark material with no provenance or other information, we explain how different records from both CTR and other archives can be used in order to date and determine the provenance of the textile in question.

Colouring Techniques and Mycenaean Chronology: A Case Study from the Knossos Tablets

Rachele Pierini (University of Bologna and CTR, UCPH)

This paper will analyse the colouring techniques *ki-ri-ta* and *ko-ro-to* by combining Mycenaean textual sources with linguistic, history of science, and archaeology. The designations *ki-ri-ta* and *ko-ro-to* might be antonyms (Luján 1996/1997) or synonyms (Del Frego *et al.* 2010). According to Luján, the former means 'to anoint' and refers to the technical process of applying the colour onto the cloth, whereas the latter means 'to dye' and implies the immersion of the fabric into a dye bath. The difference between *ki-ri-ta* and *ko-ro-to*, though, might also rely on a personal preference of the scribe since *ki-ri-ta* is written by the scribal hand 114 and *ko-ro-to* by 116. However, a further element to be considered is the deposit from which each word comes from: the *North Entrance Passage* (NEP) for *ki-ri-ta* and the *West Magazine VI* for *ko-ro-to*. Palaeographic and archaeological studies have proved that the NEP, along with the *Room of the Chariot Tablets*, far predates all the other Knossos deposits and almost the entire archives in the mainland too. This paper will argue for *ki-ri-ta* and *ko-ro-to* being antonyms in light of their chronological gap, the different context in which they appear, and the different colours and techniques involved.

Folk weaving techniques in a contemporary form

Marta Pokojowczyk (Interweave Studio)

This poster relates to the project Weaving 3D which has started in 2019. Main pillar of the concept is based on learning and implementing ancient, folk weaving techniques from North East Poland into contemporary weaving forms. Double-thread tapestry, sejpak and perebory are a part of a weaving trail entitled The Route of the Weft and the Warp. The provenance of these techniques goes back to the Baltic regions, Lithuania and Belarus thus mapping the crossborders of various cultures and traditions. As a result, designed weaving form - a contemporary linen wallhanging interweaves a technical knowledge passed from mouth to mouth between generations, with an element of creation. Being an eyewitness to the history of craftsmanship I make sampling of information from fields like Ethnography, History of Textiles and Weaving Technology.

Egyptian textile fragments: technical differences between two cloths from Case Provv.569 from the Museum of Anthropology and Ethnography of the University of Turin
Valentina Poletto (Conservazione e Restauro dei Beni Culturali "La Venaria Reale") with Cinzia Oliva, Monica Gulmini, Rosa Boano, Paolo Gallo, Anna Piccirillo, Matilde Borla, and Elisa Fiore Marochetti

The work will focus on the study and the conservation of three Egyptian textile fragments. Two of them were identified as cloths fringes (P.569/113, P.569/133). The artefacts were found among the numerous textiles finds, together with other materials and parts of mummies, inside a large wooden case (Provv.569) coming from the Museum of Anthropology and Ethnography (University of Turin). It was not known the archaeological site, but it is assumed to be

acquired from one of the excavation campaigns of the Missione Archeologica Italiana (1910-1937). The two artefacts are composed of plain weave with linen yarn, although they showed different technical-conservative characteristics.

The first fragment (Provv. 569/113), dated 385-157 B.C. through radiocarbon dating, is characterised by a light colour of the linen, warp-fringes and a small embroidery in two blue threads (darker and lighter). The second textile (Provv. 569/133) has both selvages and warp-fringes.

The study, bibliographic research and analysis, such as optical microscopy, scanning electron microscopy, fiber optic reflectance spectroscopy, X-fluorescence spectrometry and Fourier-transform infrared spectroscopy, allowed the collection of all the necessary data to deepen the knowledge of the artefacts highlighting the differences between these two textiles identified as same typology.

The Art and Evolution of the Traditional Craft of Gold and Silver Leaf Making: A Travel Across Cultures and Timelines

Radhana Raheja and Simmi Bhagat (University of Delhi)

Since their discovery, precious metals have been known to hold a status of their own. Their use has not only been an indication of power, status and luxury, but also an example of intricate craft skills exhibited by artisans worldwide.

Gold and silver, perhaps the oldest precious metals and also the most popular have had a diverse use in the field of textiles. One such craft is the art of leaf making from these metals. Leaf making, the art of beating these precious metals into thin leaf and then their application on textiles, wood, and other materials is known to have existed for more than 3000 years. This was discovered from Egyptian tablet excavations and has travelled across cultures

and along the years, ranging from USA to India and is still practiced by many artisans. The presentation would focus on the evolution and comparison of leaf making across various cultures, its socio-cultural significance, and the changes that have taken place in terms of techniques and materials, along with the present-day status and practice by the *Pannigar* community of Jaipur, Rajasthan, India, which refer to this craft as *warak* making.

Viking Age Textiles Under the Macroscope

Kait Sepp (University of Tartu)

Viking Age clothing is a gripping topic that has gained traction both in academia and in popular culture in the 21st century. There are varied sources of information available on Viking Age material culture, yet Medieval Scandinavian literature has not yet been systematically used to illuminate the clothing of the narratives mainly set in the Viking Age.

This paper combines the newest digital humanities methods in an interdisciplinary approach. The macroscope allows us to get a large-scale overview of a topic and then interpret the findings with a

qualitative approach. Digital corpus analysis of approximately 1.7 million words gives an overview that reveals larger patterns that may otherwise remain undiscovered or be obscured at human scale. These patterns and their constituting elements can then be studied in detail using the researcher's literary and embodied knowledge.

The paper entails interactive visualisations of the digitally available corpus as well as the included textile references, insights into the data, and a glimpse of the challenges and rewards these new methods yield.

Working in-between the different worlds of museum and research standards – the “inter-disciplinary within” /// Structuring the properties of 12000 dress fragments - Connecting information within and between collections

Anna Silwerulv and Karolina Pallin (Vasa Museum)

In the research program *Dress* at the Vasa Museum we are currently documenting textiles and leather found on the ship. When we started it became clear that documenting for a museum catalogue or for research is different things. Especially when the aim is to cover as many information demands as possible.

In the 1980s Walton and Eastwood published a guide for cataloguing archaeological textiles. This is still a fundamental text in our field. Since then there has been great development in laboratory methods for textile research, but almost none in documentation methods. We saw the need to develop this further.

We work with in-depth documentation as a model and slow-looking as a method in combination with an information toolset. We named this work model SATin (System for Archaeological Textile in-depth documentation and analysis).

Hopefully this system, in part or in full, can serve as a go-to help for other people working with textile collections or textile research. This paper focus on our SATin documentation model and the differences between museum and research information standards, a work that is “inter-disciplinary within”.

The research program *Dress* at the Vasa museum documents the 12000 dress fragments from the ship, to prepare for future research. When registering the documentation data in the museum catalogue system it became clear it couldn't accommodate all details. A system that could index structured detailed information was needed.

We decided to build a custom-made database structure for storing and querying textile archaeological information on a scientific research level. The database also holds contextual information and can scale to accommodate information about any other object or object group, within or between collections.

The database is the middle part of a 3-part toolset: structured digital documentation forms, a database back-end and a front-end client. The system, that we call SATin (System for Archaeological Textile in-depth documentation and analysis) is under development with the documentation forms and database structure in operation and the front-end in testing. The aim is to develop the full potential of this tool and make it public and free.

This paper focus on the SATin toolset, how, where and why we store information.

Session 7

Sensory studies in textile research

Keynote lecture:

A Sensory Archaeology of Textiles
Susanna Harris (University of Glasgow)

The sensory archaeology of textiles presents a stimulating opportunity to embrace the full range of sensory qualities of textiles and interrogate their significance in past cultural environments. Textiles are inherently sensory materials. They move, are textured, retain scents, can be lustrous and imbued with colourful dyes. In production, textile technologies involve learned ways of moving the body and sensing materials. In practice, people sense textiles intimately in daily tasks of making, dressing, socialising, and all manner of industrial and domestic applications. These sensations are significant because people are socialised into the senses. Historically, western science has favoured the five senses of sight, sound, touch, taste, and smell. Learning from wider cultural traditions, to this can be added sensations of movement, balance and emotions. In this way, perception is opinionated, as from a young age people are socialised to pay attention to certain senses and dull others.

In this lecture I appraise the diverse and innovative approaches textiles archaeologists apply from the humanities and sciences to investigate sensory textiles. Using these results, I consider how sensory qualities enable archaeologists to understand the purpose and value of textiles. I evaluate the potential of sensory textiles to understand past societies both in terms of academic discourse and in presentation to the public. From this perspective, textile archaeologists have much to contribute to understanding sensory past worlds, as their material, through fragile, played a significant role in past human interactions.

Live papers:

A new perspective: ancient dress in motion
Ulrike Beck (Universität der Künste Berlin)

In the 1st Century AD in Xinjiang, an exquisitely constructed silk skirt was produced. A new method reveals: The skirt embodies a remarkable idea. When worn, it artfully cascades around the body and moves like a fine mist while the seams draw subtle lines into the fabric (Ulrike Beck 2018, pp. 195-198).

Clothes are designed for motion. Only when worn, they are complete.

Clothing fulfils practical, communicative, and social functions (Susan North 2006, p. 5., Gabriele Mentges 2005, pp. 11-39) and plays an essential role in economic production and trading processes. Furthermore, it is a powerful driving force for the development of new technologies. Clothing production is complex: the requirements on garments differ according to their social context. Construction, materials, and realization are linked to available resources and knowledge. Above all, clothing is bound to the principles of motor function, whether we use it as functional wear or form of expression.

Textile finds still contain the concepts of their design. Their production strategies are preserved in the compelling logic of their construction. Based on different case studies, this lecture presents a new methodology, which combines reverse engineering techniques with forensic studies, to extract primary data from the material culture. It will demonstrate new insights and how reconstruction and functional tests can be implemented scientifically accurate (Ulrike Beck 2018, pp. 26-60).

Rigid Textiles. Tactility and Amovibility within the Liturgy during the late Middle Ages

Julie Glodt (Paris 1 Panthéon-Sorbonne)

During the late Middle Ages, some liturgical textiles became more rigid : antependia, dossals, garments but also linens, such as the pall, a new object which replaced one of the corporals on the altar. This phenomenon transformed the ways textiles were moved, touched, and used within the liturgy. What was to be their status, once they were diverted from one of their first characteristics: pliability? Combining material and ritual studies, I will explore the tactility and amovibility of rigid textiles.

The rigidity is mainly related to their weight (materials, density...), but also on their treatment: lining, waxing, starching... Some sets up with wooden frames and nails could also contribute to their stiffening. This way, the celebrant's gestures and the textiles' movements became more pragmatic and simplified. The rigidification of textiles announced the rationalisation of modern liturgy. The pliable veil that concealed things was reconsidered for the benefit of a more immediate connection to the sacred. Therefore, the rigidification of textiles changed their aspect and their uses, in conjunction with the evolution of the liturgical setting between the medieval and the modern era.

Textiles in ancient Greco-Roman art

Cecilie Brøns (Ny Carlsberg Glyptotek)

Since textiles are only rarely preserved in the archaeological record of ancient Greece and Rome, we must rely on other sources when seeking information on their original appearance. Among the most significant are the ancient sculptures, rendering men, women, and divinities. These white marble statues were originally painted in a wealth of colours. Unfortunately, the original colours of ancient sculptures and reliefs have usually – like the textiles they represent – disappeared. However, scientific methods can reveal their original splendour, thus providing us with valuable and fascinating information on the colours and decoration of ancient dress.

Yet, the experience of ancient textiles and garments was not only visual, but also included smell, touch, and sound. Although these aspects are mostly lost to us today, ancient art does provide us with some clues. In fact, the ancient encounter with the sculptures preserved to us today was also a sensory experience. Not only was it often possible to touch the work of art, creating a haptic encounter between man and marble, but statues were also occasionally scented with perfumes. Moreover, specific attributes and ways of rendering fabrics etc. contributes with information on how the textiles should be interpreted and perceived by the viewer.

Sensorial Embroidery in Early Medieval England

Alexandra Makin (independent scholar)

People living in early medieval England (AD 450-1100) imbued embroidery with multiple meanings, often associated with how their wider physical and invisible (religious) worlds were sensorially perceived. Everything was interconnected and often tied to how myths or religions explained these world(s). We know that in later early medieval England the senses had an order of hierarchy; sight, sound, taste, smell and touch, and a resulting monetary value associated with their loss or mutilation. We also know that society understood the senses as both negative and positive attributes for example, 'bad' smells could corrupt but 'good' smells came from the divine and purified. Within this multi-sensory environment embroidery embodied or conveyed meanings and messages through a spectrum of sensory engagement. Today we are able to partially explore how early medieval people sensorially engaged with making, using and encountering embroidery through experimental archaeology and interdisciplinary research.

This presentation will discuss early medieval embroiderers' sensorial engagement with their work, as experienced by the author during her recreation of a section of an early 10th-century maniple. It will then

give an overview of how early medieval society sensorially engaged in embroidery with examples drawn from both the early pagan and the later Christian periods.

Recorded short presentations and posters:

Research in the making

Hazel Mallon and Karen Modrei (MA CRAFT! Textiles)

As craft-makers, the relationship between body, material and tool is integral to our practices in the generation and preservation of skills, knowledge, and artistic expression. Using our bodies as tools for research, our collaboration *intra:knit* explores these relationships using the caring hands of technology to shine a light on a more sensorial and experiential way of understanding textiles. We hope to traverse the boundaries between academic research and practical skill and allow for a more interdisciplinary and collaborative creation of knowledge.

Our work expands around the domestic knitting machine, a craft field of particular historical value. Popularised only 50, maybe 60 years ago, these machines were strongly connected to the domestic space and a different kind of labor division. By introducing (current) technology to both machine and material we invite an interactive understanding of this practice. We propose to conduct a more performative presentation of our research that allows for interaction and response and depending on the restrictions we can adapt to an online presence or hopefully attend in real life.

Session 8

Ancient dress. Towards a global history of fashion

Keynote lecture:

Where did you get that? A light-hearted look at Roman shopping
Mary Harlow (University of Leicester)

Not all Roman clothing was produced domestically. From the third century BCE to late antiquity there is evidence for the sale of both 'ready-made' and bespoke clothing from a variety of retailers. Fashion and shopping seem to go hand-in-hand, even in antiquity. This paper gathers a range of evidence from comedy, lyric poetry, satire, documentary writings and visual material to examine attitudes to shopping for clothing and the raw material needed for produce clothing. The context of the evidence is often ambiguous, but this does not prevent us from envisaging lively conversations about particular styles and colours among discerning shoppers. The evidence also reminds us that clothing and textile production in general was a constant preoccupation in Roman life and a major part of the economy across the empire.

Live papers:

Who wore the Pants in the Neolithic? A Survey on the Beginnings of Women's Trousers in Prehistory
Kalliope Sarri (guest researcher at CTR, UCPH)

Prehistoric costume is a challenging subject of study as material remains are missing, and the iconographic evidence is scarce. The earliest indications come from the decoration of Stone Age figurines that retain some abstractly rendered, iconographic elements. Based on these testimonies, we can tentatively reconstruct some main components of the clothing of the early prehistoric communities.

The available evidence mainly concerns women's clothing depicted on Neolithic figurines. Dresses, skirts and bodices made of multicoloured pieces of fabric are attested in the Neolithic Aegean and the Balkans, and some survive in the Minoan and Mycenaean costume. Trousers, on the other hand, are considered a much later creation having its origins in the 1st millennium BCE and far from Europe.

However, a closer look at the decoration of a small group of Neolithic figurines from SE Europe shows us that trousers must already have been a known type of clothing. These rare but clear indications demonstrate the existence of trousers worn by women, sometimes holding babies, leaving hints for the connection of this garment's use with motherhood. The paper addresses the earliest evidence of the existence of trousers in prehistoric Europe and attempts to open a discussion about their usage.

Development of Royal, Religious, and International Fashion for Women during the Bronze Age in the Ancient Near East

Zahra Kouzehgari (University Louis Lumière, Lyon 2)

By emergence of large socially complex and stratified societies during the early third millennium BC, in the Ancient Near East and the formation of royal courts with enthroned kings, women served as queens, royal wives, mother of princesses in the palaces and high-ranking nuns in the temples entered the political, social, and religious aspects. In the surviving iconographical documents from this period, women are represented in different contexts with different dresses, jewellery, and hairstyles. This article aims to discover the

relation between the role and status of women in the societies, the contexts, and scenes and as well as the fashion they have been represented with. To do this, material culture, written and iconographical evidence, discovered from a vast geographical area, Central Asia, Indus Valley, Iranian Plateau, Mesopotamia, Anatolia, Levant, and Egypt are examined. In the proposed paper three major different style fashion for women will be represented in the Bronze Age societies: first, the royal fashion, second, the religious fashion, and the international fashion. In addition, existing material are representative of the importance and prosperity of the production and trade of textile, thread, and wool in the globalized trade network of the ancient Bronze Age societies.

Dress as a symbol of resistance in Ancient Rome

Zofia Kaczmarek (Adam Mickiewicz University)

Dress, as a communication medium, was of crucial importance in ancient Rome. The clothed body was enough to determine the status, age, marital status, gender, or even life circumstances (e.g. mourning) of a person. Ancient authors, like Ovid or Quintilian, gave precise instructions of how the clothes should be worn, emphasizing the fact that the attire, apart from giving comfort, was also supposed to convey a message. Moreover, not only the clothed body could receive the symbolical meaning. Egon Flaig argued that the naked body was displayed in the public sphere to achieve political goals. Similarly, there are examples when textiles and dress became a tool in a domestic and foreign policy of the Roman Empire, whether during the mutiny of Percennius in Pannonia or the rebellion in Egypt during Gallienus reign, to name just these two examples. In my lecture I would like to explore those cases from the ancient Rome's political and cultural history, when dress could be understood as a symbol for opposition and disagreement with the commonly accepted lifeways.

Understanding Ascetic Dress in the Later Roman Fashion Context

Amy Place (University of Leicester)

The growing popularity of ascetic dress among the emerging Christian groups within Roman society c. AD 200 onwards marked a significant development in contemporary clothing fashions. An 'ascetic uniform' served to embody Christian ideals and values and was especially pronounced in female dress rhetoric. By shunning extravagant dress in favour of modest attire, Christians ensured that their clothed bodies demonstrated their religious commitment. Such clothing behaviours promoted fashions that actively sought to reject sartorial ornamentation and, while not all performances of Christian ascetic dress were extreme in nature, it is the notable acts of self-denial that are deemed the most noteworthy in the textual sources. Such written evidence often presents us with a somewhat contradictory view of ascetic fashions. In disregarding sartorial display, these individuals in fact made themselves objects of display and paradigms of Christian virtue. A trend towards modest female clothing was not a new phenomenon, but the accompanying rhetoric that framed active disdain for bodily appearance as *the* way of dressing was. This paper investigates how we should conceptualise the ascetic fashion system, how it interacted as part of the broader evolution of Roman clothing, and what this tells us about the importance placed upon clothing practices.

From Byzantium to Baghdad – fashion trends at the medieval court of Makuria (Sudan)

Magdalena M. Wozniak (PCMA, University of Warsaw)

The paper will explore how the Makurite royal costume attests the adoption and/or adaptation of foreign aesthetics on the occasion of political and diplomatic encounters of the court with successive empires'

capitals. The visit of Byzantium's missionaries in the second half of the 6th c. had a deep impact on the visual expression of the royal power, still attested in portraits painted in the 9th c. In later paintings, dated to the second half of the 10th c., the types of garments are the same, however the fabrics display a different set of decorative patterns. The adoption of this rich *repertoire*, common to the Mediterranean area, may perhaps be related to the embassy led in 835 by the heir of the throne, young Georgios I, to Baghdad.

The Palestinian diaspora as expressed through dress: how notions of home in the North have affected cultural textiles
Cailin Kwoh (Lund University)

Textiles have long been used as subtle and not-so-subtle signifiers in material culture: consider the designer coat that differentiates and signifies wealth and status in the modern world. In the Palestinian case, the *thob*, a traditional woman's A-line style dress with a square of embroidery on the front, and the keffiyeh, traditionally a man's scarf, have come to be the textile symbols that represent Palestinian identity throughout the world. However, after the Nakba (catastrophe) and the creation of the Israeli state in 1948, identity and their symbols were politicized in new ways. This event resulted in the massive dislocation of local peoples, leading to an international diasporic movement. Through the interview process, I examine how Palestinian garments of clothing the interviewees brought or bought when they relocated to Sweden are expressive of Palestinian identity within the Swedish diaspora.

Recorded short presentations and posters:

The textile collections from the vesuvian area: raw materials, fabrics and textile imprints
Francesca Coletti (Sapienza University)

The extraordinary corpus of textile remains and imprints from Pompeii and the Vesuvian area offers the chance to greatly improve our understanding of the Roman textile culture in the I century AD, drawing conclusions from this important site located at the center of the Empire. In fact, the specific environmental conditions caused by the volcanic eruption in AD 79 sealed the city of Pompeii and the surrounding areas, preserving a multitude of archaeological evidence. Among that, a wide range of textile finds have been preserved: textiles, soles, nets, cordages as well as gold threads and shellfish-purple dye.

This presentation aims to show the potential and the major results of the investigation carried out on the textile remains and imprints preserved on the human plaster casts. Microscopic and archaeometric analyses allowed to obtain essential information concerning the *chaîne opératoire*: spinning, weaving, finishing techniques, as well as the qualities and the standardization of the textile materials, allowing in certain cases the reconstruction of garments and their reuse. Therefore, the study of the textile imprints improved the dataset collected from the carbonized fabrics and gave a new insight on the types of garments, shoes and accessories worn by the victims of the eruption.

Embroidered dresses and décor of communities of Kutch: recent trends
Kruti Dholakia (National Institute of Fashion Technology – India)

Application of specific colorants, usage of specific materials and adornments on various utility products has been human being's obsession chiefly to display the cultural value and social status. The phenomenon is constant irrespective of hierarchy, geographical location, economic or occupational status. However variety is seen in the methods, techniques and materials. Realizing the importance of hand embroidery as a medium of ornamentation, a research was conducted to develop know-how of embroidered dresses and home

decorations amongst the communities of Kutch, a region in western part of the Indian sub-continent. Present paper describes the findings of the research through multi method approach. Results revealed that various communities were practicing embroidery as a core of folk culture in the region. Dresses and décor possessed with the artisans at the time of data collection has been explained in comparison with the various earlier studies. The focus is on the type of garment and its embroidery design layout. Based on the findings it was interpreted that various factors were responsible for the communities' changed mindsets, cultural and social ethos which had significant impact on their basic dressing and home decoration styles. It was concluded that causes and effect was specific to each community.

Egyptian tunics with scattered-motifs embellishment

Anne Kwaspén (CTR, UCPH)

During the 1st Millennium CE, the woven-to-shape tunic was the basic garment in Egypt, worn by men, women and children. The ground weave of these tunics was made in wool or linen. Most tunics were embellished with clavi, longitudinal stripes, running over the shoulders and identical on front and back, often supplemented with shoulder and hem decorations, neck panels, sleeve bands and trimmings. The variations in design of these decorative elements are countless and were produced in different techniques. In many museum collections, a style of linen tunics can be found in which these typical decorations are formed by small woven-in 'scattered' motifs. The single woven small tapestry figures together form the clavi, sleeve bands, and neck or hem panels. This group of tunics, dating from the early Middle Ages, is discussed in detail in this paper, alongside an attempt to ascertain whether this style was rather a place-bound, age-related or time-bound fashion.

Something old, something borrowed and something blue: 12th century female fashion in Eastern Baltic

Riina Rammo (University of Tartu)

The starting point of the presentation is remains of richly decorated funeral clothing from 12th century female graves on the southern shore of the Gulf of Finland (eastern Baltic). These finds give an idea of women's appearance and allow us to define a certain form of dress that is adopted by a group of people in a particular area and period. The aim of the presentation is to look at this costume in the context of fashions in the wider Baltic region, as the sea provided opportunities for communication and interaction with different people and places. Despite lively overseas communication, the female outfit can be described by the word 'traditional' and it seems strongly express local identity. In part, the traditional appearance may be due to the fact that these garments were used in the funeral context. On the other hand, even choices from such a specific context provide information on people's preferences for certain textiles, garments, and ornaments and provide information on their possible meanings.

Fashion in Greece in the archaic and classical Periods (6th-4th century BC)

Quentin Richard (École du Louvre)

The Greek garment has nowadays almost completely disappeared. Artistic representations are a central source in the knowledge of the appearance of textiles. Some garments are depicted in marble sculptures, vases and terracotta figurines. I will use these documents as a reflection of fashion in the archaic and classical Periods. Ancient authors also described fashion and textiles. Colour is an essential component of Greek clothing: murex-purple and saffron were the most prestigious dyeing but Greeks also used blue, yellow and red. Fashion in Greece did not follow a linear evolution. Garments are decorated with small repetitive

patterns in the Archaic Period but these elements almost completely disappear at the beginning of the 5th century. Some modern scholars interpreted this change in fashion as a reaction against the Persian luxury. I will argue that this opinion is not correct, this change in clothing is not due to a reaction to Persian luxury: patterns still persist in specific scenes. Luxurious garments were also used throughout the 5th century. Patterns are widely used again at the end of the 5th century and the time of Alexander the Great is characterized by a specific taste for luxurious clothing.

Evaluating the Greek *sakkos*, a popular headwear and social indicator

Elisabeth Trinkl (University of Graz)

In Archaic and Classical Greece married women were expected to almost completely conceal their hair in public. Essentially two versions can be distinguished, a wrapped cloth, called *mitra*, and a closed cap, usually called *sakkos*. From iconographical sources we know that sometimes more than one cloth was used, likely to protect the hairstyle. Headdresses were frequently decorated with a broad variety of patterns and by adding tassels and fringes as well as fashionable accessories, such as tiaras or ribbons.

In this paper I will discuss the fashion trends of female headdresses commonly found from the 7th to the 4th century BC and their textile production process. In this context I will present a highly specific wearing of the *sakkos*, so far largely overlooked. It combines the textile cap(s) with a hair pin to build two characteristic raised points on the back of the head. A rather sophisticated headdress, that was popular around 500 BC and was superseded by a much simpler, baggy version in the following centuries.

A reconstruction of Old Prussian dress in the late middle ages

Isabella Żołądziowska (University of Warsaw)

The region which is now northeastern Poland, inhabited by the Baltic tribe of Old Prussians and the first to be conquered by the Teutonic Order in the 13th century, has so far seen little attention when it comes to the reconstruction of the dress. A minute analysis of the available sources – archaeological, historical, and ethnographic - has resulted in an attempt to reconstruct the dress of this distinct cultural group. The time taken into consideration, i.e. the late 13th to the beginning of the 14th century, is especially interesting since the Prussian dress became a statement, an opposition to the Western European dress of the new Christian elite and their colonists. As a historical reenactor and educator, I have been wearing and working in this reconstruction for a decade now throughout changing weather conditions and in different surroundings and would like to share the sources, reconstruction and my experiences with the audience.

Session 9

Looking forward: EuroWeb and the future of textile research

Europe through textiles: network for an integrated and interdisciplinary humanities –

The first six months of the EuroWeb COST Action CA 19131

Agata Ulanowska (University of Warsaw), Christina Margariti (Directorate of Conservation, Hellenic Ministry of Culture), Magdalena M. Wozniak (PCMA, University of Warsaw), Louise Quillien (CNRS)

EuroWeb, conceived by the CTR, is a new network of scholars and stakeholders from academia, museums, conservation and cultural institutions, as well as creative industries, that already represent 31 European countries and Israel. It has received funding from the EU Horizon framework and the COST Association to operate throughout the period 2020–2024. During the panel, the action leaders will briefly discuss the challenges in building a network based on mobility and in-person contacts in the first six months of the action under the pandemic security measures. We will discuss ideas, as well as practical solutions for cooperation and networking that help implement the initial networking tools for the action.

We will also discuss how the main aims of EuroWeb came into the (virtual) being, including: 1) formulating a new vision of European history based on textiles; 2) uncovering the underlying structures connected to textiles in languages, technologies and identities; 3) bridging different theoretical and methodological approaches grounded in European scholarship, and testing/disseminating new analytical and multi-disciplinary methods; 4) dissolving the traditional and often obsolete and obstructive dichotomies of practice and theory through a more integrated approach of disciplines and cultural institutions; and 5) forging new notions of inclusive European identity based on a shared heritage and experience of textiles and a sense of belonging and social cohesion.