


Centre for Textile Research 2005 2016

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Nationalmuseet
 National Museum of Denmark

KØBENHAVNS UNIVERSITET
UNIVERSITY OF COPENHAGEN



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Introduction

Initiator and director of CTR, Marie-Louise Nosch, is a historian, specialized in ancient Greek history. She studied in France and Italy and received her Ph.D. from Universität Salzburg, Austria. Her primary area of study is Aegean epigraphy and Mycenaean textile production. In 2009, Marie-Louise Nosch was appointed research professor at the Saxo Institute, University of Copenhagen

Dear friends and colleagues,
It is a great pleasure and honour to present textile research at CTR 2005-2016. It is truly breathtaking how far we have come, how much we have achieved, and where we are heading. The Danish National Research Foundation trusted us twice with funding to realise our ideas and goals, and gave international textile research an opportunity to flourish.

The home of CTR is the University of Copenhagen, the Faculty of the Humanities and in particular the Saxo Institute. It is of great value to the CTR to be part of an institution with so many expert colleagues, and we are thankful for the support and help we have received over the years.

The National Museum of Denmark has been a valuable and inspiring partner deeply involved in our research since the very beginning. This collaboration has been formalised as we negotiated funding for a second period of research 2010-2016. I am proud to announce that since 2010 the CTR has been embedded into both the National Museum of Denmark and the Saxo Institute, University of Copenhagen. This dual context – university and museum – reflects the core activities in contemporary textile research very well and forms a perfect platform for our research.

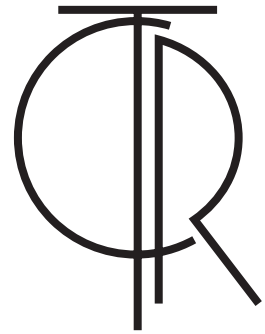
Indeed, in our research design it remains our ambition to integrate museum expertise with scholarship from academia. Research at CTR is based on a large, international network of scholars from a multitude of disciplines. You have all contributed with your time and expertise and I thank you for your confidence and enthusiasm.

I look forward to the coming years in the international textile research community with joy and anticipation!

Yours sincerely,



Marie-Louise Nosch
Director, The Danish National Research Foundation's
Centre for Textile Research



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Even though CTR's primary support comes from the Danish National Research Foundation, the centre is also maintained thanks to many other fundings and grants, from many different entities and sources.

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ERA, Seventh Framework Programme
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Norden, Nordic Culture Fund
HERA
Institute for Aegean Prehistory
Kerteminde Håndarbejdsseminarium
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Introduction to CTR 1

Since 2005, CTR has set the agenda in European textile research. Methodologies have been developed and established, knowledge challenged and supplemented. Cutting edge research has shown how textiles can contribute with important information to our understanding and interpretation of prehistoric societies.

In October 2004, The Danish National Research Foundation awarded 18 million DKK to Marie-Louise Nosch for the establishment of the Danish National Research Foundation's Centre for Textile Research at the University of Copenhagen. The centre is based on a collaborative, interdisciplinary and ambitious concept developed by Marie-Louise Nosch, Eva Andersson Strand and Ulla Mannering. The Centre opened on the 1st of August 2005 and was officially launched on the 16th of September at the University of Copenhagen with the participation of

University officials and staff, representatives from the Danish National Research Foundation and more than 200 guests from Denmark and several European countries. CTR was met with enthusiasm from colleagues in and outside Denmark which motivated and stimulated the initiators in their efforts. It was a dream come true. Researchers from all over the world have contributed to CTR's research. Universities, museums and laboratories have shared their expertise and materials. Research at CTR is a truly international and interdisciplinary endeavour.



CTR initiators



Director Marie-Louise Nosch

Initiator and director of CTR, Marie-Louise Nosch, born in 1970, is a historian, specialised in ancient Greek history. She studied in France and Italy and received her Ph.D. from Universität Salzburg, Austria in 2000. Her special area of study is Aegean epigraphy and Mycenaean textile production. In 2009, Marie-Louise Nosch was appointed research professor at the Saxo Institute, University of Copenhagen. CTR's activities have benefited pro-

foundly from the fact that Marie-Louise Nosch received awards for outstanding research achievements amounting to a total of more than 3 million DKK:

- The Danish Association of Masters' Prize for Transdisciplinary Research (Dansk Magister Forenings Pris for Grænseoverskridende Forskning): 50.000 DKK
- Einar Hansen's Research Foundation's grant for outstanding research in the Humanities (Einar Hansens Forskningsfonds legat for enestående humanistisk forskning): 150.000 DKK
- The Danish Ministry of Research, Technology and Innovation's Elite Research Price (EliteForsk) which consists of a Price of Honour: 200.000 DDK plus 900.000 DDK for research purposes
- Category A Research Grant from the Alexander S. Onassis Public Benefit Foundation
- Annelise Meier Award of the Humboldt Foundation: 250.000€

Moreover, the Danish Councils for Independent Research and the Research Council for the Humanities nominated CTR and textile research as the most promising and dynamic area of independent research in Denmark in 2008.



Eva Andersson Strand

Initiator and research programme manager Eva Andersson Strand is an archaeologist specialised in textile production and craft organisation during the Iron and Viking Ages in Scandinavia. She received her Ph.D. in Prehistoric Archaeology from Lund University. She also works with textile production in the Bronze Age Mediterranean and experimental archaeology. Eva Andersson Strand came to CTR from a position as lecturer and director of studies at the Department of Archaeology and Ancient History, Lund University. At CTR she is programme manager for the TTTC programme. Since 2009 Eva Andersson Strand holds the position

as associate professor at CTR and in 2012 she was appointed docent at Lund University in Sweden.



Ulla Mannering

Initiator and research programme manager Ulla Mannering is an archaeologist specialised in North European textiles and costumes. She received her Ph.D. in Prehistoric Archaeology from the University of Copenhagen. She has analysed textiles for numerous museums in Denmark and abroad. Her areas of research include Scandinavian and Roman textile and costume traditions, the use and production of prehistoric plant fibre materials, especially nettle and flax, and the study of costume from iconographic sources. She was programme manager for the DTC research programme

from 2005-2010 at CTR and held the position as associate professor from 2009-2010. Since 2010 Ulla Mannering is employed at the National Museum of Denmark in Copenhagen as senior researcher and programme manager of the TECC Research Programme.



Margarita Gleba

Margarita Gleba Ph.D. came directly from her Ph.D. studies at Bryn Mawr, USA to a post doc position at CTR. She was subsequently appointed programme manager together with Ulla Mannering. Margarita Gleba is specialised in Pre-Roman textile production. In October 2009 Margarita Gleba received the prestigious Marie Curie Fellowship at the University College London, UK and continued textile research abroad. Since 2013 she conducts research with an ERC starting grant at UCL in the UK.



Karin Margarita Frei

Karin Margarita Frei has a M.Sc. in geology and geochemistry from the University of Copenhagen. She started her Ph.D. studies at CTR in 2007 and received her PhD in Pre-historic Archaeology from the University of Copenhagen in 2010. Her research is focused on the development of a method which allows for an isotope-geochemical characterization of the raw material of ancient textiles. In 2011 she was awarded the international prize for the best Ph.D. in Archaeometry by the Groupe des Méthodes Pluridisciplinaires Contribuant à l'Archéologie (GMPCA). In 2012 she was awarded the For Women in Science Prize by L'Oréal Denmark and UNESCO at the Danish Royal Academy of Science. In 2010 she continued her research as a post doc at CTR and in 2012-2014 at the National Museum of Denmark to continue her research in collaboration with CTR.

Missions

From the beginning CTR set up six major missions which are our overall guidelines:

- **To bridge the methodological gap between Northern European scientific and experimental research in textiles and tools, and Southern European historical, iconographical and epigraphical approaches.** This gap lay between the different terminologies, methods, sources and interpretations. The discrepancy between the North European tool-and-technique method and the South European historical method also defines the framework of all textile research around the world. CTR has integrated the two traditions by conducting seminars, authoring joint publications, and collaborating closely with scholars from both Northern and Southern European scientific traditions. Likewise, CTR has through research activities and courses for young scientists strived
- **To unify the scattered research in textiles carried out at many institutions, both within and outside universities and museums.** CTR has challenged this situation - without ignoring the fact that the atomised character of textile research also comprises an inspiring and fertile aspect of the field. However, there has been an urgent need to combine and connect the milieus, in order to facilitate more systematic and internationally based research. CTR has engaged in partnerships with many institutions, and collaborated with a wide range of international and regional partners at all academic levels. CTR has also provided services such as manuals, websites, and a newsletter in order to facilitate contact and exchange between textile scholars.

- **To challenge the traditional picture of early technological development.** Traditionally, the origin of textile production has been linked with the introduction of agriculture and the domestication of animals. Today we know that textile technology developed far earlier than agriculture, and even before ceramics. This knowledge, however, has not been embedded in our cultural history. The existence of twills in the Bronze Age Mediterranean has now been attested through systematic tool studies. Furthermore, textile analyses have shown how Scandinavian Early Iron Age textiles are made of carefully selected wool, sometimes even traded from far away.



- **To challenge the peripheral position of textile research in such areas as military, maritime, agricultural and industrial history and archaeology.** For many years, textiles have

been associated with female producers. Likewise, textile research has mainly been performed by women scholars. It was our ambition to achieve new results in fields of cultural history in which women scholars have traditionally been less represented, and in which textiles as objects of study or as sources of information are largely absent. Besides organising seminars and courses on textile history of their own, CTR has organised textile sessions in several international conferences on archaeology and history – a strategy which has been very successful, raising awareness of and interest for the large potential in textile research. Likewise, the international seminar on Military and Textiles (2008) and the publication of its proceedings have raised the awareness of textiles within research on military strategies and army history.

- **To conceptualise textile studies.** CTR has followed up on previous contributions from the fields of anthropology and ethnology to the analysis of clothing. In particular, CTR has concentrated on the cognitive aspects of textile production, from the early shift from leather to textile, to modern, identity-shaping clothing, but also on how early textile technology influenced the development of later technologies

such as pottery and metallurgy. These issues have been shared with European and Scandinavian ethnologists, archaeologists, designers and historians at conferences and workshops and explored at courses in universities.

- **To connect textile research to modern textile industry and design.** We share knowledge with the textile crafts and textile design, and we believe in the potential and mutual benefit inherent in textile research and industrial applications, both on the practical and theoretical level. This has resulted in collaboration with Kolding School of Design, student exchange programs, and seminars by modern designers at the CTR. A collaboration was begun with the Copenhagen Business School to explore design as a competitive parameter in the Danish textile industry. Workshops and conferences such as “Future Textile – Tecno-

logy and Intelligent Textiles” organised by CTR have brought various textile companies into close contact with the CTR.

Interdisciplinary research is the backbone of CTR. We determinedly seek collaborations and opportunities both inside and outside the Humanities. The results on the crystalline structures in nettle as a defining phenomenon for plant identification as developed by our partners in Physics at Bergen and Kiel Universities, the diachronic and comparative study of textile terminologies in Hittite, Egyptian, Mycenaean, Old-Babylonian etc., and the far reaching consequences of the systematic testing of degradation phenomena in dyes which will definitely change conservation praxis in the future are examples where traditional methods from archaeology are combined with new analytical tools from the Natural Sciences with great success.



Bobbins from a silk loom in China

CTR Core Research



Recording and drawing

Textile *craft* is one of the most ancient human technologies, playing a crucial role in societies worldwide throughout our past. Textile *garments* play a vital role in human environments and express who we are, our tastes, affiliations and know-how. Textile production reflects human interactions with the environment since the end of the Ice Age. The scientific core of CTR consists of two research blocks which is focused on North European and South European Bronze and Iron Ages. In the first CTR research period (2005-2010) *The Tools and Textiles, Texts and Contexts* (TTTC) focused on textile production of the Mediterranean Bronze Age. The research programme started immediately after the opening of the Centre in August 2005, and submitted its first results to the scientific community after only six months. The *Textile and Costume from Early Iron Age in Danish Collections* (DTC), which investigates Danish textiles and skin costumes in a European context was kicked off in March 2006.

CTR 2005-2016

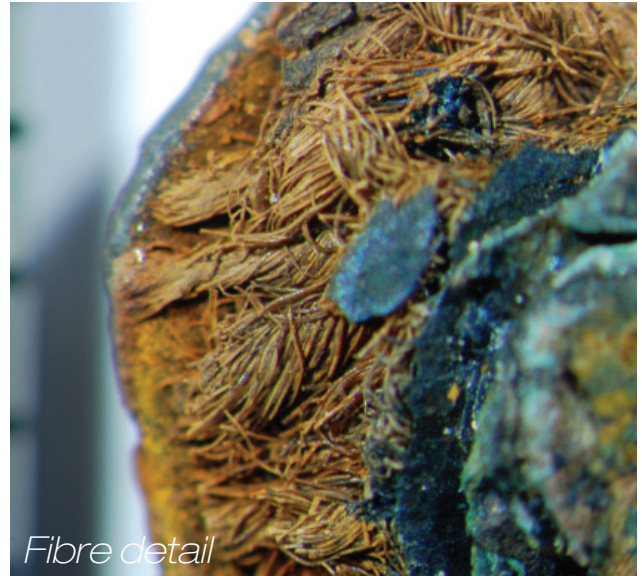
Since then many different researchers have been linked directly or indirectly to the CTR core research programmes. Likewise, other researchers have brought new and different research programmes into CTR's.

In 2009 an international evaluation of CTR as a centre of excellence took place. It was also the year in which a new research plan for 2010-2015 was developed and new collaborations were planned. Our research and future plans were submitted to an international panel of experts who visited CTR on April 27 and discussed with us for an entire day. The international evaluation report, together with our new research plans, was submitted to the Danish National Research Foundation. As a result, the board of the Foundation granted DKK 25 millions for another five years of textile research. The new research includes a strong partnership and joint research plans with the National Museum of Denmark.

The research programmes launched in 2010 built on the research results obtained in the TTTC and DTC programmes.

The overarching theme to be explored in the period between 2010 and 2016 is the connection between textile, environment and society: *how did the human need and desire for textiles transform ancient environment and society?*

This question will be explored via re-



Fibre detail



Mummy from a danish bog



Wool and comb

search programs with subprojects and affiliated Ph.D. projects.

CTR's ambitions are to achieve new results in the intersection between environmental studies and textile research, to continue the development of new analytical methods and to make textile knowledge an integrated part of teaching, training and research in archaeology and history.

The research programme *Textile Economies, textile consumption and the organisation of textile pro-*

duction in the 2nd and 1st millennia Mediterranean area (TEMA) explores textile production from the Late Bronze Age palace cultures in Greece and the Near East to the Roman era, while the *Textile Crafts and Cultures (TECC)* programme investigates the development of northern European textile and skin production until c. AD 400. Altogether this varied and multifaceted research makes CTR a constant developing, inspiring and leading research environment.



Marie-Louise Nosch receives the Elite Research Prize in 2009

Danish Textiles and Costumes from the Early Iron Age (DTC)

DTC is an international and interdisciplinary programme directed by Ulla Mannering and Margarita Gleba (2006-2009), and executed in collaboration with the National Museum of Denmark, in particular the Department of Conservation. Lise Bender Jørgensen from the Norwegian University of Science & Technology, Trondheim was in 2006 affiliated to this programme as an external expert.

The aim of the programme is to examine the costumes from the Early Iron Age from bogs, burials and weapon deposits using modern scientific methods, and to create new international reference standards for these artefacts. In the course of this research programme the material is analysed, discussed and contextualised integrating technical studies, cultural historical analysis,

and cross-cultural and diachronic studies. The long-term aim is to set new standards for textile research, and to explore and communicate the new knowledge acquired during the process.

Background

Denmark possesses a unique collection of prehistoric textiles and garments recovered from bogs and burials. In their totality, they provide an outstanding contribution to our understanding of Scandinavian prehistoric textile and costume development. The majority of these Danish prehistoric costumes have been dated to the Bronze Age (1800-500 BC) and Early Iron Age (500 BC-400 AD). In the 1930s and 1940s, the Danish scholar Margrethe Hald wrote her two seminal books about these finds: *Costumes*

of the Bronze Age in Denmark (1935/1940) and *Ancient Danish Textiles from Bogs and Burials* (1950/1980). These books are still used worldwide as the primary reference for these finds. They contain detailed information on specific finds and on textile technology in general but are, however, out of date and out of print. Since Margrethe Hald published her work half a century ago, knowledge of prehistoric Scandinavian textile technology has increased dramatically and we found it was time to integrate Margrethe Hald's work with the accumulated insights and knowledge gained since the 1950s and apply them in their proper archaeological context.

Research

The material studied includes finds

from three distinct contexts: bogs, weapon deposits and burials. The main focus of this research programme was the finds from the bogs and weapon deposits. The former consisted of both textile and skin objects. The vast majority of these finds belong to the collections of the National Museum of Denmark, but also several local museums in Jutland; Kulturhistorisk Museum Randers, Moesgård Museum, Museum Sønderjylland, Arkæologi Haderslev, Nordjyllands Historiske Museum, Silkeborg Museum, Skive Museum, Museet for Salling og Fjends, Vejle Museum, Vesthimmerlands Museum and Viborg Stiftsmuseum have contributed to the investigation.

Project managers Ulla Mannering and Margarita Gleba first focused on the creation of a database of Iron Age Textiles which was first and fore-



Ulla Mannering working on a grave find

most based on the information in the monograph *Ancient Danish Textiles from Bogs and Burials* by Margrethe Hald (1980). The database consists of individual entry sheets for every textile/skin item, and gathers all relevant data like provenance, location, dating, technical information and description, bibliography etc. The database facilitated the organization of basic information about each item to be analysed and enabled statistical analyses of data. The database now consists of approximately 170 individual items (textiles and skins) also including additional unpublished finds.

The project investigated the specific technical characteristics of the textiles i.e. weave, yarn, fibres, patterns and colours and provided an interpretation regarding their original function. Visual appearance and the field of making reconstructions were also considered. Likewise new standards and methodologies for skin analysis and documentation were developed and employed. The wide-ranging international collaboration has resulted in numerous articles in Danish and international journals, and several books. The specialist analyses as presented below were employed and developed with our many national and international collaborators.

Designed for Life and Death (2014), by Ulla Mannering and Margarita Gleba with contributions (publication in collaboration with the National Museum of Denmark).

Textiles and Textile Production in Europe from Prehistory to AD 400, edited by Margarita Gleba and Ulla Mannering, Ancient Textiles Series 11, Oxford 2012.

Radiocarbon Dating

^{14}C dates were analysed by Göran Possnert, Uppsala University, Sweden and Jan Heinemeier, Århus University, Denmark. Jan Heinemeier also recalibrated old ^{14}C dates which were provided by Steen Wulff Andersen, Klaus Ebbesen, Christian Fischer, Kaare Lund Rasmussen and Ernst Stidsing.

A total of 45 ^{14}C samples from 43 different locations were analysed, and have demonstrated that the majority of the selected finds belong to the Pre-Roman Iron Age. Textiles were selected validating previous experiences of textiles as the most reliable test material, as human remains and skin objects demand more careful and sophisticated pre-cleaning methods to obtain a reliable result. Only one bog body, the Man from Undelev, and a few leather shoes were dated to the Late Bronze Age. Likewise few finds were dated to the Roman Iron Age and one skin shoe to the Late Iron Age (Arnitlund). It was also ascertained that the textiles from Tvis and Vong, published by Margrethe Hald together with the other Iron Age finds, are not pre-historic but date to much later historical periods. The analyses have thus provided a whole new chronology for the selected finds and a fine-tuning of our understanding of Scandinavian costume chronology.

2010, Ulla Mannering, Göran Possnert, Jan Heinemeier & Margarita Gleba, "Dating Danish textiles and skins from bog finds by ^{14}C -AMS", *Journal of Archaeological Science* 37, 261-268.



Dye analyses

Dye analyses have been carried out by Ina Vanden Berghe at the Royal Institute for Cultural Heritage (KIK-IRPA), Brussels. Over 75% of the samples tested positive for dye components, indicating that the majority of textiles were dyed. A new sample of peat from Tollund bog provided by Christian Fischer was analysed for dyes in order to test to what extent the bog environment could influence the presence of dye components in the textiles. The results have shown that only tannins and no dyes were present in the bog environment, and thus there can be no doubt that the results reflect dyes applied in prehistory.

Yellow dyes were most commonly used but also red and blue colours occur; sometimes they were used as the only colour and sometimes

in combination with other dyes. This demonstrates that the dyeing technology was already well developed in the Scandinavian Pre-Roman Iron Age. The results further indicate that textiles were dyed repeatedly, probably to refresh or change the visual appearance of the colours.

In addition, 10 textile samples from two of the most important Norwegian bog textile finds, Tegle and Helgeland, were analysed, as well as samples from several rich Danish Roman Iron Age graves. In December 2007, the preliminary results of dye analyses were reviewed at a meeting with the leading European dye specialist Dominique Cardon, CNRS, Lyon, France.

2010, Ina Vanden Berghe, Margarita Gleba & Ulla Mannering "Towards the identification of dye-stuffs in Early Iron Age Scandinavian peat bog textiles", *Journal of Archaeological Science* 36, 1910-1921.

Fibre Analyses

Yarn and sewing threads from 26 different textiles and wool from four skin capes were selected for fibre quality analysis performed by conservator Irene Skals, the National Museum of Denmark. A new fibre analysis methodology developed by Antoinette Rast-Eicher, Archeotex, Switzerland, was employed and further developed. The results have shown that the Early Iron Age textiles are made from an exceptionally fine wool quality, which have given the textiles a very light and soft appearance.

Also the use of plant fibres in this period has been demonstrated, which has not previously been documented. To develop the methodology for identifying specific plant fibres like flax, nettle and hemp, collaboration was established with Bodil Holst, University of Bergen, Norway, who has developed advanced fibre microscopy and analysis. The preliminary result of the fibre analysis of the plant fibre threads from Huldremose

I indicate that the textile was made from nettle.

Several samples from Prehistoric plant fibre textiles were analysed at the European Synchrotron Radiation Facility in Grenoble, France, by microfocus X-ray diffraction in collaboration with Bridget Murphy, University of Kiel, Germany.

Strontium Isotopic Tracing

Strontium Isotopic tracing was from the outset investigated in collaboration with Gisela Grupe and Mike Schweissing, Ludwig Maximilians Universität, Germany, and Claus von Carnap-Bornheim, Landesmuseum Schloss Gottorp, all from Germany. In May 2007 Karin Margarita Frei started her Ph.D. research on isotopic tracing on wool fibres funded by the University of Copenhagen. During this research Karin Margarita Frei developed a new methodology for extracting strontium isotopes from dyed and non-dyed wool fibres and has successfully demonstrated that strontium isotopes can be used to trace the provenance of ancient textiles.

2009, Karin Margarita Frei, Robert Frei, Ulla Mannering, Margarita Gleba, Marie-Louise Nosch & Henriette Lyngstrøm, "Provenance of Ancient textiles - a pilot study evaluating the Sr isotope system", *Archaeometry*, V 51, 2, 252-276.

2009, Karin Margarita Frei, Irene Skals, Margarita Gleba & Henriette Lyngstrøm, "The Huldremose Iron Age textiles, Denmark: an attempt to define their provenance applying the strontium isotope system", *Journal of Archaeological Science* 36, 1965-1971.



Skin cape from Haraldskaer

X-Ray

The two capes from Huldremose I were x-rayed by Birthe Gottlieb, the National Museum of Denmark and

digital images of combined photos were created. This method has been useful in identifying otherwise hidden structures and techniques.

CT-scanning

The head of the Stidsholt Woman and the skin shoe still containing the foot of the Fræer Woman were CT-scanned by Niels Lynnerup, the University of Copenhagen, Denmark, in order to create three-dimensional images of the finds and to study otherwise hidden structures and details.

The human remains related to the bog finds, studied by Pia Bennike and Niels Lynnerup, University of Copenhagen, have provided new information on the life and death of the many Danish bog mummies. The results have given rise to a new interpretation of the bog mummies.



DNA

In collaboration with Eske Willerslev and Tom Gilbert (at that time the Ancient DNA Group, University of Copenhagen) DNA analysis on a

few samples of skin garments from supposedly different animal species was performed in order to see if any DNA still remained in the bog finds. Five samples from costumes of skin were sent for DNA analysis, but although the preliminary results seemed to indicate positive identification of goat in one of them, the tests were negative. A DNA analysis of the plant fibre found on the body of the Huldremose Woman could unfortunately not identify the fibre, but on the other hand confirmed that the fibre is ancient. The DNA test further identified traces of pine DNA, which most likely was contamination from wood shavings in which the mummy was stored at some point and this result shows the effectiveness and high sensitivity of DNA for testing of modern contaminants.

Two archaeology students, Lena Diana Tranekjer and Luise Ørsted Brandt were engaged in the development of a methodology for using DNA analysis on ancient wool textiles. The results have shown that technologies such as mordanting and dyeing as well as the context and environment greatly influence the preservation of DNA.

In 2011 Luise Ørsted Brandt started her Ph.D. studies in Ancient DNA at CTR in collaboration with DNR's Centre for GeoGenetics.

2011, Luise Ørsted Brandt, Lena Diana Tranekjer, Ulla Man-
nering, Maj Ringgaard, Karin Margarita Frei, Eske Willerslev,
Margarita Gleba & M. Thomas P. Gilbert, "Characterising
the potential of sheep wool for Ancient DNA analyses", *Ar-
chaeological and Anthropological Sciences* 3, 209-221.



Highlights of the DTC programme

- The Huldremose I find has become especially significant for the research programme as it has been used as a test case for the development of new methodologies and analyses. An examination of the Huldremose mummy has shown that tiny fragments of plant fibre textile were still adhering to the back of the body. Also imprints of the already known costumes on her chest and imprint of a possible finger ring on the left hand were discovered. It can therefore be concluded that the Huldremose Woman wore a plant fibre garment under her skin capes and wool garments. The presence of plant fibre textile is unique in this period and context, and gives new perspectives to the interpretation of this important find. The Huldremose Woman was definitely not a poor woman deprived of private goods and belongings. Her costume testifies that she had access to many different materials and techniques during her lifetime.
- The Ømark textile dated 390-200 BC has been proven to be the oldest painted textile known in Europe.
- Dye analyses have demonstrated that the vast majority of the Early Iron Age Danish textiles were much more colourful than previously anticipated, thereby fundamentally altering our view of ancient costume. The dye tests showed that the preferred colour was not brown as the textiles look today or even white but yellow with red or blue accents.
- Fibre analyses have shown that the Early Iron Age people had access to high quality wool and that the raw material was subject to vigorous selection and preparation processes.
- The new ¹⁴C datings provide a whole new platform for the interpretation of our cultural history and a wider understanding of the Danish Early Iron Age textile and skin craftsmanship.

Public Outreach

DTC researchers have also had the pleasure to contribute with information on textiles and skin costumes in



connection with the opening of the new permanent exhibition on Danish prehistory, which opened at the National Museum of Denmark on May 16th 2008. Furthermore, CTR and the National Museum of Denmark have developed a new website <http://natmus.dk/historisk-viden/danmark/oldtid-indtil-aar-1050/livet-i-oldtiden/> which serves as a digital extension of the new permanent exhibition *Danmarks Oldtid* with a special focus on archaeological textiles and the new results accumulated during the first five years. The Oak Foundation, Oticon and the Danish Heritage Board financed the site. A new web technology with an extremely high resolution and 3D imaging now enables scholars all around the world to study the Dan-

ish textile collections at fibre level. This was also a CTR contribution to the strategies of conservation of the unique and fragile textiles.

In 2008 *National Geographic Television* made a documentary on bog mummies from Denmark, North Germany and Ireland by Singing Cat Productions, USA (producer Wynette Yao). The programme features Ulla Mannering at the Department of Conservation, the National Museum of Denmark in Brede.



Textile from Haraldskær

DTC Collaborators

- Steen Wulff Andersen, Vejle Museum, DK
- Eva Andersson Strand, CTR, DK
- Johanna Banck-Burgess, Landesdenkmalpflege Baden-Württemberg, DE
- Marta Bazzanella, Museo Degli Usi E Costumi Della Gente, Trento, IT
- Tereza Belanová-Štolcová, Archaeological Institute, SK
- Lise Bender Jørgensen, Norwegian University of Science and Technology, NO
- Pia Bennike, University of Copenhagen, DK
- Christian Bergfjord, University of Bergen, NO
- Luise Ørsted Brandt, University of Copenhagen, DK
- Enrico Cappellini, Natural History Museum of Denmark, DK
- Dominique Cardon, Centre National de la Recherche Scientifique Lyon, FR
- Carol Christiansen, Shetland Museum and Archives, UK
- Martin Cizuk, University College of Borås, SE
- Sandra Comis, NL
- Ida Demant, Land of Legends, DK
- Dee DeRoche, Virginia's Department of Historic Resources, USA
- Klaus Ebbesen, Akademos, DK
- Per Ethelberg, Museum Sønderjylland, Arkæologi Haderslev, DK
- Christian Fischer, Silkeborg Museum, DK
- Roberto Fortuna, The National Museum of Denmark, DK
- Mari-Louise Franzén, Statens Historiska Museum, SE
- Karin Margarita Frei, University of Copenhagen, DK
- Robert Frei, University of Copenhagen, DK
- Tom Gilbert, Natural History Museum of Denmark, DK
- Carmen Alfaro Giner, University of Valencia, ES
- Jens Glastrup, The National Museum of Denmark, DK
- Kordula Gostenčnik, AT
- Karina Grömer, Naturhistorisches Museum, AT
- Gisala Grube, Ludwig Maximilians Universität, DE
- Per Thorling Hadsund, Nordjyllands Historiske Museum, DK
- Sunniva Halvorsen, NO
- Lena Hammarlund, Göteborg, SE
- Marianne Bloch Hansen, University of Copenhagen, DK
- Åsa D. Haugen, Stavanger Museum, NO
- Lotte Hedeager, University of Oslo, NO
- Elizabeth Wincott Heckett, University College Cork, IE
- Jan Heinemeier, University of Århus, DK
- Bodil Holst, University of Bergen, NO
- Stjepan Hrkac, University of Kiel, DE
- Steen Hvass, The Heritage Agency of Denmark, DK
- Jesper Stub Johnsen, The National Museum of Denmark, DK
- Sabine Karg, SAXO Institute, University of Copenhagen, DK
- Heini Kirjavainen, University of Turku, FI
- Lise Ræder Knudsen, Conservation Centre Vejle, DK
- Inge Kjær Kristiansen, Skive Museum. Museet for Salling og Fjends, DK
- Tatjana Krupa, Kharkiv University, UA
- Ulla Lund Hansen, SAXO Institute, University of Copenhagen, DK

Danish Textiles and Costumes from the Early Iron Age (DTC)

- Eva Lundwall, Statens Historiska Museum, SE
- Henriette Lyngstrøm, SAXO Institute, University of Copenhagen, DK
- Niels Lynnerup, Anthropological Laboratory, University of Copenhagen, DK
- Orla Madsen, Museum Sønderjylland, Arkæologi Haderslev, DK
- Jerzy Maik, Institute of Archaeology and Ethnology of the Polish Academy of Sciences, PL
- Fabienne Médard, FR
- Susan Möller-Wiering, Landesmuseum Schloss Gottorf, DE
- Christophe Moulherat, FR
- Bridget Murphy, University of Kiel, DE
- Bjarne Henning Nielsen, Vesthimmerlands Museum, DK
- Anna Nørgård, Copenhagen, DK
- Linda Olofsson, Klagstorp, SE
- Anette Hjelm Petersen, The National Museum of Denmark, DK
- Margit Petersen, Viborg Stiftsmuseum, DK
- Göran Possnert, Uppsala University, SE
- T. Douglas Price, Wisconsin-Madison University, USA
- Kaare Lund Rasmussen, University of Southern Denmark, DK
- Antoinette Rast-Eicher, Archeotex, CH
- Morten Ravn, University of Copenhagen, DK
- Charlotte Rimstad, University of Copenhagen, DK
- Hans Rostholm, Herning Museum, DK
- Anne-Lisbeth Schmidt, The National Museum of Denmark, DK
- Mike Schweissing, Ludwig Maximilians Universität, DE
- John Simonsen, Skive Museum. Museet for Salling og Fjends, DK
- Irene Skals, The National Museum of Denmark, DK
- Youlie Spantidaki, GR
- Annemarie Stauffer, University of Applied Sciences Cologne, DE
- Ernst Stidsing, Kulturhistorisk Museum Randers, DK
- Julian Subbert, Hamburg University, DE
- Amica Sundström, Statens Historiska Museum, SE
- Marie Louise Stig Sørensen, Cambridge University, UK
- Lena Diana Tranekjer, University of Copenhagen, DK
- Ina Vanden Berghe, Royal Institute for Cultural Heritage, BE
- Carol van Driel Murray, Amsterdam Archaeological Centre, NL
- John Peter Wild, University of Manchester, UK
- Eske Willerslev, Natural History Museum of Denmark, DK
- Rane Willerslev, Moesgård Museum, DK
- Andrew Wilson, University of Bradford, UK
- Kelvin Wilson, Ridderkerk, NL
- Irita Zeiere, Museum of History, LV



Textiles for War

Textiles for War was carried out as an independent postdoctoral research project by Susan Möller-Wiering, co-financed by CTR, the Danish Research Council for the Humanities, the research project *Iron Age in Northern Europe* and Landesmuseum Schloss Gottorf, Germany. The weapon deposits in bogs contain thousands of weapons and other objects. It is not well known that some of these weapon deposits also contain collections of textiles. The textiles are now mostly mineralized through the contact with metals especially weaponry without contact with human bodies, but complete or almost complete costumes have also been found.

The aim of the *Textiles for War* project was to analyse all the textiles from the weapon deposits Illerup Ådal, Nydam, Thorsberg in Jutland and Vimose on Funen. The purpose was to view these textiles together, not only as finds belonging to specific locations, but as a complex of their own: as *Textiles for War*. The project studied the specific characteris-

tics of the textiles – i.e. their weave type, thread type, colours and qualities – and provided an interpretation regarding their original function. Each weapon deposit has specific features and the project examined whether these differences reflected varying conditions for preservation, or rather differences in chronology or geography. The analysis of textile remains from the four Roman Iron Age weapon deposits has demonstrated that textiles were a substantial part of the ritual destruction of the enemy's weapons: soldier's clothing and sacks were wrapped around the weapons before their deliberate ritual deposition. These results have shed new light on Early Iron Age textiles, aggression and cults.

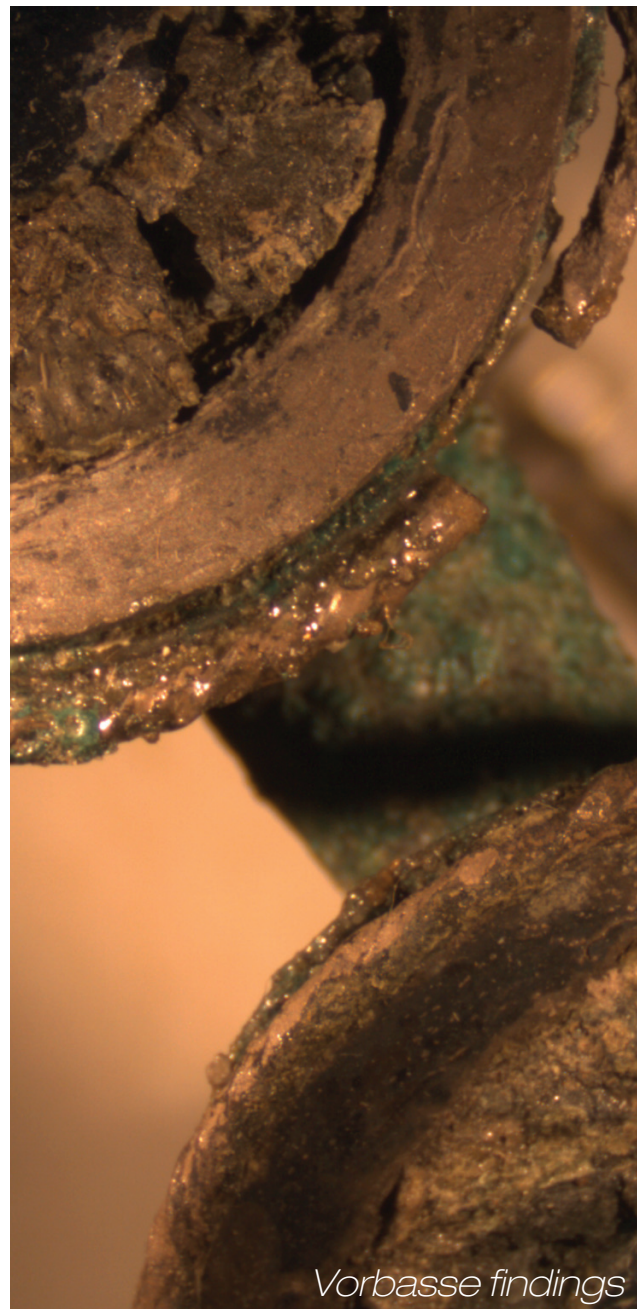
War and Worship: Textiles from 3rd to 4th Century AD Weapon Deposits in Denmark and Northern Germany, by Susan Möller-Wiering with a contribution by Lise Ræder Knudsen, Ancient Textiles Series 9, Oxford 2011.

Textile from Thorsberg

Vorbasse project 2008-2011

A project on Late Roman Iron Age textile production in Vorbasse, Jutland, based on the study of settlement and grave materials began in 2008 under the direction of Ulla Lund Hansen, SAXO Institute, and was partly hosted by CTR. The project was funded by FKK and provided important information on the comparative material from Early Iron Age grave contexts. The project provides a link between the two CTR research programmes (TTTC and DTC), and a chance to apply results obtained in the TTTC research programme on a Scandinavian pre-historic context. The core textile investigators are Lise Ræder Knudsen, Ida Demant, Linda Mårtensson, Ulla Mannering and Eva Andersson Strand.

2011, Eva Andersson Strand & Ulla Mannering, "Textile production in the late Roman Iron Age - a Case Study of Textile Production in Vorbasse, Denmark", in Linda Boye et al. (eds), Sonderband t 61. Internationale Sachsensymposion 2010, Haderslev, Danmark, Arkæologi i Slesvig/Archäologie in Schleswig. Neumünster, 77-84.



Vorbasse findings

Lønne Hede project 2011-2014

The Lønne Hede project is an interdisciplinary research project with participation of researchers from CTR, the Saxo Institute, University of Copenhagen, the National Museum of Denmark, Museum of Varde City and Environs and Conservation Centre Vejle. This project is based on collaborative efforts across institutions and involving disciplines such as prehistoric archaeology, textile research and natural science. The core investigators are Ulla Lund Hansen, Lene Frandsen, Ida Demant, Ulla Mannering and Irene Skals.

The Lønne Hede burial site in Western Jutland is dated to the Early Roman Iron Age (AD 1-150) and was excavated by the National Museum in 1969 and again by Museum of

Varde City and Environs in 1995. The grave excavated in 1969 contained a female buried in costume, the so-called "Lønne Hede girl" which has since provided the basis for several reconstructed Iron Age female cos-

tumes in museums and in publications. The Lønne Hede cemetery distinguishes itself from other contemporary Iron Age cemeteries on account of its many remains of textiles and human hair. Thus, the Lønne Hede graves constitute unique find materials in a European context which provide new and interesting know-



A well-preserved textile

ledge on how peoples of the Scandinavian early Roman Iron Age were dressed and how they produced their textiles.

Hammerum project 2008-2011

The Hammerum project is an interdisciplinary research project with participation of many different researchers. The core investigators are Hans Rostholm, Ulla Mannering and Lise Ræder Knudsen. The project is based on collaborative effort across institutions and involving disciplines such as prehistoric archaeology, textile research and natural sciences.

In 1993 during the construction of a new road a small cemetery containing seven inhumation graves were located in Hammerum near Herning in Jutland, Denmark. Four of the graves were excavated on site, but unfortunately they neither contained any remains of the buried bodies nor of any grave goods.

The three remaining graves on the other hand, yielded great surprises as it was discovered that they contained well preserved organic material. Therefore these graves were taken up as whole blocks of soil and brought to the local conservation department. The first grave to be excavated contained a wooden

coffin covered by a well preserved wooden lid (Grave 8). The other two graves (Grave 100 and 83) had on the excavated surfaces clear traces of wood, human hair and textiles. For various reasons the excavation of the two graves never continued, and they were kept in storage until 2009 when this project was launched. The graves are ^{14}C dated to the late Roman Iron Age (AD 200-400).

The project is funded by The Heritage Agency of Denmark and CTR.



Excavation of the grave

Hammerum Grave

Textile Crafts and Cultures (TECC)

TECC is a joint national endeavour of CTR and the National Museum of Denmark. The programme is headed by Ulla Mannering in collaboration with Eva Andersson Strand and is hosted by the National Museum of Denmark. Two Ph.D. projects are linked to this programme.

Seen from an archaeologist's perspective, Scandinavia is a treasure box where organic and inorganic manmade remains have had unique conditions for preservation. At the same time, Scandinavia has a strong tradition for excavating, recording and preserving archaeological artefacts and remains. Whether we are concerned with the Stone, Bronze, Iron or Viking Age, Scandinavia possesses an enormous wealth of finds that in different ways can enlighten our understanding of the lives of the early inhabitants in this area. While Scandinavia is not an area that is known for being the place where civilisations started, it is an area where scientists can follow

long-term developments of textile crafts and cultures.

It is impossible to understand the habitation and development of northern Europe and Scandinavia in particular without incorporating the history of costume. Likewise there can be no doubt that the study of tools and installations from different contexts provides a fuller view of the production at a site or in a region. However, in surveys of Scandinavian cultural historical development, or even more specific works on agricultural history, there is rarely any mention of neither the use of raw materials for making costumes, nor the influence of its production on the Scandinavian prehistoric society. Irrespective of the scale of a community, the production of raw materials for textiles and skins requires long-term planning, knowledge of animal husbandry and cultivation technology, and exploitation and management of available natural resources. Although it cannot be questioned

that textile and skin production represent important parts of agriculture and animal husbandry, this knowledge is still lacking in our cultural history.

The common aim of the research programme is to investigate the development of northern European textile and skin production until c. AD 400 by combining various approaches and methods in archaeology, history, conservation and the natural sciences and to focus on the environment and the long-term strategies, from breeding sheep and cultivating textile crops to the international trade and exchange in textiles and their final destination in bogs, settlements and graves. Within this research platform old and new analyses and information will form the basis for the discussion of past societies and cultural history. The methods and results from the DTC research programme and registration and interpretation of textile tools investigated in the TTTC research programme provide an important outset and comparison.



Wool combing

Ph.D. Projects

The Ph.D. project From household craft to specialized production – technological and economic aspects of textile production in Denmark in the Late Iron Age and the Viking Period is conducted by Lone Gebauer Thomsen (2010-2013)

The main focus of the Ph.D. project is to describe the purpose, quality and scale of textile production in Denmark in the period 550-1100 AD. The study is based on an analysis of tools related to textile production excavated at various settlement sites in Zealand, including agrarian villages, coastal production sites, landing places and manor sites. The study of tools and contexts enables us to evaluate the quality of the textiles produced and to shed light on similarities and differences in the level of textile production and its organization. Important research questions are: Were textiles produced for the household only or for exchange or sale? Who were involved in the production – men, women, farmers' wives, slaves or specialized textile workers? Was textile production merely a domestic industry or was it organized as an attached specialist production?

The Ph.D. grant is financed by The Danish Council for Independent Research | Humanities.

The Ph.D. project aDNA – a tool for analysis of the earliest Danish production of wool and linen textiles,

and the development of costume and identity is conducted by Luise Ørsted Brandt (2011-2014)

The Ph.D. project applies state of the art biomolecular analysis with the aim of supplementing archaeological analysis in investigations of prehistoric costumes. The project is set up in collaboration between CTR, Centre for GeoGenetics and the SAXO Institute. The study applies two bio molecular methods: mass spectrometry based protein sequencing (MS-PS) and analysis of ancient DNA. The aim of the MS-PS is to make species identifications of skins from the Danish Bronze

Age and Iron Age skin capes found in Danish peat bogs. The result of this study adds to the discussion on prehistoric animal exploitation and skin clothes production.

Using DNA analysis entire mitochondrial and nuclear genes from ancient sheep bones and wool textiles are extracted. This enables an investigation of the occurrence and development of sheep wool. This project part will yield important knowledge to archaeological evidence for the development of wool used for textile production.

The Ph.D. grant is financed by CTR.



Luise Ørsted Brandt working in the DNA laboratory

Scandinavian Prehistoric Costume

This research project is headed by Ulla Mannering and investigates the Danish collections of textile and skin objects dated to the Stone, Bronze and Early Iron Ages (until 400 AD). Selected material is investigated from a technological, as well as a design and costume perspective. The research results and methods used in the DTC research programme which worked specifically with the collections from Danish bogs and weapon deposits is applied and further developed. The majority of the studied objects belong to the collections of the National Museum of Denmark, but textiles and skin objects from various Danish local museums are also included. Within this framework several different research projects have been launched.

Danish Bronze Age Textiles

Primary investigators are Ulla Mannering, Karin Margarita Frei, Irene Skals and Anne Lisbeth Schmidt. Collaborators from other museums and universities in as well as outside Denmark participate in various parts of the project.

Some of the most well-preserved costumes in Europe have been recovered in the Danish oak coffin graves from Borum Eshøj in East Jutland, Egtved, Skrydstrup, Trindhøj, Guldhøj and Jels in Southern Jutland, and Muldbjerg in Western Jutland dated to the Early Bronze Age (1700-1100 BC). Less spectacular but just as informative is the complete collection of Danish Bronze Age textiles and costumes, and all together they comprise more than 200 finds from approximately 150 graves. Most of these objects belong to the National Museum of Denmark but materials from several Danish local museums are also included. Some of these finds have never been recorded before.

The project investigates the technology and visual appearance of the Danish Bronze Age textiles and skin costumes by applying a thoroughly and highly specialized research method developed by CTR. The aim of the investigation is to shed light on the early textile craft and agriculture in Scandinavia including the availability and circulation of raw materials in Danish Bronze Age society.

Apart from the textile and skin analysis which includes a wide range of technological data, the more specialized scientific analysis focuses on wool fibre, dye and strontium isotope analyses. Wool fibre analysis has proved to be one of the most significant parameters determining the overall textile development and an important indicator of prehistoric craftsmanship and agriculture. Fiber analysis is employed on a group of textiles, selected on basis of the state of preservation, textile technology, function, and representativity in regards to dating and geographical origin.

The majority of the Danish Bronze Age textiles have a homogeneous brown color which is partly due to the long stay in the oak coffins and partly due to the textiles being produced of naturally pigmented wool. Therefore the Danish Bronze Age textiles have not previously been analyzed for traces of dyes. On the other hand, dye analysis of the textiles dated to the Pre-Roman Iron Age (500-1 BC) has shown that the use of naturally pigmented wools did not exclude the use of plant dyes. Approximately 95 % of all textiles from the Pre-Roman Iron Age have traces of plant dyes. The fact that this technique was used in a varied and complex way indicates that the dyeing technology was not new in Scandinavia and possibly originates further back in time. A group of textiles will be selected for dye analysis

based on the state of preservation, textile technology, function, and representativity in regards to dating and geographical origin.

Strontium isotopic tracing has proved a suitable method for the determination of provenance of prehistoric animal and plant fiber material. A pilot study based on the Voldtofte textile and skins finds (see below) has shown that raw material and/or finished textile products of non-local provenance was circulating in Late Bronze Age society. A group of textiles and skin objects will be selected for strontium isotope analysis based on the state of preservation, textile technology, function, and representativity in regards to dating and geographical origin. In particular the textile samples selected for fiber and dye analysis will be analyzed as the strontium isotope analysis method vary according to presence of dyes in the samples.

Important partners are the HERA funded EU project Creativity in the Bronze Age (CinBA) and the ERC advanced grant RISE by Kristian Kristiansen, University of Gothenburg, Sweden.

The results of the project will be published as articles in conference proceedings and journals in conjunction with the collaborators. A monograph on Danish Bronze Age Costume by Ulla Mannering is also planned.

The project is supported by the Danish Cultural Heritage Agency.

The Development of wool based on Danish Bronze Age textiles in comparison with other Scandinavian and Central European textile finds

Primary investigators are Ulla Man-
nering, Luise Ørsted Brandt, Antoi-
nette Rast-Eicher, Irene Skals and
Anne Lisbeth Schmidt. Collabora-
tors from other museums and uni-
versities in as well as outside Den-
mark participate in various parts of
the project.

The aim of this research pro-
gramme is to conduct fibre analysis
of a selection of Danish Bronze Age
textiles with a method that can give
new information about fibre quality,
sorting and preparation methods.
Some of the Danish samples and
a few samples from Sweden and
Central Europe will be selected for
DNA analysis in order to see if the
European Bronze Age textiles were
produced from wool deriving from
the same type of sheep. The pro-
ject also focuses on the different
methodologies for species iden-
tification and the development of
mass spectrometry based protein
sequencing (MS-PS). The results
will be published in several articles
together with the different collabo-
rators.

The project is supported by Kultur-
ministeriets Forskningspulje, the
Danish Ministry of Culture.

Prehistoric shoes

Primary investigators are Ulla Man-

nering, Anne Lisbeth Schmidt and
Margit Petersen.

Recently five leather shoes, 3 sin-
gle shoes and a pair, were located
at Viborg Stiftsmuseum. The shoes
have not been recorded previously
and the shoes will be ^{14}C -dated and
analysed according to the same
methodology as used on the other
Danish finds of prehistoric shoes.
The results will be published in an
article in Danish Journal of Archae-
ology.

The project is supported by the AMS
 ^{14}C -dateringspuljen.

The Voldtofte Find

Primary investigators are Ulla Man-
nering and Karin Margarita Frei with
contributions by Flemming Kaul,
Jens Glastrup and Bodil Holst.

The aim of this pilot project on the
Late Bronze Age grave find from
Lusehøj in Voldtofte is to highlight
the range and capacity of early tex-
tile production and to demonstrate
how raw materials and/or finished
textile products of non-local prov-
enance was circulating in Late
Bronze Age society.

Several articles presenting the vari-
ous results from for instance the
 ^{14}C -analysis, the fibre identifications
and the strontium isotope analy-
sis are planned. The first article can
be downloaded from [http://www.
nature.com/srep/2012/120928/
srep00664/full/srep00664.html](http://www.nature.com/srep/2012/120928/srep00664/full/srep00664.html).



The Egtved Girl's costume

The Ginnerup Grave

Primary investigators are Ulla Mannering in collaboration with Trine Wiinblad, Irene Skals, Niels Lynnerup and Thisted Museum.

In 2008 a stone plate grave containing the burnt bones of one or more individuals was excavated by Thisted Museum. The excavator suspected that the grave also contained traces of textiles and therefore the grave was taken up as a complete block. It is extremely rare that graves with traces of textiles dated to the Bronze Age are excavated. The grave is excavated at the Conservation Department at the National Museum of Denmark, and the last remains of a textile were identified. Niels Lynnerup is in charge of the forensic anthropological analysis of the burnt bones.

Insulating and thermal capacity of wool, linen and nettle fibres

Primary Investigators are Ulla Mannering, Anne Batzer Højrup and Bodil Holst.

During experimental archaeological tests with production and preparation of flax and nettle fibres for textile use carried out by Ulla Mannering at the Land of Legends, Lejre in 1994 and 1995 it was noted that nettle textiles possess extraordinary insulation properties. A property not recorded for linen textiles. The aim of the project is to investigate the qualities of nettle as a raw material for textiles and to compare its properties to other available raw materials like flax and wool in prehistory. In 2011/2012 Anne Batzer Højrup has created five weaving samples of wool, linen and nettle each measuring 35 x 35 cm and with an average thread density of 9 threads per cm in both thread directions. The samples are to be used for the thermic tests which will be executed in 2013. When the analyses are finalized a joint article will be published which contributes with new and important information on prehistoric textile production, technology and exploitation of resources in prehistoric society.

The project is supported by Elisabeth Munksgaard Fonden.

Textiles and pollen. A key to ancient daily life

Initiators of this project are Marie-

Louise Nosch and Ulla Mannering. The project is based on a collaborative effort across institutions and involving disciplines such as prehistoric archaeology, textile research, palynology and several more advanced disciplines within the natural sciences.

Researchers from Department of Plant Biology and Biotechnology/Section for Plant Biochemistry, Faculty of Life Science (LIFE), University of Copenhagen, Geological Museum, the Natural History Museum of Denmark, University of Copenhagen, Interdisciplinary Nanoscience Center (iNANO) and Department of Chemistry, Aarhus University, Seminari d'Estudis i Recerques Prehistòriques Dept. Prehistòria, Història Antiga i Arqueologia, University of Barcelona, Videometer A/S, Geological Survey of Denmark and Greenland, Department of Environmental Archaeology and Conservation, Moesgaard Museum and Pratt Institute, Math and Science, New York, USA, participate in the project. During the analyses of a Danish Late Iron Age grave find from Hammerum in Herning, Denmark, containing an extremely well-preserved textile costume, in which project CTR is one of the primary investigators, it was discovered that threads belonging to one of the textiles contained a completely different pollen spectrum than that obtained from the surrounding soil taken from the grave. The unusual content of grain

pollen stored in the costume is interpreted as representing an activity related to the processes of harvesting or threshing: the cleaning process where the glume is separated from the grain or the pollen could also come from work with the straws. Based on these results it can be concluded that the content of pollen in the soil and the costume are different and that they represented different bio zones and environments. The results are published by René Enevold in *Journal of Archaeological Science* 40 (2013) pp. 1838-1844.

The results open for a whole new use of palynological information which until now primarily has been used to characterise ancient landscape and environment. In short we think that we have found a whole new method to identify human activities by identifying the pollen that has been stored in ancient textiles.

The aim of the programme is to explore and develop a new cross-disciplinary field of research, to test new hypotheses, and to develop a new methodology for identifying pollen in textiles. In the coming years the potential of and possibilities in this new field will be explored in collaboration with researchers in Denmark and abroad.

On the 6th of September 2011 CTR organised an internal workshop on "Textiles and pollen. A key to ancient daily life" where the research programme was presented and it

was discussed how this topic could be developed into a new field of research. At the workshop strategies for continuing the research was discussed and the programme is con-

tinued according to these ideas. The project is supported by Research and Innovation University of Copenhagen (KUFIR).



The man from Trindhøj



The Egtved Girl



The old man from Borum Eshøj



The woman from Borum Eshøj

Landscape of Textile Production in the Bronze and Early Iron Age Denmark

The project is headed by Eva Andersson Strand.

In this project textiles and textile production are investigated and discussed via cultural, economic, social and gendered landscapes. The focus is placed on Scandinavian Bronze and Early Iron Ages contexts. The research project includes systematic registration and analysis of raw materials of vegetal and animal origin, tools and production installations in combination with aspects on the physical and social use of the landscape.

The combination of CTR's experimental research on functional characteristics of tools, recent work on textile tools and production in Late Iron and Viking Age Scandinavia and the many well preserved archaeological textile and skin finds from Scandinavia provide a unique opportunity to investigate Scandinavian prehistoric textile and skin technology, development of fibre materials, tool functions and their specific influence on production.

An excellent example of how it is possible to combine these differ-

ent aspects and thereby achieve a much fuller picture of Scandinavian skin and textile production is demonstrated in the pilot project on textile production in the Late Roman Iron Age settlement Vorbasse in Denmark, conducted by Ulla Lund Hansen in collaboration with CTR. The pilot project uses a model and a series of guidelines developed at CTR for how material sources and different analytical methods can be combined in an optimal way. Tools, textiles and contexts were studied and it was demonstrated that textile crafts people in Vorbasse during the Late Roman Iron Age were highly skilled and knowledgeable. The investigation indicated a visible production of high quality textiles produced in Vorbasse with the type of tools found during excavation. Additionally, the textile analyses demonstrated that these textile crafts people had the knowledge of and opportunity to select fibres of a very high quality, and that the sheep were well taken care of and that a system of selective breeding existed. The results of the analyses of the

textiles clearly suggest that both the spinners and weavers were skilled and had the ability to produce high quality standardized textiles. The few preserved tools and textiles are in general linked to high status burials which indicates that the warp weighted loom during this period was not commonly used at Vorbasse. In later settlement phases textile tools are more common in the settlement area especially in the pit houses. Pit houses are excellent weaving houses and it is possible that in subsequent periods changes in the Vorbasse settlement structure partly reflect a more widespread use of the warp-weighted loom and a reorganization of the textile production.

These results challenge earlier interpretations as well as general assumptions of, for example, the economic impact and textile craft specialisation and organisation modes. The results will, without doubt, enrich not only textile research, but also archaeological research in general and thereby provide a better picture and under-

standing of past peoples and societies.

The ambition of the project is also to make textile research an integral part of the university curriculum for archaeologists, as well as in archaeological field training and in local museum practice. Therefore teaching at university courses and execution of experimental workshops are important parts of this project.

An important goal is to connect the research results with knowledge on societal, cultural and economic developments in Scandinavia. This is accomplished through collaboration with a varied range of scholars and disciplines, and participation in established networks, workshops and national and international conferences.

The research will be carried out in close collaboration with archaeologists from several local Danish museums and the National Museum of Denmark. The results of the project will be published as articles in conference proceedings and journals in conjunction with the different collaborators.



Strontium Isotopic Tracing of Bronze Age Danish textiles

The project is headed by Karin Margarita Frei and collaborates with the laboratories at the Danish Centre for Isotope Geology, Department of Geography and Geology, University of Copenhagen.

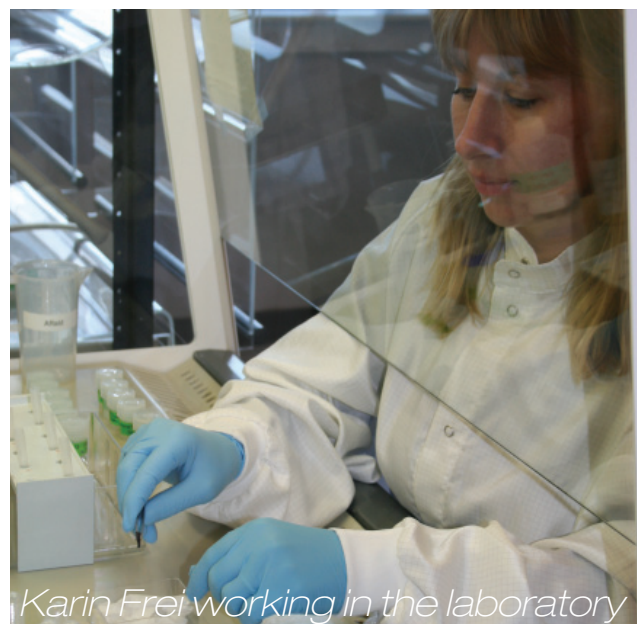
One of the most important questions that archaeologists pose to ancient material is the question of origin. However, provenance is one of the hardest pieces of information to obtain about any archaeological object in absolute terms. Recently the development of a new archaeometric tool which enables us to gather information on the provenance of ancient textiles' raw material, created a new important possible source of information within the field of textile research.

This tracing method rests on the fact that each geological area has a characteristic strontium-isotopic 'signature', which is transferred to plants and animals without fractionating throughout the food chain. Thus these signatures are also transferred to the wool or plant fibres of textiles. Moreover, by developing baselines of the bio-available strontium isotope ratios of the re-

trieval site it is possible to establish if the raw material (wool/plant fibre) is of local provenance or not.

This method is applicable also to dyed material. The aim of this project is to investigate and expand previous research by moving back in time from Danish Early Iron Age to Danish Bronze Age. Focus will be placed on tracing information on the network/trade behind textile production in Danish prehistory.

The project also collaborates with the ERC advanced grant RISE by Kristian Kristiansen, University of Gothenburg, Sweden (see <http://the-rise.se/>).



Karin Frei working in the laboratory

Textile Crafts and Cultures collaborators

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- Steen Hvass, Helsingør, DK
- Flemming Kaul, The National Museum of Denmark, DK
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- Kristian Kristiansen, University of Gothenburg, SE
- Ulla Lund Hansen, University of Copenhagen, DK
- Niels Lynnerup, University of Copenhagen, DK
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Late Bronze Age Shoes from Ørbækgård

Tools and Textiles – Texts and Contexts (TTTC)

TTTC is an international and interdisciplinary research programme directed by Marie-Louise Nosch and Eva Andersson Strand. The programme encompassed two stages: “Tools and Textiles” and “Texts and Contexts” and the aim was to investigate textile production in the Aegean, Anatolia and in the Levant during the Bronze Age. The research was based on collaboration with 40 archaeologists representing 34 sites in present day Greece, Turkey, Cyprus, Israel, Jordan, Syria and Gaza. The programme furthermore employed Agnete Wisti Lassen (DK), Marta Guzowska (PL), Jo Cutler (UK), and Lorenz Rahmsdorf (DE) as researchers for extended periods of time. An important prerequisite for the success of the programme was the establishment of the CTR database of textile tools

compiled by the collaborators with approximately 10,000 textile tools recorded. The database differentiates tools chronologically, typologically and according to site type and context providing a solid foundation for the understanding of textile tools and their developments from the 4th to the 2nd millennia BC. The functions of the tools were addressed via experimental archaeology: systematic tests were conducted according to precise guidelines and external analyses yielded very precise data about the time used for production and tool function.

Background

The programme’s geographical and chronological framework was more precisely the Central and Eastern Mediterranean in the 3rd and 2nd millennia BC. This was the

period when, for the first time in history, textile production rapidly developed from household production to standardised, industrialised, centralised production, on the basis of a division of labour. It was during this period that sheep developed a white coat/wool through selective breeding, which then provided the dynamics for the development of dye industries, colour extraction and the intensive use of colour symbolism in dress. Within this area we also have the development of palace economies, new means of production, inscriptions on production management, tools, glyptic, fresco and relief iconography in which types of dress are visible, and evidence of the architecture of production from excavations. TTTC has analysed and discussed the parameters for and the impact on society of the development of this intensive, industry-like production. We have shown how tools and technology developed to meet new demands. However, in most previous studies the approach has mainly been descriptive. Our approach is different: we have combined specialist knowledge from the region itself with the Scandinavian tradition of experimental archaeology in order to find a new way of dealing with the production processes and the absence of archaeological textile remains.

Research

The aim of the first stage of the re-

search programme, *Tools and Textiles*, was to understand the technological parameters for textile production and to develop experimental textile archaeology. The main analyses have previously been based on shape and decoration rather than on function. We wanted to provide a systematic study of textile tools based on their function in the Central and Eastern Mediterranean in the 2nd millennium BC with clear parameters for identification. Such parameters have been lacking and consequently there has been a great deal of confusion concerning the definition of textile tools in the Mediterranean area. For instance, what had previously been interpreted as Aegean 'buttons' are in fact spindle whorls (Nosch & Andersson, *Aegaeum* 24, 2003, 197-203).

In TTTC we addressed the main sources, the tools, with a *functional* approach: We investigated their function, their qualities and limits, and registered time consumption. We could build on previous results that had demonstrated that variations within a tool group determine variations in the final textile product. The variations in the tools thus inform us about very specific qualities in the cloth or thread, and suggest the type and quality of textile production in a given settlement.

An important aim of the TTTC research programme was to explore experimental archaeology as

a method, including a definition of its potentials and risks. To ensure scientific control, the experiments were conducted according to the developed TTTC guidelines for utilizing experimental archaeology. These types of guidelines had previously been absent in tests and created new standards in textile experimental archaeology filling the gap between experimental archaeology and textile archaeology. Thus the goal to develop experimental textile archaeology was fulfilled.

Textile Tools Catalogue

The research group wished to establish a typological framework on the basis of systematic, empirical studies of the function, variations, chronological framework and archaeological context of textile tools. As part of this a catalogue of possible textile tool types was established based on a database of individual textile tools, with information on their function, provenance, date, type, weight and context. The data for the tool typology consist in part of published material and partly of unpublished material. Information was gathered by the CTR staff and by our collaborators in Greece, Turkey, Cyprus, Israel, Jordan, Syria and Gaza. By the end of 2007 approximately 10,000 textile tools were recorded in the database.

A major gain was access to approximately 700 unpublished loom-weights from Malia, Crete, excavat-

ed by Jean-Claude Poursat, which in 2008 were added to the CTR database by Françoise Rougemont, CNRS, Paris, France, and published in collaboration with the excavator in 2009.

The database has provided a solid foundation for the understanding of textile tools and their developments from the 4th to the 2nd millennia BC. It differentiates tools chronologically, typologically and according to site types and contexts. The functions of the tools are addressed via experimental archaeology: systematic tests conducted according to precise guidelines and external analyses have yielded very precise data about the time consumed and tool function.

CTR's guidelines for experimental archaeology

Function was tested in an experimental archaeological study by skilled craftswomen at the Lejre Experimental Centre. The CTR's guidelines for utilising experimental archaeology as a scientific method are as follows:

- Raw materials should be selected according to our knowledge of Bronze Age wool and linen fibres.
- Tools should be reconstructed on the model of precise copies of archaeological artefacts.
- The primary parameter to be investigated is function.
- All processes must be perfor-

med by skilled craftspeople.

- Each test should be performed by at least two skilled craftspeople, in order to secure a more objective assessment of the results.
- All processes must be documented, and some filmed.
- All processes must be analysed in their own right.
- All products must be submitted to textile analysis by external persons.
- On the basis of the established typology, the tools will be reconstructed by experienced craftspeople.
- Experimental testing will be conducted with the aim of analysing the functioning of the tools, time consumption, and the quality and quantity of thread and textile.

Tools and Textiles Web Reports

The results of *Tools and Textile* were regularly published on the CTR web page which meant that they were quickly and effectively communicated to the scientific community. This efficiency was an important prerequisite for the overwhelming interest in, and consequently the success of, the programme.

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Selected Tools and Textiles publications

2009, Linda Mårtensson, Marie-Louise Nosch & Eva Andersson Strand, "Shape of Things: Understanding a Loom Weight", *Oxford Journal of Archaeology* 28.4, 373-398.

2009, Marcella Frangipane, Eva Andersson, Romina Laurito, Susan Möller-Wiering, Marie-Louise Nosch, Antoinette Rast-Eicher & Agnete Wisti Lassen, "Arslantepe (Turkey): Textiles, Tools and Imprints of Fabrics from the 4th to the 2nd millennium BC", *Paléorient* 35:1, 5-30.



Spindle whorls from Italy



Texts and Contexts

Towards the end of 2008, the second stage of TTTC – *Texts and Contexts* – was launched with the seminar *Textile Terminologies in the 3rd and 2nd millennia BC*, organised by Marie-Louise Nosch at CTR, in collaboration with Cécile Michel, CNRS, Paris. We were especially interested in texts relating to textile production in the Bronze Age Mediterranean area. One part focused on textile terminology; the other on textile production and its role in societies of increasing complexity. In the written records of the Mediterranean area in the 3rd and 2nd millennia BC, we have references to a complex terminology of textiles, tools and techniques, decoration and specialised textile occupational titles. However, we often have no precise idea of the meaning of these. This stage also profited from the knowledge of textile quality and types gained from the typological research programme.

Terminologies of Textiles

In *Textile Terminologies in the 3rd and 2nd millennia BC* we cooperated

with philologists and linguists and experts in various languages (and scripts) of the 3rd and 2nd millennia BC. Textile terminology was in need of more clear-cut definitions, without which further classification was useless. We initiated a theoretical discussion of textile classification according to terminological systems based on use, technique or fibre and a concrete identification of the textile terminology, and we addressed the problems concerning translations of textile terms from language to language. The goal was to test the degree of standardisation in Bronze Age societies, and the degree of standardised textile terminology.

The written sources from the Ancient Near East and the Eastern Mediterranean Area from the 3rd to the 1st millennium contain rich terminologies describing textiles. The survey of textile terminologies demonstrates the interconnections between languages and cultures via textiles: The Greek word for a long shirt, *khiton*, *ki-to* in Linear B, derives

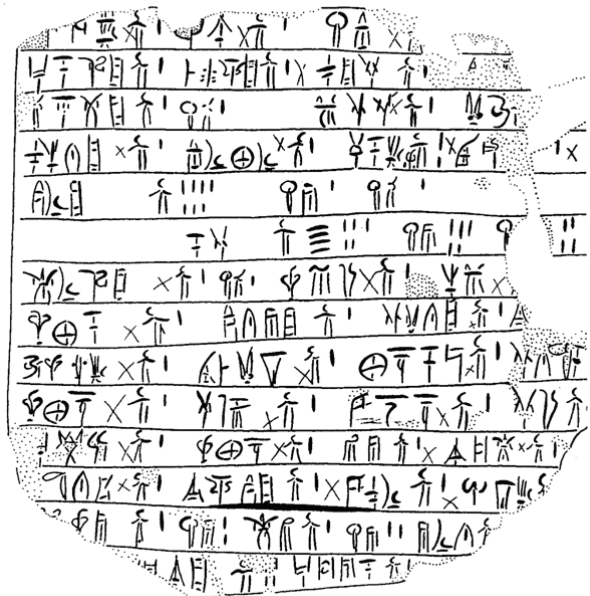
from the Semitic root *ktn*. The Akkadian term for linen is *kitûm*, but the Old Assyrian *kutānum* is made of wool and the Arab and English word for cotton today has the same root. This example illustrates on the one hand how connected some textiles terms are across time and space, but it also shows how very carefully we must conduct the etymological and terminological enquiry with constantly changing semantics as the common thread.

The concept of the exploratory workshop emerged in 2005 as a collaboration between Marie-Louise Nosch and Cécile Michel at CNRS laboratory “Histoire et Archéologie de l’Orient Cunéiforme” (HAROC).

In Nanterre, the research programme *The economy of wool in the ancient Near East* was also launched in 2005 by the HAROC team under the CNRS. The team is composed of both archaeologists and philologists who work on the various ancient Near Eastern cultures over a chronological time span defined by the use of cuneiform writing. One of the research themes is the Mesopotamian wool and textile economy. Within the framework of this research programme, several aspects are studied such as the practical wool treatment, the processing and manufacture of textiles, wool production, wool and textile trade, commercial structures, and the use and function of textiles. The

research programme is multidisciplinary: the integrated collaborations and the association of data from different periods demonstrate several constant characteristics and allow isolating peculiar phenomena from the general developments.

Our aim was to interlink the French and Danish research programmes and to exchange knowledge. The scientific exchange was facilitated by the formal convention of collaboration between the Danish National Research Foundation (DNRF) and the Centre National de la Recherche Scientifique (CNRS), as well as a generous subvention from *La Mission de Coopération Scientifique et Universitaire*, Ambassade de France in Copenhagen. The European Science Foundation was the main sponsor of the exploratory workshop.



Linear B Text

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Selected Texts and Contexts publications

Textile Terminologies from the 3rd to the 1st mill. BC in the Ancient Near East and the Eastern Mediterranean Area, edited by Cécile Michel & Marie-Louise Nosch, Ancient Textiles Series 8, Oxbow Books 2010.

KOSMOS. Jewellery, Adornment and Textiles in the Aegean Bronze Age, (13th international Aegean conference held at Copenhagen, April 2010/13eme rencontre égéenne, Copenhague, avril 2010.) edited by Marie-Louise Nosch & Robert Laffineur, *Aegaeum* 33 (2012).



Weaving on the warp-weighted loom



Greek Textile Tools

Continuity and changes in textile production in Early Bronze Age Greece

Project by Malgorzata Siennicka, Marie Curie Intra European Fellow at CTR 2013-2015

This project will provide new insights into the development and importance of textile production techniques in Greece in the Early Bronze Age (EBA). During this period basic cultural features of the later Minoan and Mycenaean civilisations were determined, yet the impact of textile production in this process has never been investigated. Despite the fact that EBA Greece developed significant links with Europe and the Eastern Mediterranean, their impact on textile production and technical development throughout the 3rd millennium BC is yet to be studied. A systematic analysis of textile tools, their first appearance and distribution patterns will be the project's point of departure. Full sets of EBA textile tools will be tested experimentally at the Centre of Textile Research in Copenhagen and evaluated with

an international team of textile researchers in order to understand the manufacturing techniques and to identify the types of threads used (animal vs. plant).

The objectives are to examine the rate of development of textile techniques; to elucidate the role of textiles in the long debated cultural change at the end of the EBA; to integrate theoretical and practical studies of textile tools in order to develop new ways of interpreting archaeological data; to address social and economic issues by analysing contextual evidence from settlements with implications to functional zones and the status of textile production. This project will be carried out through collaboration with numerous sites and research institutions in Greece, Germany, Poland and Denmark.

The expected major accomplishments will be a far greater understanding of the development of textile production in EBA Greece and the impact of its contacts with Europe and the Eastern Mediterranean, the evaluation of analytical

methods and experiments to understand the function of the textile tools, and the integration of these new results into a more robust archaeological reconstruction of EBA Greece.



Greek loom weight

TEXTHA

Textile Terminology of Hittite Anatolia

Project by Matteo Vigo,
Marie Curie Intra European
Fellow at CTR 2013-2015

This research project provides an accurate and updated analysis of the Hittite textile terminology.

This is achieved through a precise examination of the preserved epigraphic sources, most of which have been collected in general works, or spread throughout scholarly journals and minor publications. In order to pursue this analysis, the research project needs as a necessary first step the creation of a complete corpus of all epigraphic sources of the “Hittite textiles”, the first of its kind.

The methodological approach is based on a meticulous lexical and etymological investigation on verbal – noun paradigms referring to textiles in the Hittite world and professional titles.

The primary objective is to create a comprehensive and useful dictio-

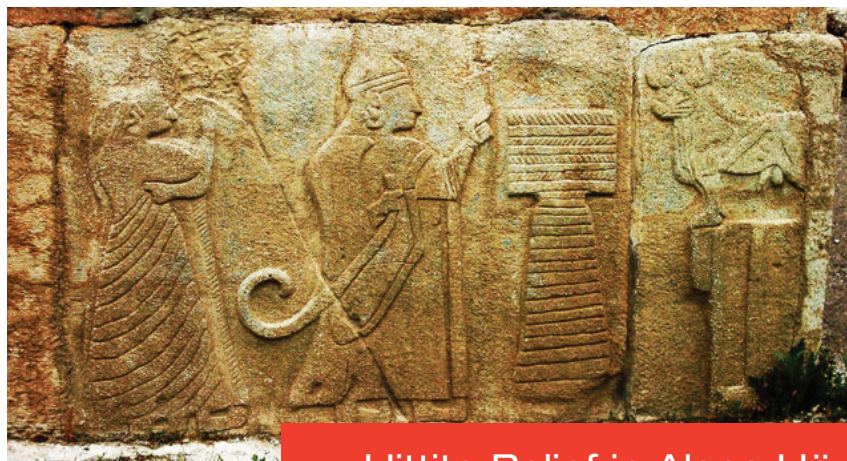
nary of textile terminology of Hittite Anatolia. Matteo Vigo's own academic background skills in Hittite language and philology are combined with CTR's expertise in the field of experimental archaeology of ancient textile remains and tools.

Thus, information provided by specialists at CTR is combined with the data collected by analysing the Hittite textual documentation; not only administrative and economic texts, but also all those Hittite written sources that potentially describe the palace management of textile production, the accounts of weaving workshops (including terms for crafting and tools), the luxury goods as finished products (not only cloth, but also clothes and furnishings) and the textile items used in symbolic contexts (during rituals or cult activities).

The comparative methodological approach is justified by the fact that ancient textiles rarely survive, not only in Anatolia, but also all over the ancient Near East and Mediterranean area, with the notable exception

of Egypt. Fortunately the Scandinavian area provides many Bronze Age finds that have been already accurately analysed by Danish and Swedish specialists in recent years. Their technological competence is very useful in order to better define textile terms attested in the written documentation (in particular for what concerns specific aspects of the “Hittite” textile production). Because of the wide chronological gap between the archaeological remains of Anatolia under investigation (mostly belonging to the fourth-third millennia BC) and textual documentation related to textiles (second millennium BC), the proposed methodology explores connections

using experimental archaeology as a method (with a conscious awareness of its potential risks). The scientific expertise of CTR staff in the field of experimental analysis on selected raw materials found in different Hittite excavations enables the creation of typological classifications of textiles according to the information provided by the Hittite texts. In a mutual and interdisciplinary way the work process described in detail, e.g. in the Hittite ritual texts, can be tested by CTR specialists and managed by a qualified group of supervisors, always bearing in mind the risks connected with the selected material.



Hittite Relief in Alaca Höyük with priestly dressed royal couple

FABRIC

Weaving the Fabric of Society: Bronze Age Aegean Economies of Cloth

Project by Joanne Cutler,
Marie Curie Intra European
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The FABRIC project aims to expand current understanding of a core – but significantly understudied – aspect of economy and society in the Bronze Age Aegean: the production and consumption of textiles. The manufacture of textiles is one of the most ancient human technologies, and throughout history the production of cloth has played a fundamental role in processes of socio-economic change.

In Bronze Age Aegean communities, as in most ancient communities, there would have been a demand for a wide variety of textiles, including clothing (ranging from utilitarian, everyday dress to elaborately patterned elite costumes), sails, bedding, wall-hangings and coverings, as well as bags or sacks. These textiles would have been

made in different qualities, using different techniques and raw materials, and were produced with different types of tools. The manufacture of cloth, from fibre procurement to finished fabric, is an extremely labour intensive process, and would have had an impact at every social level. The study of textile production is therefore vital to our understanding of Aegean Bronze Age societies. The focus of the FABRIC project is the Middle and Late Bronze Age textile industries on Crete, with selected case studies of sites beyond Crete. The socio-economic role of cloth within Aegean societies is investigated through the application of an interdisciplinary methodology, considering archaeological evidence in combination with textual and iconographic evidence. New perspectives on institutional, household and individual economic and social strategies will be gained by further considering the evidence for the Aegean industries within the context of the large-scale production and circulation of textiles in the wider Eastern Mediterranean,

where written records demonstrate that cloth was produced at a variety of scales, to serve economic, social and political aims. The highest quality textiles were highly valued commodities, and the textual sources demonstrate their important role in diplomatic relationships, elite gift exchange and more mercantile exchange, as well as within local economies. Textiles were also acquired as booty and tribute/tax, were used in ceremonies, offered to deities, given as dowries and distributed on other occasions; allocations of cloth were given to individuals in the service of palatial and other institutions. The intensive production and exchange of cloth in this region was long established, with the records from Ebla demonstrating that large quantities of textiles were being exported to centres in Mesopotamia, Syria, Anatolia and the Levantine littoral in the 24th century BC.

In the Aegean, the Late Bronze Age (LBA) Linear B tablets from Knossos on Crete and from the southern Greek mainland document the existence of major palatial textile industries, which were highly specialised and large-scale, during the Mycenaean period (c. 1490-1200 BC). In contrast, for the preceding Minoan palatial periods on Crete (c. 1950-1490 BC), the archeological record provides extensive evidence for textile production at both palatial and non-palatial sites, but negligible textual evidence for the scale and

nature of the textile industry is preserved. Nevertheless, the few earlier Linear A tablets from Crete do indicate that the palatial Mycenaean textile industry developed out of an already established Minoan textile production system. In the Linear B vocabulary associated with textile production, certain varieties of cloth, as well as a number of textile terms and professional designations, have no known Greek etymology and may have been adopted from an existing Cretan textile terminology to describe textile types, techniques and associated occupations borrowed from a pre-existing textile industry. Furthermore, on the southern Greek mainland, there is no evidence for the existence of an organised textile industry before the emergence of the Mycenaean palatial economies of the later LBA.

By combining the archeological and textual datasets from LBA Crete, new insights will be gained into the nature, scale and organization of textile production during the Mycenaean period.

This will provide a new and richer text-informed model to compare against the evidence from the preceding Minoan period. By considering the Minoan and Mycenaean evidence for the production and consumption of textiles in comparative perspective, the FABRIC project aims to generate a new understanding of both systems.

Textile Economies in the Mediterranean Area (TEMA)

The research programme is headed by Marie-Louise Nosch and explores textile production from the Late Bronze Age palace cultures in Greece and the Near East to the Roman era. During this period, major societal transformations and economic shifts took place, which are well documented both in written sources and in the archaeological record. The basic textile technology, however, remains identical throughout the period.

This specific situation leads to major research questions:

- How has textile technology influenced the appearance of and innovations in other technologies? What are the technological developments in textiles from the period under investigation? This includes in particular the use of different loom types and introduction of new fibre types.
- What is the influence of textile production – with its long production time, division of labour, and demands for both skilled craft and cheap labour – on society?

How can society be viewed via textile production?

- What are the patterns of textile trade? How do technology, knowledge, patterns and trends develop and travel?

The research project investigates the textile production which took place outside the household sphere such as in the Bronze Age palace workshops, in sanctuaries in the 2nd and 1st millennium BC, in classical Greece, and in the Hellenistic textile factories. Textile production thus reflects the societal changes of the periods and areas. The project focuses on how complex textile production is administered and organised on a city-state level, on an institutional level, in larger private enterprises, or in collective structures such as religious corporations. An important component throughout the 1st millennium BC is textile production deriving from sanctuaries, which requires further investigation. In the Bronze Age, textiles are produced in palace workshops, as is evidenced in the Pylos documen-

tation. Other palace administrations set up systems of assigned textile work to villagers, in which also the palace flocks are monitored by local herdsman; flax is grown on palace land and integrated into the centrally monitored textile production. The different Mycenaean palace systems testify to various modes of organisation, but are extremely similar in their control mechanisms and in their graphic traditions. Thus in the textile administration we perceive a mixture of inherited decentralised systems combined with strong centralised administrative practices. The analysis of the economic and administrative framework of palatial textile production can now be paired with the textile tool studies from the Minoan and Mycenaean palaces, resulting from CTR's research in 2005-2010.

In the Early Iron Age and Archaic period, written evidence on economic transactions becomes scarce; Homeric descriptions of textiles show production modes which have become much closer to the household economy. Textiles are formalised parts of gift exchange systems, in particular the gender-specific exchange between women; an example of such a textile is the famous Lefkandi tunic, excavated more than 50 years ago and now finally being analysed and published by Greek experts; it is also worth reviewing the theories about the emergence of alphabetic writing and its close

connection to textile tools in the Archaic period.

In classical Greece we are enriched by the vast written documentation on textile workers, salaries, loans, prices, dowries including textiles, and spinning competitions. The Greek city-state employs textiles in the large public works such as construction and refurbishment of sanctuaries, cult statues, and sails for the fleet. Temple inventories report on the incoming garments for sanctuaries. Textile production in classical Greece has received particular attention in gender studies but only little attention as industry or craft.

Finally, in the Hellenistic period, textile production becomes 'global' and the new fibres of silk and cotton are introduced in textile production. The focus is on the Hellenistic non-domestic textile production in the trade networks of workshops and structures similar to factories, with extremely specialised production and division of labour. Anatolia seems to play an important role in this development; another rich source is the collection of papyri concerning textile production in Hellenistic Egypt. However, in parallel to standardised, industrialised production, trade and consumption circuits of extreme luxury products appear, often connected to Far-Eastern trade and imports of silks and dyes from or via India.

Resources and Textiles

The overarching theme of textiles and the environment requires an investigation of the larger strategies in agriculture and animal husbandry for providing fibres and dye plants for non-domestic textile production. These strategies change in various situations according to the political and economic contexts.

Alum, which is a vital component for fixing dye stuff to textiles, can only be acquired in few places in the Mediterranean areas, for example, on the Aegean island of Milos, and trade and supply of this vital product is a key to the understanding of the organisation of textile production. *Linum usitatissimum* and *Cannabis sativa* were important textile fibre crops. Flax and hemp stems are retted and broken in order to free the fibres, and flax is well documented in Greek archaeobotanical assemblages. Cotton (*Gossypium* sp.) seems to have reached Greece with the expedition of Alexander the Great and was a rare and expensive commodity. Cotton cultivation and its processing technologies were gradually implemented in the Hellenistic period. In the field of plant dyes, red dye from the roots of the plant madder, *Rubia tinctorium* was extracted, and the madder plant was extensively cultivated.

Another non-domestic production context is the production of sails for the fleets of the various Greek city-states and for the Hellenistic states.

Again, focus will be on the strategies for obtaining the material and human resources for the production, rather than the use of sails.

An important issue is to what degree textile production - with its very long production time - follows market mechanisms and demands? How fast could textile production act and react to a market? The study of textile production will also serve as a case for reviewing past and current theories about technological developments and innovations in Antiquity and how it spread and impacted on societies. While the weaves do not change in the period under investigation, patterns and fibres are modified and undergo important changes.

The main sources in this work are:

- Written sources of economic nature (Linear A and B inscriptions; accounts, dedications, grave stones, papyri, temple inventories)
- Literary sources (lyric, epics, plays, orators)
- Iconography (stelae, frescoes, vase paintings)
- Textile tools
- Remains of archaeological textiles

The research programme is based on the existing and solid international CTR network. In Denmark, the programme collaborates with An-

tiksamlingen, the National Museum of Denmark, Bodil Bundgård Rasmussen and John Lund. Other partners are colleagues in ancient history, classical philology, and classical archaeology in Danish universities, and in particular within the Saxo Institute.

Outside Denmark, this research programme collaborates closely with Cécile Michel and the HAROC group, CNRS, Paris; with Margarita Gleba and her ERC Starting grant PROCON; with the University of Salento, Lecce; Leibniz Universität Hannover, and Leicester University.



Mycenean Mural

Periphron Penelopeia

Textile Technology and the Tacit Dimension of Thought in Ancient Greece

Project by Ellen Harlizius-Klück,
Marie Curie Intra European Fel-
low at CTR 2012-2013

The aim of the project is to investigate the relevance of textile structure and technology for the thinking styles and ordering concepts of Greek antiquity. Within TEMA the project covers the task of integrating textile research into the understanding of culture in ancient Greece and focusses on the distribution of patterns subject to textile technology into science and philosophy. Mostly attributed as metaphors, textile technologies provide the invisible craft to gain knowledge on cosmic and social order.

Woven patterns and pictures may be seen as figured atoms that provide a kind of tacit reasoning on a world view that makes abstract processes and structures visible. Therefore, this project intends to analyse textile processes and structures in order to reveal figures, ideas

and concepts of order that prefigured scientific thought in Greek antiquity, one that has a marked tendency towards dyadic structures, pairs, doubles and turns possibly originated in weaving.

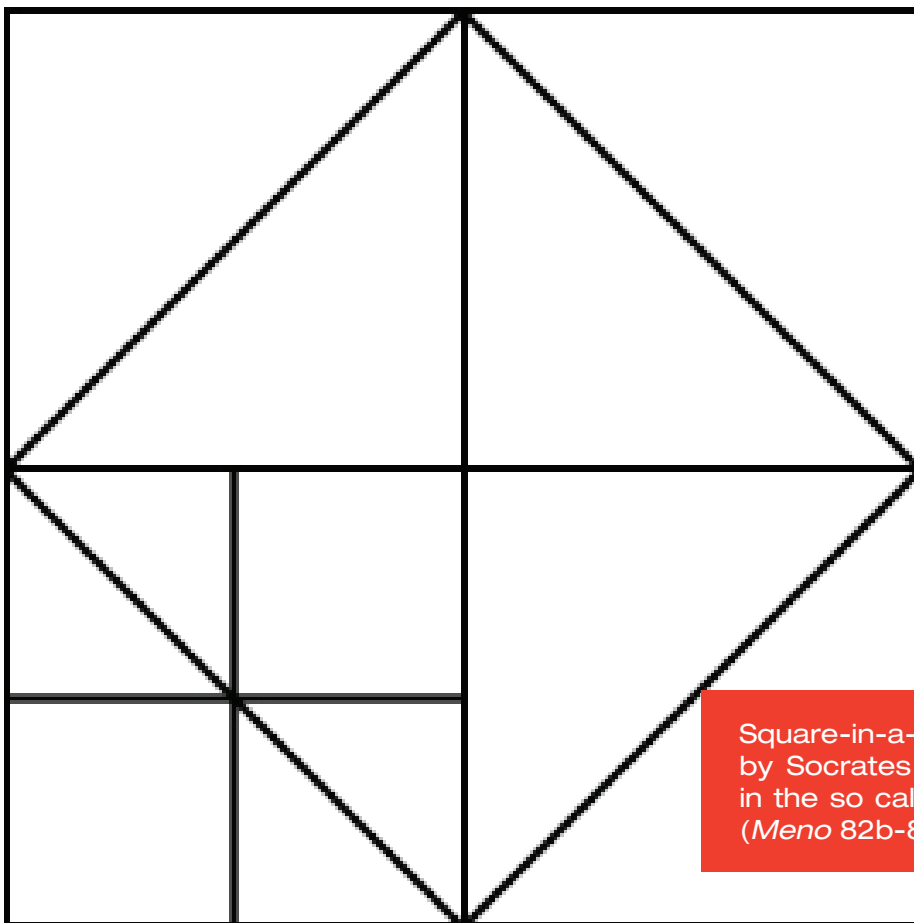
Textiles in general are today no longer perceived as objects that express either a mathematical or a technical vocabulary. They mostly form part of our language in terms of lifestyle or metaphor. Textiles were, however, the first objects that tacitly expressed technical and even logical notions. To our world and time they rather evoke smoothness or decoration. Should they be used in a technical context (e.g. web or network), we do not perceive them as words related to textiles, presumably due to the fact that all counting, crossing, grouping and dividing of the fibres is hidden in machines and factories.

The aim of the project is to unveil the relevance of textile culture and technology not only for the ancient Greek mode of life but also for their mode of thought. The focal con-

cern of this project is to elucidate the technical and mathematical aspects and to structure their widespread use in their earliest historical context, i.e. the evolving natural sciences and philosophy.



Depiction of a warp weighted loom with square-in-a-square pattern on the fabric. Plate from Cyprus, ca. 850-750 B.C., Collection of the University of Bonn, Germany



Square-in-a-square diagram used by Socrates in Plato's Dialog Meno in the so called lesson on geometry (*Meno* 82b-85c)

West and East

Textile Technologies and Identities in the 1st millennium B.C. South Italy and Cyprus

Project by Hedvig Landenius
Enegren, Marie Curie Intra
European Fellow at CTR 2012-
2014

The project explores textile tool technology in South Italy and Cyprus in the Iron Age, regions with a similarly culturally mixed heritage. My interest lies in the socio-cultural dynamics between indigenous people and the 'colonising' contingents of new settler populations. Is there a real dichotomy between the two or is the picture rather more nuanced? Experimental and ethno-archaeology have opened up new research means to assess tool technology in antiquity.

Thus the project looks at the technological parameters of textile tools, inter alia loom weights and spindle whorls, uncovered in the archaeological record at chosen sites in the regions mentioned, with a view to see any cultural divergences and patterns that may appear. Some of these textile tools have decora-

tions which may not always have been purely aesthetic additions but which may have had some functional aspect connected to them. A comparison of decorations on textile tools at diverse sites may throw more light on this matter. Moreover, I assess agency theory in this textile research context and by extension place textile tools within a wider social framework.

Textiles were of great importance and had a huge economic impact in the ancient world. Although textiles only survive in the archaeological record if certain specific environmental conditions are met, the textile tools used to produce them reveal information about the textiles once manufactured at any given site. Thus, this material is a unique portal to further our knowledge about textiles in antiquity.

Loom weights



Zoroastrian Text(ile)s

Regulations, Symbolism, Identity

Project by Miguel Ángel
Andrés-Toledo, Marie Curie
Intra European Fellow at CTR
2013-2015

ZOT offers an innovative interdisciplinary approach to the understanding of the modalities and changes in the use of textiles in the Zoroastrian communities of the Iranian milieu (from ca. the 2nd millennium BC through to the 17th century AD).

The Avesta, containing the sacred books of Zoroastrianism, comprises different collections of texts mostly related to rituals and composed in the 2nd and 1st millennia BC in the oldest Iranian language preserved, known as Avestan. These texts were later rendered into Pahlavi, the Middle Iranian language of the Sasanian period (224 - 651 AD), and translated in its turn from this medieval language into New Persian in Iran and into Sanskrit and Gujarati in India. Because of this uninterrupted textual transmission and the continuity of the Zoroastrian ritual

practices and religious beliefs, the Zoroastrian sources are a mine of information about the evolution of religious regulations, in which they abound.

Although textiles play an important role in these regulations and in shaping the Zoroastrian identity, the role and symbolism of textiles in Zoroastrianism have not yet received the attention from scholars that they deserve. Indeed, although textiles in pre-Islamic written sources of Iran have been intensively studied from diverse points of view, the Zoroastrian sources dealing with them have largely been neglected. In order to fill this gap in the research, the ZOT project will present a comprehensive analysis of the principal Zoroastrian normative texts concerning textiles in the Avestan, Pahlavi and New Persian languages, which constitute our main Zoroastrian written sources from Old Iranian until modern times, to determine the degree of continuity or innovation in the Zoroastrian regulations about textiles.



Zoroastrian Textiles

Assyrian Textiles

A study of the terminology and the material culture of textiles in the Neo-Assyrian Empire

Project by Salvatore Gaspa,
Marie Curie Intra European Fel-
low at CTR 2013-2015

The goal of this project is to develop a new fundamental tool for use in both Assyriological and textile-oriented studies. The project will investigate and systematically map the textile terminology in use in the Neo-Assyrian period (c. 9th-7th century BC). The research is intended to provide the scholars of both Oriental studies and of ancient textile studies with a comprehensive study on the Assyrian textiles which will fill gaps in the present-day scholarly knowledge about textiles in the Ancient world.

The Neo-Assyrian textile terminology mirrors the Assyrian imperial society of the first millennium BC, its economic system, its culture, and its identity. Through the collection and analysis of the lexicon of the Assyrian textiles we may gain new insights into important aspects of

the development of the society, the economy, the craft, the trade, and the technology. Most of the textual and iconographical evidence about textiles in first millennium BC Assyria reflects the world of the Assyrian upper class ruling the Assyrian kingdom from 9th to 7th century BC. In fact, the palace reliefs from Quyunjiq (Nineveh) and Nimrud (Kalhu) show many representations of court life as well as of military campaigns as a reflection of the needs of the social élite ruling the empire and of the policy of territorial expansion of the Assyrian state between 9th and 7th century BC.

The study of this terminology as well as of other textile-related aspects concerning the world of textiles in Assyria requires the exploration of the written sources stemming from the main Assyrian archives of the first millennium BC, namely As-sur (modern Qal'at Šerqāt), Kalhu (modern Nimrud), and Nineveh (modern Quyunjiq), the three main urban centres of the land called Assyria (modern northern Iraqi region).

Head-band with
Rosette-like
Decoration



Furthermore, the investigation of the Neo-Assyrian textile designations will be accompanied by the analysis of all the contextual data about the production, the tools, the decoration, the material, the size, the colour, the professionals involved, and the destination of the textiles in question. In order to elucidate the meaning and the possible semantic change over time of the textile designations, lexical data of other periods, namely the Old and, especially, the Middle Assyrian period will be included. In particular, the investigation of the Middle Assyrian texts from the archives of Assur will give further evidence of the terms attested in late Assyrian texts and favour a more detailed discussion in a diachronical perspective on the textiles under examination and the development of their terminology.

This enlargement of the lexicological perspective will enable a better definition of the textile products in question and, consequently, a new typological classification of all the attested Neo-Assyrian textiles. More importantly, this study will be based on an interdisciplinary approach of the topic.

Through a comparison of archaeological, iconographical, textual, and ethnographical data, I will investigate specific aspects, such as the organization of female labour within the palace household, the procurement and processing of raw materials, the production of decorative

elements (both fabric-based and metal appliqués). The research will also take into account the rich mine of information which has been provided by the 8th century tombs discovered in Nimrud by the Iraqi archaeologists around twenty years ago. Although no systematic study of the Nimrud textile-related materials is possible at present (due to the post-war situation of museum collections in Iraq), my research will combine for the first time the archaeological data available on this recent discovery with the information from textual and iconographical sources as regards the use of metal appliqués to textiles.

The Emperor's New Clothes

Power dressing in the Roman Empire from Augustus to Honorius

Project by Berit Hildebrandt,
Marie Curie Intra European Fel-
low at CTR 2013-2015

This project will shed new light on the political and institutional history of the Roman Empire through the study of imperial dress and representation.

It will explore changes in the costume of the Roman emperor, his family and his court. The hypothesis is that we can track the development of an imperial wardrobe, which follows the gradual acceptance and consolidation of autocracy, from the plain woollen toga of the ideal princeps (literally: "the first") to the luxurious purple silks of the monarch.

Clothes can be perceived as a sign system that shows how we see ourselves and how we want to be seen. "Power dressing" can indicate a person's actual social position, but also where he or she wants to be in the future. In this way "dressing up" can also be interpreted as a claim to power. Reactions to these signs

can be understood as an indicator of whether others accept these self-perceptions or not. Through the analysis of the emperors' clothing and the way ancient authors talked about them we are able to track changes in the status of the Roman emperors and/or their self-perceptions before these changes become visible on an institutional level.

In this regard the project will help us understand which frame conditions provide a background for alterations in social hierarchies, if those alterations had an impact on the next generations, and how society dealt with these changes and negotiated them by commenting on and reacting to them.

The Roman emperors and their court and families are an interesting research topic for such an investigation because they were moving in a field that was full of contradictions: In terms of status representation, the early emperors walked a tight rope between conforming to the supposed frugality and uniform-

ity of their ancestors and being the rulers of the Roman world. For historical reasons they had to avoid allusions to monarchy and behave as "first among equals" in their interaction with their senatorial peers, while most of their subordinates in the Eastern Mediterranean provinces of the Empire were used to ostentatious status representation. Changes in status display through clothes therefore mirror the changing perception of the position of the Roman emperor within the social hierarchy of the Roman Empire.

This project will cover the time from the first princeps, Augustus, to the emperor Honorius (1st century BC-5th century AD). In particular it will focus on the representation of "good" (e. g. Augustus, Marcus Aurelius) vs. "bad" (e. g. Caligula, Nero) emperors as the discourses surrounding them are highly ideologically charged. This will help to define the turning point(s) when the discourses changed and permitted "good" emperors to wear precious clothes. This indicates that the position of the emperor at the top of the social hierarchy was now openly acknowledged and their corresponding status representation considered appropriate.

The aim is to track the continuities and breaks as well as the idiosyncrasies that occurred during this process. The approach is interdisciplinary: written sources (literature, legal texts, inscriptions, papyri) as well as archaeological ones (textile

finds and depictions of the emperors and their close relations, e. g. in form of statues, reliefs, coins, consular diptychs and mosaics).

By combining all the available evidence, the political and institutional history of the Roman Empire can be highlighted from a new angle.

Moreover, the question of how groups negotiate status and which status displays are "allowed" or approved of within a certain group or community – and what they in turn tell us about the self-perception of this group or society – is still relevant. The discussions about German chancellor's Angela Merkel's clothing and the long debate about her haircut when she came to power revealed a lot about German gender-related role-models and diverging ideas about how political leaders of a democracy should represent their nation.



Roman Coin

Identities and Transformation in the Eastern Mediterranean

Evolution and Continuity of Textile Tools in the Late Bronze Age (LBA) and Early Iron Age (EIA); 13th - 10th c. B.C.E.

Project by Caroline Sauvage,
Marie Curie Intra European Fellow at CTR 2014-2016

The Late Bronze Age (1550 – 1250 B.C.E.) of the eastern Mediterranean was a period of intense exchange of goods, ideas, and men. Movements of people, from trading trips to massive migrations, are well attested in this area between the 13th and the 10th c. B.C.E. However, from an archaeological point of view, identifying people's identities or defining ethnic extension within territories is not easy and requires the use of cultural markers. Such markers are generally sought for within the most utilitarian objects such as cooking pots, most likely to preserve their owners' cultural heritage. Textile tools are amongst the most reliable markers since they are culturally specific: as demonstrated by Barber, the use of a high or low spindle-whorl on a spindle direct-

ly relates to groups' identities, and therefore to their larger geographic origins, each group being convinced that its spinning method is the best.

This project will therefore aim to establish a better understanding of the problematic transition period at the end of the Late Bronze Age by studying together key aspects of the development of textile technology (including spindle-whorls, loom-weights, spindles and distaffs) in the Late Bronze Age and Early Iron Age in Cyprus and the northern Levant, and by demonstrating the value of using textile tools and technological changes associated with textile production as a marker for possible population changes and renewals.

Performing the Fabric of Song

Textile Technology and Imagery in Ancient Greek Poetry and Poetics. An Interdisciplinary Study in Terminology and Metaphors

Project by Giovanni Fanfani,
Marie Curie Intra European Fellow
at CTR 2014-2016

This research project attempts an systematic investigation of the relevance of textile technology and crafts in shaping the archaic Greek conception of poetry-making, one that combines the double dimension of performance and composition. The lexicon of archaic Greek epic and choral lyric poetics (7th-5th centuries BC) displays a significant textile background which, beyond matters of etymology, seems to convey the idea of the conceptual analogy drawn between the weaving of a fabric and the performance of poetry. This project will apply to a selection of poetic samples the (metaphorical) frame of the (archaeologically reconstructed) ancient weaving technology, in order to test the hypothesis of the textile-like structure of the archaic Greek song.

The structure of this project is three-fold; the three blocks aim at providing:

1. a 'textile-philological' analysis of the structure of some patterns of Greek epic and choral lyric poetry as mirroring the structure and the processes of ancient weaving;
2. a systematic investigation of a significant sample of ancient Greek textile terminology – namely, the lexicon related to the warp-weighted loom and its implements: the analysis of textile terminology will shed light on the figurative meanings and on the metaphors for song-making, that this lexical series has produced;
3. a reassessment of the repertoire of textile imagery in archaic Greek poetry through the creation of a typology, i.e. different textile metaphors associated with specific crafts (weaving, spinning, plaiting), each conveying the idea of a different poetic performance or compositional structure (epic, lyric).

Textile Studies between knowledge and knowhow

A case study from Archaeological textiles

Project by Flavia Carraro, Marie Curie Intra European Fellow at CTR 2014-2016

The project consists in an ethnographic investigation among textile experts and explores the modern reconstruction of archaeological textiles and of ancient technological textile practices. It aims to highlight the topical concepts of “knowledge” and “knowhow” as specific as well as complementary knowing and knowledge production processes while describing and questioning the relationship between the disciplines and the heterogeneous methods that contribute to defining the scope and substance of Textile Studies in the hybrid field of archaeological textiles. In particular experimentation, experience and interpretation are into the focus of the anthropological analysis that is distributed on three main complementary axes: 1) the relationship between Past and Present; 2) the specific modes and regimes

of knowledge implemented, the knowledge systems mobilized and the concrete or conceptual tools employed; 3) the textile technology. The main fieldwork locations are: The Danish National Research Foundation's Centre for Textile Research – CTR; The National Museum of Denmark; The Sagnlandet Lejre Historical and Archaeological Research and Communication Centre; The Danish Centre for Isotope Geology, Institute of Geography and Geology, University of Copenhagen; The Department of Plant Biology and Biotechnology/Section for Plant Biochemistry, University of Copenhagen.

Archaeological textiles have a special status among archaeological items because of the scarcity of the remains and of the condition, form and nature in which they occur. Therefore, their study lies on a variable scale and involves the use of such methods as experimental archaeology and ethnoarchaeology, analysis of fibres and dyes, analysis

of archaeobotanical and archaeozoological remains, palaeoenvironmental and geochemical investigations, tool studies, visual grouping, linguistic-textual references and iconographic materials interpretation. Actually, the “reconstruction process” - from historical interpretation, to experimental and experiential methods dealing with bio/physical or human/social or subjective data - can indicate a concrete, material fabrication (as in tools study or in experimental archaeology); an activity simulation (as in technical processes testing or in living crafts experience); a virtual activity organization (as in curatorial practices and exhibition design); the use of scientific devices (as in scientific experimentation on fibres, dyes and remains); interpretation and analysis (as in the case of linguistic, textual and visual sources); or a theoretical and speculative design (as in research models implementation). Likewise it can take form in language and gestures, arising in both material and semi-otic dimensions, employing both theoretical abstract knowledge and practice. The very participation of both natural sciences and humanities, experimental and experience (hands-on and/or subjective) methods, and the technical skilled practices of craftsmanship enable the establishment of a hybrid field of research: a complex network of knowledge and knowhow, theory and practice, thought and skills, dis-

cursive and non-discursive knowledge arises between past and present practices, between different academic and extra-academic habits, and between theoretical, experimental and practical regimes. It makes explicit the issues that are the focus of this research project and permits the questions that structure its progression to be formulated in a concrete and empirical way. Academics, technicians and craftspeople, museum curators and conservators in research centres and museums, archaeological centres and parks, laboratories and workshops are the principal actors of the study by an investigation that encompass the actual communities of textile experts, their scholarly habitus and *façons de faire*, their concrete research activities, the methods involved and the resources mobilized, the knowing and thinking schemas implemented.

Taking an anthropological and an ethnographic approach, rooted in cultural technology, in the history and anthropology of knowledge and in ANT, the investigation moves symmetrically through a “double anthropology” along the two lines of diachrony and synchrony, depending on whether the focus is on archaeological textiles and ancient techniques (past and unobservable) or on the study of it (contemporary and observable) as it is actually realised in CTR’s research programs. It is the convergence and the mul-

tiple crossing points of these lines that configure the theoretical matrix of the research work and map the actual fieldworks of the inquiry. The empirical definition of their relationship that this ethnography intends to outline allows the particular regime of “knowledge” and “know-how” to be described and analysed within the disciplines in which they are distributed.

What conditions are necessary and how do we “rebuild” the Past based on techniques and material remains? This fundamental archaeological and historical question unveils the relevance and the newness of this research project and the value of its empirical approach. For

ethnologists and archaeologists, it raises important issues by investigating the very possibilities of and methods for studying material culture. For anthropologists of science and technology as well as textile researchers, it raises timely theoretical issues concerning the definitions of the field of knowledge and practices inasmuch as it challenges the meaning of “textile” in between product and technique as well as the meaning of “knowledge” in between object and subject of study. Finally it allows for an opening of the “black box” of Textile Studies, and moreover of the epistemological distinction between “knowledge” and “knowhow”.

Textiles in Southern Etruria (TexSEt Project)

Textile Technology in Central Tyrrheanian Italy from Late Prehistory to the Roman Republican Period

Project by Romina Laurito,
Marie Curie Intra European Fel-
low at CTR 2014-2016

The TexSEt project will investigate the emergence and development of textile technologies and the use of textile fibres in Central-Western Italy from Late Prehistory (Final Bronze Age – 10th century BC) until the Roman Republican period (1st century BC), with a particular focus on the Etruscan period (8th-4th century BC). Ancient textile production and fibres will be examined using all materials, methods and sources of information available for a up to date and innovative archaeological exploration. The study includes preserved archaeological textiles, textile implements and their contextualization, as well as ancient iconographic and literary sources. The research will integrate further methods: experimental archaeology combined with an ethnographic approach and the new analytical methods for textile analyses developed in recent years. I will bring together archaeology, history, iconography, and ethnography

to explore what constituted a pre-Etruscan and Etruscan textile tools kit and the range of fabric qualities and explore if and what changing elements are recognizable in the archaeological record.

An integrated study of archaeological textiles will enhance our understanding of the long period of evolution, based on the selection and development of processing technologies, before arriving at the standardisation in technology and production of the Roman Empire.

A key issue of my research will be focused on dissemination and museological aspects. My ambition is to “translate” the obtained scientific results in new ways to exhibit specific objects such as textile tools at the prestigious institution of the National Etruscan Museum of Villa Giulia in Rome.

The final goal of my IEF project is to combine an innovative archaeological study with museological research aimed at new concepts of how to exhibit textile remains and tools in a museum context. It finds no parallel in the field of Italian or European studies.

PICS *TexOrMed* 2012-2014

CTR and UMR 7041 ArScan in CNRS collaborate in the Programme international de coopération scientifique, DNRF and CNRS (PICS): Textiles de l'Orient à la Méditerranée du III^e au I^{er} millénaire avant J.-C. (TexOrMed). Technical developments, improvement of the manufacture of threads and fabrics, and the domestication and establishment of animal husbandry have coined Mesopotamia the homeland of wool. Large scale factories carried production of fabrics and clothes to an unprecedented level. This transformation radically modified the natural environment, the political landscape and international trade and networks, but also enabled new visual expression of individual and collective identities and the appearance of 'fashions'. This impact on societies can be observed from the Aegean to Asia in a multitude of sources and involving many experts: historians of texts and images, archaeologists, craftspeople testing techniques and textile tools. TexOrMed unites these expertises in order to reconstitute the processes which led to the first form

of industry in the Antiquity.

Primary partners in France:

- Catherine Breniquet, Centre d'Histoire "Espaces et Cultures"
- Corinne Debaine-Francofort, Archéologies et Sciences de l'Antiquité
- Francis Joannes, Archéologies et Sciences de l'Antiquité
- Cécile Michel, Archéologies et Sciences de l'Antiquité
- Louise Quillien, Archéologies et Sciences de l'Antiquité
- Françoise Rougemont, Archéologies et Sciences de l'Antiquité
- Aline Tenu, Archéorient
- Emmanuelle Vila, Archéorient
- Pierre Villard, Archéorient

Partners in Denmark:

- Marie-Louise Nosch, CTR
- Eva Andersson Strand, CTR
- Cecilie Brøns, CTR 2011-2014
- Richard Firth, UK
- Joanne Cutler, UCL, UK
- Luise Ørsted Brandt, CTR 2011-2014
- Bodil Bundgaard Rasmussen, National Museum of Denmark, Department of antiquity and near eastern antiquities
- Susanne Lervad, CTR
- Agnes Henriksen, University of Copenhagen

CTR 2005-2016

- Agnete Wisti Lassen, University of Copenhagen

Work programme 2012-2014

Joint master courses held in 2012 at University of Copenhagen.

In November 2012 an exploratory workshop *L'économie de la laine/ Wool Economy in the Ancient Near East and the Aegean: from the Beginnings of Sheep Husbandry to Institutional Textile Industry*, was held in Nanterre with 25 European participants. The contributions of the exploratory workshop will be edited as an anthology by C. Breniquet & C. Michel in the Ancient Textiles Se-

ries, Oxbow Books, Oxford in 2014. CTR hosted French Ph.D. student Louise Quillien and Richard Firth is hosted at CNRS Nanterre in 2012 and 2013. Other research stays are planned.

Cécile Michel and Marie-Louise Nosch co-host the Textile Terminologies 1000 BC-AD 1000 conference in June 2014.

Cécile Michel, Mary Harlow and Marie-Louise Nosch will co-edit an anthology.

Joint edition of the publication of the special issue of the international scientific journal *Paléorient Pluridisciplinary review of Prehistory of Southwestern and Central Asia*, vol. 38/2/2013, on the theme of textile fibres in the Orient. Special issue editors Breniquet, Michel, Anderson Strand, Nosch, Tengberg.



Invisible Craft

Living Textile Handicraft & Textile Experimental Archaeology – Rendering invisible Textile Production visible

One challenge for archaeology is that we can never expect to find all remains of the past and that an archaeological record never mirrors ancient everyday life accurately. Houses and furnishing, tools and textiles (and the people themselves) have naturally disappeared. Yet, in the interpretation of prehistoric society it is crucial to be aware of and consider this fundamental premise in our reconstruction of the past. This premise is particularly valid for textile research where the preservation of textiles and tools is extremely rare, and tools such as looms and spindles were and are preferably made of perishable materials, e.g. wood or bone.

On the basis of textile tool studies in combination with experimental archaeology, CTR has explored the tacit knowledge of textile production in the Bronze Age Eastern Mediterranean (Andersson Strand & Nosch in press). The results have given new and important insights and allow us to assess textile production without any

preserved textiles, only based on the tool data. In the research programme Invisible Crafts, the aim is render textile craft visible in areas and periods where the archaeological evidence is scarce or absent, thereby giving a fuller and more differentiated view of textile production. This will be accomplished by combining the living handicraft knowledge of textile techniques and tools with experimental textile archaeology. The research programme is directed by Eva Andersson Strand in collaboration with Mary Harlow, Leicester, Cecile Michel and Catherine Breniquet at PICS research program, CNRS, Nanterre, and it is a part of the CTR TEMA and TECC research programmes.

The investigation is divided into four parts, each with individual goals, planning, participation and outcomes:

- Traditional Textile Craft – an Intangible Cultural Heritage
- Practise – documentation of living tex-

tile handicraft in Turkey, Jordan and Egypt

- Experiments – testing of textile tools from the studied regions
- Imprints and visible textiles – textile production in Bronze Age Eastern Mediterranean

Traditional Textile Craft – an Intangible Cultural Heritage

Textile craft and textile design have always had an important social, cultural and economic impact on both individuals and societies. The cultural heritage of textiles does not end with preservation and collection of costumes and other textiles in museums. It includes living traditions inherited from our ancestors and passed on to our descendants, knowledge and skills to produce traditional crafts, and the language and terminologies used to describe both the activities and the material outcomes.

Cloth and clothing have also always been of interest to anthropologists and archaeologists. From both sides we are aware of each other's research, in the same way we are aware of crafts people and their advocates. However, we tend to discuss our work in isolation: archaeologists have their forums and anthropologists theirs. It is one of the primary aims of this workshop to bring together archaeologists, anthropologists and craftspeople to better understand each other's approaches, uses, theoretical frameworks and the practical realities of craft. It will explore the use of traditional textile craft across time and space with the aim of exchanging knowledge and gaining insights into each other's agendas in order to get a better understanding of traditional textile craft and heritage frameworks.

The questions we raise require global reflection on a number of levels. As a first step an international workshop took place in Amman, Jordan in March 2014 in col-

laboration with Jordan Museum and curator Jihad Kafafi.

It is possible to follow our post workshop and read abstracts and full representations on our website (www.conferences.saxo.ku.dk/traditionaltilecraft/) and blog (www.traditionaltilecraft.dk/)

Practise – new documentation of living textile handicrafts

Several craft processes and thus skills are rapidly disappearing today and it is urgent to document what is left. Furthermore, UNESCO has listed Traditional Craft as an intangible cultural heritage stressing the importance of preserving it. By combining Motion Capture and experimental archaeology it will be explored how the results can be used in our interpretation of the suitability of the tools. The results will undoubtedly give new important insights and perspectives on textile production in ancient societies. This will be achieved via systematic experiments in collaboration with craft technicians.

Experiments – testing textile tools

The aim is to suggest what type of tool may have been used during the prehistoric era and by that render invisible textile tools visible. The tests will complement earlier experiments made at CTR and the results will allow us to go one step further in our interpretation of the past textile production. Experimental testing combined with contextual analyses help to ask questions which are difficult to answer by studying the tools alone.

Imprints and Visible Textiles, Textile production in Bronze Age Eastern Mediterranean

Analyses of textile imprints can give specific knowledge of, for example, thread quality, fabric density and weaving techniques: important information that gives new insights on what type of textiles were

produced even if no actual textiles have been preserved. Furthermore, it is sometimes possible to see the type of fibre that was used. However there is a difference in analysing actual textiles and analysing their negative (the imprints). It is therefore necessary to develop a special methodology for the analysis of textile imprints. The unique collection from Kültepe, Turkey, is the focus of the first pilot study.

tween anthropology and archaeology will be a starting point for a new and necessary debate within this field of research. Results will also be published in conference proceedings and journals and presented at various workshops and conferences.

Outcome of the Invisible Crafts Research Programme

In general, this research programme illuminates the complexity and variety in textile production in various craft traditions and over time. It will add a new dimension to the complexity, variation and organisation of other crafts specialisations and archaeological research. Furthermore, the discussion of the role of textile craft be-



Traditional Textile Craft Workshop, Amman, Jordan 2014

First Textiles

The beginnings of Textile Manufacture in Europe and the Mediterranean

This project concerns the beginnings of textile manufacture, tools and techniques, with a focus on the Neolithic and Early Bronze Age in Europe and the Mediterranean. Despite our extensive knowledge about late prehistoric textile production (especially in the Middle and Late Bronze Age) supported by numerous archaeological, textual and iconographic evidence, the very beginnings of thread and fabric manufacture still need to be explored.

Methods

Application of varied interdisciplinary methods of systematic analysis of textiles, such as studies on ancient textile remains, basketry, mat and textile imprints in clay, textile tools (e.g. spindle whorls, loom weights, needles, shuttles), experiments with copies of ancient textile implements, or recently developed scientific methods of analysing textiles and recognising the provenience of animal fibres, e.g. through DNA analysis, strontium-, and isotope-tracing will offer important insights into the oldest textile techniques, their beginnings and development throughout prehistory. One of the main objectives of our research is to review and systematize the recent achievements in the research field of the most ancient textiles and textile techniques and to set the agenda for further research.

In the project, various approaches and data will be combined: studies of actual remains of the ancient textiles, prehistoric textile implements (e.g. spindle whorls, loom weights, needles, combs), iconographic sources, impressions of textiles and mats/baskets in clay and other materials, experimental archaeology and archaeological reconstructions. More specifically, the programme will focus on the following questions:

- When were the first threads and fabrics made? What sources are available to study them?
- What were the first textile techniques and how did they change and develop during the Neolithic and Early Bronze Age?
- When were the spindle whorls and loom weights invented and attested, how did they spread through distant regions and cultures and how were they used?
- What fibres were preferred during the early prehistoric periods? Which scientific and other analytic methods are available to recognise them?
- What can the first textiles or textile implements tell us about the society, household production, work organisation and specialisation, social status, gender?

- Can textile implements and techniques tell us more about the cultural changes during the prehistoric times?

Network of international researchers

The purpose of the project is to create a dynamic network of international researchers, Ph.D. students and students who wish to exchange their knowledge and present recent advances in the study of the beginnings of textile manufacture. The project will provide a platform for all members of the academic community who share an interest in archaeological textiles, ancient textile techniques and tools.

The research project will group scholars from different countries, institutions, museums, and universities. The director of the project Dr. Małgorzata Siennicka (University of Warsaw) was awarded a Marie Curie Mobility Fellowship for 2013-2015 and works as associate professor at CTR. Her research project, Greek Textile Tools. Continuity and changes in textile production in Early Bronze Age Greece, deals with textile production in the Aegean during the Early Bronze age.

Activities in 2013-2015

International workshop in Berlin

Participation in the international workshop (17-18 February 2014) The Distinction of Fibers: Methods and Approaches organized by TOPOI-Research Group 'Textile Revolution'.

EAA Istanbul session on Textile production in Europe and the Mediterranean in the 4th and 3rd millennia BCE

A regular session, Textile production in Europe and the Mediterranean in the 4th and 3rd millennia BCE, is accepted for the conference EAA (European Association of Archaeologists) in Istanbul, 10-14 Sep-

tember 2014. The session is organized by Dr. Małgorzata Siennicka (University of Copenhagen/University of Warsaw), Dr. Lorenz Rahmstorf (University of Mainz) and Ph.D. candidate Agata Ulanowska (University of Warsaw).

The final programme will be published on the 17th March 2014. The session will provide the opportunity to connect international scholars working on ancient textiles, textile tools and techniques, and will present new discoveries and data in the field, as well as discuss new approaches and perspectives. The session will also set the agenda for the First Textiles conference that is planned for spring 2015 at CTR.

Conference "First Textiles" at CTR - planned for spring 2015

A conference on First Textiles is planned for spring 2015 at CTR. In autumn/winter 2014 the first call for papers will be announced. The aim of the conference is to summarise the recent research on the beginnings of textile manufacture mainly in Europe and the Mediterranean and to present current research. Collaborators from various institutions and independent researchers are encouraged to participate.

Publication of the proceedings of the EAA session and First Textiles conference (2016)

The proceedings of the regular session at the conference EAA in Istanbul (September 2014) and of the conference at CTR (spring 2015) is planned to be published in 2016 as a joint volume (edited by Małgorzata Siennicka) in the Ancient Textile Series edited by Prof. Marie-Louise Nosch of CTR and published by Oxbow Books.

Costumes, Clothing, Con- sumption and Culture (CCCC)

CTR, the National Museum of Denmark and the Museum of Copenhagen have intense research co-operation within the field of textiles and dress 1600-1900. From 2013-2016 particular focus is on the consumption and circulation of fabrics, fashions and luxury goods in the city of Copenhagen and Denmark, in the Nordic Countries, and between Europe and the distant colonial and commercial networks, especially in India. The research programme is directed by Paula Hohti (CTR) and Mikkel Venborg Pedersen (The National Museum of Denmark). The international partners are Warwick University, Glasgow University, UK, Jawaharlal Nehru University, Indian Council of Historical Research, Delhi, India and the European University in Florence, Italy.

The Research Programme

The research programme comprises scholars of several levels and institutions. In 2013-2015 the Marie Curie Mobility Fellowship is awarded to Paula Hohti, Finland, for a research project on 'Global Encounters: Fashion, Culture and Foreign Trade in Scandinavia, 1500-1630'. Mikkel Venborg Pedersen is in 2013 publishing his monograph on the colonial influences into Danish everyday life and consumption in the 18th century: *Luksus. Forbrug og kolonier i Danmark i det 18. århundrede*.

There are also currently five young international scholars affiliated to CTR, who conduct their Ph.D. research in the field of historical costume and consumption studies. Connected Ph.D.'s are Charlotte

Rimstad with the project "Renaissance Clothes of Copenhagen", Vivi Lena Andersen with the project "Between cobbles, bunions, shoe last and fashion. An appropriation and adaption analysis of footwear from the Middle Ages, Renaissance and Absolutism from archaeological excavations in Copenhagen", Karolina Hutkova (Warwick University) with the project "Seventeenth and Eighteenth-Century Asian Textiles in Europe and North America", Vibe Maria Martens (European University of Florence) with the project "Indian Textiles in Seventeenth- and Eighteenth Century Denmark: Colonialism and the Rise of a Global Consumer Culture", and Toolika Gupta (Glasgow University) with the project "The effect of British Raj on Indian fashion (Clothing and Textile preferences) of the Early Twentieth Century". A number of BA and MA students are also affiliated to the programme.

The CCCC research programme has strong links with various research initiatives on early modern and modern textile and clothing terminology, which are currently being conducted in Europe. In Denmark it is textilnet.dk, a collaborative project with Designmuseum Danmark. In Europe it is *Textile et vêtements*. Most research projects in the research programme conduct terminological explorations combined with other approaches.

This research programme also has

a strong affiliation to museum exhibitions. In 2012, some of the programme's research results were communicated via the exhibition at the Designmuseum Denmark entitled *Rokoko-mania*. The research is also feeding into V&A's new galleries on Europe 1600-1800. Finally, the programme will enrich a planned new costume exhibition of The National Museum of DK. The research programme is also engaged in teaching at the Saxo Institute, University of Copenhagen.



Fashioning The Early Modern 2011-2013

EU Funded (HERA) Collaboration On Fashion Research

Why did men from Spain to Sweden start to shave their heads and wear someone else's hair in the mid-seventeenth century? Why did women decide that it was necessary to wear masks and other full-face coverings in public towards the end of the century? What was the economic and social impact of the sudden proliferation of ribbon-making machines?

Funded by the Humanities in the European Research Area (HERA), this project has taken fashion seriously, asking the simple question: how and why did certain goods such as wigs, new textiles, ribbons, ruffs and lace become successful in early modern Europe while others failed? How far did these goods travel and how were they transmitted across linguistic, social and geographic borders. These are questions that are still very relevant today and our project demonstrates how a study of creativity and innovation as an economic and cultural force in the past can help our understanding of the same issues today.

In doing so, a new interdisciplinary European community of academics, museum curators and fashion and design professionals was created who worked together to consider creativity, innovation and fashion in all its aspects from 1500-1800, its display in museum settings and its relevance to contemporary policy, legal practices and to the designers and manufacturers of today's fashionable goods.

Staff involved at CTR was Maj Ringgaard, Marie-Louise Nosch, Camilla Luise Dahl, Mette Bruun, Laila Glienke. Partners were Queen Mary, University of London, UK; Victoria & Albert Museum, UK; University of Helsinki, Finland; Stockholm University, Sweden. Danish collaborators are The National Museum of Denmark, Design Museum Denmark,



Danish School of Design, The Royal Theatre and Den Gamle By, Århus. The project also collaborated with the Danish Costume Group on an interdisciplinary project on the creation and development of an on-line dictionary of historical terms for dress and textiles: textilnet.dk. Project leader of this project is Tove Engelhardt Mathiasen and Maj Ringgaard is part of the group. During the project period several workshops and conferences were held and the project has demonstrated how a study of creativity and innovation as an economic and cultural force in the past can help our understanding of the same issues today. From CTR Maj Ringgaard conducted the post doc project

Creative traditions: knitting in Europe, 1500-1800 (2011-2012), where research on the distribution of knitted objects in Northern Europe during the late 16th, 17th and the first part of the 18th century, was undertaken.

The research also included investigations of traditional knitting, exploring the meaning of this term, on the historic reuse and recycling of textiles, on starch, coating and impregnation of textiles in early modern time and on the implementation of knitted textiles in daily wear and work wear.

Fashionable Encounters. Perspectives and Trends in Textiles and Dress in the Early Modern Nordic World. Ancient Textiles Series, Oxbow Books, Oxford 2014, edited by Tove Engelhardt Mathiasen, Marie-Louise Nosch, Maj Ringgaard, Kirsten Toftegaard, Mikkel Venborg Pedersen.



Global Encounters

Fashion, culture and foreign trade in Scandinavia, 1500-1630

Project by Paula Hohti,
Marie Curie Intra European Fel-
low at CTR 2013-2015

This study of early modern Scandinavian clothing, fashion and textile trade investigates how international trade and global cultural encounters shaped Scandinavian cultures in the Renaissance period. By focusing on clothing, fashion and the trade of foreign textiles in Denmark, Sweden and Finland in 1550-1650, the main questions posed by the project are:

How was the textile and clothing trade organised and what were the mechanisms through which foreign products were acquired in Sweden, Denmark and Finland? How did international fashions influence the dress of the Finnish, Swedish and Danish nobility? How were new dress designs and products disseminated across social classes and applied and integrated within the local production and cul-

ture? What impact did novel fashion products and cultural encounters with Europeans have on social behaviour, regulation of dress and the cultural meanings that were associated with dress and appearance? The central goal of the project is to propose a new methodology combining empirical research and theoretical models drawn from fashion theory, social and economic history and anthropology with the tradition of textile analysis and costume



16th century decorative bands

conservation. The intention is also to develop new theoretical models for economic and social interpretation, in order to evaluate how this work fits within and can contribute to the ongoing debates concerning economic, social and cultural change in Europe. By placing Scandinavian states along the Baltic trade route on the 'map' of the early modern

global encounters, previously overlooked in this kind of research, this project will not only open up new horizons for Nordic research, but it will also challenge the perceptions that social and cultural change in the 16th and 17th centuries was limited within the great European cultural and commercial centres such as Spain, Italy, and France.



Clothing and Identity in the Roman World - DressID

In 2007-2013 CTR and six other European research institutions received major funding for a research project from the European Executive Agency for Culture, Audiovisual and Education (EACEA). The project was coordinated by Reiss-Engelhorn-Museen, Mannheim.

The DressID project was launched in December 2007 in Valencia at the 1st General Meeting.

CTR scholars were elected as spokespersons for three study groups under the project:

- Elements of costume (spokesperson Ulla Mannering)
- Experimental textile archaeology (spokesperson Eva Andersson Strand)
- Production and Trade (spokespersons Margarita Gleba & Judit Pasztokai-Szeöke)

The main objectives of the DressID project were:

- to provide a position in cultural history for clothing and textiles
- to demonstrate how clothing is a key to identity studies
- to strengthen the network and exchange of knowledge and ideas of European scholars and to combine the various scientific traditions in Europe
- to contribute to European identity by investigating its common cultural heritage

The Roman Empire forms the frame of the project. At the time of its maximum extent — in the 2nd century AD — the Roman Empire incorporated the territory of most of Europe, numerous Balkan countries, and the Mediterranean seaboard. It also had an outstretching web of diplomatic and economic relations with

peoples living beyond its borders. Chronologically, the project embraces a long period of time, from the Early Iron Age to Late Antiquity. With its sources, the Roman Empire provides a perfect frame for investigations of cultural uniformity and diversity. Its pervading political and administrative structures provide an excellent platform for identity studies on all levels.

Clothing and Identity in the Roman World

The clothing of individuals and collective bodies serves as a major tool for communication on a non-verbal level. As a whole it expresses relational constructions within groups, and it demonstrates affiliations or exclusion as well as ethnicity, social rank, profession, gender and age. Clothing may reveal the regional origin of the bearer, present variations in local costumes, and it reflects in a highly visible way the correlation between tradition and innovation.

Dress codes were defined by recognisable elements of clothing like the use of the toga or the braca, and

by apparent aspects as the quality of cloth and the combination of accessories, through which people might express their individuality in various ways.

The investigation both addresses the European-wide Roman dress and identity, but also the dress codes beyond the Roman Empire, reflecting peoples' histories and cultures.

A new interdisciplinary method

Numerous textile experts and institutions all over Europe have carried out specific investigations concerning Roman clothing on an individual basis. The DressID-project combined the knowledge and research results from various branches in order to reach new insights. The new component of this multidisciplinary approach was the combination and inclusion of results gained by the humanities like archaeology, ancient history and epigraphy, with physics and chemical analyses as well as systematically conducted tests of tools and techniques provided by experimental archaeology.



Dress-ID – Publications and Exhibitions

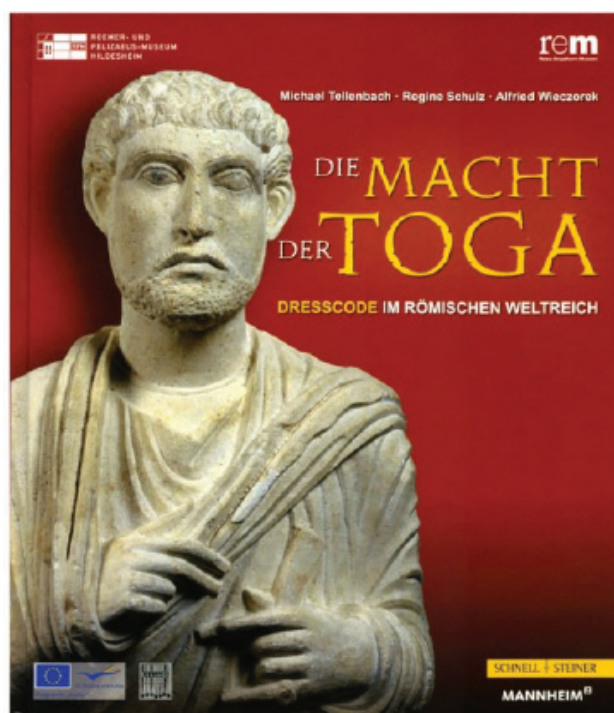
All the data generated by the researchers in this project are available to other scholars and to the public via web-based communication, papers, public meetings, databases, and the public media (see www.dressid.eu). A major outcome addressing a larger international public is the exhibition *Die Macht der Toga - Mode im römischen Weltreich* at the Roemer- und Pelizaeus-Museum in Hildesheim, Germany (April 20 to September 8, 2013) which is based on the conducted research. The exhibition shows original finds from all over the ancient world in combination with the scientific results, visualised by experimental archaeology and modern media.

Dress code of the dead in chieftain graves in Slovakia

Within the frame of the DressID, CTR launched a special project based on an exceptional textile find from Slovakia, in collaboration with archaeologists Tereza Belanová-Štolcová and Karol Pieta, Slovakia, and with conservator Gabriele Zink, Archäologisches Landesmuseum, Stiftung Schleswig-Holsteinische Landesmuseen Schloß Gottorf, Schleswig. Textile and leather material analysed comes from the unique chieftain's tomb in Poprad-Matejovce (Northern Slovakia), excavated in 2006. Flooded by ground water and mud, there was found a perfectly pre-

served wooden double chamber grave, dated to 4th-5th centuries AD. The grave yielded much organic material: wood from the construction, wooden furniture, textile, leather and basketry objects. Metal, glass, pottery as well as human and animal bones were found in smaller amounts. The finds point to the princely status of the deceased and can be equally compared with other graves of the highest social class of Germanic tribes all over Europe during the Late Roman Period. Twenty blocks with textile fragments were taken out in situ, and kept frozen at -20°C in Archäologisches Landesmuseum. In autumn 2008 the laboratory examination of in situ blocks began and revealed tablet-woven textiles in wool and several traces of gold leaf.

Die Macht der Toga. Dresscode in Römischen Weltreich M. Tellenbach, R. Schultz, A. Wiczorek (eds), Mannheim 2013.



The International FLAX Network

CTR engaged in collaboration with Sabine Karg, National Museum of Denmark, and collaborated on the international research project FLAX – Interdisciplinary research on the evolution and cultural history of the useful plant flax (*Linum usitatissimum* L.) – a resource for food and textiles for 8000 years sponsored by the Danish Research Agency for Culture and Communication.

Flax is an important plant for its oil and fibres and therefore has a lot of meanings for human culture and development for more than 8000 years. The products of flax still play a role in our modern every-day life. The seeds are well-known to be healthy, they contain nutritional values and high amounts of short-chain omega-3 fatty acids; clothes made of linen are the oldest textiles manufactured by our ancestors, and have become more popular again during the last decades; and linseed oil is one of the oldest commercial oils used for centuries in

painting and varnishing. No artificial chemical product has replaced the flax products.

The aim of the FLAX-network was to promote international and cross-disciplinary collaboration, and to offer a platform to create new research projects within this field. Two international workshops to communicate and exchange new knowledge on the flax plant were held in Denmark in 2009 and 2010.

2011, Sabine Karg (ed.), New research on the cultural history of the useful plant *Linum usitatissimum* L. (flax), a resource for food and textiles for 8,000 years, *Vegetation History and Archaeobotany*. Vol. 20 No. 6, 507-584.

C. Bergfjord, S. Karg, A. Rast-Eicher, M-L. Nosch, U. Mannering, R. Allaby, B. M. Murphy, B. Holst, "Comment on "30,000 Year-Old Wild Flax Fibres"", *Science* 328, 1634b.



CTR Staff 11

STAFF

CTR has welcomed a large number of visitors – students, colleagues, designers, from Denmark and abroad, who visited CTR for shorter or longer periods during the last five years. CTR has also hosted receptions and gatherings for various groups of scholars. This has been an opportunity to present the centre and to reach out to other academic communities in an informal way.

CTR Visiting professors

- Lise Bender Jørgensen, NTNU, NO (2006)
- Carmen Alfaro Giner, University of Valencia, ES (2007)
- Cécile Michel, CNRS Paris, FR (2008/2009/2012)
- Pia Bennike, Anthropological Laboratory, PANUM, University of Copenhagen, DK (2009)
- T. Douglas Price, University of Wisconsin-Madison, USA (2010)
- Mary Harlow, University of Birmingham, UK (2011-2013)

Visiting scholars and students

- Camilla Luise Dahl, University of Copenhagen, DK (2005-2006/2010-2013)
- Kitt Boding, University of Copenhagen, DK (2006)

- Brendan Burke, University of Victoria, CA (2006)
- Ylva Cederborg, Uppsala University, SE (2006)
- Marta Guzowska, Warsaw University, PL (2006)
- Niels Ladefoged, University of Copenhagen, DK (2006)
- Cherine Munkholt, University of Copenhagen, DK (2006)
- Susan Möller-Wiering, Landesmuseum Schloss Gottorf, DE (2006)
- Lorenz Rahmstorf, Johannes-Gutenberg Universität Mainz, DE (2006)
- Riina Rammo, University of Tartu, EE (2007)
- Morten Ravn, University of Copenhagen, DK (2007)
- Françoise Rougemont, CRNS, FR (2007)
- Henriette Lyngstrøm, University of Copenhagen, DK (2007-2008)
- Elizabeth Barber, Occidental College, California, USA (2008)
- Sophia Bergerbrant, University of Stockholm, SE (2008)
- Oliver Dickinson, University of Bristol, UK (2008)
- Sanna Lipponen, University of Oulu, FI (2008)
- Florica Matsau, University of Iasi, RO (2008)
- Pietro Militello, University of Catania, IT (2008)
- Tereza Belanová-Štolcová, Academy of Sciences, SK (2008)
- Kathrine Vestergaard Pedersen, University of Copenhagen, DK (2008)

- Joanne Cutler, London University, UK (2009-2010)
- Ole Holger Hansen, University of Copenhagen, DK (2009)
- Katrina Honeyman, School of History at Leeds University, UK (2009)
- Sabine Karg, The National Museum of Denmark, DK (2009)
- Michael Langkjær, University of Copenhagen, DK (2009)
- Susanne Lervad, Term Plus, Copenhagen, DK (2009-2013)
- Sascha Mauel, University of Copenhagen, DK (2009)
- Paula Mazare, University of Alba Iulia, RO (2009)
- Jean-Claude Poursat, University of Clermont-Ferrand II, FR (2009)
- Judith Cameron, Australia's National University, AU (2010)
- Richard Firth, (2010/2011/2012)
- Johan Zimsen, University of Copenhagen, DK (2010)
- Hedvig Enegren, Brussels, BE (2011)
- Sølvi Helene Fossøy (2011)
- Agnes Henriksen, University of Copenhagen, DK (2011)
- Zofia Kaczmarek, Adam Mickiewicz University, PL (2011)
- Francesco Meo, University of Salento, IT (2011)
- Christina Skelton, UCLA, USA (2011)
- Beate Wagner-Hasel, Hannover University, DE (2011)
- Giovanni Fanfani, IT (2011-2014)
- Michael Weigl, University of Vienna, AT (2011/2012)
- Manin Wu, , University of Donghua University, Shanghai, CN (2011-2013)
- Glenys Davies, Edinburgh, UK (2012)
- Sheila Dillon, Duke University, USA (2012)
- Kerstin Dross-Krüpe, Philipps-Universität Marburg, DE (2012)
- Laila Glienke, University of Copenhagen, DK (2012)
- Bob Hunt, USA (2012)
- Ulrikka Mokdad, University of Copenhagen, DK (2012)
- Vijaya Ramaswamy, JNU Delhi, IN (2012)
- Anna Rybarczyk, Polish Academy of Sciences, PL (2012)
- Lia Perez Moreno, University of Barcelona, ES (2012-2013)
- Camilla Sørensen, University of Copenhagen, DK (2012-2013)
- Cai Xin, University of Donghua University, Shanghai, CN (2013)

CTR academic staff, student assistants and editorial assistants

- Annette Borrell (2005-2007)
- Marianne Bloch Hansen (2005 – 2012)
- Cherine Munkholt (2006, 2008-2014)
- Anne-Marie Carstens (2008)
- Kathrine Vestergård Pedersen (2008)
- Vibe Martens (2008-2011)
- Mette Bruun (2009-2014)
- Ida Demant (2010)
- Henriette Kofoed (2010)
- Ingeborg Philipsen (2010)
- Peder Flemestad (2010-2014)
- Egzona Haxha (2010-2014)
- Sidsel Frisch (2010-2014)
- Sandra Holm (2010-2013)
- Niels Møldrup (2010-2013)
- Camilla Ebert (2012-2014)
- Ziff Julie Jonker (2012-2014)
- Ulrikka Mokdad (2012-2014)
- Camilla Toft (2012-2014)
- Christian Schmidt (2013)
- Julie Bjørg Raith (2013-2014)
- Philip Kristian Dons Madsen (2014)
- Stine Marie Bøttern (2014)
- Louise Ludvigsen (2014)
- Line Lerke (2014)



CTR Ph.D. Projects

Karin Margarita Frei

The Ph.D. grant for research in textiles, financed by the SAXO Institute, University of Copenhagen was granted to geologist Karin Margarita Frei with a research project named: (Isotope)- Geochemical studies of textiles and wool: tracing their sources. Karin Margarita Frei started her Ph.D. research on May 1st 2007, and successfully defended her Ph.D. dissertation, Provenance of Pre-Roman Iron Age textiles – methods development and application on August 6th 2010.

Maj Ringgaard

The Ph.D. grant for research in Textiles and Conservation, with focus on textiles from the collections in the Danish National Museum, co-financed by CTR and the National Museum of Denmark was granted to Maj Ringgaard with a research project named: "Nedbrydningsfænomener i tekstiler fra omkring 1700 fundet i københavnske byudgravninger". Maj Ringgaard started her Ph.D. research on August 1st

2006, and successfully defended her Ph.D. dissertation, "To par strixstrømper og en nattrøje naccarat" Filtede og strikkede tekstiler fra omkring år 1700, fundet i Københavnske byudgravninger - og sammenhænge mellem tekstilers farve og bevaring, on May 14th 2010.

Ulla Isabel Zagal-Mach

The Ph.D. grant for research in Textiles and Experimental Archaeology, co-financed by CTR and Lund University, Sweden, was granted to Ulla Isabel Zagal-Mach with a research project named: Sejlet på horisonten – et håndværksorienteret studie af den integrationsproces, der gjorde den nordiske båd sejlførende. Ulla Isabel Zagal-Mach started her Ph.D. research on February 1st 2006, and successfully defended her Ph.D. dissertation, Grasping Technology, Assessing Craft. Developing a Research Method for the Study of Craft-Tradition on March 8th 2013.

Judit Pásztoókai-Szeőke

The Ph.D. grant for research in Tex-

tiles and Archaeology, co-financed by CTR, University of Århus and the Danish Ph.D. School in Archaeology was granted to Judit Pász-tókai-Szeöke with a research project named: The archaeological evidence of textile production in Roman Pannonia. Judit Pász-tókai-Szeöke started her Ph.D. research on March 1st 2006, and finished her studies at CTR in 2009.

Birgit Lyngbye Pedersen

The Ph.D. grant for research in Design as a competitive Parameter in the Development of the Danish Textile Industry, co-financed by CTR, CBS/Centre for Business History, Centre for Design Research/Kolding School of Design, and the private foundation Fonden Frigges Legat, was granted to Birgit Lyngbye Pedersen with a research project named: Design som konkurrenceparameter i tekstilindustriens udvikling i Danmark efter 2. Verdenskrig. Birgit Lyngbye Pedersen started her Ph.D. research on August 1st 2006.

Lone Gebauer Thomsen

The Ph.D. grant for research in Technological and Economic Aspects of Textile Production in Denmark in the Late Iron Age and Viking Period, financed by FKK (The Danish Council for Independent Research Humanities), was granted to Lone Gebauer Thomsen with a research project named: Mellem husflid og profes-

sionelt håndværk – teknologiske og økonomiske aspekter af tekstilproduktionen i Danmark i yngre jernalder og vikingetid. Lone Gebauer Thomsen started her Ph.D. research on February 1st 2010. The dissertation is submitted in 2013.

Luise Ørsted Brandt

The Ph.D. grant for research in Archaeology, Ancient DNA, and Textile Research was granted to Luise Ørsted Brandt with a research project named: DNA - et redskab til analyse af den tidligste danske produktion af uld- og hørtexstiler samt udviklingen af dragt og identitet. Luise Ørsted Brandt started her Ph.D. research on June 1st 2011. She will be performing the DNA analysis in cooperation with Centre for GeoGenetics, The Natural History Museum of Denmark. The dissertation will be submitted in 2014.

Cecilie Brøns

The Ph.D. grant for research in Archaeology on the Cultic Use of Textiles and Clothing Items, the Production of Textiles and Greek Sanctuaries was granted to Cecilie Brøns with the research project named Gods and Garments. Textiles in Greek Sanctuaries in the first millennium BC. Cecilie Brøns started her Ph.D. in September 2011. The dissertation will be submitted in 2014.

Karolina Hutkova

The Ph.D. grant for research in History, on the Different Impacts of Chinese and Italian Cotton and Silk Imports, co-financed by CTR and the University of Warwick, was granted to Karolina Hutkova with the research project named: Seventeenth and Eighteenth-Century Asian Textiles in Europe and North America. Karolina Hutkova started her Ph.D. research on 1st December 2012. The dissertation will be submitted in 2015.

Toolika Gupta


PhD candidate at the University of Glasgow. Affiliated to CTR as a member of the CCCC Research Programme. Her research project is entitled "The effect of the British Raj on Indian fashion (clothing and textile preferences)". Toolika Gupta started her PhD in 2012.

Charlotte Rimstad

The Ph.D. grant for research in Archaeology, focusing on Archaeological Renaissance Textiles, financed by the Faculty of Humanities, was granted to Charlotte Rimstad with the research project named: Renaissance Clothes of Copenhagen. Charlotte started her Ph.D. in January 2013. The dissertation will be submitted in 2017.

Vivi Lena Andersen

The Ph.D. grant for research in Archaeology, Focusing on Footwear from the Middle Ages, Renaissance and Absolutism, co-financed by the Saxo Institute, CTR and the Museum of Copenhagen, was granted to Vivi Lena Andersen with the research project named: Between Cobbles, Bunions, Shoe Last and Fashion. Vivi Lena Andersen started her Ph.D. in March 2013. The dissertation will be submitted in 2016.



The Danish painted textile
from Ømark dated to the
Pre-Roman Iron Age

Marie Curie Fellows

Hedvig Landenius-Enegren (SE) was granted the Marie Curie mobility grant in 2012-14, and her project is entitled "West & East: Textile technologies and identities in the 1st millennium B.C. South Italy and Cyprus".

Ellen Harlizius-Klück (DE) was granted a Marie Curie mobility grant in 2012-13 and her project is entitled "Periphron Penelopeia. Textile Technology and the Tacit Dimension of Thought in Ancient Greece".

Salvatore Gaspa (IT) was granted a Marie Curie Fellowship in 2013-15, with his project "Assyrian textiles: A study of the terminology and the material culture of the textiles in the Neo-Assyrian Empire".

Miguel Ángel Andrés-Toledo (ES) was granted the Intra-European Fellowship project 2013-15 with his project entitled "Zoroastrian Text(ile)s: Regulations, Symbolism, Identity" (ZOT).

Berit Hildebrandt (DE) was granted the Marie Curie Fellowship in 2013-

15 with her project: "The Emperor's New Clothes "Power Dressing in the Roman Empire from Augustus to Honorius".

Małgorzata Siennicka (PL) was granted a Marie Curie Fellowship in 2013-15, with her project "Greek Textile Tools. Continuity and changes in textile production in Early Bronze Age Greece".

Matteo Vigo (IT) was granted a Marie Curie Fellowship in 2013-15, with his project "Textile Terminology of Hittite Anatolia".

Paula Hohti (FI) was granted a Marie Curie Fellowship in 2013-15, with her project "Global encounters: Fashion, culture and foreign trade in Scandinavia, 1500-1630".

Joanne Cutler (UK) was granted a Marie Curie Fellowship via Gerda Henkel Stiftung as well as a Post Doc grant from the Institute of Aegean Prehistory with her project "Weaving the fabric of society: Bronze Age Aegean Economies of Cloth" in 2013-2015.

Romina Laurito (IT) was granted a Marie Curie Fellowship in 2014-16 with her project "Textiles in Southern Etruria. Textile Technology in Central Tyrrheanian Italy from Late Prehistory to the Roman Republican Period".

Flavia Carraro (IT) was granted a Marie Curie Fellowship in 2014-2016 with her project "Textile Studies between knowledge and knowhow. A case study from Archaeological textiles".

Giovanni Fanfani (IT) was granted a Marie Curie Fellowship in 2014-16 with his project "Performing the Fabric of Song. Textile Technology and Imagery in Ancient Greek Poetry and Poetics. An Interdisciplinary Study in Terminology and Metaphors".

Caroline Sauvage (FR) was granted a Marie Curie Fellowship in 2014-2016 with her project "Identities and Transformation in the Eastern Mediterranean: Evolution and Continuity of Textile Tools in the Late Bronze Age (LBA) and Early Iron Age (EIA)".



*Marie Curie master class at CTR
2013*

Major Conferences organised by CTR

Tools and Textiles - 1st Workshop

January 20th-21st 2006

CTR organised the Tools and Textiles workshop hosted by the Danish Institute at Athens. The goal of the workshop was to bring together the international collaborators in order to introduce them to the TTTC programme and to present the results of the research conducted by CTR so far, including the Textiles Tools Database and the first tests in experimental archaeology.

1st Fibre Workshop

May 22nd-23rd 2006

CTR organised this workshop at home in order to discuss new methods within fibre analysis and to share information on wool fibres in the two CTR research programmes.

Archaeological Skin and Leather Workshop

September 25th 2006

CTR organised the workshop at the National Museum of Denmark in Brede in order to discuss new methods within skin analysis and to

share information with our international collaborators.

2nd Fibre Workshop

November 20th-21st 2006

This workshop was organized at CTR in order to further discuss new methods within fibre analysis and to share information on wool fibres in the two CTR research programmes.

Textiles in Context, New Research on Ancient Danish and European Textile Finds

January 17th-20th 2007

The 4-day conference at University of Copenhagen attracted 28 participants and a daily audience of 50. The results of the research presented at the conference are published in the book *Textiles and Textiles Production in Europe from Prehistory to AD 400* edited by Margarita Gleba and Ulla Mannering (Oxbow Books 2012).

10th North European Symposium of Archaeological Textiles (NESAT)

May 13th-18th 2008

The 10th NESAT Jubilee Symposium took place in Copenhagen and was organised by CTR in cooperation with the Department of Conservation at the National Museum of Denmark and the Lejre Experimental Centre. The members of the organising committee were Marie-Louise Nosch (CTR), Ulla Mannering (CTR), Margarita Gleba (CTR), Eva Andersson (CTR), Maj Ringgaard (CTR), Jesper Stub Johnsen (The National Museum of Denmark), Irene Skals (The National Museum of Denmark), Marianne Rasmussen (Lejre Experimental Centre). The conference was funded by CTR, The National Museum of Denmark, Nordisk

Kulturfond, Danish Research Agency for Culture and Communication, Dronning Margrethes og Prins Henriks Fond and Knud Højgårds Fond. The proceedings are published in the book NESAT X edited by Eva Andersson Strand, Margarita Gleba, Ulla Mannering, Cherine Munkholt & Maj Ringgaard (Oxbow Books 2010).

Roman Military and Textiles

May 20th 2008

International Conference at CTR, integrated into the 2nd General Meeting of the DressID project. The proceedings are published in the book Wearing the Cloak. Dressing the Soldier in Roman Times, edited by Marie-Louise Nosch (Oxbow Books 2011).



Textile History and the Military

May 21st-23rd 2008

International Conference organised by CTR and Kjeld Galster from the Royal Danish Defence College at the University of Copenhagen with 30 military experts from Europe and the USA. Funded by FKK and NATO Science. The results are published in the book *Textile History and the Military* edited by Kjeld Galster and Marie-Louise Nosch (Textile History 2010).

Experimental Archaeology Research - New Approaches

October 1st-3rd 2008

International Conference in Östersund, Sweden, organised by Eva Andersson Strand (CTR), Lars Larsson (Lund University), Roger Engelmark (Umeå University) and Kjell-Åke Aronsson (Aijte, Swedish Mountain and Sámi Museum, Sweden). The conference was funded by CTR, Vitterhets Akademien, Sweden - Kungl. Humanistiska Vetenskapssamfundet, Lund, Sweden, The Culture Programme of the European Union and Jamtli Museum, Östersund, Sweden.

Communicating Identity in Italic Iron Age Communities

October 23rd-24th 2008

International Symposium at University of Copenhagen, organised by Margarita Gleba (CTR) and Helle W. Horsnæs (National Museum of Denmark). Funded by CTR, Nation-

al Museum of Denmark and FKK. The proceedings are published in the book *Communicating Identity in Italic Iron Age Communities*, edited by Margarita Gleba & Helle Horsnæs (Oxbow Books 2012).

Textile Terminologies in the 3rd and 2nd Millennia BC

March 4th-8th 2009

The aim of the ESF exploratory workshop was to make an interdisciplinary and comparative investigation of textile terminology in the written records of the Mediterranean area in the 3rd and 2nd millennia BC. The workshop was organised by CTR in collaboration with CNRS Nanterre, research group ArScAn/ Histoire et Archéologie de l'Orient Cunéiforme and its director Cécile Michel in connection with their research programme, *The Economy of Wool* (2009-2012). Thirty-five scholars and experts were convened at the seminar. The results of the seminar are published in the book *Textile Terminologies from the 3rd to the 1st millennia BC in the Ancient Near East and the Eastern Mediterranean Area*, edited by Cécile Michel and Marie-Louise Nosch (Oxbow Books 2010).

Future Textiles – Technology and Intelligent Textiles

November 3rd 2009

The conference was organised by Mette Bruun, CTR at Copenhagen University and focused on deve-

lopments in the field of nanotechnology and intelligent textiles. It addressed both the prospects and problems which appear when science and textile design are interconnected. The speakers focused on the importance of intelligent textiles in relation to lifesaving protective clothing, design and architecture. Also, the environmental risks and the problems related to repair difficulties in connection with the use of intelligent textiles were illuminated. The conference incorporated participants both from the textile and design industry and from textile research institutions. The conference also touched upon the question of Denmark's international position in the field and whether Denmark is able to set an example in ecologically sustainable intelligent textile production.

First International FLAX Workshop

November 24th-26th 2009

The 1st international FLAX seminar took place at Carlsberg Academy in November 2009. Flax has been important for human culture and development for more than 8000 years and it constitutes one of the oldest textiles manufactured by our ancestors. The workshop organised by Sabine Karg, National Museum of Denmark, in collaboration with CTR launched the international Flax Network, sponsored by the Danish Research Council for Cul-

ture and Communication. The aim was to exchange knowledge about the cultural history of archaeological flax finds, ancient technologies of flax and linen preparation and production, and new methods in fibre identification. The proceedings are published in a special issue of *Vegetation History and Archaeobotany* Vol. 20 no. 6 2011.

ICAANE London Textile Workshop 2010

April 16th-20th 2010

A workshop on textile production was convened during the 7th International Congress on the Archaeology of the Ancient Near East by Eva Andersson Strand and Marie-Louise Nosch. The workshop combined several approaches: textile tool studies, experimental testing, iconographical studies, and context studies. The aim was to raise awareness of the existence of textiles in these early periods. The workshop discussed backgrounds for the introduction of textiles in the Ancient Near East; it searched for the spread and strategies for tools, fibres and techniques, and the evolution of textile tools in various regions. This raised the question of how textile technologies have influenced the development of other, later technologies. The development of garments, social aspects of clothing and the environmental conditions and their relationship with the development of clothing are other as-

pects that have importance even today. As the overall outcome, the network aimed at answering how textile production influenced early societies.

The 13th Aegean KOSMOS Conference

April 19th-23rd 2010

The themes of the KOSMOS conference were jewellery, costumes, aesthetics, body adornment, colours, dyes and pigments, textile production, luxury and exotics, gender and femininity/masculinity, as well as their social, religious, ideological, economic, technological, administrative and philological connections in the Aegean Bronze Age. When the conference was due to open on the 19th April, less than 10 of the 135 registered international participants had been able to reach Copenhagen due to the Icelandic volcanic ash affecting air traffic. However the conference organisers Marie-Louise Nosch (CTR) and Robert Laffineur (Université de Liège) received help from ITMEDIA (University of Copenhagen) in order to run a highly successful online conference instead of the planned conference. With the formal permission of the authors, their conference papers were read aloud by a team of volunteers comprising the few visiting participants and CTR staff. In other cases, the participants sent a recorded narration of their papers which was broadcasted. To ensure

maximum participation worldwide, the conference was broadcast in the afternoon and evening (Copenhagen time) on the first day. An audience from 28 countries worldwide actively participated through the online conference chat room. The stranded authors too were able to discuss their papers, answer questions and even provide links to other material in response to questions. An estimated 1700 persons from around the world, both researchers and students, made use of the live streaming and online chat possibilities to listen to and participate in the live discussions. Although most participants would surely have missed the physical proximity of their colleagues, the virtual conference enabled a great many who may not have been able to afford the time or financial expense to travel to Copenhagen to participate. Only time will tell how many students it inspired to research into the fields covered by KOSMOS. The proceedings are published in the series *Aegaeum. Annales d'archéologie égéenne de l'Université de Liège* edited by Marie-Louise Nosch and Robert Laffineur (2012).

Second International FLAX Workshop

June 29th-30th 2010

The second International Flax seminar took place at Sonnerupgaard and the Land of Legends, Lejre in June 2010. The workshop

embraced the whole process of flax production, comparing the results of prehistoric and classical archaeologists, textile researchers and natural scientists, geologists and physicists from Scandinavia, the Netherlands, UK, Germany, Switzerland and Estonia. The workshop constituted an important platform for further international and cross-disciplinary collaboration in the field of flax research. It formed a cross-disciplinary investigation on the evolution and cultural history of flax and linen. The conference addressed the issues of archaeobotanical records of flax weeds and dye plants, archaeological records of flax offerings, agricultural aspects of flax cultivation, environmental impact of flax production and the social aspects of flax and linen production.

Experimental Archaeology: Textile Production Workshop

August 23rd-25th 2010.

The workshop gave practical instructions into different aspects of textile production based on knowledge from the Roman World and from Roman Iron Age Scandinavia. Four subjects were introduced: Dyeing with plant material (woad, madder and tancy); fibre preparation: sorting and combing of wool and hackling and scutching of flax, spinning with a drop spindle; Weaving on an upright loom: warping with tablets, heddling and weaving; and finally making of loom weights and

drop spindles of clay from mixing the clay, adding temper and forming the weights after original finds. The workshop was part of the Dress-ID project's Study Group 6 and was organised by Ida Demant (Land of Legends) and Eva Andersson Strand (CTR). The workshop gathered at the Land of Legends researchers and experts from Denmark, India, UK, Germany, Israel, Greece, Norway and the Netherlands.

HERA Fashioning the Early Modern Workshop

October 6th-8th 2011

A workshop on the theme of early modern textile production was co-organised by the National Museum of Denmark, CTR and Den Gamle By Open Air Museum, Aarhus. Twenty eight participants from Denmark, Sweden, United Kingdom, Finland, France, Italy, Germany and Australia took part in the 3rd project workshop on Early Modern Textile Production. The first day, participants visited the Brede Manor House, the National Museum conservation workshop, and the Rosenborg Castle conservation department where they saw selected items from the Royal Danish costume collection, as well as study rooms of the National Museum's Store Rooms where they saw selected textiles from the collections. On the second day, the participants visited the Old Town Museum in Aarhus and had the opportunity to view selected items from the textile

collection. The afternoon of the second day was dedicated to a Ph.D. student presentation session followed by a discussion.

Spandex to Sportstech – Fashion and Innovation in Sportswear Conference

November 8th 2011

CTR hosted an international conference at the University of Copenhagen on textiles and sportswear. Papers on sports fashion, sportswear from a historical point of view, consumer research and innovations in the field of technical and intelligent textiles were presented. Participants were scholars, designers and sport wear companies. The conference was live streamed and people also participated in the ongoing debate via remote participation. Papers from the conference will be published as a special issue of an international journal edited by Mette Bruun and Michael Langkjær.

CTR Textile Tools Database Workshop

November 22nd-25th 2011

The workshop was organised by Lone Gebauer Thomsen, Eva Andersson Strand and Marie-Louise Nosch, and consisted of a series of seminars followed by practical exercises in which the participants worked with the database using their own dataset. The participants would thereby have the opportunity to register, analyse and interpret

their own textile tools in a separate CTR database under supervision from CTR. In addition, the workshop included hands-on experience of prehistoric textile tools during a visit to the Land of Legends (Lejre). The aim was to give the participants a basic understanding of the function and usage of prehistoric textile tools, the ability to make an independent analysis of textile tools, excavated from an archaeological context, by means of the CTR Textile Tools Database, and the ability to extract data and to interpret own dataset, while taking account of the possibilities and limitations of measuring and analysing textile tools.

The Wadi ath-Thamad Project

March 1st 2012

As part of the cooperation agreement between Michael Weigl (Vienna) the Wadi ath-Thamad Project and CTR, which includes analysis of textiles and textile-related tools in Iron Age Syro-Palestine, a workshop was organised by CTR at the Academy of Sciences, Vienna where the project was presented. CTR has in 2012 supported Michael Weigl and Agnes Henriksen in their work at Khirbat al-Mudayna.

Dress, Gender and Sculpture

May 30th 2012

A work-in-progress seminar at CTR with visiting scholars Sheila Dillon (Duke University), Glenys Davies (Edinburgh), Jane Fejfer (KU) and

Mary Harlow (CTR) to discuss the relationship between dress as worn and as portrayed on sculpture. This was also attended by students from the CTR 2012 MA course.

Spinning the Fates and the Song of the Loom

June 1st-2nd 2012 and June 6th-7th 2013

Two international seminars were organized by Mary Harlow, Marie-Louise Nosch and Giovanni Fanfani at CTR to discuss the use of textile metaphors in Greek and Roman literature. The seminars were attended by scholars from Denmark, UK, France, Spain, Greece, the US, South Africa, Italy and Germany. The two seminars are to be published by Giovanni Fanfani, Mary Harlow and Marie-Louise Nosch in the Ancient Textile Series in 2014.

HERA Fashioning the Early Modern Workshop

June 13th-14th 2012

CTR hosted the 5th HERA Workshop in The Carlsberg Academy. The Workshop was divided into 'The rococo day' arranged by curator Kirsten Toftegaard and the textile and fashion designers Nikoline Liv Andersen, Laura Baruël and Anne Damgaard. The subject was the current exhibition at Designmuseum Danmark entitled Rokokomania and creativity processes by the three participating designers. During 'The knitting day' Maj Ringgaard

presented her project on knitting in the Early Modern, as well as the Copenhagen city excavations and her field work in European museums. The Danish group consisting of Tove Engelhardt Mathiasen, Marie-Louise Nosch, Maj Ringgaard, Kirsten Toftegaard and Mikkel Venborg Pedersen edited the anthology: Fashionable Encounters. Perspectives and Trends in Textiles and Dress in the Early Modern Nordic World to be published in the Ancient Textiles Series in 2014.

Colour Workshop – Red Dyes, Problems and Solutions

July 2nd-3rd 2012

The workshop was organised by Ulla Mannering and held at CTR at the University of Copenhagen. The aim of this workshop was to give an update on the current research and results on the dye analysis on textiles from the Danish Bronze and Early Iron Ages in the Danish collections, and to discuss the problems related to the identification of red dyes and their analysis in particular in the textile finds from Hammerum and Lønne Hede. During the workshop new and different collaborative ways to continue the dye analyses on Danish prehistoric finds were discussed.

Experimental Archaeology: Textile Production Workshop

August 21st-24th 2012

The Second Textile Production Workshop was organized by Eva Andersson Strand, and was a practical introduction into textile techniques based on knowledge on ancient craft traditions. The workshop was divided into two activities: fibre preparation and spinning, and production of tools for textile production. The aim of the fibre preparation and spinning part was to give a practical introduction into different stages of fibre preparation and spinning, which included processing flax and nettle stems from retted state to fiber breaking, scutching, hackling and brushing. The aim of the second activity was to give a theoretical and practical introduction into different stages of tools, made of clay, for textile production, and to give a short theoretical introduction to tools made of wood. This included a theoretical introduction to replicating tools in clay, i.e. how to measure the water content of the clay, weighing the clay and getting the proportions right, and a theoretical introduction into making the wooden tool-parts, what wood to choose and how to carve.

The Economy of Wool

November 8th-11th 2012

25 researchers from Europe and USA participated in the European Science Foundation Exploratory

Workshop on Wool Economy in the Ancient Near East and the Aegean: From the Beginnings of Sheep Husbandry to Institutional Textile Industry, in the Maison de l'Archéologie et de l'Ethnologie, Nanterre, organized by C. Michel and C. Breniquet. Among the participants were several researchers from CTR: Eva Andersson Strand, Marie-Louise Nosch and Agnete Wisti Lassen. The proceedings of this workshop will be published in 2014 within the CTR Ancient Textiles Series.

Sea-silk and Shell Purple Dye Workshop

May 26th - 28th 2013

Hedvig Landenius Enegren at CTR arranged an international workshop on sea-silk and shell purple dye in Lecce in cooperation with Francesco Meo at the Dept. of Cultural Heritage at the Università del Salento in Lecce, Italy. The conference was interdisciplinary, exploring the biological, chemical, terminological, archaeological, cultural and historical aspects of purple and sea silk. One session was a practical demonstration of how to work sea silk, and another session was a experimental session on purple dye. These sessions were conducted by experienced craftspeople.

Verbal and non-verbal representations in textile terminology

November 8th 2013

Verbal and non-verbal representations of concepts show up in a number of terminologies of scientific and technical disciplines. This is especially the case for the activities at the The Danish National Research Foundation's Centre for Textile Research which show that verbal and non-verbal representations have been used for several millennia. In the field of weaving, in particular, weaving representations for basic and derived weaves are configured in diagrams and logograms, thus collapsing designation and definition. A good example of this phenomenon is the basic weave "tabby" which can be designated by figures, codes and terms.

The workshop was arranged together with the TOth (Terminology & Ontology: Theories and applications) network in France. The TOth conferences aim to bridge the gap between terminology and ontology by highlighting the contributions that one makes to the other and by opening up new perspectives for both theoretical and practical developments. Terminology is about names for concepts and objects in a given subject area, but it is also concerned with other units such as collocations, lexical combinations or phraseologies in actual use, all of which are part of specialised lan-

guages and discourse. The quality and the precision of specialised discourse is directly linked to the relation between the way lexical items are ordered and the way knowledge is organised: sufficient encouragement in itself for active collaboration between terminologists, translators, lexicographers, knowledge engineers and IT specialists.

Terminology and ontology share similar objectives in the way they approach and describe reality. Ontologies, which come from knowledge engineering, are now one of the most promising ways to model conceptual systems for terminologies. Of the numerous applications to be found in the digital world, ontologies are particularly useful to make terminologies operational and ensure their applications in various roles : as translation tools, for information and knowledge management, the semantic web, etc.

Textiles and Cult in the Mediterranean Area in the first millennium BC

November 21st-23rd 2013

The workshop explored the use and production of textiles in cultic contexts in the Mediterranean area. The aim of the workshop was to gain a greater knowledge of the use of textiles in ancient cults, such as the dedication of garments to deities, the dressing of cult statues, the existence of certain priestly garments and clothing regulations

for visitors to sacred areas, as well as the question of whether textiles were produced in sanctuaries. A publication of the workshop is scheduled for 2015: C. Brøns & M.L. Nosch (eds), *Textiles and Cult in the Mediterranean in the first millennium BC*, Ancient Textiles Series, Oxbow Books, Oxford (2015). Participants from France, Germany, USA, Italy and Denmark.

Framings - Interdisciplinary Conference on Frames is organised together with the Department of Arts and Cultural Studies at Copenhagen University (IKK)

November 29th - December 1st 2013
The conference was organised by Slavko Kacunko, Ellen Harlizius-Klück and Gunhild Borggren and brings together strands of international research on frames that took place over the past 5 years and extend the conceptual and material framework of interdisciplinary research between the Humanities, Social- and Communication Sciences. It involved contributions from art and media history and theory, philosophy and cultural studies, dance and theater studies, film theory and film semiotics, literature and music, communication science, visual and textile studies, and computer science. For further information see <http://www.framings.org>.

Traditional Textile Craft – an Intangible Cultural Heritage

March 21st-26th 2014

This workshop with 25 international scholars representing different research fields and organisations was held in Amman, Jordan. The workshop was jointly organised by the Jordan Museum and CTR. Textile craft and textile design have always had an important social, cultural and economic impact on both individuals and societies. The cultural heritage of textiles does not end with preservation and collection of costumes and other textiles in museums. It includes living traditions inherited from our ancestors and passed on to our descendants, knowledge and skills to produce traditional crafts, and the language and terminologies used to describe both the activities and the material outcomes. We are researchers with a particular interest in textile traditions which we utilize to understand the craft in the past from which we rarely have surviving textiles but often do have textile tools. However, our interest is also wider than this. The workshop gathered experts in traditional textile crafts, experts from the fields of museums, conservation and heritage, as well as designers, art historians, anthropologists, cultural historians, and, of course, craftspeople. The aim was to discuss questions surrounding notions and definitions of traditional craft for all our various disciplines and interests. The areas

of focus was: definitions of traditional craftsmanship and terminology; aspects of traditional craft used in modern fashion; the use of traditional craft in understanding ancient societies; preserving traditional craft and making it visible. We recognise the complexity of these issues and hope that by creating cross-disciplinary and cross-cultural discussions we will all better understand each other's agendas and interests.

Textile Terminologies

June 18th-22st 2014

International conference in Copenhagen 2014 on Textile Terminologies 1000 BC to AD 1000. Approximately 40 participants from Europe, China, India and USA. Publication of the contributions in the Ancient Textiles Series, Oxbow Books, Oxford. The conference includes textile terminologies in Greek, Latin, Phoenician, Albanian, French, Hebrew, Coptic, Persian, Arab, German, Chinese, Slavic, Neo-Assyrian and Neo-Babylonian.

Coming conferences are announced on the CTR website:
<http://www.ctr.hum.ku.dk>



Participants in Spinning the Fates and the Song of the Loom Conference

CTR China Tour 2009

When Marie-Louise Nosch received the Danish Elite Research Prize in 2009, it was decided to travel to China in order to celebrate the prize and to gain inspiration for future research. The Chinese lecture and study tour took place October 4th to 21st 2009. CTR staff had the possibility to bring family members along at their own expense. In addition, important partners in textile research were also invited to join us, at their own expense, and the group consisted of 29 participants plus two guides. Research visits had in advance been arranged with Chinese institutions and scholars. *The China National Silk Museum* at Hangzhou had invited CTR, and we spent a day with their researchers and students. CTR scholars gave four lectures at the museum. Our host was Prof. Dr. Feng Zhao, China's leading expert on silk, vice director of the *China National Silk Museum*, deputy to the National People's Congress and also professor at the *Donghua University* in Shanghai. The trip also included meeting with researchers at *Nanjing Textile Research Institute*

and the *Archaeological Institute of Shaanxi*. The groups also visited in particular the *Shanghai History Museum*, *Shanghai Museum*, *Capital Museum* in Beijing, *Indigo Dyeing Factory* and *Nantong Blue Calico Art Gallery*, *Nantong Textile Museum*, *Donghua University Textile Museum*, *Emperor Qin's Terracotta Army at Xian*, and *Shaanxi Historical Museum*. Also textile workshops were on the programme: Silk Dyeing Workshop, Silk Brocade Weaving Workshop, Suzhou Embroidery Research Institute, Silk Spinning Factory. Finally, the CTR team gave five lectures at *Donghua University*, Shanghai for students in design and art history. The China tour brought energy and inspiration to the centre and an outlook on the wider world.



CTR India Tour 2012

CTR decided to expand our research activities outside Europe and embarked on a lecture and study tour to India in order to meet old and new colleagues and plan new collaborations. Since 2010, CTR has been creating an anthology, *Global Textile Encounters: China, India, Europe*. Several Indian colleagues participate in this project.

The voyage started with an:

Indo-Danish textile historical research seminar at JNU: Perspectives on Production, Trade and Cultural Interactions

The seminar was organized by our colleague at JNU, professor Vijaya Ramaswamy, Centre for Historical Studies, and included Danish and Indian scholars:

- Laila Tyabji: – an overview of Indian Textile History and briefly on the significant role played by DASTKAR
- Marie-Louise Nosch & Berit Hildebrandt: India, Greece and Rome, CTR/Harvard University
- Mary Harlow: Matrona and whore: walking the tightrope between social approval and condemnation, CTR
- Ishrat Alam: Textile Production and Technology in Medieval North India, Indian Council of Historical Research
- Eva Andersson Strand: Textiles and Textile production in Viking Age Scandinavia, CTR
- Vijaya Ramaswamy: Cultural-scape of Textiles in Medieval South India, Centre for Historical Studies, JNU
- Vibe Martens: Indian textiles in 17th and 18th Century Denmark: Colonialism and the Rise of a Global Consumer Culture: preliminary findings. CTR, PhD at European University Institute, Florence
- Arvind Sinha: Indian Manufacturers and Global Consumers: French Sources on the Textile Trade, 1750-1800. Centre for Historical Studies, JNU
- Martin Cizuk: 18th century Indian textiles in Swedish collections and the Indian influence on de-

sign of Swedish printed cottons, School of Textiles, University of Borås

- Kirsten Toftegaard: The Tranquebar Tapestry, 1740-46, Designmuseum Denmark
- Santosh Rai: Many Madanapurās: Memories of Weaver Migrations, Khalsa College, Delhi University

The team also organized an event in order to gather Indian experts on archaeology and conservation:

Indo-Danish seminar on Textile Archeology and Conservations convened by CTR at the India International Centre, New Delhi.

- Marie-Louise Nosch: Welcome
- Ulla Mannering: Textiles and textile analyses
- Eva Andersson Strand: Textile tool analyses
- Karin Margarita Frei: Strontium isotopic tracing within prehistoric textiles
- Martin Ciszuk: Reconstructing patterns on Scandinavian archaeological silk textiles
- Kirsten Toftegaard: Museum storage practices in Designmuseum Denmark
- Maj Ringgaard: Museum Storage practices in a changing global climate: approaching a CO₂-neutral storage
- Maj Ringgaard: Experimental – the degradation or preservation

of textiles and dyes in waterlogged soil

- Subhra Devi: Textile Dyeing in Assam: Need of a holistic approach for preservation
- Jessica Hallett: Textiles, Trade and Taste: A research project on the global circulation of colour
- Sh. Ved Prakash and K.S. Rana: Restoration of textiles: Ghara, Zeenat Mahal, Archaeological Survey of India (Science Branch)

At the National Institute for Fashion Technology in Delhi a lecture was given by Tove Engelhardt Mathiasen, Den Gamle By, on the theme of India and Indian inspirations in the new exhibits of the 1970's in the Open-Air Museum, Århus. We met with professor Vandana Narang, NIFT dean professor Banhi Jha, Mrs Purva Khurana, and Director General of NIFT, India Prem Kumar Gera. A collaboration plan was drafted with colleagues at ICHR, Indian Council for Historical Research, Dr. Ishrat Alam and chairman of ICHR Prof Basudev Chatterji. This includes a joint master class for Ph.D. and postdoc fellows on the theme of textiles and trade between Europe and India 18th to 20th centuries and exchange of senior scholars. Other common interests are the cooperation on documentation, translation and rendering public Indian archival material, as well as sharing the Danish public records of historical and colonial themes with our Indian col-

leagues. Other important collaborators include Dr. Lotika Varadarajan, Tagore National Fellow, National Museum, New Delhi, our co-editor of the forthcoming CTR anthology *Global Textile Encounters*, to be published in India (2014) and China (2014).

The team made a visit to the Best-seller's Varanasi Weavers and Button Project and silk production centres. The team discussed with the inspiring project manager how to brand this excellent craft project and how to preserve the cultural heritage as well as sustainable occupations for the more than 200,000 local weavers of the region.

The team held a meeting with Swati Singh Ghai and her colleagues at the National Institute of Design in

Ahmadabad. Themes were to incorporate young scholars at NID into an international master class by CTR and to promote mobility; another possible collaboration is in museology and conservation with NID's master education in exhibition design.

Visit to the privately owned Calico Museum, the premier textile museum of the country, well known for its distinguished and comprehensive collection of textiles and artifacts. In Surat the team visited the privately owned TAPI Collection's exquisite collection of ancient textiles.



Dissemination of CTR Research

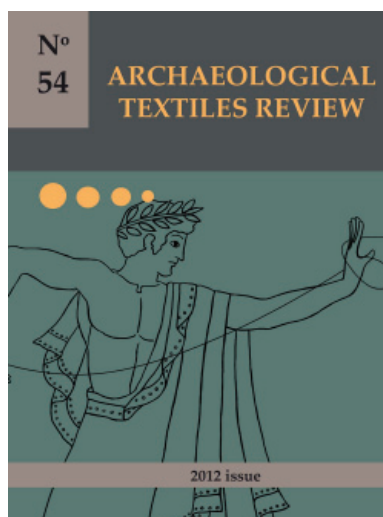
Archaeological Textiles Newsletter/Review (ATN/ATR)

In 2008 CTR assumed editorial responsibility for the international journal Archaeological Textiles Newsletter (ATN) from John Peter and Felicity Wild, Manchester University, UK, which has been published twice yearly since 1985. In 2012 the journal changed its name to Archaeological Textiles Review (ATR) and is published once yearly.

ATR is hosted by CTR, but independently of its centre of excellence structure. The society Friends of ATN was established to secure the publication of the journal and the Pasold Fund provided funding for the creation of a website and a web based payment platform. Eva Andersson Strand, Margarita Gleba, Susanna Harris and Ulla Mannering constitute the editorial committee and the members of the Board of the Society consist of several renowned textile scholars (see www.atnfriends.com). Nordic Board for Periodicals in the Humanities and Social Sciences

(NOP-HS) sponsored the journal in 2011 and The Danish Council for Independent Research, Humanities (FKK) 2012-2014.





For more information see <http://www.atnfriends.com>

The Margrethe Hald Price 2011-2015

The Margrethe Hald Price was founded by CTR in 2010 and is an annual award granted to outstanding Master theses which touch upon textile research issues, with the aim to highlight and reward excellent textile research conducted by younger scholars. The first prize is 15.000 DKK and the second prize is 8.000 DKK. The candidates may be from any Danish university. The first Margrethe Hald Price was awarded in the summer of 2011.



Ancient Textile Series

In collaboration with Oxbow Books at Oxford, CTR is the editor of a book series on the topic of ancient textiles. The editor is Marie-Louise Nosch. Editorial board is Ulla Mannering, Eva Andersson Strand and Margarita Gleba. The series publishes CTR research and also invites colleagues to submit their scholarly work. The series so far comprises the following volumes:

Ancient Textiles Series

- Vol.1. Ancient Textiles. Production, Crafts and Society edited by C. Gillis and M.-L. B. Nosch. Proceedings of the international conference held in Lund and Copenhagen, 19-23 March 2003. Oxbow Books, Oxford (2007) (289 p)
- Vol. 2 First Aid for the Excavation of Archaeological Textiles edited by C. Gillis & M.-L. Nosch, Oxbow Books, Oxford (2007) (43 p)
- Vol.3 Dressing the Past edited by M. Gleba, C. Munkholt and M.-L. Nosch, Oxbow Books, Oxford (2008) (167 p)
- Vol. 4 Textile Production in Pre-Roman Italy by Margarita Gleba, Oxbow Books, Oxford (2008) (269 p)
- Vol. 5 NESAT X. Proceedings of the 10th North European Symposium of Archaeological Textiles, held in Copenhagen, May 2008, edited by E. Andersson Strand, M. Gleba, U. Mannering, C. Munkholt and M. Ringgaard, Oxbow Books, Oxford (2010) (306 p)
- Vol. 6 The Medieval Broadcloth, edited by M.-L. Nosch & K. Vestergaard Pedersen, Oxbow Books, Oxford (2009) (159 p)
- Vol.7 From Minos to Midas. Ancient Cloth Production in the Aegean and in Anatolia, by Brendan Burke, Oxbow Books, Oxford (2010)
- Vol.8 Textile Terminologies from the 3rd to the 1st mill. BC in the Ancient Near East and the Eastern Mediterranean Area. C. Michel & M. L. Nosch (eds) Oxbow Books, Oxford (2010) (473 p)
- Vol.9 War and Worship: Textiles from 3rd to 4th century AD Weapon Deposits in Denmark and Northern Germany by Susan Möller-Wiering (with a contribution by L. Ræder Knudsen) Oxbow Books, Oxford (2011) (224p)
- Vol. 10 Wearing the Cloak: Dressing the Soldier in Roman Times, edited by M.-L. Nosch (2011) (144p)
- Vol. 11 Textiles and Textile Production in Europe from Prehistory to AD 400, edited by M. Gleba and U. Mannering, Oxbow Books, Oxford (2012) (512p)

- Vol. 12 Textile Production and Consumption in the Ancient Near East. Archaeology, Epigraphy, Iconography, edited by M.-L. Nosch, H. Koefoed & E. Andersson Strand, Oxbow Books, Oxford (2012) (247p)
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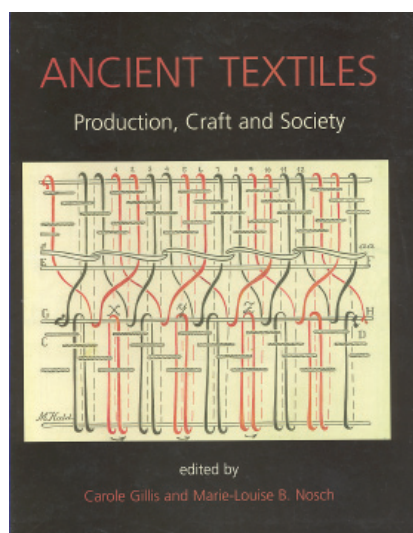
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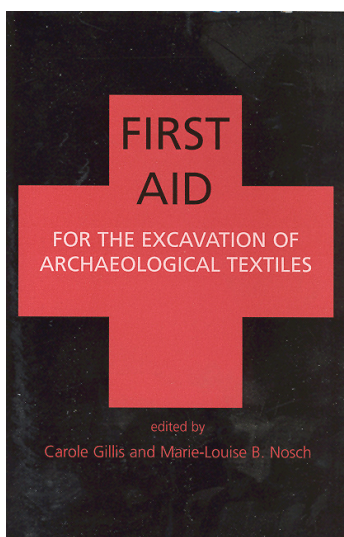
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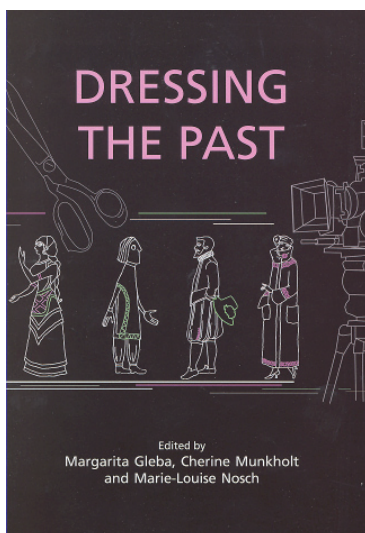
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Cecilia Aneer, "Tailored Criticism: The Use of Renaissance and Baroque Garments as Sources of Information", in *Dressing the Past*,

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Maj Ringgaard, "Cut, Stitch and Fabrics: Female Dress in the Past 200 Years" in *Dressing the Past*, 134-157.

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Tereza Belanová-Štolcová & Karina Grömer, "Loom-Weights, Spindles and Textiles – Textile Production in Central Europe from the Bronze Age to the Iron Age", in NESAT X, 9-20.

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Milena Bravermanová, "Archaeological Textiles from Prague Castle, Czech Republic", in NESAT X, 31-35.

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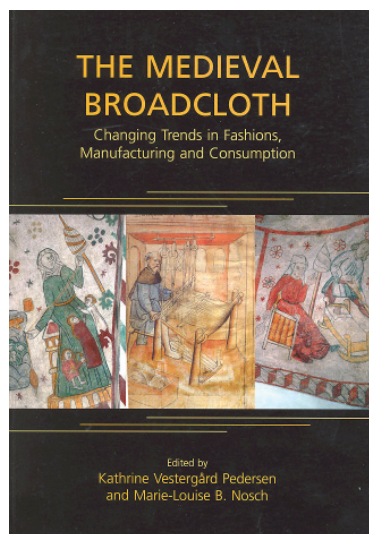
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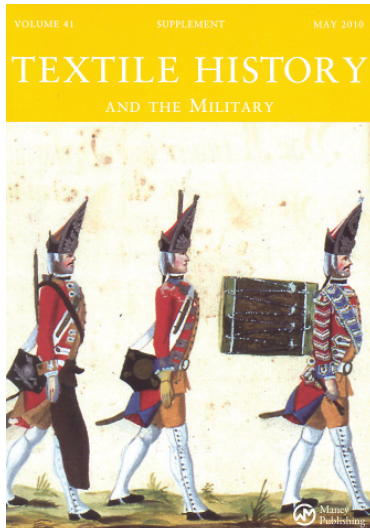
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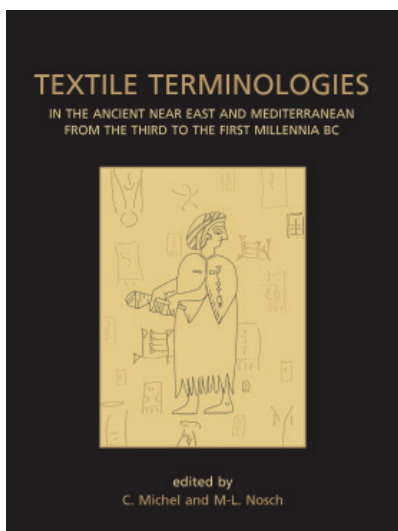
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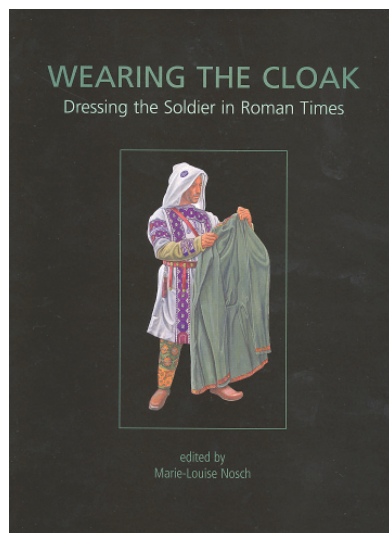
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Catherine Breniquet, "Weaving in Mesopotamia during the Bronze Age: Archaeology, Techniques, Iconography", in *Textile Terminologies*, 52-67.

Ole Herslund, "Cloths – Garments – and keeping secrets. Textile classification and cognitive chaining in the Ancient Egyptian writing system", in *Textile Terminologies*, 68-80.

- Jana Jones, "The 'linen list' in Early Dynastic and Old Kingdom Egypt: text and textile reconciled", in *Textile Terminologies*, 81-109.
- Benjamin Foster, "Clothing in Sargonic Mesopotamia: Visual and written evidence", in *Textile Terminologies* 110-145.
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- Jacopo Pasquali, "Les noms sémitiques des tissus dans les textes d'Ebla", in *Textile Terminologies*, 173-185.
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- Matteo Vigo, "Linen in Hittite Inventory Texts", in *Textile Terminologies*, 290-322.
- Juan-Pablo Vita, "Textile terminology in the Ugaritic texts", in *Textile Terminologies*, 323-337.
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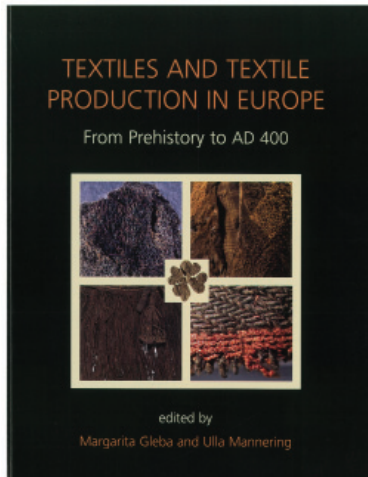


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- Marie-Louise Nosch & Henriette Koefoed, "Introduction and Acknowledgements", in *Wearing the Cloak*, v-vii.
- Michael Speidel, "Dressed for the Occasion. Clothes and Context in the Roman Army", in *Wearing the Cloak*, 1-12.
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- Stefanie Hoss, "The Roman Military Belt", in *Wearing the Cloak*, 29-44.
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- Hero Granger Taylor, "Fragments of Linen from Masada, Israel – the Remnants of Pteryges? – and Related Finds in Weft- and Warp-twining including several Slings", in *Wearing the Cloak*, 56-84.

- Annette Paetz gen. Schieck, "A Late Roman Painting of an Egyptian Officer and the Layers of its Perception. On the Relation between Images and Textile Finds", in *Wearing the Cloak*, 85-108.
- Susan Möller-Wiering, "Warrior Costumes in Iron Age Weapon Deposits", in *Wearing the Cloak*, 109-116.
- Graham Sumner, "Painting a Reconstruction of the Deir el-Medineh Portrait on a Painted Shroud and other Soldiers from Roman Egypt", in *Wearing the Cloak*, 117-127.



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Margarita Gleba & Ulla Mannering, "Introduction: Textile Preservation, Analysis and Technology", in *Textiles and Textile Production in Europe*, 1-24.

Karina Grömer, "Austria: Bronze and Iron Ages", in *Textiles and Textile Production in Europe*, 27-64.

Kordula Gostenčnik, "Austria: Roman Period", in *Textiles and Textile Production in Europe*, 65-88.

Ulla Mannering, Margarita Gleba & Marianne Bloch Hansen, "Denmark", in *Textiles and Textile Production in Europe*, 91-118.

Susan Möller-Wiering, "Germany: Bronze and Pre-Roman Iron Ages", in *Textiles and Textile Production in Europe*, 122-138.

Johanna Banck-Burgess, "Case Study: The Textiles from the Princely Burial at Eberdingen-Hochdorf, Germany", in *Textiles and Textile Production in Europe*, 139-150.

Susan Möller-Wiering & Julian Subbert, "Germany: Roman Iron Age", in *Textiles and Textile Production in Europe*, 153-181.

Youlie Spantidaki & Christophe Moulherat, "Greece", in *Textiles and Textile Production in Europe*, 185-200.

Marta Bazzanella, "Italy: Bronze Age", in *Textiles and Textile Production in Europe*, 203-213.

Margarita Gleba, "Italy: Iron Age", in *Textiles and Textile Production in Europe*, 214-241.

Annemarie Stauffer, "Case Study: The Textiles from Verucchio, Italy", in *Textiles and Textile Production in Europe*, 242-253.

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Irita Zeiere, "Latvia", in *Textiles and Textile Production in Europe*, 266-272.

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Fabienne Médard, "Switzerland: Neolithic Period", in *Textiles and Textile Production in Europe*, 367-377.

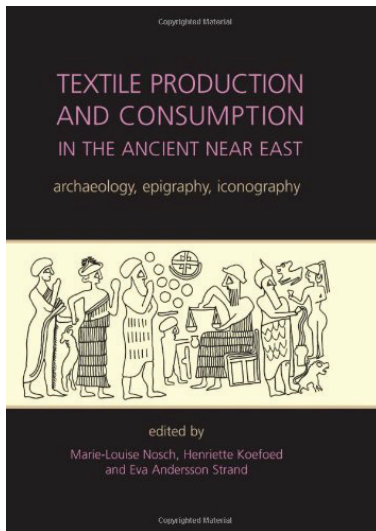
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Margarita Gleba & Tatjana Krupa, "Ukraine", in *Textiles and Textile Production in Europe*, 399-425.

Elizabeth Wincott Heckett, "Scotland and Ireland", in *Textiles and Textile Production in Europe*, 428-442.

Dee DeRoche, "England: Bronze and Iron Ages", in *Textiles and Textile Production in Europe*, 444-450.

John Peter Wild, "England: Roman Period", in *Textiles and Textile Production in Europe*, 451-456.



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CONTENTS:

Henriette Koefoed, Eva Andersson Strand & Marie-Louise Nosch, "Introduction, Archaeology, Epigraphy, Iconography", in Textile Production and Consumption in the Ancient Near East, V-VIII.

Catherine Breniquet, "Functions and Uses of Textiles in the Ancient Near East Summary and Perspectives", in Textile Production and Consumption in the Ancient Near East, 1-25.

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Nurith Goshen, Assaf Yasur-Landau & Eric H. Cline, "Textile Production in Palatial and Non-Palatial Contexts: the Case of Tel Kabri", in Textile Production and Consumption in the Ancient Near East, 45-53.

David R. A. Lumb, "Textiles, Value, and the Early Economies of North Syria and Anatolia", in Textile Production and Consumption in the Ancient Near East, 54-77.

Agnete Wisti Lassen, "Technology and Palace Economy in Middle Bronze Age Anatolia: the Case of the Crescent Shaped Loom Weight", in Textile Production and Consumption in the Ancient Near East, 78-92.

Allison Karmel Thomason, "Her Share of the Profits: Women, Agency, and Textile Production at Kültepe/Kanesh in the Early Second Millennium B", in Textile Production and Consumption in the Ancient Near East, 93-112.

Eva Andersson Strand & Maria Cybulska, "Visualising Ancient Textiles – how to make a Textile visible on the Basis of an Interpretation of an Ur III Text", in Textile Production and Consumption in the Ancient Near East, 113-127.

Bernice Jones, "The Costumes of Inanna/Ishtar", in Textile Production and Consumption in the Ancient Near East, 128-139.

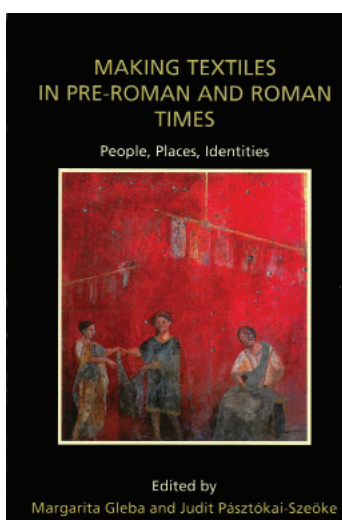
Richard Firth, "Considering the Finishing of Textiles based on Neo-Sumerian Inscriptions from Girsu", in Textile Production and Consumption in the Ancient Near East, 140-160.

Joanna S. Smith, "Tapestries in the Bronze and Early Iron Ages of the Ancient Near East", in Textile Production and Consumption in the Ancient Near East, 161-188.

Caroline Sauvage, "Spinning from old Threads: The Whorls from Ugarit", in Textile Production and Consumption in the Ancient Near East, 189-214.

Laura B. Mazow, "Throwing the Baby Out with the Bathwater: Innovations in Mediterranean Textile Production at the End of the 2nd/Beginning of the 1st Millennium BCE", in Textile Production and Consumption in the Ancient Near East, 215-223.

Salvatore Gaspa, "Textile Production and Consumption in the Neo-Assyrian Empire", in Textile Production and Consumption in the Ancient Near East, 224-247.



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Sanna Lipkin, "Textile Making – Questions Related to Age, Rank and Status", in Making Textiles in Pre-Roman and Roman Times, 19-29.

Karina Grömer, "Discovering the People behind the Textiles: Iron Age Textile Producers and their Products in Austria", in Making Textiles in Pre-Roman and Roman Times, 30-59.

Kordula Gostenčnik, "Textile Production and Trade in Roman Noricum", in Making Textiles in Pre-Roman and Roman Times, 60-86.

Ivan Radman-Livaja, "Craftspeople, Merchants or Clients? The Evidence of Personal Names on the Commercial lead tags from Siscia", in Making Textiles in Pre-Roman and Roman Times, 87-108.

Lena Larsson Lovén, "Female Work and Identity in Roman Textile Production and Trade: A Methodological Discussion", in Making Textiles in Pre-Roman and Roman Times, 109-125.

Jinyu Liu, "Trade, Traders and guilds (?) in Textiles: the Case of Southern Gaul and Northern Italy (1st-3rd Centuries AD)", in *Making Textiles in Pre-Roman and Roman Times*, 126-141.

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Sophie Gällnö, "(In)visible Spinners in the Documentary Papyri from Roman Egypt", in *Making Textiles in Pre-Roman and Roman Times*, 161-170.

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HIGHLIGHTS 2007

In January CTR hosted the international conference



A funding amounting to 2 million DKK from Oak Foundation and Oticon was awarded with a view to creating a new web site, this being done in collaboration with the National Museum of Denmark for the purpose of communicating CTR research on Danish textiles and skins from Bronze Age and Iron Age.

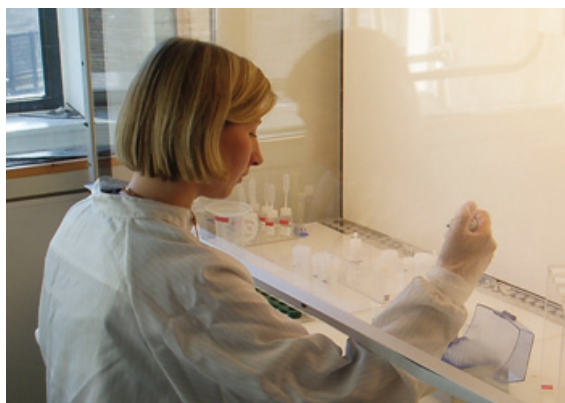
CTR and six other European research institutions received major funding for a research and exhibition project 2007-2012 from the European Executive Agency for Culture, Audiovisual and Education (EACEA).

CTR is co-organiser of *Clothing and Identity in the Roman World – DressID*.

CTR staff was elected spokespersons for three out of ten study groups under the project.



The methodology developed by PhD scholar Karin Frei for detecting Sr isotopes in wool was successful and accepted for publication in the A-rated *Archaeometry*.



It was discovered that the Iron Age bog mummy, the Huldremose woman, wore a plant fibre garment under her skin cape and woollen scarf. The presence of textile in plant fibre is extremely unusual in this period and context and gives new perspectives to the interpretation of this important find. Analyses of the mummy, imprints on the skin and DNA analyses of the fibre were employed to verify this discovery.



Dye analyses have demonstrated that the vast majority of Early Iron Age Danish textiles were coloured, thereby fundamentally altering our view of ancient costume.

The National Museum of Denmark has decided to organise a large exhibition in 2009 on costumes and textiles, featuring CTR research.



National Geographic Television made a documentary on bog mummies from Denmark, North Germany and Ireland by Singing Cat Productions (producer Wynette Yao) – to be broadcasted in spring 2008. The program features Ulla Mannering in Brede, Department of Conservation.



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HIGHLIGHTS 2008



CTR director Marie-Louise Nosch received three awards for outstanding research achievement for a total of DKK 1.4 million (DM forskningspris for grænseoverskridende forskning, Einar Hansens Forskningsfonds for enestående humanistiske forskning, EliteForsk prisen).

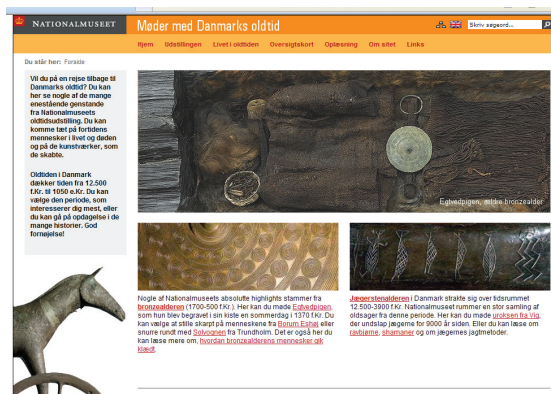
The Danish Councils for Independent Research and the Research Council for the Humanities designated CTR and textile research as the most promising areas of independent research in Denmark.

CTR, the Royal Danish Defence Academy and NATO Science convened an international conference on *Textiles and Military*, for military historians, curators and textile scholars. More than 150 textile researchers gathered in Copenhagen for the *North European Symposium of Archaeological Textiles X*, May 13-18.



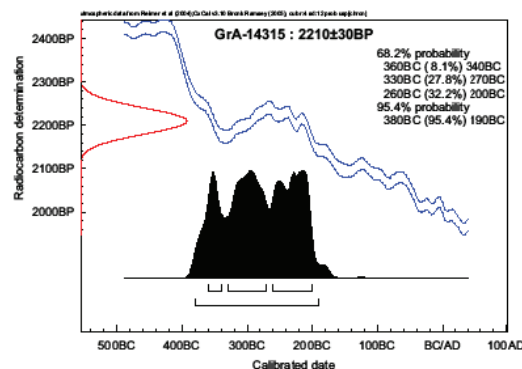
A textile piece made of goat wool from Arslantepe, Turkey, is dated to the 4th mill. BC was discovered. It is of extreme fineness and one of the oldest textiles made of animal fibre. This sheds new light on early Bronze Age textile production and on the domestication of animals, the use of animal fibres and their introduction into textile production.

CTR and the National Museum of Denmark has in 2008 developed a new website <http://oldtiden.natmus.dk>, which will serve as a digital extension of the new permanent exhibition *Danmarks Oldtid* with a special focus on the archaeological textiles.



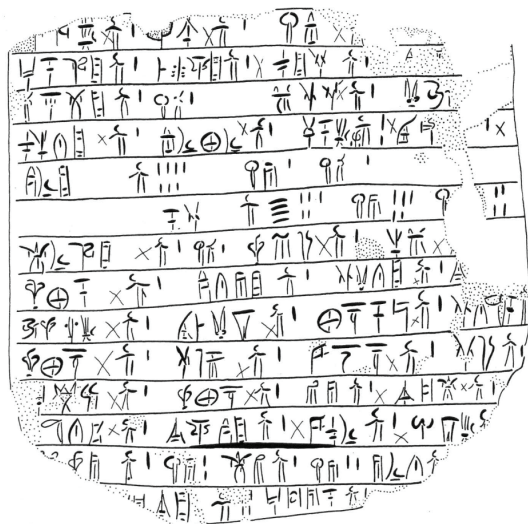
The Oak Foundation, Oticon and the Danish Heritage Board financed the site. New web technology with extremely high resolution and 3-D imaging now enables scholars all around the globe to study the Danish textile collections on fibre level. This is also a CTR contribution to strategies for the conservation of the brittle and fragile textiles.

A total of 43 C14 analyses and 198 dye analyses of all Danish Early Iron Age textiles from bogs were completed providing a new understanding of textiles from bogs and a new tool for future research.





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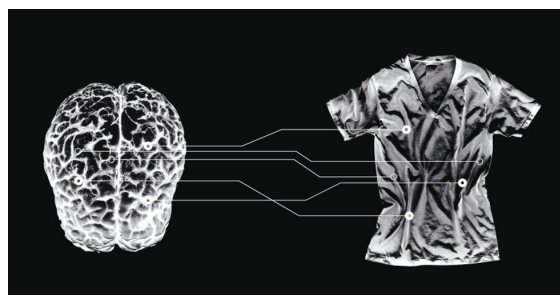
March 2009 CTR hosted the international exploratory workshop *Textile Terminologies in the 3rd and 2nd millennia BC*. The workshop was arranged by CTR as part of the research program *Tools and Textiles – Texts and Contexts* in collaboration with CNRS Nanterre's research group ArScAn/Histoire et Archéologie de l'Orient Cunéiforme, directed by Cécile Michel. See: <http://ctr.hum.ku.dk/upload/application/pdf/f51d6748/web%20site%20text.pdf>

A delegation of 10 CTR researchers participated in a Study Tour to China 4 - 20 October 2009. The tour included visits, workshops or lectures at Shanghai History Museum, Indigo Dying Factory, Nantong Textile Museum, Embroidery Research Institute, Silk Spinning Factory, Hangzhou National Silk Museum, Donghua University, Nanjing Textile Research Institute and Shaanxi Historical Museum and Archaeological Institute.



HIGHLIGHTS 2009

FUTURE TEXTILES – Technology and Intelligent Textiles was the subject of a conference 3 November 2009 hosted by CTR.



The conference focused on nanotechnology and intelligent textiles and incorporated participants both from the textile and design industry and from textile research institutions. See: <http://ctr.hum.ku.dk/calendar/futuretextiles>



The International
FLAX Network

CTR and Dr. Sabine Karg, the National Museum of Denmark hosted the First International Flax

Seminar which constituted the launch of the establishment of an international Flax Network. The workshop embraced the whole process of flax production, comparing the results of prehistoric and classical archaeologists, textile researchers and natural scientists, geologists and physicists from Scandinavia, The Netherlands, UK, Germany, Switzerland and Estonia.



CTR organised a seminar about *Production and Trade* at the Hallstatt meeting in June 2009 during the 4th General Meeting.

CTR edited the publication of the *North European Symposium for Archaeological Textiles X* with 50 contributions (Oxbow Books, Oxford 2010).





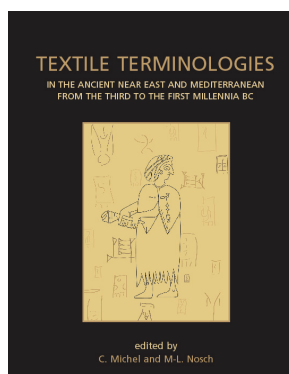
HIGHLIGHTS 2010



The 2nd International *FLAX* workshop was held 29-30 June 2010 at Sonnerupgaard and Land of Legends, Lejre. The workshop results will be published in a special edition of *Vegetation History and Archaeology*.

As part of the project *Dress-ID* a workshop was held 23-25 August focusing on experimental textile archaeology in Land of Legends, Lejre. The workshop gave practical instructions into different aspects of textile production based on knowledge from the Roman World and from Roman Iron Age Scandinavia.

1 April 2010 CTR hosted the international Conference *KOSMOS. Jewellery, Adornment and Textiles in the Aegean Bronze Age* in cooperation with professor Robert Laffineur, Université de Liège. The Conference was part of the CTR research programme *Tools and Textiles – Texts and Contexts* and due to live streaming it had more than 1500 visitors. See: <http://ctr.hum.ku.dk/conferences/archive/kosmos>



In 2010 CTR published the book: Michel, C. & Nosch, M. L.: *Textile Terminologies in the Ancient Near East and Mediterranean from the third to the first millennia BC*. Ancient Textiles Series Vol 8. Oxbow Books, Oxford.

CTR organized the seminar *Textile Production in the Ancient Near East Neolithic-Bronze Age-Iron Age* in April 2010 as part of the 7th International Congress on the Archaeology of the Ancient Near East at British Museum, London. The 17 presentations given by specialists in the field attracted many listeners.

The international research project *Fashioning the Early Modern. Creativity and Innovation in Europe. 1500-1800* was launched in July 2010. Research partners are Queen Mary, University of London; Victoria & Albert Museum, UK; Centre for Fashion Studies, University of Stockholm; University of Helsinki. See: <http://www.fashioningtheearlymodern.ac.uk>

The research programme *TEMA* (Textile Economies in the Mediterranean Area) was launched in August 2010. Focus is on textile production in the Mediterranean area in the first millennium BC.

CTR published in 2010 a technical comment on flax in *Science Magazine*: C. Bergfjord, S. Karg, A. Rast-Eicher, M.-L. Nosch, U. Mannering, R. G. Allaby, B. M. Murphy, M.-L. Nosch, B. Holst, "Comment on '30,000-Year-Old Wild Flax Fibers'", *Science* vol. 328, 25 June 2010, 1634. See: <http://www.sciencemag.org>

1 2010 CTR launched the *Margrethe Hald Prisen*. Two traveling grants of 8.000 and 15.000 DKK will be awarded to extraordinary master theses on textile research in June 2011.



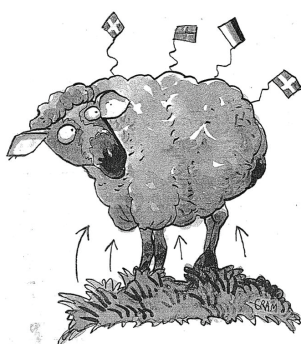


HIGHLIGHTS 2011



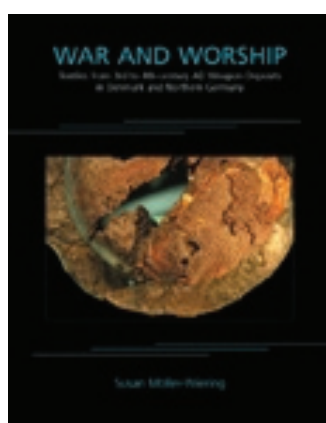
In 2011 Marie-Louise Nosch had her article "The Mycenaean administration of textile production in the palace of Knossos: observations on the Lc(1) textile targets" published in *American Journal of Archaeology*. See <http://www.ajaonline.org/article/1015>

Postdoc. Karin Margarita Frei received the "GMP-CA 2011 PhD prize" in 2011 for her PhD thesis *Provenance of Pre-Roman Iron Age textiles – methods development and applications* from 2010. The international prize is given every second year for the best PhD in French or English within the field of archaeometry. In the thesis Frei has developed a new geochemical method of provenience



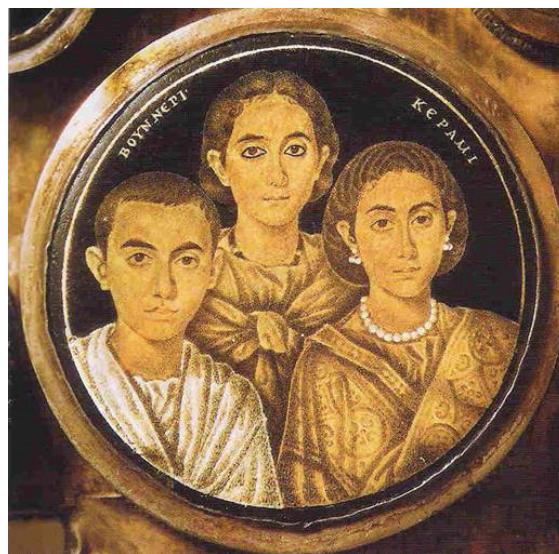
for archaeological wool and plant fibre textiles from preroman Iron Age in Denmark and Sweden (500 B.C.).

In 2011 CTR celebrated the publishing of Susan Møller-Wiering's book *War and Worship: Textiles from 3rd to 4th-century AD Weapon Deposits in Denmark and Northern Germany*, Ancient Textiles Series 9, Oxford. The book is the first coherent documentation and analysis of textiles and their cultic part in weapon deposits.



The database workshop *From Tools to Textiles* in the research programme *TEMA* (Textile Economies in the Mediterranean Area) was held 22-25. November 2011 organized by Eva Andersson Strand and Lone Gebauer Thomsen.

Professor Mary Harlow is affiliated to CTR from 1. September 2011. For the next year she will be working to build up the research programme *TEMA* (Textile Economies in the Mediterranean Area) together with Marie-Louise Nosch.



Due to a generous donation from the Danish Agency for Culture it is now possible to finish all analyses in the project of the Hammerum girl and her costly textiles. A publication on the project results is in preparation.

During summer 2011 two new PhD scholars has begun their work at CTR.

Cecilie Brøns on the project *Textiles in Greek sanctuaries. 1050 – 323 BC*

Luise Ørsted Brandt on the project *aDNA - et redskab til analyse af den tidligste danske produktion af uld- og hørtekstiler samt udviklingen af dragt og identitet*.

The receivers of the *Margrethe Hald Prize* 2011 were anthropologist Henrik Kloppenborg for his MA thesis *Becoming Real Businessmen? Negotiating Huangniu Identities at a Fake Commodity Market in Shanghai* and textile engineer Karen Marie Hasling for her MA thesis *Functional Fiber Composites*.



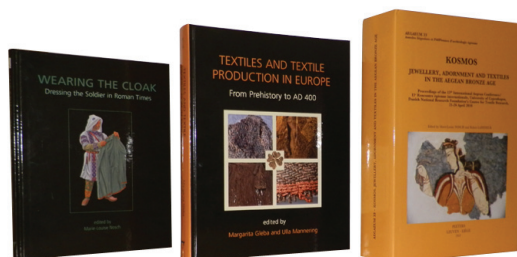


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HIGHLIGHTS 2012



In 2012 researchers from CTR had their contribution "Nettle as a distinct Bronze Age textile plant" published in the open access journal *Scientific Report* under the Nature Publishing Group. See: <http://www.nature.com/srep/2012/120928/srep00664/full/srep00664.html>



In 2012 CTR welcomed two Marie Curie mobility grant scholars, Hedvig Landenius-Enegren (SE) and Ellen Harlizius-Klück (DE). In 2012 seven other researchers received funding for a Marie Curie mobility grant, and they will begin their research at CTR in 2013. Due to funding from the Danish Agency for Culture it was possible to continue the Lønne Hede Textile Project in collaboration with Museum of Varde City and Environs.



Post doc Karin Margarita Frei received the "For Women in Science Award" by UNESCO and L'Oréal Danmark for her results with strontium isotope analysis on textile materials. Prof. Marie-Louise Nosch was awarded the the Greek Onassis Category A scholarship for research visits in Athens. Eva Andersson Strand was promoted to Docent at Lund University.

In August CTR organized a textile production workshop with hands-on experience. 16 researchers from Europe, USA, China and Iran participated in this workshop.

In 2012, three new PhD fellows initiated their research project at CTR in collaboration with University of Warwick, UK, Florence International European University, Italy and the SAXO Institute, University of Copenhagen.

In 2012 CTR celebrated the publishing of three major books: Margarita Gleba and Ulla Mannering's (eds) volume on *Textiles and Textile Production in Europe from Prehistory to AD 400* and *Wearing the Cloak: Dressing the Soldier in Roman Times* by Marie-Louise Nosch (ed) (Ancient Textiles Series 10 and 11), and the conference proceedings from the KOSMOS conference at CTR in 2010, *KOSMOS. Jewellery, Adornment and Textiles in the Aegean Bronze Age. 13th international Aegean conference held at Copenhagen, April 2010/13eme rencontre égéenne, Copenhague, avril 2010*. *Aegaeum 33* by Marie-Louise Nosch and Robert Laffineur (eds). Also the high ranking journal *Paléorient* (38.1-2) published in collaboration with researchers from CTR a special issue on prehistoric textiles in the Near East.



In October a group of researchers and collaborators from CTR went on a study tour to India in order to meet new colleagues and plan new research collaborations. During their stay they held two conferences and many interesting museum and textile collections were visited.



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HIGHLIGHTS 2013

In 2013 CTR made 77 publications including two substantial books: *Textile Production and Consumption in the Ancient Near East: archaeology, epigraphy, iconography* edited by Marie-Louise Nosch, Henriette Koefoed and Eva Andersson Strand (Ancient Textiles Series 12, Oxbow Books) and *Making Textiles in Pre-Roman and Roman Times. Peoples, Places and Identities* edited by Margarita Gleba and Judit Pásztoókai-Szeoke (Ancient Textiles Series 13, Oxbow Books).



In May CTR co-organized an international conference in Lecce, Italy on *Treasures from the Sea: Sea-silk and Shell Purple Dye in Antiquity*, with 23 scholars from 12 different countries.



CTR welcomed 7 Marie Curie mobility grant scholars: Salvatore Gaspa (IT), Miguel Ángel Andrés-Toledo (ES), Berit Hildebrandt (DE), Malgorzata Siennicka (PL), Paula Hothi (FI), Matteo Viggo (IT) and Joanne Cutler (UK), and two new PhD students: Charlotte Rimstad and Vivi Lena Andersen.

A group of CTR researchers and collaborators went to Nuuk, Greenland to teach at the University of Greenland, and during the stay several textile workshops, conferences and public outreach events were organized.

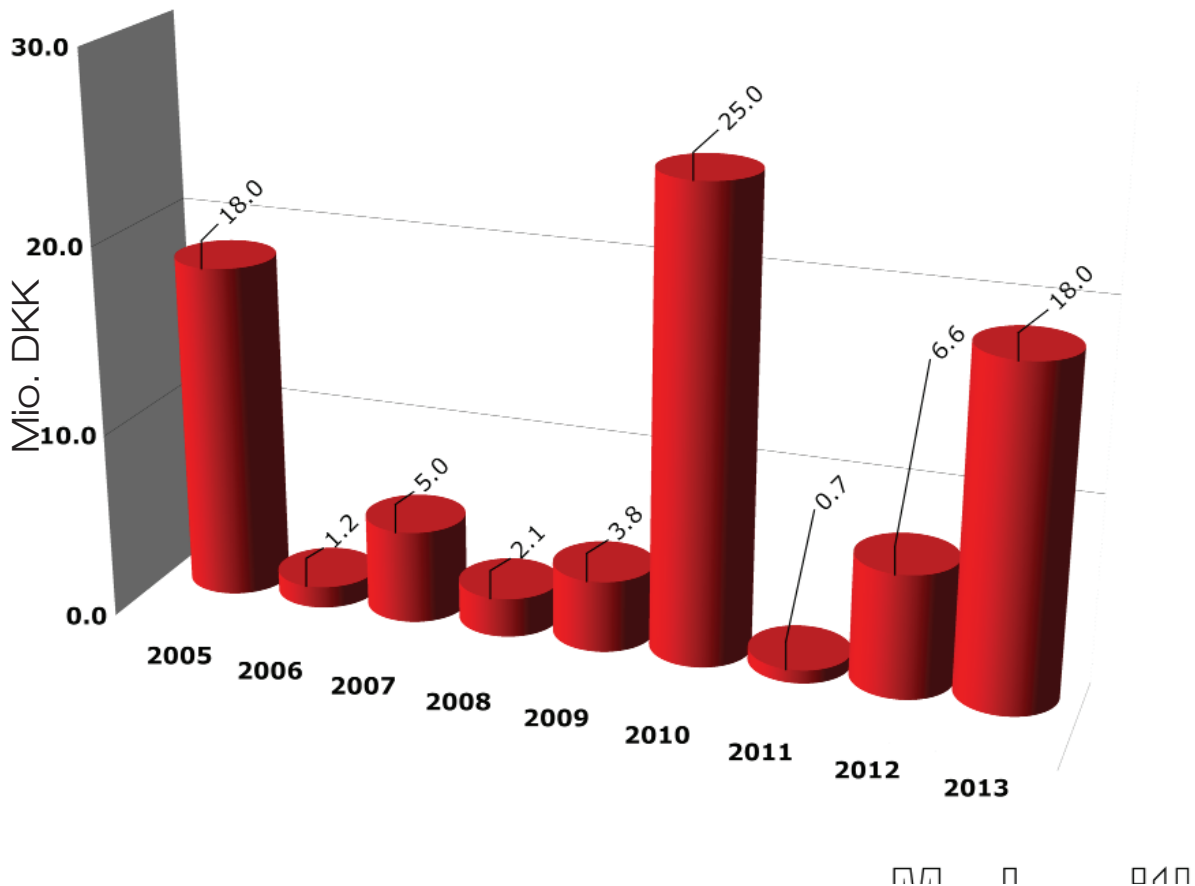
In 2013 CTR has organized 15 conferences and workshops in 5 different countries. In April a group of CTR researchers and collaborators co-organized the international conference *Wool on the Silk Road* at the China National Silk Museum (CNSM) in Hangzhou, China. The conference was part of the collaboration on *Textiles in Eurasia in the Bronze Age: From Scandinavia to China* between CTR and CNSM.

CTR Director Marie-Louise Nosch received the prestigious German Anneliese Maier Research Award from the Alexander von Humboldt Foundation. The prize included €250,000 which will be used to strengthen Danish-German research relations and future collaborative research projects.



Funding

FUND 15



2005

- DNRF: 18,000,000 DKK for CTR

2006

- Elisabeth Munksgaard Fonden: 50,000 DKK for Sr isotope analyses in the DTC programme
- Institute of Aegean Prehistory: \$ 8,000 for analyses of an archaeological textile from Crete
- FKK: 690,000 DKK for a post doctoral fellowship for Susan Möller-Wiering on Textiles in Iron Age Weapon Deposits

CTR 2005-2016

- Remuneration for teaching at SAXO Institute: 11,631 DKK
- Iron Age in Northern Europe: 180,000 DKK for analyses of the Illerup Ådal Textiles
- FKK: 25,000 DKK for the publication of Marie-Louise Nosch's book The Knossos Od Series
- Cotton Foundation: £ 4,000 for the publication of Margarita Gleba's book Textile production in pre-Roman Italy
- Lejre Experimental Centre: 20,000 DKK for Linda Mårtensson's spinning experiments
- Letterstedske Fond: 5,000 SEK for textile excursion organised by Kathrine Vestergaard Pedersen
- The Department of Conservation, The National Museum of Denmark, contributed 1,000 hours of work by conservators to the DTC programme

Co-funding 2006

- 2/3 Ph.D. grant from Aarhus University and the Ph.D. School in Archaeology
- 1/2 Ph.D. grant from Lund University
- 2/3 Ph.D. grant from CBS
- 1/2 Ph.D. grant from the National Museum of Denmark

2007

- FKK START: 99,600 DKK, funding for EU application
- The National Bank of Denmark provided 6 months free housing for CTR visiting professor Carmen Alfaro Giner
- Oak Foundation, Danish Heritage Board and Oticon: 2,000,000 DKK to create a new web site in collaboration with the National Museum of Denmark for the purpose of communicating CTR research on Danish textiles and skins from Danish prehistory
- Dronning Margrethes og Prins Henriks Fond: 20,000 DKK for the NESAT X conference
- FKK: 10,800 DKK for the NESAT X conference
- Nordisk Kulturfond: 40,000 DKK for the NESAT X conference
- Pasold Research Fund: £ 980 for ATN
- FKK: 36,000 DKK for the conference Textiles and Military
- FKK: 167,064 DKK for technical analysis of archaeological textiles
- Dan og Lillian Finks Fond: 15,000 DKK for the publication of Dressing the Past
- CNRS-DNRF: € 1,000 for Dominique Cardon travels and stay at CTR
- CNRS-DNRF: € 2,000 for Francoise Rougemont's travels and stay at CTR
- EACEA 2,700,000 DKK for DressID

Co-funding 2007

- 1 Ph.D. grant from the Faculty of Humanities

2008

- FKK: 1,300,000 DKK for a project on Iron Age textile production in Vorbasse, Jutland, based on the study of settlement and grave material to Ulla Lund Hansen
- Ambassade de France: 1,400 € in connection with a CTR project in cooperation with Cécile Michel, HAROC
- Knud Højgårds Fond: 75,000 DKK for the NESAT X conference
- University of Copenhagen: 500,000 DKK bonus for obtaining EU funding
- NATO Science: € 15,000 for the conference Textiles and Military
- ESF: € 14,000 for the exploratory workshop Textile Terminologies

2009

- Elisabeth Munksgaard Fonden: 10,000 DKK for development of strontium isotopic tracing method by analysis of textiles and control soil samples
- Danish Ministry of Research and Technology: 1,100,000 DKK for Elite Research Prize for Marie-Louise Nosch
- FKK START: 66,745 DKK for HERA Fashioning the Early Modern application
- CNRS: € 2,009 for the French participants in the Textile Terminologies workshop
- Humanities in European Research Area: € 984,312 for Fashioning the Early Modern with € 285,000 to the Danish CTR group
- CNRS-DNRF: 50,490 DKK for travel between Denmark and France
- FKK: 79,000 DKK for the KOSMOS conference
- Dronning Margrethes og Prins Henriks Fond: 25,000 DKK for the workshop Textiles in the Ancient Near East
- FKK START: 51,120 DKK for the ESF research network
- Institute of Aegean Prehistory: \$ 14,000 for the KOSMOS conference
- Pasold Research Fund: £ 800 for the workshop Textiles in the Ancient Near East
- FKK START: 51,120 DKK for ERC starting grant
- Pasold Research Fund: £ 500 for the publication of Textile History and the Military
- FKK START: 92,229 DKK for NOS-HS application
- FKK START: 83,851 DKK for EUROCORES

2010

- DNRF: 25,000,000 DKK for CTR2
- Fonden af 29. december 1967: 100,000 DKK for Research on the textile cultural history of Denmark
- Elisabeth Munksgaard Fonden: 15,000 DKK for performing textile analysis on wool, flax and nettle

2011

- FKK: 78,912 DKK for the CIETA conference
- Dronning Margrethes og Prins Henriks Fond: 30,000 DKK for the conference Cultural Encounters in Textiles and Dress
- KUFIR: 200,000 DKK for the project Textiles and pollen. A key to ancient daily life.
- FI: 348,652 DKK for the International Network Programme with China
- Dronning Margrethes og Prins Henriks Fond: 20,000 DKK for publishing four books about textiles
- Ellen og Knud Dalhoff Larsens Fond: 10,000 DKK for publishing four books about textiles
- Lillian og Dan Finks Fond: 20,000 DKK for the publication of textile anthology Global Textile Encounters
- Kulturarvsstyrelsen: 150,000 DKK for performing dye and isotope analysis on Danish textiles from the Bronze Age

Co-funding 2011

- 2 Ph.D. grants from the Faculty of Humanities
- 1/2 Ph.D. grant from the National Museum of Denmark

2012

- Gerda Henkel Foundation, Ellen Harlizius-Klück: 150,000 €
- Marie Curie Intra European Fellowship, Hedvig Landenius Enegren: 300,000 €
- University of Copenhagen: 500,000 DKK bonus for obtaining EU funding
- Kulturministeriets Forskningspulje, Ulla Mannering: 394,000 DKK
- The Alexander S. Onassis Public Benefit Foundation (Category A grant), Marie-Louise Nosch: 67,500 DKK
- Women in Science Award by UNESCO and L'Oréal Danmark, Karin Margaritha Frei: 100,000 DKK
- Rothenborgs Legat for Nationalmuseets videnskabelige medarbejdere, Ulla

Mannering: 5,000 DKK

- FKK, Tidsskriftsstøtte, Ulla Mannering: 110,000 DKK
- Kulturarvsstyrelsen, Lene Frandsen: 163,256 DKK
- AMS C14-dateringspuljen, Ulla Mannering: 6,000 DKK
- AMS C14-dateringspuljen, Ulla Mannering: 3,000 DKK
- Kulturarvsstyrelsen, Tove Engelhardt Mathiassen: 1,200,000 DKK
- Kulturarvsstyrelsen, Tove Engelhardt Mathiassen: 30,000 DKK
- Kulturarvsstyrelsen, Tove Engelhardt Mathiassen: 29,000 DKK
- Dronning Margrethe & Prins Henriks Fond, Johan Zimsen: 20,000 DKK
- Elisabeth Munksgaard Fonden, Karin Margarita Frei: 25,000 DKK
- Danish Institute in Athens, Cecilie Brøns: 4,000 DKK
- Programme science – IFD, French – Danish research program 2013, Marie-Louise Nosch: 22,200 DKK
- CNRS-DNRF (French side), Cécile Michel: 220,000 DKK
- CNRS-DNRF (Danish side), Marie-Louise Nosch: 312,000 DKK

Co-funding 2012

- 1/2 Ph.D. grant from the University of Warwick

2013

- Marie Curie Fellowship, Małgorzata Siennicka: 300,000 €
- Marie Curie Fellowship, Paula Hohti: 300,000 €
- Marie Curie Fellowship, Salvatore Gaspa: 300,000 €
- Marie Curie Fellowship, Matteo Vigo: 250,000 €
- Marie Curie Fellowship, Berit Hildebrandt: 300,000 €
- Marie Curie Fellowship, Miguel Ángel Andrés-Toledo: 250,000 €
- University of Copenhagen: 3.000.000 DKK bonus for obtaining EU funding
- INSTAP & Gerda Henkel, Joanne Cutler: 500,000 DKK
- Anneliese Meier Award to Marie-Louise Nosch: € 250,000
- ERC Advanced Grant, University of Gothenburg, 500,000 DKK to Karin Margarita Frei
- CNRS-DNRF (Danish side), Matteo Vigo: 32,000 DKK

2014

- FKK Mobilex post doc grant, Giovanni Fanfani, 2: 100,000 DKK
- Marie Curie Fellowship, Romina Laurito : 300,000 €
- Marie Curie Fellowship, Caroline Sauvage: 300,000 €
- Marie Curie Fellowship, Flavia Carrero: 300,000 €
- University of Copenhagen, bonus for obtaining EU money: 1,500,000 DKK



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