

SEM and microanalysis in the study of historical technology, materials and conservation (SEM 2010)

Thursday 9 and Friday 10 September 2010

BP Lecture Theatre, British Museum

Provisional programme

Thursday 9 September

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| 09.00–09.50 | Registration |
| 09.50–10.00 | Opening remarks |
| Session 1 | |
| 10.00–10.20 | How 'non-destructive' is Variable Pressure SEM?
Alexander D. Ball and Anton Kearsley, Natural History Museum, UK |
| 10.20–10.40 | A case study of ancient parchment biodegradation: integration of variable pressure and high vacuum scanning microscopy and microanalysis with microbiological diagnostics
Flavia Pinzari and Vanja Cialei, Istituto Centrale per la Conservazione ed il Restauro del Patrimonio Archivistico e Librario, Laboratorio di Biologia, Italy
Guadalupe Piñar, Universität für Bodenkultur, Vienna Institute of Biotechnology, Austria |
| 10.40–11.00 | Amulets and Infant Sacrifice: Glass beads from the Carthage Tophet
Katherine Eremin and Joseph A. Greene, Harvard Art Museum, USA
Andrew Shortland, Cranfield University, UK
Marc Walton, The Getty Conservation Institute, USA
Patrick Degryse, Katholieke Universiteit Leuven, Belgium |
| 11.00–12.00 | Tea/posters |
| Session 2 | |
| 12.00–12.20 | The surface of materials at high magnification: what do we see?
Ineke Joosten and Luc Megens, Netherlands Institute for Cultural Heritage (ICN), Holland |
| 12.20–12.40 | The Iron Age Snettisham torc hoard; technological insights revealed by SEM
Jody Joy, Caroline Cartwright, Nigel Meeks, Duncan Hook and Aude Mongiatti, The British Museum, UK |
| 12.40–13.00 | The Bedford Lemere Collection: SEM-EDX analysis of deteriorating glass plate negatives
Sarah Allen, David Dungworth, Jenny Hodgson and Sarah Paynter, English Heritage, UK |
| 13.00–14.00 | Lunch/posters (lunch will be provided) |

Session 3

14.00–14.20

Quantitative EDX analysis of smalt pigment in the variable pressure SEM

Marika Spring, National Gallery, UK
Stewart Bean, Zeiss, UK

14.20–14.40

Medieval window flashed glass. Composition, structure and manufacturing processes in light of microanalytical methods

Jerzy Kunicki-Goldfinger, Cardiff University, UK

14.40–15.00

Current examinations of organic remains preserved by metal corrosion products

Andrea Fischer, Staatliche Akademie der Bildenden Kuenste, Germany

15.00–15.20

Multi-analytical study of the pigments in 17th century Portuguese Azulejos

Susana Coentro, Vânia S. F. Muralha and Augusta M. Lima, Universidade Nova de Lisboa, Portugal
João Manuel Mimoso and António Santos Silva, Laboratório Nacional de Engenharia Civil, Portugal
Alexandre Nobre Pais, Museu Nacional do Azulejo, Portugal

15.20–15.50

Tea/posters

Session 4

15.50–16.10

Investigation of Medieval Opaque Glasses and Enamels using SEM-EDXA

Ian Freestone, Cardiff University, UK
Heike Stege, Doerner Institut, Germany
Mark Wypyski, The Metropolitan Museum of Art, USA

16.10–16.30

SEM and TEM analyses of chrome-yellow dyestuffs used for imported and domestic cotton fabrics “touzan” in Japan in 19th century

Nahoko Sugioka and Masahiro Kitada, Tokyo University of the Arts, Japan

16.30–16.50

Inscriptions, filing and polishing marks on the bronze weapons from the Qin Terracotta Army in China

Xiuzhen Janice Li, Museum of Emperor Qin Shihuang’s Terracotta Army, China and UCL Institute of Archaeology, UK
Marcos Martinon-Torres, UCL Institute of Archaeology, UK
Nigel Meeks, The British Museum, UK
Yin Xia, Museum of Emperor Qin Shihuang’s Terracotta Army, China

18.30–20.00

Reception in Addis Gallery, British Museum

Friday 10 September

Session 5

9.00–9.10

Opening remarks

09.10–09.30

Applications of electron backscatter diffraction (EBSD) in archaeology

Shirley Northover, Open University in the South, UK

Peter Northover, Oxford University, UK

09.30–09.50

A forgotten tradition: The re-discovery of Mexican feathered textiles through an interdisciplinary approach to SEM technology

Hector Manuel Meneses Lozano, Museo Textil de Oaxaca, Mexico

09.50–10.10

The investigation into the raw materials used in the production of Chinese porcelain and stoneware bodies.

Michael Tite, Research Laboratory for Archaeology and the History of Art, UK

Ian Freestone, Cardiff University, UK

Nigel Wood, University of Westminster, UK

10.10–10.30

Reconstructing vegetation change over the last 40,000 years in the Western Cape, South Africa: the role of SEM-based charcoal identification

Caroline Cartwright, The British Museum, UK

John Parkington, University of Cape Town, South Africa

Richard Cowling, Nelson Mandela Metropolitan University, South Africa

10.30–11.30

Tea/posters

Session 6

11.30–11.50

Subsurface analysis by application of FIBSEM to samples of geological and historical importance

Diane Johnson, Open University, UK

Stuart Kearns, University of Bristol, UK

Monica Grady, Open University and Natural History Museum, UK

11.50–12.10

Gold Usage. Wear marks and/or deterioration in site conditions

Alicia Perea and O. García-Vuelta, Grupo Arqueometal, Centro de Ciencias Humanas y Sociales, CSIC, Spain

12.10–12.30

Arsenic and apricots: the sober still lifes of Adriaen Coorte

Carol Pottasch, Royal Picture Gallery Mauritshuis, The Netherlands

12.30–12.50

Learning strategies and technological change in Middle Minoan polychrome ware production

Edward Faber, University of Nottingham, UK

12.50–13.50

Lunch/posters (lunch will be provided)

Session 7

13.50-14.10

Non-invasive sample preparation with cross-section polishing (CSP)

Paul Bellendorf, Katrin Wittstadt, Jürgen Meinhard,
Fraunhofer ISC, Germany

14.10-14.30

**Understanding Viking filigree and granulation by SEM and tool
mark analyses**

Barbara Armbruster, TRACES - UMR 5608, France

14.30-14.50

ESEM-EDX, a universal tool in restoration

Martina Raedel, Ines Feldmann, Martin Sabel and Michael Buecker,
BAM Federal Institute for Materials Research and Testing, Berlin, Germany

14.50-15.10

A study of Pre-Columbian gold beads from Panama

Ainslie Harrison, National Museum of the American Indian, USA
Kim Cullen Cobb and Harriet Beaubien, Museum Conservation Institute, USA

15.10-15.40

Tea/posters

Session 8

15.40-16.00

The use of SEM imaging techniques for examination of paintings

Aviva Burnstock, Courtauld Institute of Art, UK
Lauren Howard and Alexander D. Ball, The Natural History Museum, UK

16.00-16.20

Metallurgy through the eyes of the SEM

Nigel Meeks, The British Museum, UK

16.20-16.50

SEM – future directions

Chris Jones, Hitachi High-Technologies

16.50-17.00

Closing remarks

Posters

Iron age painted pottery from Eastern Central Italy, the Marches region, Italy: Chemical and mineralogical characterisation by X-ray absorption spectroscopy and by SEM/EDX

Giovanna Bergonzi, Dipartimento di Scienze Archeologiche e Storiche, Università degli Studi di Macerata, Italy

Eleonora Paris, Dipartimento di Scienze della Terra, Italy

Characterization of gold leaf from Baroque altarpieces by SEM-EDS: false positives

Ana Patrícia Bidarra, Marta Ascensão Carmona Ferro and Fernando Rocha, Campus Universitário de Santiago, Portugal

João Freitas Coroado, Instituto Politécnico de Tomar, Portugal

Metallurgical and chemical characterization of Venetian silver denarii dating to the late 12th century

Irene Calliari and Michele Asolati, University of Padova, Italy

Andrea Saccocci, University of Udine, Italy

Francesco Grazi, Istituto Sistemi Complessi, Florence, Italy

Antonella Scherillo, Istituto Sistemi Complessi, Florence, Italy and ISIS Facility, UK

The use of scanning electron microscopy and other microscopy techniques to analyse the state of conservation of archaeological wood from Italian excavations.

Chiara Capretti, Cristiana Giordano, Simona Lazzeri, Nicola Macchioni and Lorena Sozzi, CNR-IVALSA, Italy

Gianna Giachi: Soprintendenza per i Beni Archeologici della Toscana, Laboratorio di Analisi, Italy

Cristina Salvatici: CEME – CNR, Italy

The Swash Channel Wreck Project and the use of Scanning Electron Microscope to evaluate different tipologies of in-situ preservation methods on marine environments

Chiara Capretti, Simona Lazzeri, Nicola Macchioni and Lorena Sozzi: CNR-IVALSA, Italy

Paola Palma: Bournemouth University, UK

Keeping your temperature under control: an SEM study of the anatomical changes to Fabaceae wood from traditional kilns in Pernambuco, north-east Brazil

Caroline Cartwright, British Museum, UK

Peter Gasson and Claudia Luizon Dias Leme, Kew Gardens, UK

Chris Jones, Hitachi, UK

Copper phthalocyanine's optic modifications

Catherine Defeyt, Université de Liège, Belgium

A study of the microstructure of thin sheets of ivory using SEM and ESEM

Alan Derbyshire, Victoria and Albert Museum, UK Satomi Kitano, Royal College of Art, UK

Nigel Meeks and Caroline Cartwright, British Museum, UK

Chris Stain and Geoffrey Mitchell, University of Reading, UK

Characterisation and attribution of 18th-century Meissen porcelain using handheld X-ray fluorescence (XRF) supported by variable-pressure scanning electron microscopy (VPSEM-EDX) and conventional XRF

Kelly Domoney and Andrew Shortland, Cranfield University, UK

The modification of industrial cellulose nitrate lacquers in David Alfaro Siqueiros's easel paintings in 1945

Manuel Eduardo Espinosa-Pesqueira, ININ, Mexico

Sandra Zetina-Ocaña, Elsa Minerva Arroyo-Ilemus and Eumelia Hernández-Vázquez

IIE-UNAM, Mexico

Jose Luis Ruvalcaba-Sil, IF-UNAM, Mexico

Microstructural, molecular and colour changes of synthetic polymer varnishes during thermal degradation

Helen Veronika Farmakalidis, Benaki Museum, Greece

Ioannis Karatasios, Vassilis Kilikoglou, Antonis Douvas and Panagiotis Argitis, National Center for Scientific Research, Greece

Sofia Sotiropoulou, 'ORMYLIA' Foundation Art Diagnosis Center, Greece

Stamatis Boyatzis, Technological Educational Institute of Athens, Greece

Yoannis Chrysosoulakis, National Technical University of Athens, Greece

SEM-EDS-XRF applied to the study of ancient gold artefacts

Daniela Ferro, Institute for Nanostructured Materials (ISMN-CNR), Rome, Italy

Vania Virgili, Sapienza University of Rome, Department of Chemistry, Rome, Italy

Archaeometric study of the metallic artefacts from a rich late Roman tomb at Torrejón de Velasco (Madrid, Spain)

Oscar García-Vuelta, Alicia Perea, Fabián Cuesta, Marc Gener, Ignacio Montero, Mercedes Murillo and Martina Renzi, Grupo Arqueometal – Centro de Ciencias Humanas y Sociales, CSIC, Spain

Salt weathering of Nubian Sandstone in some ancient Egyptian Buildings

Sayed Hemeda, Cairo University, Egypt

Abdou El-Derby, South Valley University, Egypt

Characterisation of metal threads from the wall decorations of the audience-room of the Saxon King Augustus II the Strong in the Dresden castle using SEM/EDX analysis

Sylvia Hoblyn and Christoph Herm, Hochschule für Bildende Künste (HfBK) Dresden, Germany

A crucible for Egyptian Blue?

Rosemary Jeffreys and Thilo Rehren, UCL Institute of Archaeology, UK

Caroline Cartwright, British Museum, UK

Metal threads, evaluation of a cleaning method

Ingrid Karina Jiménez Cosme, Carolusa González Tirado, and Jannen Contreras Vargas,

Escuela Nacional de Conservación, Restauración y Museografía, Mexico

José Luis Ruvalcaba Sil, Instituto de Física-UNAM, Mexico

Porch 25, scientific analysis applied to the preservation of a mural painting from Teotihuacan

Ingrid Karina Jiménez Cosme: Mexico

Characterisation of pigments mixture and minority components in Murillo's paintings by EDX

Maria Carmen Jimenez de Haro, Maria Luisa Franquelo, Adrian Duran and Jose Luis Perez-Rodriguez, Materials Science Institute of Seville, Spain

Microstructure and Impurities of bronze mirrors fabricated in the Koryo Period (10th to 14th century)

Jung-Eun Choi and Masahiro Kitada, Tokyo University of the Arts, Japan

SEM analysis and imaging of lab prepared iron gall inks used in the copy press procedure

Agathi-Anthoula Kaminari and Philip Miller-Tate, Kingston University, UK

Athina Alexopoulou, Department for Conservation of Antiquities and Works of Art, Greece

Eileen Buckley-Dhoot, Dublin Business School, Ireland

The metal threads from the silk garments belonging to the Tang Dynasty (7th-10th c. AD)

Anna Karatzani, Historical Archives of Crete, Greece

Thilo Rehren, UCL Institute of Archaeology, UK

Lu Zhiyong, China

Application of SEM and SEM-EDX Microanalysis in the study of architectural decorations of Pir-i-Hāmzeh Sābz-Poush's Tomb in Iran

Amir-Hossein Karimy, University of Isfahan, Iran

Parviz Holakoei, University of Ferrara, Italy

The Russian avant-garde palette: analysis of inorganic materials from paintings and watercolours by Kazimir Malevich, Ivan Kliun, Liubov Popova and Alexander Rodchenko using SEM-EDX analysis

Maria Kokkori, Courtauld Institute of Art, UK

The influence of glass transition temperature on Paraloid B72 in hot climates: modeling incorporation of particulates

Vasiliki Kontogianni and David Watkinson, Cardiff University, UK

Coloured glazes on baroque thrones in Serbian orthodox monastery Krusedol – examination of original pigments by SEM-EDS techniques

Daniela Korolija-Crkvenjakov, Gallery of the Matica srpska, Serbia

Jonjaua Ranogajec, University of Novi Sad, Serbia

Technological insights in Eugene's Delacroix "Episode from the Greek War of Independence"

Eleni Kouloumpi, Agni-Vassileia Terlix, Anna P. Moutsatsou, Panayiotis Rompakis and Michail Doulgeridis, National Gallery-Alexandros Soutzos Museum, Greece

Ioannis Karatasios, National Centre of Scientific Research, Greece

White grounds on the main altarpiece of the Old Cathedral of Coimbra: historical technology and material characterization, from 1502 to 1900

Agnès Le Gac and Ana Isabel Seruya: Universidade Nova de Lisboa, Portugal

Maria José Oliveira and Isabel Ribeiro, Laboratório de Conservação e Restauro José de Figueiredo, Portugal

Characterization of lapis lazuli for a provenance study by means of CL-SEM-EDS

Alessandro Lo Giudice, Alessandro Re, Debora Angelici and Paolo Olivero, Dipartimento di Fisica Sperimentale and INFN Sezione di Torino, Italy

Giovanni Pratesi, Università di Firenze, Italy

Secondary phases in historical materials: a microstructural approach for interpreting correct sequences of crystallization

Lara Maritan, Michele Secco, Claudio Mazzoli and Gilberto Artioli, University of Padova, Italy

Analytical characterization of bole used in gilded plasterwork (Arab room, Palácio da Bolsa, Oporto, Portugal)

Patrícia Maria Garcia Mestre Marques De Carvalho, Fernando Joaquim Fernandes Tavares Rocha and João Paulo Pereira de Freitas Coroado, Universidade de Aveiro, Portugal

The metallurgy of Late Bronze Age high-tin bronze socketed axes: hoards from Langton Matravers, Southern England

Nigel Meeks, Duncan Hook, Aude Mongiatti, Ben Roberts: British Museum, UK

Andrew Fitzpatrick: Wessex Archaeology, UK

Peter Woodward: Dorset County Museum, UK

Scientific study for treatment & conservation of archaeological iron artifacts, applied on a selected object from Tell-El Farama, North Sinai, Egypt

Mohamed M. Megahed, Fayoum University, Egypt

Characterization of the cracking system in 17-18th century Portuguese Azulejos by SEM

João Manuel Mimoso and António Mimoso Santos Silva, Laboratório Nacional de Engenharia Civil, Portugal

Susana Coentro, Universidade Nova de Lisboa, Portugal

SEM and optical microscopic study of gilded tiles from Darb-e-Imam Tomb in Isfahan (Iran)

Moslem Mish Mastnehi and Hamid Reza Chaman, Zabol University, Iran

Muhamad Mortazavi, Art University of Isfahan, Iran

Evaluation of white rot deterioration in historic wood cellular structure by scanning electron microscopy and FTIR analysis

Mohsen Mohammadi Achachluei and Gholamreza Vatankhah, Art University of Isfahan, Iran

Ali Akbar Enayati, University of Tehran, Iran

Yellow pigments in the painting *Venus and Adonis* from collections of the National Gallery in Prague

Jana Odvárková, Andrea Rousová and Jiří Třeštlík, National Gallery in Prague, Czech Republic

Tomáš Grygar, Academy of Sciences of the Czech Republic, Řež, Czech Republic

Tomáš Trojek, Czech Technical University in Prague, Czech Republic

Microstructural interpretation of the elasticity of ancient fibulae springs: the contribution of SEM-EDS-EBSD analysis

Luca Peruzzo, Institute of geosciences and earth resources (IGG-CNR), Padova, Italy

Daniela Ferro, Institute for Nanostructured Materials (ISMN-CNR), Rome, Italy

Vania Virgili, Sapienza University of Rome, Department of Chemistry, Rome, Italy

Variable Pressure Scanning Electron Microscopy in the study of ancient manuscripts and inks

Flavia Pinzari and Marina Bicchieri, Istituto Centrale per la Conservazione ed il Restauro del

Patrimonio Archivistico e Librario, Italy

Investigation into the weathering of stone of an excavated Stupa at Kanaganahalli, Taluk Chittapur Dist. Gulbarga, Karanataka, India

K.S. Rana, Shilpa Raturi and P.K. Mukherjee, Archaeological Survey of India, India

The stabilization treatment of the cast iron objects from the marine environment, evaluated by SEM and EDS

S. Ahmed Saleh and Georgios Batis, Department of Materials Science and Engineering, National Technical University of Athens, Greece

Liana Filippaki and Yannis Bassiakos, Plasma Physics Lab., IMS, NCSR "Demokritos", Greece

Vassiliki Argyropoulos, Technological Educational Institute (TEI) of Athens, Department of Conservation of Antiquities and Works of Art, Greece

Scanning Electron Microscopy and ceramic technology: the study of metalworking ceramics from late prehistoric Scotland

Daniel Sahlén, University of Glasgow and National Museums Scotland, UK

SEM study of the technology used in China to work jade: comparing excavated Bronze Age artefacts with jades in the British Museum

Margaret Sax and Nigel Meeks, British Museum, UK

LI Boqian and Qin Ling, School of Archaeology and Museology, Peking University, China

A minero-petrographic study of the anthropomorphic stelae from the Megalithic Area of Saint-Martin de Corléans (Aosta, Northern Italy)

Margherita Serra and Alessandro Borghi, Università degli studi di Torino, Italy

Lorenzo Appolonia and Stefano De Leo, Soprintendenza per i Beni e le Attività Culturali della Regione autonoma della Valle d'Aosta Direzione Ricerca e Progetti Cofinanziati, Italy

Scanning electron microscope investigation of the Nuzi "frits"

Andrew Shortland, Cranfield University, UK

Katherine Eremin, Harvard Art Museum, USA

Susanna Kirk, National Museums Scotland, UK

Marc Walton, The Getty Conservation Institute, USA

Patrick Degryse, Katholieke Universiteit Leuven, Belgium

Using SEM to characterise dust in the Old Library, Trinity College Dublin

Allyson Smith, Trinity College Dublin, Ireland

Identification and analysis of the building stones used in the historical period and some remedies with particular reference to Indian monuments: Comparative study of a substituted antique stone with restored stone using SEM and XRD technique.

Janbade Prafulla Tarachand, Chandigarh College of Architecture, India

N. M. Thakur and B. N. Tandon, School of Planning and Architecture, New Delhi, India

Use of low-vacuum SEM to study the morphology and degradation of organic materials

Michelle Taube, Anna-Grethe Rischel and Maj Ringgaard, National Museum of Denmark, Denmark

Gold beads in Ancient Egyptian jewellery, a technological study of necklaces and belts from the Middle Kingdom and 2nd Intermediate period

Lore Troalen and Jim Tate, National Museums Scotland, UK

Maria Filomena Guerra, C2RMF, France

Nigel Meeks and Susan La Niece, British Museum, UK

SEM-EDX technological studies of some unique Early Bronze Age (third millennium BC) gold artifacts from Balinov Gorun Locality near the village of Dubene, Karlovo Region, Bulgaria

Svetla Tsaneva-Dimitrova, National Museum of History, Bulgaria

Dissolution, depletion, diffusion, deposition. The formation of complex crusts due to the degradation of lead white and smalt in seventeenth-century oil paintings

Annelies van Loon and Petria Noble, Royal Picture Gallery Mauritshuis, The Netherlands

Scanning Electron Microscopy in the technological study of tenochca shell and lapidary objects

Adrian Velazquez-Castro and Emiliano Melgar-Tisoc, Museo del Templo Mayor, Mexico

Characterization of painted surfaces in historic buildings; uncovering techniques in architectural paint research analysed and visually compared

Edwin Verweij, Norsk Institutt for Kulturminneforskning (NIKU), Oslo, Norway

Primary study of "Bright Spot" technique of ancient Chinese Bronze Ge from the Eastern Zhou Dynasty

Wu Lai-ming, Ding Zhong-ming, He Huang, Shanghai Museum, China