

2nd International Conference

ARCHAEOMETALLURGY IN EUROPE 2007

17-21 June, 2007

Aquileia · Italy

ADVANCED PROGRAMME

Organized by:

**Associazione
Italiana
di Metallurgia**



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The Associazione Italiana di Metallurgia (AIM)

plans to repeat and to improve the positive and successful experience of the International Conference “Archaeometallurgy in Europe” organized in Milan in 2003.

The 2nd International Conference “Archaeometallurgy in Europe 2007” will be organized in Aquileia (province of Udine, Italy) from the 17th to the 21th of June 2007.

The Conference aims at gathering and sharing information on all aspects of the history of metallurgy, covering a wide range of aspects relating to European Archaeometallurgical items dating back from the origins to the first half of the 18th c. AD.

The Conference intends to promote an active dialogue among archaeometallurgy researchers with different specialisations and backgrounds, to create an opportunity to discuss the study of ancient metallurgical processes, conservation science and to discuss the application of modern metallurgical experimental methods and techniques used to investigate, to identify and to date ancient artefacts. Its purpose is also that of creating an interaction between institutions and researchers, to facilitate the integration of different approaches and finally to promote contacts and collaborations between scholars from European and non-European countries and from different research areas.



SUNDAY, 17 JUNE 2007

ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

OPENING CEREMONY

16.30 Welcome Addresses by

- **Walter Nicodemi** *AIM President*
- **Authorities**
- **Fulvia Lo Schiavo** *Soprintendenza ai Beni Archeologici della Toscana e del Friuli Venezia Giulia*

OPENING LECTURES

Evidences for the earliest smelting processes in Western Europe

P.T. Craddock - The British Museum, London, United Kingdom

Medieval mercury production in the mining plant of Idrija, Slovenia

A. Giumlia-Mair - AGM Archeoanalisi, Merano, Italy

Looking into the microcosmos: chemical and lead isotope analyses of (Chalcolithic?) maceheads and other items from Israel

A. Hauptmann, M. Prange - Deutsches Bergbau-Museum, Bochum, Germany

M. Bode - Westfälische Wilhelms-Universität Münster, Germany

O. Misch Brandl - The Israel-Museum, Jerusalem

S. Schmitt-Strecker - Max-Planck-Institut für Chemie, Mainz, Germany

18.30 GET TOGETHER COCKTAIL

MONDAY, 18 JUNE 2007

ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

COPPER AND COPPER ALLOYS I

Chairperson: *A. Adriaens*

- 9.00 Chalcolithic metal production and provenance in the site of San Blas (Cheles, Badajoz, Spain)**
M.A. Hunt Ortiz, V. Hurtado Perez, I. Montero Ruiz, S. Rovira Llorens, J.F. Santos Zalduegui - Universidad de Sevilla, Spain
- 9.20 Archaeometallurgical studies on eneolithic copper artifacts from Northeast Bulgaria**
I. Iliev, E. Pernicka - TU Bergakademie Freiberg, Germany
K. Dimitrov, I. Kuleff - Sofia University "St. Kliment Ohridski", Bulgaria
- 9.40 Results of a metallographic examination of copper age flat axes from eastern Central Europe and the Carpathian basin**
T.L. Kienlin - Ruhr Universität, Bochum, Germany
- 10.00 Manufacturing techniques of copper age axes**
G. Artioli - Università di Padova, Italy
C. Mapelli - Politecnico di Milano, Italy
- 10.20 Composition and some considerations of the provenance of Armenian early bronze age copper artefacts**
Kh. Meliksetian, R. Badalyan - Armenian National Academy of Sciences, Yerevan, Armenia
E. Pernicka - Universität Tübingen, Germany
- 10.40** Coffee break

Chairperson: *Th. Rehren*

- 11.20 Bronze age metallurgy in Norway**
A-L. Melheim, P. Northover - OMCS, Yarnton, United Kingdom
- 11.40 The prehistoric metals from Oman: new data**
C. Giardino, G. Guida - Università Suor Orsola Benincasa, Napoli, Italy
S. Ridolfi - Centro Orafo "il Tari", Caserta, Italy
- 12.00 The Biederthal copper ingots: new data on late bronze age copper exchange in Europe**
B. Mille - Centre de Recherche et de Restauration des Musees de France
J-F. Pinigre - Service Regional de l'Archeologie de Franche-Comte
- 12.20 Early copper metalwork in the Trento area**
P. Northover, A. Pedrotti - OMCS, Yarnton, United Kingdom
- 13.00** Break





MONDAY, 18 JUNE 2007

ROOM 2 "COMUNE" - PIAZZA GARIBALDI

IRON

Chairperson: *A. Jouttijärvi*

9.00 Iron production in the Etruscan site of Populonia: new data

L. Chiarantini, M. Benvenuti, P. Costagliola - Università di Firenze, Italy

A. Cartocci, M.E. Fedi - INFN, Firenze, Italy

S. Guideri - Società Parchi Val di Cornia, Italy

9.20 Technological choices and the innovation of iron

E. Hjältner-Holdar - National Heritage Board, Uppsala, Sweden

C. Risberg - Museum Gustavianum, Uppsala, Sweden

9.40 Victims of crime? The technology and origins of two pattern-welded long swords from Roman Canterbury

B. Gilmour - University of Oxford, United Kingdom

10.00 Two iron tool depots of the 3rd and 4th century in Mannersdorf / Leithagebirge in lower Austria

K. Kastowsky - Vienna Institute for Archaeological Science, Austria

10.20 Bars with rolled extremities - summary of a multi-disciplinary study (archaeology and archaeometry) of semi-products of iron production in the European Iron Age

S. Bauvais, M. Berranger, P. Fluzin - CNRS UMR, Belfort, France

10.40 Coffee break

Chairperson: *E. Hjältner-Holdar*

11.20 A consideration of the methods of constructing iron sword blades in the pre-medieval period

J. Lang - Watford, United Kingdom

11.40 Mining and iron-making in the Bohinj Region

M. Ogrin - Gorenjski Muzej, Kranj, Slovenia

12.00 Updating of analysis on the nails from the Roman legionary at Inchtuthil

E. Gariboldi, C. Mapelli, W. Nicodemi, M. Vedani - Politecnico di Milano, Italy

12.20 The shadow of a blacksmith

A. Jouttijärvi - Heimdal-Archaeometry, Virum, Denmark

12.40 Metallography of medieval knives from Malin (Bohemia)

J. Hošek, E. Ottenwelter, F. Velimsky, A. Silhova - Institute of Archaeology CAS, Praha, Czech Republic

13.00 Break

MONDAY, 18 JUNE 2007

ROOM 3 "PINACOTECA" - VIA ROMA

GOLD

Chairperson: *M. Aucouturier*

- 9.00 Recent studies of bronze age gold from Britain**
S. La Niece - The British Museum, London, United Kingdom
- 9.20 Gold alloys in jewellery items (7th to 3rd centuries B.C.) from South Iberian Peninsula**
I. Ortega-Feliu, M.A. Respaldiza - Centro Nacional de Aceleradores, Sevilla, Spain
B. Gomez-Tubio, M.L. de la Bandera - Universidad de Sevilla, Spain
M.A. Ontalba Salamanca - Universidad de Extremadura, Caceres, Spain
F. Fernández - Museo Arqueológico de Sevilla, Spain
G. Ovejero Zappino - Cobre Las Cruces, Gerena, Spain
- 9.40 Jeweller's moulds for casting and stamping. New documents from iron age Iberia**
A. Perea - CSIC, Madrid, Spain
B. Armbruster - CNRS, Toulouse, France
- 10.00 Analytical and technological studies of iron age torcs from Snettisham, Norfolk**
D. Hook, N. Meeks, S. La Niece, C. Cartwright, M. Hockey, F. Shearman - The British Museum, London, United Kingdom
- 10.40** Coffee break

Chairperson: *A. Perea*

- 11.20 Early Iron Age gold artefacts from Castro dos Ratinhos (Moura, Southern Portugal)**
P. Valério, L.C. Alves, A.M.M. Soares, M.F. Araujo - Instituto Tecnológico e Nuclear, Sacavém, Portugal
L. Berrocal-Rangel - Universidad Autonoma de Madrid, Spain
A.C. Silva - Instituto Português do Património Arquitectónico, Évora, Portugal
- 11.40 Technological and typological studies on gold jewellery from the archaic Artemision at Ephesos: the "boat-shaped" earrings**
B. Buhler, A.M. Pulz - Vienna Institute for Archaeological Science, Austria
- 12.00 Do details of technique have a role in the attribution of ancient Greek jewellery?**
M. Dági - Museum of Fine Arts, Budapest, Hungary
- 12.20 Sixteenth-century methods of gold gain from ore in Zloty Stok (Silesia, Poland)**
M. Karbowiczek, I. Suliga, E. Salwach, K. Stransky - AGH University of Science & Technology, Krakow, Poland
- 13.00** Break





MONDAY, 18 JUNE 2007

ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

COPPER AND COPPER ALLOYS I

Chairperson: *S. Rovira Llorens*

- 14.30 Cypriote 2000 BC copper metallurgy from Pyrgos - Mavroraki**
M.R. Belgiorno - ITABC-CNR, Roma
- 14.50 Bronzework in Peloponnese and Crete in Late Bronze Age: two stories with a mutual end?**
M. Kayafa - University of Birmingham, United Kingdom
L. Hakulin - University of Helsinki, Finland
- 15.10 Late bronze age metal artefacts from an orientalising burial (?) at "Fraga dos Corvos" (Macedo de Cavaleiros - NE Portugal): a first archaeometallurgical approach**
E. Figueiredo, R.J.C. Silva - Universidade Nova de Lisboa, Caparica, Portugal
J.C. Senna-Martinez - Universidade de Lisboa, Portugal
M.F. Araujo - Instituto Tecnológico Nuclear, Sacavem, Portugal
- 15.30 Snapshot of a final bronze age metal worker: archaeometallurgical study of the cache and the working tools from Chiusa di Pesio, Cuneo, Italy**
I. Angelini, G. Artioli, G. Molin - Università di Padova, Italy
T. Frizzi, R. Alberti - Politecnico di Milano, Italy
M. Venturino Gambari - Soprintendenza per i Beni Archeologici del Piemonte, Torino, Italy

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

- 16.50 POSTER SESSION 1**

MONDAY, 18 JUNE 2007

ROOM 2 "COMUNE" - PIAZZA GARIBALDI

IRON

Chairperson: *B. Gilmour*

- 14.30 The blacksmith's craft of the medieval Permians: archaeometallographic investigation**
V.I. Zavyalov - Russian Academy of Sciences, Moscow, Russia
- 14.50 Ore - slag - iron: what can we learn from the early medieval smithies discovered in the iron production district of the Central Jura, Switzerland?**
M. Senn - EMPA, Dübendorf, Switzerland
L. Eschenlohr - Office de la Culture, Porrentruy, Switzerland
- 15.10 An late middle age ironworking site at Bergerac (Dordogne France): first archaeological and analytical results**
C. Colliou - Arkemine
P. Dillmann - CNRS, Gif sur Yvette, France
- 15.30 Metallographic study of some 17th and 18th c. European sword (rapier) blades**
M. Gener - Instituto de Historia (IH - CSIC), Madrid, Spain
- 15.50 Historical and microstructural investigations on the cast iron gate of Royal Palace of Turin**
P. Rizzi, M. Baricco - Università di Torino, Italy
- 16.10 Characterisation of iron finds from ancient upper Macedonia, northern Greece**
A. Jordanidis - Technological Educational Institute (TEI) of Western Macedonia, Kozani, Greece
J. Garcia-Guinea - Museo Nacional Ciencias Naturales, Madrid, Spain
G. Karamitrou-Mentessidi - Archaeological Museum of Aiani, Greece
G.D. Papadimitriou - National Technical University of Athens, Greece
- 16.30 Between bloom and blast furnace: the iron smelting slags of Ludres Chaudeau merovingian workshop**
M. Leroy, P. Merluzzo, C. Le Carlier - CNRS, Jarville La Malgrange, France

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

- 16.50 POSTER SESSION 1**



COINS AND TOOLS

Chairperson: *S. La Niece*

- 14.30 Seleucid coins and economic pattern for Parthian coinage**
S. Moosavi - Institute of Islamic Revolution, Tehran, Iran
F. Khademi Naddoshan, M. Saffari - Tarbiat Modaress University, Tehran, Iran
- 14.50 Technical study of fire-gilded Aksumite silver coins: first results**
M. Blet-Lemarquand, B. Gratuze, J-N. Barrandon - IRAMAT-CEB, CNRS, Universite d'Orleans, France
F. Tereygeol - IRAMAT-LCM-CNRS, Belfort, France
- 15.10 Some metallurgical aspects of ancient silver coins discovered in Romania (original and imitations). Provenance, destination and commercial networks**
B. Constantinescu, V. Cojocar, R. Bugoi - National Institute for Nuclear Physics and Engineering "Horia Hulubei", Bucharest, Romania
- 15.30 The changes of copper for coinage during the Roman imperial period: lead - and copper isotope analysis**
S. Klein, H.-M. Kaenel, Y. Lahaye, G.P. Brey - Institut fur Geowissenschaften, Frankfurt, Germany
- 15.50 A new approach for the investigation of ancient silver coins: depth profile analysis by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS)**
G. Sarah, B. Gratuze, M. Bompaigne, J-N. Barrandon - IRAMAT/CNRS, Orleans, France
- 16.10 Two silvering processes used in the French medieval minting**
A. Arles, B. Gratuze - IRAMAT Centre Ernest Babelon, Orleans, France
F. Tereygeol - IRAMAT, Laboratoire Métallurgies et Cultures, UTBM, Belfort and CEA-CNRS Laboratoire Pierre Süe, CEA, Saclay, France
- 16.30 Investigation on Augustean auxiliary coins from Thraco-Moesic area**
I. Calliari, M. Magrini, E. Ramous - Università di Padova, Italy
R. Martini - Civiche Raccolte Numismatiche, Milano, Italy
E. Vaina - Chemical Researcher, retired, Italy

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

- 16.50 POSTER SESSION 1**

TUESDAY, 19 JUNE 2007

ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

COPPER AND COPPER ALLOYS II

Chairperson: *V. Pigott*

- 9.00 Primary study on corrosion of metal objects from the ancient site Half Tepe, Southwest Iran**
O. Oudbashi, S. Mohammadamin Emami, H. Bakhshandehfard - Art University of Isfahan, Iran
- 9.20 An investigation of unworked lumps of Cu-based materials (Aes Rude?) from two Etruscan sites**
M. Benvenuti, L. Chiarantini, P. Costagiola, I. Giunti - Università di Firenze, Italy
A. Dini - CNR, Pisa, Italy
L. Giuntini, M. Massi - Istituto Nazionale di Fisica Nucleare, Firenze, Italy
- 9.40 Production and use in a group of pre-historical knives from Ripatransone (Ascoli Piceno, Italy)**
M. Ferretti, G. Guida, N. Lucentini, F. Milazzo - CNR - Istituto per le Tecnologie Applicate ai Beni Culturali, Monterotondo, Italy
- 10.00 Iron age fibulae from Castro de Pragança (Portugal)**
A. Ávila de Melo, E. Figueiredo, M. de Fatima Araujo, J.C. Senna-Martinez - Museu Nacional de Arqueologia, Lisbon, Portugal
- 10.20 A chemical research on the production technology of fibulae from the iron age in Northwest Bulgaria**
V. Bonev - University of Sofia, Bulgaria
- 10.40** Coffee break

Chairperson: *D. Hook*

- 11.20 An art historical and scientific analysis of a classical Greek bronze vessel cast with figurative relief: a situla in the museum of fine arts, Boston**
B. Barr-Sharrar - New York University, USA
R. Newman - Museum of Fine Arts, Boston, USA
- 11.40 On the ancient restorations and modifications of imported Greek and Achaemenid metalware by the Eurasian nomads**
M. Treister - Bonn, Germany
- 12.00 A compositional study of the Porticello bronzes by portable x-ray fluorescence and laser-induced breakdown spectroscopy**
E. Console, M. Ferretti, S. Legnaioli, S.M. Pagnotta, P. Palaia, V. Palleschi - CNR - Istituto per le Tecnologie Applicate ai Beni Culturali, Monterotondo, Italy
- 12.20 Roman metallurgy in Danish votive offerings**
A. Jouttijärvi - Heimdal-Archaeometry, Virum, Denmark
- 13.00** Break





TUESDAY, 19 JUNE 2007

ROOM 2 "COMUNE" - PIAZZA GARIBALDI

MINES

Chairperson: *G. Artioli*

9.00 Ancient metallurgy in the Caucasus during the chalcolithic and Early Bronze Age: recent results from excavations in Western Azerbaijan

A. Gasanova - Institut of Archaeology, Bakou

A. Courcier - University of Paris I, France

A. Hauptmann - Deutsches Bergbau Museum, Bochum, Germany

9.20 Metal supply, and internal metal trade in nuragic Sardinia

G. Marras, P.G. Valera, R.G. Valera - Università di Cagliari, Italy

9.40 Roman jarosite exploitation at Riotinto (Spain)

L. Anguilano, Th. Rehren - University College London, United Kingdom

W. Muller Royal Holloway - University of London, United Kingdom

B. Rothenberg - Institute of Archaeometallurgical Studies, London, United Kingdom

10.00 Medieval mining in Södermanland, Sweden - a feudal enterprise

E. Skyllberg - National Heritage Board, Stockholm, Sweden

10.40 Coffee break

ORES, SMELTING PROCESSES AND REFRACTORIES

Chairperson: *E. Pernicka*

11.20 Direct ironmaking with partial reduction and slag formation as a first step. An explanation for successful production?

A. Espelund - Norwegian University of Science and Technology, Trondheim, Norway

11.40 From artefact to ore deposit - The search for the provenance of the copper used in the Portuguese copper age

G. Goldenberg, E. Hanning - Universität Freiburg, Germany

R. Müller, E. Pernicka - Curt-Engelhorn-Zentrum Archäometrie, Mannheim, Germany

M. Kunst - Deutsches Archäologisches Institut, Madrid, Spain

M. Bartelheim - Freie Universität Berlin, Germany

12.00 An early blast furnace at Durstel, Langenbruck, Baselland, Switzerland

B. Guenette-Beck, V. Serneels - Institute of Mineralogical and Petrography, Fribourg, Switzerland

J. Tauber - Archaeological Service of Liestal BL, Switzerland

12.20 Influence of physical iron ore on reduction process in ancient smelting furnace

M. Karbowniczek, W. Weker - AGH University of Science & Technology, Krakow, Poland

12.40 Geochemical evidence of differential roasting of bog iron ore in the Grafjell area, East Norway

D. Andersson, L. Grandin - National Heritage Board, Uppsala, Sweden

13.00 Break

SILVER AND LEAD

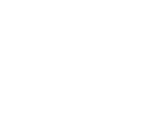
Chairperson: *M. Pernot*

- 9.00 The metallurgy of the Gundestrup Cauldron**
A. Jouttijärvi - Heimdal-Archaeometry, Virum, Denmark
- 9.20 Lead and silver metallurgy in Emporion (l'Escala, Girona, Spain)**
I. Montero-Ruiz, P. Castanyer, M. Gener, M. Hunt, J.M. Mata, E. Pons, S. Rovira, C. Rovira, M. Renzi, M. Santos-Retolaza, J.F. Santos-Zalduegui - Instituto de Historia CSIC, Madrid, Spain
- 9.40 Materials, recipes and choices: some problems and potentials of the study of cupellation remains**
M. Martinon-Torres, Th. Rehren, A. Mongiatti - University College London, United Kingdom
N. Thomas - Université Paris I Panthéon-Sorbonne, France
- 10.00 Roman lead ingots in Europe - a key to reconstruct lead trade and lead production in the Roman world?**
P. Rothenhöfer - Kommission für Alte Geschichte und Epigraphik, München, Germany
M. Bode, K. Mezger - Westfälische Wilhelms-Universität Münster, Germany
N. Hanel - Universität Köln, Germany
A. Hauptmann - Deutsches Bergbau-Museum, Bochum, Germany
W. Eck - Institut für Altertumskunde, Köln, Germany
- 10.20 Mining and smelting of silver and copper during the 16th and 17th centuries in the mining district of Dornstetten and Freudenstadt, Northern Black Forest, south-western Germany**
U. Meyerdirks - Universität Tübingen, Germany
- 10.40** Coffee break

NON EUROPEAN METALLURGY

Chairperson: *T. Fenn*

- 11.20 Metallurgical analysis of early metal objects from the Liushui Cemetery, Xinjiang, Northwest China**
J. Mei, Y. Ling, K. Chen, X. Wu, M. Wagner - University of Science and Technology Beijing, China
- 11.40 Copper production and technological reproduction: defining "Technological style" in the Khao Wong Prachan Valley of prehistoric central Thailand**
T.O. Pryce, M. Martinon-Torres, V.C. Pigott, Th. Rehren - University College London, United Kingdom
- 12.00 Beginning of iron metallurgy in India: an assesment**
R.N. Singh - Banaras Hindu University, Varanasi, India
- 12.20 Metallographic studies of megalithic iron artifacts from central India, 700-400 BC**
H. Narain, S.K. Bhatia, M.V. Nair - India
- 12.40 Iron bloomery production in the Dogon Country (Mali / Western Africa)**
V. Serneels, S. Perret - University of Fribourg, Switzerland
C. Robion-Brunner - University of Geneva, Switzerland
- 13.00** Break





TUESDAY, 19 JUNE 2007

ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

COPPER AND COPPER ALLOYS II

Chairperson: *J-F. Maréchal*

- 14.30 Metallographic study of Gallo-Roman copper-based alloy artefacts of the Cité Judiciaire of Bordeaux, France**
F. Adamski, M. Pernot - IRAMAT CNRS Université Bordeaux, Pessac, France
C. Sireix - INRAP, Pessac, France
- 14.50 Archeological and archeometric study of metal fittings of Roman age belts. Preliminary perspectives**
T. Budai-Balogh - Aquincum Museum Budapest, Hungary
- 15.10 Copper alloys of bronze jewellery from the Roman limes - iron gate**
D. Ratković, M. Stojanović - National Museum, Belgrade, Serbia
V. Andrić, S. Čupić - Institute of Nuclear Sciences "Vinča", Belgrade, Serbia
- 15.30 Some bronze statuettes from the Hermitage Museum: a metallurgical investigation**
N. Gulyaeva - The State Hermitage Museum, St. Petersburg, Russia
- 15.50 Reconstruction of the modes of shaping wax models for producing ornaments in the 4th - 3rd cc. BC - 4th - 5th cc. AD in the Volga and the Oka interfluvium**
I.A. Saprykina - Russian Academy of Sciences, Moscow, Russia
- 16.10 Traditions of metalworking in the classical world frontier**
A.A. Malyshev, N.N. Terekhova, L.S. Rozanova - Institut of Archaeology RAS, Moscow, Russia
I.G. Ravich - State Scientific-Researches Institut of Restoration

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

- 16.30 POSTER SESSION 2**

TUESDAY, 19 JUNE 2007

ROOM 2 "COMUNE" - PIAZZA GARIBALDI

ORES, SMELTING PROCESSES AND REFRACTORIES

Chairperson: *V. Serneels*

- 14.30 Trace elements behaviour in direct- and indirect- iron metallurgy: the case of Pays de Bray (France)**
A-M. Desaulty, C. Mariet, P. Dillmann, J-L. Joron, B. Gratuze, C. Mahe-Le Carlier, P. Fluzin - CEA, Gif sur Yvette, France
- 14.50 An extensive medieval bloomery iron production in the Grafjell area, East Norway**
L. Grandin, D. Andersson - National Heritage Board, Uppsala, Sweden
- 15.10 12th Century smelting of Rammelsberg ore at the Huneberg site near Goslar**
B. Asmus - University College London, United Kingdom
C. Bartels - Deutsches Bergbaumuseum, Bochum, Germany
F.A. Linke, L. Klappauf - Stützpunkt Goslar, Germany
- 15.30 Smelting of gold ore in renaissance Austria**
A. Mongiatti, Th. Rehren, M. Martinon-Torres, B. Cech - University College London, United Kingdom
- 15.50 El castro de gusendos de los oteros: late bronze age ceramic refractories from the Iberian Peninsula**
P. Campo-Gleich - Complutense University, Madrid, Spain
- 16.10 A copper isotopes and trace elements database of alpine-appennine Cu-ores for provenancing ancient metals: state of the art**
F. Colpani, I. Angelini - Università di Milano, Italy
M. Marelli, B. Giussani, S. Recchia - Università dell'Insubria, Como, Italy
B. Baumgarten - Museo di Scienze Naturali dell'Alto Adige, Bolzano, Italy
G. Artioli - Università di Padova, Italy

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

16.30 POSTER SESSION 2





TUESDAY, 19 JUNE 2007

ROOM 3 "PINACOTECA" - VIA ROMA

NON EUROPEAN METALLURGY

Chairperson: *J. Mei*

- 14.30 Copper metallurgy in Sub-Saharan West Africa and the connections to North Africa and the Mediterranean**
T.R. Fenn, D.J. Killick, J.T. Chesley, J. Ruiz - University of Arizona, Tucson, USA
- 14.50 Elemental analysis of Peruvian copper-based artifacts using LA-ICP-MS**
L. Dussubieux, P.R. Williams - Field Museum of Natural History, Chicago, USA
- 15.10 An archaeo-metallurgical study on the use of European furnaces in colonial Bolivia**
C.R. Cohen, Th. Rehren - University College London, United Kingdom
M. Van Buren - Colorado State University, USA
- 15.30 Spanish metallurgy, native technology: copper production in New Spain in the early and middle Colonial Periods (ca. 1521-1700)**
B. Maldonado - El Colegio de Michoacan, La Piedad, Mexico
- 15.50 Prehispanic metallurgy in Northwest Argentina (South-American Andes)**
L.R. Gonzalez, G.A. Gluzman - Museo Etnografico "Juan Bautista Ambrosetti", Buenos Aires, Argentina
- 16.10 Impact of the Inka conquest in the pre-hispanic metallurgy of the Argentinian Northwest**
C.I. Angiorama - Universidad Nacional de Tucuman, Argentina

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

- 16.30 POSTER SESSION 2**

COPPER AND COPPER ALLOYS III

Chairperson: *A. Shugar*

- 9.00 In the melting pot - metal casting at early Viking age Kaupang**
U. Pedersen - University of Oslo, Norway
- 9.20 Medieval bronze mask-pendants from Eastern Europe (details of horse and rider equipment)**
L.V. Konkova - Russian State University for Humanities, Moscow, Russia
G.G. Korol - Russian Academy of Sciences, Moscow, Russia
- 9.40 Non-ferrous ornaments from Medieval Russian princely castle: analysis of microstructure and technological patterns**
I.E. Zaitseva - Institute of Archaeology RAS, Moscow, Russia
- 10.00 Analytical investigation of the shrine of St. Domitianus, a 12th century Mosan masterpiece of Belgium**
H. Wouters - Royal Institute for Cultural Heritage, Brussels, Belgium
- 10.20 The Medieval doors in Canosa and in Monte Sant'Angelo: characterization and comparison by EDXRF and SEM-EDS analyses**
F. Adduci, A. Buccolieri, G. Buccolieri, A. Castellano, V. Iacobelli, R. Laviano, L.S. Leo, F. Vona - Università di Lecce, Italy
G.L. Garagnani - Università di Ferrara, Italy
- 10.40** Coffee break

FORGING, JOINING AND METAL FINISHING

Chairperson: *P. Craddock*

- 11.20 Rare treatment technologies of copper and its alloys in metal production tradition among the Maikop culture tribes in the Northern Caucasus**
N. V. Ryndina - Moscow State University, Russia
I. Ravich - State Research Institute of Conservation, Moscow, Russia
- 11.40 Manufacture and use of bronze age swords: multidisciplinary investigation of Austrian full hilted and Griffzungen-type swords**
M. Mödlinger, T. Ntaflou - Universität Wien, Austria
- 12.00 Searching for the idea of metal inlay**
S. Müller - Vienna, Austria
- 12.20 A new approach to study ancient Egyptian black bronze**
M.A. Abd-El-Raouf, W.A. Mohamed - Cairo University, Giza, Egypt
- 12.40 Hmty-km or the Egyptian bronzes polychromy: the study of the Egyptian collection of the Louvre museum**
F. Mathis, E. Delange, D. Robcis, M. Aucouturier - Université de Liege, Belgium
- 13.00** Break



SLAGS

Chairperson: *P. Northover*

9.00 The earliest copper smelting slags in Italy: petrographic, and chemical investigations towards a reconstruction of the metallurgical processes in chalcolithic times

F. Colpani - Università di Milano, Italy

E. Burger, D. Bourgarit - C2RMF Louvre, Paris, France

G. Artioli, I. Angelini - Università di Padova, Italy

L. Anguilano - University College of London, United Kingdom

9.20 The mystery of Plattenschlacke in protohistoric copper smelting: early evidence at the early bronze age site of Saint-Véran, French Alps

E. Burger, D. Bourgarit, P. Rostan, L. Carozza - C2RMF, Paris, France

9.40 Mineralogical and geochemical investigation to ancient smelting slag from Khouni Area

A. Pourjabbar, S.M. Emami - Tehran, Iran

10.00 The ancient mine of Servette (Saint-Marcel, Val d'Aosta, Western Italian Alps): a mineralogical, metallurgical and charcoal analysis of furnace slags

P. Casartelli, S. Tumiati, P. Frizzo, M. Rottoli, A. Mambretti, S. Martin - Università dell'Insubria, Como, Italy

10.20 Geophysical prospecting of ancient slag deposits in Munigua (Spain) and Ain El Hajer (Marocco) using complex resistivity tomography

B. Ullrich - Eastern Atlas, Berlin, Germany

A. Weller - Clausthal University of Technology, Clausthal-Zellerfeld, Germany

T. Günther - Federal Institute of Geosciences and Natural Resources, Hannover, Germany

C. Rücker - Leipzig University, Germany

10.40 Coffee break

WORKSHOP

Chairperson: *A. Ávila de Melo*

11.20 Bronze melting and symbolic of power: the foundry area of Fraga dos Corvos bronze age habitat site (macedo de Cavaleiros, North-eastern Portugal)

J.C. Senna-Martinez, E. Figueiredo, M.F. Araújo, J.M.Q. Ventura, H. Carvalho - Universidade de Lisboa, Portugal

11.40 Iberian iron workshops from the 4th-3rd Centuries BC in the Valencian Region, Spain

C. Mata, A. Moreno, M.A. Ferrer - Universitat de València, Spain

12.00 Reconstructing the existence of a 7th century BCE smithy in Tel-Dor, Israel, by combined on-site XRF and FTIR analyses of sediments in a pit

A. Behar, S. Shilstein, A. Gilboa, I. Sharon, S. Weiner - Weizmann Institute of Science, Rehovot, Israel

12.20 "...With hammer and tongs in the forges...". Alamanni work methodologies and artefacts between the 3rd and 5th centuries in southern-central alpine areas

P. de Vingo - Università di Torino, Italy

12.40 The Renaissance laboratory of Oberstockstall, Austria: experimental or analytical practice?

A. Mongiatti, M. Martinon-Torres, Th. Rehren - University College London, United Kingdom

13.00 Break

WEDNESDAY, 20 JUNE 2007

ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

FORGING, JOINING AND METAL FINISHING

Chairperson: *A. Williams*

- 14.30** **Plating of Greek iron objects with bronze and silver in the Early Iron Age**
Th. Rehren, E. Asderaki, I. Lemos - University College London, United Kingdom
- 14.50** **Making gold-mercury amalgam: the evidence from Southampton, England**
J. Bayley, V. Fell - English Heritage, Portsmouth, United Kingdom
- 15.10** **Metallographic study of gold amalgams and gilding technology of Medieval gilded objects in the Iberian Peninsula**
J. Barrio, J. Chamon, M. Ferretti, M. Arroyo, A.I. Pardo - Universidad Autonoma de Madrid, Spain
- 15.30** **Iron cementation following Theophilus: experimental tests and analytical evaluation**
P. Piccardo, A. Ervas, M.R. Pinasco, M.G. Ienco - Università di Genova
- 15.50** **Late Medieval copper metallurgy in France: technical insights into the mass production of copper alloy common wares**
D. Bourgarit, N. Thomas - Centre de Recherche et de Restauration des Musees de France, Paris

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

- 16.30** **POSTER SESSION 3**





WEDNESDAY, 20 JUNE 2007

ROOM 2 "COMUNE" - PIAZZA GARIBALDI

HISTORY OF METALLURGY

Chairperson: *N. Gulyaeva*

- 14.30 Archaeometallurgy in age of complexity: production and distribution of metal artifacts in the southern Levant during the first part of the Second Millennium B.C.**
S. Shalev - Haifa Univ. & Weizmann Institute, Rehovot, Israel
- 14.50 Paleometallography of irons - contributions of fifty years research into iron technology and history**
J. Piaskowski - Krakow, Poland
- 15.10 History of foundation the first "old" iron works in Serbia**
S. Devič - Institut IMS, Beograd, Serbia
J. Stojković - U.S. Steel Serbia d.o.o., Smederevo
- 15.30 Metallurgy in settlement of Myslī**
M. Gurin - Niasvizh, Belarus
- 15.50 Archaeological sources and documentary sources relating to the manufacture of metalwork in medieval Piedmont**
P. de Vingo - Università di Torino, Italy
- 16.10 Semi-finished brass products fabricated around 1700 AD in Nürnberg**
J-M. Welter - Luxembourg
K.F. Hachenberg - Bad Breisig, Germany
A. Borhan - Sérifontaine, France

FOYER ROOM 1 "CAPITOLO" - PIAZZA CAPITOLO

- 16.30 POSTER SESSION 3**

PRODUCTION AND PRODUCTS

Chairperson: *J. Hošek*

- 9.00 A late bronze age stone mould for flat axes from Casarao da Mesquita 3**
A.M.M. Soares, P. Valério, J.C. Frade, M.J. Oliveira, D. Patoilo, I. Ribeiro, L. Arez, F.J.C. Santos, M.F. Araújo - Instituto Tecnológico e Nuclear, Sacavém, Portugal
- 9.20 Metallurgy of bronze at the iron age in septentrional Europe: new discoveries of crucibles and elements of evolution**
C. Veber, M. Mauvilly, J-F. Piningre, V. Serneels - INRAP, Strasbourg, France
- 9.40 The chemical composition of the articles of non-ferrous metals of the Bolshe-Tiganskiy burial ground**
S.I. Valiullina, R.K. Khranchenkova - Kazan, Russia
- 10.00 Characterization of gilded metal threads**
G. Simsek, A.F. Cakir - ITU, Maslak, Turkey
- 10.20 Analytical investigation of metal threads from textiles dated between the 13th and the 19th centuries**
A. Karatzani, Th. Rehren - University College London, United Kingdom
- 10.40** Coffee break

Chairperson: *C. Veber*

- 11.20 Metal artifacts of "Seppanibale Grande": hypothesis of work**
A. Attolico - Bari, Italy
- 11.40 Early Walloon refining process: first experimental restitution and metallographic analyses**
P. Dillmann, A.-M. Desaulty, S. Leroy, R. Arranda, G. Lechevallier, D. Neff, F. Teregeol - IRAMAT, Gif sur Yvette, France
D. Arribet-Deroin - Laboratoire de Medievistique Occidentale, Paris, France
L. Bellot-Gurlet - Laboratoire de Dynamique, France
- 12.00 Technical study from the hoards of Sermizelles (Yonne, France)**
C. Lagarde, M. Pernet - IRAMAT Université Bordeaux 3, Pessac, France
M. Gabillot - Université de Bourgogne, Dijon, France
- 12.20 The changes in the composition of copper alloys from the 15th to the 17th century in Franconia and Thuringia (Germany), analysed using metal memorial slabs**
P. Bellendorf, R. Drewello - University of Bamberg, Germany
- 12.40 Technical aspects of South Arabian raised bronze inscriptions: new data from Sumhuram (Sultanate of Oman)**
A. Avanzini - Università di Pisa, Italy
C. Chiavari, M. Degli Esposti, C. Martini - Università di Bologna, Italy
G.L. Garagnani, D. Prandstraller - Università di Ferrara, Italy
- 13.00 Metallurgy in southern Etruria: data from Veii and Pyrgi**
F. Felli, G. Saviano, L. Drago - Università La Sapienza, Roma, Italy



ARCHAEOMETRY

Chairperson: *M. Notis*

- 9.00 Beginning of metallurgy in Balkan and Central Europe: Croatia and Slovakia**
L. Mihok - Technical University, Košice, Slovakia
I. Mamuzić - Zagreb University, Sisak, Croatia
- 9.20 About Scandinavian prehistoric mining and metallurgy**
J-F. Maréchal - SOFRAS, Musée de la Marine, Paris, France
- 9.40 Further evidence for bronze age production of copper from ores in the Lavrion ore district, Attica, Greece**
N.H. Gale - University of Oxford, United Kingdom
- 10.00 Neutron diffraction in archaeometry: the Italian neutron experimental station INES@ISIS**
M. Celli, F. Grazzi, S. Imberti, S. Siano, M. Zoppi - CNR, Firenze, Italy
- 10.20 Characterizations of bronze artefacts from archaeological excavations of the Mediterranean Basin**
E. Angelini, S. Grassini - Politecnico di Torino, Italy
G.M. Ingo, T. de Caro - Istituto per lo Studio dei Materiali Nanostrutturati - C.N.R., Roma, Italy
A. Çilingiroğlu - Ege University, Ismir, Turkey
V. Gouda - National Research Council, Cairo, Egypt
- 10.40 Coffee break**

Chairperson: *N.H. Gale*

- 11.20 Metallography, microanalysis and corrosion of the Athlit Ram**
M. Notis, M. Hoban - Lehigh University, Bethlehem, USA
- 11.40 Swiss Alps as a copper supply for the early Bronze Age metallurgy: a lead isotope analysis**
F. Cattin, M. Besse - University of Genève, Switzerland
I.M. Villa - Universitaet Bern, Switzerland and Università di Milano Bicocca, Italy
- 12.00 Phoenician metallurgical production at SE-Spain**
M. Renzi - CSIC, Madrid, Spain
A. Hauptmann - Deutsches Bergbau Museum, Bochum, Germany
S. Rovira - Museo Arqueológico Nacional, Madrid, Spain
- 12.20 Use - wear analysis on metal: a new approach to archaeometallurgy**
C. Gutiérrez Sáez - UAM, Spain
I. Soriano Llopis - UAB, Spain
- 12.40 Metallographic investigation of the corrosive attack on tin sarcophagi in the Kapuzinergruft in Vienna**
S. Strobl, P. Ettmayer - Vienna University of Technology, Austria
E. Hösl, G. Krist, R. Erlach, B. Pichler - University of Applied Arts, Vienna, Austria
- 13.00 Tracing the provenance of ancient copper objects: a multivariate data analysis approach**
B. Giussani, M. Marelli, S. Recchia - Università degli Studi dell'Insubria, Como, Italy
F. Colpani, I. Angelini, G. Artioli - Università di Milano, Italy
- 13.20 Recovering bronze metallurgy from archaeological artefacts for the production of reference materials in conservation science**
M.P. Casaletto, F. Caruso - ISMN/CNR, Palermo, Italy
G.M. Ingo, C. Riccucci - ISMN/CNR, Roma, Italy

POSTER SESSION 1

A palaeo-environmental approach brings to light evidence of early mining and metallurgical activities: the example of the Morvan massif (Burgundy, France)

B. Forel, F. Monna, C. Petit, J.-F. Piningre, J.P. Guillaumet, C. Mordant, R. Guillon - Université de Bourgogne, Dijon, France

I. Jouffroy-Bapicot - Université de Franche-Comté, Besançon, France

O. Bruguier - Université de Montpellier II, France

Serrabottini (Massa Marittima, GR): the methodology of study of an ancient mining field

B. Aranguren - Soprintendenza Archeologica per la Toscana, Italy

P. Bagnoli, M. Negri - TAGES, Italy

L. Dallai - Università di Siena, Italy

Some considerations on late Middle Age's extraction metallurgy technology in the mining site of Comasine/Val di Sole (Trentino, Italy)

S. Gialanella, A. Gottardi, M. Ischia - Università di Trento, Italy

E. Cavada - Soprintendenza Beni Archeologici, Trento, Italy

Copper production from lean ores prior to the introduction of flotation. Kernel roasting and treatment of residues, with practice at Agordo, North Italy and Follidal, Norway as examples from the 18th and 19th centuries

A. Espelund - Norwegian University of Science and Technology, Trondheim, Norway

The central producing region for iron during the iron ages

Th. Stöllner, J. Garner, G. Gassmann - Deutsches Bergbau-Museum, Bochum, Germany

Bilyar's refractories

S.I. Valiullina - Kazan, Russia

Crucibles, wastes, and metals from the terramara settlement of Beneceto (PR, Italy): report of the preliminary archaeometric investigations

I. Angelini, G. Molin, V. Pramaor - Università di Padova, Italy

P. Bianchi - Università La Sapienza, Roma, Italy

Experimental archaeometallurgy at Fivè, Trentino, Italy: Tentative reproduction of prehistoric copper-sulphide smelting processes

F. Colpani, I. Angelini, G. Artioli - Università di Milano, Italy

E. Burger, D. Bourgarit, B. Mille - C2RMF, Paris, France

A. Burens, L. Carozza - CNRS-UMR 5140 Archéologie des Sociétés Méditerranéennes, Lattes, France

The contribution to the study of hearth bottom slag: the restitution of smithing activities

M. Leroy, P. Merluzzo, C. Le Carlier - CNRS, Jarville La Malgrange, France

Pyrgos-Mavroraka (Cyprus): copper smelting slag of the beginning of second Millennium B.C.

C. Giardino, S. Rovira - Università Suor Orsola Benincasa, Napoli, Italy

XRF study of slag and charcoal in Timna (Israel)

S. Shalev - Haifa University, Rehovot, Israel

S. Sh.Shilstein - Weizmann Institute of Science, Rehovot, Israel

Yu. Yekutieli - Ben-Gurion University of the Negev, Beer-Sheva, Israel





The iron metallurgy in Cavargna Valley (Como, Italy): a preliminary investigation of smelting slags
P. Casartelli, C. Sampietro, S. Tumiati, S. Martin - Università dell'Insubria, Como, Italy

First examinations of ores, slags and iron artefacts from the iron-making site of Castel-Minier (France)

S. Leroy, A-M. Desaulty, P. Dillmann, F. Tereygeol - IRAMAT-LMC-CNRS, Belfort, France
C. Verna - Université Paris XII, France

Preliminary investigation of pre-Islamic metallurgical slags from Sumhuram, Dofar region (Oman)

L. Chiarantini, M. Benvenuti, P. Costagliola - Università di Firenze, Italy
A. Avanzini - Università di Pisa, Italy

Metalworking in the area of Teatro alla Scala in Milano

M. Castoldi - Università di Milano, Italy
A. Ceresa - Soprintendenza per i Beni Archeologici della Lombardia, Milano, Italy

Traces of a bronze smith's craft from the hinterland of Aquincum. A late Roman workshop at the Kaszas-dulo-Csikos street villa

P. Zsidi - Aquincum Museum Budapest, Hungary

An metallurgical workshop in the chora of Noviodunum (beginning of the 2nd century AD)

V. Lungu - Romanian Academy, Bucharest, Romania

Two iron blooms from the proto-urban site of Bourges (Cher, France) Ve BC

M. Leroy, P. Merluzzo - CNRS, Jarville La Malgrange, France

Ancient technology in the North-East of the Iberian Peninsula: archaeosiderurgical study of protohistoric artifacts (IV-III BC centuries)

J. Auladell i Marques - Universitat de Barcelona, Spain

The iron working remains at Castelraimondo on Zuc S'c'jaramont

S. Santoro Bianchi - Università di Parma, Italy
A. Giumlia-Mair - AGM Archeoanalisi, Merano, Italy

Microstructural investigation on a medieval sword produced in 12th century a.D.

C. Mapelli, W. Nicodemi, R.F. Riva - Politecnico di Milano, Italy

Hypereutectoid steel in Viking-age swords

A. Williams - Wallace Collection, London, United Kingdom

Iron production activities on the territory of early Byzantine Sagalassos, SW Turkey

N. Kellens, B. Musiè, P. Degryse - University of Leuven, Belgium

Treveran wrought high tin bronze funeral vessels

J-M. Welter - Luxembourg

An overview of historical surface treatment processes, their development today and their future developments: the case of gold plating

A. Scrivani - INSTM, Firenze, Italy
M. Scotti - Liceo Scientifico "A. Volta", Castel San Giovanni, Italy
C. Giolli - Università di Firenze, Italy

POSTER SESSION 2

Working copper during the Eneolithic of Central Europe: results of a metallographic examination of Altheim and Vinca type flat axes

T.L. Kienlin - Eberhard Karls Universität Tübingen, Germany

Archaeological excavation at Pletz von Mozze, Luserna, Trentino, Italy. A case study for assessment of late bronze age metallurgical activities

*F. Nicolis, P. Bellintani - Soprintendenza per i Beni Archeologici della Provincia Autonoma di Trento, Italy
G. Artioli - Università di Padova, Italy
N. Cappellozza - SAP Società Archeologica, Mantova, Italy*

New light on early bronze age copper production in the Cyclades: the case of Seriphos Island

M. Georgakopoulou, O. Philaniotou, Y. Bassiakos - British School, Athens, Greece

Early copper metallurgy in Central Italy: issues of production and social consumption

*A. Dolfini - Cambridge University, United Kingdom
G. Artioli, I. Angelini - Università di Padova, Italy
T. Frizzi, R. Alberti - Politecnico di Milano, Italy*

Egyptian Harpokrates statuettes, chronology and composition

*A. Giumlia-Mair - AGM Archeoanalisi, Merano, Italy
H. Györy - Szepmüvészeti Museum Budapest, Hungary*

Metallographic investigation and experimental reconstitution of ancient bronze mirrors

P. Piccardo, A. Ervas, M.R. Pinasco, M.G. Ienco, G. Pellati - Università di Genova, Italy

Composition of 6th - 1st centuries B.C. bronze artifacts from North-Western Bulgaria

*I. Iliev, E. Pernicka - TU Bergakademie Freiberg, Germany
I. Kuleff - University of Sofia "St. Kl. Ohridski", Bulgaria*

An archeometallurgical study of copper alloy artefacts found in the Gisacum sanctuary site of the Vieil-Evreux in France

A. Gaffiero, S. Jouen, B. Hannyer, L. Guyard - Université de Rouen, Saint Etienne du Rouvray, France

The relationship between alloy content and form of bronze rings in Aquincum

A.R. Facsady - Aquincum Museum Budapest, Hungary

Bronze finds from the first-century vicus of Aquincum, Vizivaros

K.H. Kerdö - Aquincum Museum Budapest, Hungary

Bronze statuettes from Aquincum

K. Szirmai - Aquincum Museum Budapest, Hungary

Archaeological museum of Verona: analysis of bronze sculptures from various periods

*M. Bolla - Archaeological Museum of Verona, Italy
C. Fiorini, T. Frizzi - Politecnico di Milano, Italy*

Fibulae production at Socchieve (Udine, Italy) in late antiquity

*A. Giumlia-Mair - AGM Archeoanalisi, Merano, Italy
C. De Cecco - Udine, Italy
S. Vitri - Soprintendenza Archeologica del Friuli-Venezia Giulia, Italy*





Non ferrous metal production at Castel Manfino (Te): crucibles moulds, raw material and coins

A. Iacone, S. Prosperi, V. La Salvia, S. Antonelli, M.C. Somma, M. Di Ruberto, M.R. Paciocco, P. Moschetta, T. Priore, D. Bernabei, et al. - Università di Chieti, Italy

Study and analytical investigation of metal threads

A. Karatzani, Th. Rehren - University College London, United Kingdom

An historical approach to a gold pendant. The study of different metallurgical techniques in ancient Oaxaca, Mexico, during the late post classic period

E. Ortiz-Díaz, J.L. Ruvalcaba Sil - Universidad Nacional Autónoma, México City

Treasures and goldsmiths in prehistory

M. Revello Peris - L.A.S.E.T., Roma, Italy

Prospection of an archaeometallurgical silver site in the Pyrénées (South France) using magnetic susceptibility and lead geochemistry of soils

J. Girard, M. Macouin, S. Aries, M. Munoz, B. Cauuet - LMTG, Toulouse, France

Economic reform in Sassanian period: numismatic evidence

H. Karimian, B. Nilofari, F. Khademi Nadooshan - Tehran University, Iran

Sassanian issues a new view

*B. Nilofari, H. Karimian - Tehran University, Iran
F. Khademi - Tarbiat Modares University, Tehran, Iran*

The chronology of contorniates (IVth-Vth centuries A.D.): contribution of metal analyses

I. Bollard - CNRS-IRAMAT, Saint-Quentin, France

Archaeometallurgical analyses on a “Quincussis” from vesuvian area. Comparison with another similar find from Roman Archaeological Museum (Rome)

F. Gauzzi, R. Montanari, P. Serafin, F. Scudieri, R. Volterri - Università Tor Vergata, Roma, Italy

Microchemical and X-ray diffraction (XRD) analyses for the characterisation of some monetary specimens of roman imperial age

F. Gauzzi, R. Montanari, P. Serafin, R. Volterri, A. Serra - Università Tor Vergata, Roma, Italy

Charpenterie des mines gallo-romaines du filon saint Denis (District minier de Pontgibaud - Puy-de-Dome, France)

C. Marconnet - Arkemine sarl, Saint Pierre-le-Chastel, France

Archaeometallurgy in Chaco area: Santiago del Estero, Argentina

C. Taboada, C. Angiorama - CONICET-Instituto de Arqueología y Museo de la Universidad Nacional de Tucumán, San Miguel de Tucumán, Argentina

POSTER SESSION 3

Archaeometallurgy in pre-protohistoric Italy. A research project

G. Artoli, A.M. Bietti Sestieri, A. Cardarelli, R. De Marinis, C. Giardino - IIPP, Roma, Italy

The influence of the oracle of Delphi on the development of mining and metalworking in the archaic and classical periods

I. Leonardos - National Technical University of Athens, Greece

Metallurgical concepts in Serbia

J. Stojković - U.S. Steel Serbia d.o.o., Smederevo

S. Dević - Institut IMS, Beograd, Serbia

The application of the water wheel to European iron metallurgy: the iron helve hammer is a still living reality in Italy. The museum of Tamiello helve hammer of Breganze

J.A. Pinatto - Udine, Italy

Restoration of a roman musical instrument

E. Huber, M.E. Prunas, R. Petriaggi - Istituto Centrale per il Restauro, Roma, Italy

G. Tavlaridis - Chemist, Roma, Italy

Experimental archaeometallurgy at Fivè (Trentino - Italia)

P. Bellintani, E. Silvestri, L. Comis - Soprintendenza per i Beni Archeologici della Provincia Autonoma di Trento, Italy

E. Belgrado, R. Guatelli - Archeolab, Italy

The museum Il Forno - Tavernole s/M (Brescia)

C. Simoni - Sistema Museale di Valle Trompia, Gardone V.T., Italy

Structural analysis of historical steel railway bridges: a real scale experimentation

A. Pipinato - Università di Padova, Italy

The early metals microstructures archive (EMMA)

E. Godfrey - University of Mary Washington, Fredericksburg, USA

Middle bronze I tools from the Central Negev (Israel): technology and provenance

I. Segal - Jerusalem, Israel

Non-destructive analysis of bronze and iron weapons from the Etruscan town of Populonia (Tuscany, Italy)

S. Bianchi, M. Benvenuti, P. Costagliola - Università di Firenze, Italy

G. André - CEA-CNRS, Saclay, France

R. Magli - Università di Milano, Italy

A. Rastrelli - Soprintendenza Archeologica della Toscana, Firenze, Italy

A. Romualdi - Galleria degli Uffizi, Firenze, Italy

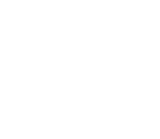
Metallurgy from the Phoenician site of La Fonteta (Alicante, Spain): a study of provenance

M. Renzi, I. Montero Ruiz - CSIC, Madrid, Spain

M. Bode - Westfälische Wilhelms-Universität, Münster, Germany

Not destructive characterisation of several copper-based finds from different archaeological sites of Liguria (Italy)

E. Franceschi, I. Cascone, D. Nole - Università di Genova, Italy





Metal to mould. An experimental study of casting moulds using ED-XRF

T. Kearns, M. Martinon-Torres, Th. Rehren - University College London, United Kingdom

Copper-based artefacts from Northeastern America: composition and technology

L. Dussubieux - Field Museum of Natural History, Chicago, USA

A. Deraisme, G. Frot, Y. Bienvenu - Ecole des Mines de Paris, Evry, France

C. Stevenson, A. Creech - Virginia Department of Historic Resources, Richmond, USA

Bronze belt garnishing from longbard area

P.M. De Marchi, L. Miazzo - Milano

Late bronze age copper production

J. Cierny, A. Hauptmann, F. Marzatico, Th. Stöllner - Deutsches Bergbau-Museum, Bochum, Germany

Non ferrous metallurgy at the medieval castle of Castel Manfrino (Teramo, Abruzzo)

V. La Salvia - Università di Chieti, Italy

Metal workshops and metallurgy at the third-millennium B.C. site of Tell Beydar/Nabada (Syria)

M. Tonussi - Ca' Foscari University, Venezia, Italy

Metallurgical and technological study of bronze objects of ancient venetic people

M. Magrini, E. Ramous, I. Calliari - Università di Padova, Italy

Ancient Villanovan metallurgy: new data from two sites in the Region Emilia-Romagna

C. Chiavari, M. Degli Esposti, C. Martini, D. Prandstraller - Università di Bologna, Italy

A. Giumlia-Mair - AGM Archeoanalisi, Merano, Italy

G.L. Garagnani - Università di Ferrara, Italy

M. Pacciarelli - Università Federico II, Napoli, Italy

T. Trocchi, P. Von Eles - Soprintendenza Archeologica dell'Emilia Romagna, Italy

Mining exploitation in the Vallon de Saint-Pierremont (Alsace, F) during the 16th c.: The Carreau Samson example

C. Lavier - C2RMF-UMR171-CNRS, Paris, France

J. Grandemange - Centre de Recherche Archéologique des Mines et de la Métallurgie, Strasbourg, France

Archaeometric analysis of two early bronze age hoards from lower Austria

V. Leusch, M. Mehofer, A. Krenn-Leeb - University of Vienna, Austria

E. Pernicka - Curt-Engelhorn-Zentrum Archäometrie, Mannheim, Germany

C. Blesl, M. Krenn - Federal Office of Cultural Monuments, Wien, Austria

GENERAL INFORMATION

CONFERENCE VENUE

The Conference is to be held in Aquileia. The Conference sessions will take place in the following rooms:

Room 1 "Capitolo": piazza Capitolo

Room 2 "Comune": piazza Garibaldi

Room 3 "Pinacoteca": Via Roma

LANGUAGE

The official language of the Conference will be English.

PROCEEDINGS

The full texts of all papers will be published in the form of a CD-ROM and issued to attendants on arrival at the Conference. A peer reviewed volume will be published by AIM after the Conference.

ON-SITE REGISTRATION

All attendants must be registered at the registration desk, located in the foyer of Room 1 "Capitolo", in piazza Capitolo.

Registration of attendants will start at 14.00 on 17 June 2007 and it will continue the following days at the on-site registration desk. All participants are required to wear the badge.

SOCIAL PROGRAMME

A social programme has been designed to give delegates the opportunity to meet informally and enjoy Aquileia's atmosphere.

Get Together Cocktail - A Welcome cocktail will be offered on the evening of 17 June 2007, at the end of the opening ceremony.

Concert - A concert will be organised on the evening of 19 June 2007, at 19.00 in Santa Eufemia Basilica of Grado. A shuttle bus will be provided from the Conference venue (piazza Capitolo) to the concert site.

Conference Dinner - On the evening of 20 June 2007, at 20.30 a Conference dinner will be served at Hotel Patriarchi - Via G. Augusta, 12 - Aquileia (Ud)

Archaeological museum visit - During the Conference the participants (wearing the conference badge) will have free entrance to the Archaeological Museum, located in via Roma.

REGISTRATION INFORMATION

Advanced Registration fees (before May 14, 2007)

Standard rate € 250 (Revenue Stamp included)

Chairmen, Speakers,

Academics € 190 (Revenue Stamp included)

Registration fees include entrance to technical sessions, CD-rom of the proceedings, get together cocktail, Conference dinner, coffee breaks and AIM Membership for the second half of 2007 and for the year 2008.

AIM MEMBERS

Standard rate € 150 (Revenue Stamp included)

Chairmen, Speakers,

Academics € 90 (Revenue Stamp included)

Registration fees include entrance to technical sessions, CD-rom of the proceedings, get together cocktail, Conference dinner and coffee breaks.

Student € 30 (Revenue Stamp included)

under 30 years of age, can take part to the Conference paying a very special fee, that includes AIM Membership as junior member for the second half of 2007 and for the year 2008. Students will have to provide valid proof of student status. • **Aim junior members** will be admitted free of charge - AIM Junior membership amounts to € 15. • **Accompanying persons** € 90,00 VAT Included (Get Together Cocktail, Conference dinner). • **After 14 May, 2007** the above rates will be subject to an **extra charge of 30 €**.

PAYMENT AND REMITTANCE

• Non-transferable bank draft or cheque, negotiable in Italy, to the order of Associazione Italiana di Metallurgia - AIM

• Bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "Banca Popolare Commercio e Industria", Branch no. 2 - Milano, account no. 00000022325 cod. ABI 05048 - CAB 01602 - IBAN IT92L050480160200000022325 - Swift code POCIITM1002.

The transfer order must specify the name of the delegate and "Archaeometallurgy 2007".

• Visa or American Express cards and cash can be used **only for payments at the on-site Registration Desk in Aquileia (only for delegates)**.

A copy of the transfer order must be sent to AIM, together with **Registration Form**.

ADVANCED REGISTRATION

If you plan to attend, please register on line or fill in the Registration Form on the Conference website <http://www.aimnet.it/archaeometallurgy2.htm> or the enclosed Registration Form and send it to the Conference Secretariat at your earliest convenience, **but not later than May 14, 2007**. Please use a separate form for each participant. Photocopies can be used. Please contact the Conference Secretariat by fax or e-mail, if possible.

CANCELLATION AND REFUND POLICY

A refund, **less 20%** deduction for administrative costs, will be issued for written cancellations received by **8 June 2007**. For participants who notify their cancellation after **8 June 2007** or will not attend the Conference, **a charge of 50%** of the Conference fee will be withheld and a copy of the proceedings will be sent after the event.

INSURANCE

The Conference Organiser and Comune di Aquileia cannot assume any responsibility for personal accident, loss or damage to the private property of participants and accompanying persons, which may either occur during or arise from the Conference. Participants should therefore take whatever steps they consider necessary as regards insurance.

TRAVEL AND ACCOMMODATION

Aquileia is now a small village in the green countryside of the plain of Friuli. The town-fortress, built here by the Romans in the 2nd C. BC has left vestiges and remains of its former glory all over the place. The ancient ruins are reflected in the clear water of the river Natissa and they are scattered around among ancient trees. The early simple fortified settlement became the second largest town of the Roman Empire. In the 3rd Century AD Aquileia was an extremely wealthy merchant town at the very centre of trade routes coming from all Mediterranean ports and going to the most important towns beyond the Alps. As its imposing buildings and basilicas with impressive mosaics demonstrate, it was also an important religious centre, famous for its cultural and spiritual magnificence. A few kilometres away, the isle of Grado, Venice little sister, shiny and proud in its lagoon, was the first port for the incoming navigators, who, carried by strong winds, sailed up the Adriatic from far away cities. In its ancient narrow streets you will find the traces of the history of its Patriarchs, its Middle-European flair - heritage of the Habsburgs domination - its friendly hospitality and the savoury local specialities.

How to get there

- by car Grado and Aquileia can be reached by car on the A4 Venice-Trieste motorway or down the A23 Tarvisio-Udine motorway. In both cases the exit to take is Palmanova, 17 km to Aquileia, 28 km to Grado.
- by train to the railway station of Cervignano del Friuli on the Venice-Trieste line, from there, there are busses to Aquileia and Grado. 8 km to Aquileia, 17 km to Grado.
- by air to Trieste/Ronchi dei Legionari airport. There are several bus connections to Grado and Aquileia. There are additional busses from the nearby villages Redipuglia and Ronchi, which you can easily reach by taxi.
- by air to Venice/Marco Polo airport. From there by bus to Venice and by train to Cervignano (120 km).

ACCOMMODATION IN GRADO

Official travel and reservation agency

GRADO PROMHOTELS

Riva Zaccaria Gregori, 9 - 34073 Grado (GO), Italy

Phone: +39 0431 82929 - Fax: +39 0431 84980

E-mail: info@promhotels.net

Website: <http://www.promhotels.net>

IN GRADO

An allotment of rooms has been reserved for delegates at different hotels in Grado from 16 to 21 June 2007. Hotel rooms will be allocated on a first-come first served basis. Due to heavy request in Grado, we advise to book hotels as soon as possible. To reserve accommodation the attached Hotel Reservation Form should be completed and transmitted to **GRADO PROMHOTELS by April 28**. After April 28, the fees will be subject to availability.

The payment conditions are the following:

50% of total payment on arrival of the confirmation through our bank below indicated (payment should arrive within 7 days - otherwise the booking will be cancelled, a copy of the payment sent via fax 0039043184980 will be appreciated)

the rest of the 50% payment, before 31.05.07 always through our bank.

Bank info: Banca Popolare di Cividale, Filiale di Grado - Italy ABI 05484 CAB 64590 CIN V - Account Nr. 1314

IN AQUILEIA

For accommodation in **Aquileia**, you may contact directly:

Hotel Patriarchi (****/ 3 stars)

Via G. Augusta, 12 - 33051 Aquileia (Ud) - Italy

Phone: +39 0431 919595 - 91036

Fax +39 0431 919596

E-Mail : info@hotelpatriarchi.it

Website: <http://www.hotelpatriarchi.it>

Youth Hostel Domus Augusta

Via Roma, 25 - 33051 - Aquileia (UD)

Phone: +39 0431 91024 - Fax: +39 0431 917105

Mobile: +39 348 741289

E-mail: info@ostelloaquileia.it

Website: <http://www.ostelloaquileia.it>

For more choices of hotels both in Grado and Aquileia, you may visit the website: <http://www.turismo.fvg.it>

Rates for hotels in Grado

STAR RATING	SINGLE ROOM		DOUBLE ROOM		DOUBLE ROOM SINGLE USE	
	B&B	HB	B&B	HB	B&B	HB
****/4 stars	68	83	60	75	79	94
***S/3 stars superior	56	66	50	60	68	78
*** /3 stars	53	63	46	56	64	74

HOTEL RESERVATION FORM



HOTEL RESERVATION

FORM

2ND INTERNATIONAL CONFERENCE ON

ARCHAEOMETALLURGY IN EUROPE

AQUILEIA, JUNE 17/21, 2007

Please send before April 28, 2007 to:

GRADO PROMHOTELS

Riva Zaccaria Gregori, 9 34073 Grado (GO), Italy

Phone: +39 0431 82929 - Fax: +39 0431 84980

E-mail: info@promhotels.net - Website: http://www.promhotels.net

Family Name First Name

Company

Address

Zip Code Town Country

Phone Fax Mobile

E-mail

Please reserve nr

single room

4 stars

double room

3 stars superior

double room single use

3 stars

B&B

HB

Date of arrival Date of departure

In case of half board, please specify arrival time in order to arrange your Break or dinner.

Hotel rates and payment

STAR RATING	SINGLE ROOM		DOUBLE ROOM		DOUBLE ROOM SINGLE USE	
	B&B	HB	B&B	HB	B&B	HB
****/4 stars	68	83	60	75	79	94
***S/3 stars superior	56	66	50	60	68	78
*** /3 stars	53	63	46	56	64	74

The payment conditions are the following:

50% of total payment on arrival of the confirmation through our bank below indicated (payment should arrive within 7 days - otherwise the booking will be cancelled, a copy of the payment sent via fax 0039043184980 will be appreciated).

The rest of the 50% payment, before 31.05.07 always through our bank.

Bank info: Banca Popolare di Cividale, Filiale di Grado - Italy - ABI 05484 CAB 64590 CIN V - Account Nr. 1314

Date Signature

REGISTRATION FORM



REGISTRATION

FORM

2ND INTERNATIONAL CONFERENCE ON

ARCHAEOMETALLURGY IN EUROPE

AQUILEIA, JUNE 17/21, 2007

Please complete and return this form by **14 May 2007** to:

ASSOCIAZIONE ITALIANA DI METALLURGIA - AIM - Piazzale Rodolfo Morandi 2 - I - 20121 Milano, Italy
Tel. +39-02-76021132 / 02-76397770 - Fax +39-02-76020551 - E-mail: aim@aimnet.it - VAT entry no. 00825780158

Advanced Registration fees (not later than May 14, 2007)

STANDARD RATES - Delegates EUR 250 (Revenue Stamp included) - Chairmen, Speakers, Academics EUR 190 (Revenue Stamp included) - Students EUR 30 (Revenue Stamp included)

AIM MEMBERS RATES - Delegates EUR 150 (Revenue Stamp included) - Chairmen, Speakers, Academics EUR 90 (Revenue Stamp included) - Students (AIM Junior Member) FREE - Accompanying persons EUR 90 (VAT included) (include Conference Dinner, Welcome Cocktail)

To register please fill in the following form in all its parts (It is also possible to register online)

Please use BLOCK letters throughout form (photocopies can be used)

INVOICE'S FIGURES

Family Name First Name(s)

Company Name

Company Fiscal Address

ZipCode Town Country

E-mail Phone Fax

Cod. Fisc./Part. IVA della Ditta (for Italian residents only)

Order ref. number (if requested on the invoice)

I will take part to the Conference as: AIM-member Non-member

Delegate €

Speaker papers number €

Chairperson of the Session €

Academic €

Student (proof of student status required) €

AIM Junior Member free

n. Accompanying persons €

Total amount being paid: €

- by non-transferable bank draft or cheque, negotiable in Italy, to the order of Associazione Italiana di Metallurgia-AIM
- by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "Banca Popolare Commercio e Industria", Branch no. 2 - Milano, account no. 000000022325 - cod. ABI 05048 - CAB 01602 - cin L, IBAN: IT92L050480160200000022325, swift code POCHITM1002. The transfer order must specify the name of the delegate and the reference "ARCHAEOMETALLURGY 2007".
- by credit card Visa, American Express, Diners cards, Carta Si or cash only at the Registration Desk in Aquileia (**only for delegates**)

We inform you that data collected will be treated following the normal institutional activity of AIM. In accordance to article 130 of the D.lgs 196/03 in every moment the interested party has the right to oppose the treatment of one's personal data. Your data will be dealt with in accordance of the D.lgs. in 30th June 2003 n.196, guaranteeing the rights of the interested parties foreseen in the 7 art. of the Decree. We also inform you that AIM will communicate to foreign partners the personal data only for above reasons. We also inform you that your personal data will be on the list of the Conference participants. In the case that you do not want to appear on this list you may block the mail box. We also inform you that the holder of the personal data is AIM in Milan in P.le Morandi 2, while owner of the personal data is Prof. Walter Nicodemi, available near the AIM offices.

Date Signature

TIMETABLE

SUNDAY, 17 JUNE 2007

ROOM 1 "CAPITOLO"

16.30	Opening Ceremony
18.30	Get together cocktail

MONDAY, 18 JUNE 2007

ROOM 1 "CAPITOLO"

ROOM 2 "COMUNE"

ROOM 3 "PINACOTECA"

9.00	Copper and Copper alloys I	Iron	Gold
10.40	Coffee break		
11.20	Copper and Copper alloys I	Iron	Gold
13.00	Break		
14.30	Copper and Copper alloys I	Iron	Coins and tools
16.50	POSTER SESSION 1		

TUESDAY, 19 JUNE 2007

ROOM 1 "CAPITOLO"

ROOM 2 "COMUNE"

ROOM 3 "PINACOTECA"

9.00	Copper and Copper alloys II	Mines	Silver and lead
10.40	Coffee break		
11.20	Copper and Copper alloys II	Ores, smelting processes and refractories	Non European metallurgy
13.00	Break		
14.30	Copper and Copper alloys II	Ores, smelting processes and refractories	Non European metallurgy
16.30	POSTER SESSION 2		

WEDNESDAY, 20 JUNE 2007

ROOM 1 "CAPITOLO"

ROOM 2 "COMUNE"

9.00	Copper and Copper alloys III	Slags
10.40	Coffee break	
11.20	Forging, joining and metal finishing	Workshop
13.00	Break	
14.30	Forging, joining and metal finishing	History of metallurgy
16.30	POSTER SESSION 3	

THURSDAY, 21 JUNE 2007

ROOM 1 "CAPITOLO"

ROOM 2 "COMUNE"

9.00	Production and products	Archaeometry
10.40	Coffee break	
11.20	Production and products	Archaeometry



Sponsored by:



ORGANIZING SECRETARIAT



ASSOCIAZIONE ITALIANA DI METALLURGIA

Piazzale Rodolfo Morandi 2
I - 20121 Milano, Italy

Phone: +39 02.7602.1132

or +39 02.7639.7770

Fax +39 02.7602.0551

E-mail: aim@aimnet.it

Website: www.aimnet.it/archaeometallurgy2.htm