



# INTERNATIONAL CONFERENCE DEWA 2023

## FROM MINE TO OBJECT *Dialogues between Eastern and Western Archaeometallurgy (3rd-1st millenium BC)*



**22 to 24 November 2023**

**Musée d'Archéologie Nationale, Saint-Germain-en-Laye, France**

**Joint sessions between APRAB (Association pour la Promotion des Recherches sur l'Âge du Bronze)  
and SPF (Société Préhistorique Française)**

**Supported by: Musée d'Archéologie Nationale et Domaine National de Saint-Germain-en-Laye**

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Archaeometallurgy (of non-ferrous alloys) is a discipline which encompasses the entire field of ancient metallurgy, from the extraction of metals from their ores to the present state of archaeological objects, has been rapidly expanding over the last two decades. Considerable progress in advancing the field is enhancing our knowledge, whether about ore extraction and mining activities, production processes (from ore to metal) or artifact transformation (from metal to finished product), as well as the lifecycle of metallic products (from finished products to their current status and location).

This structuring of archaeometallurgical research has been accompanied by several bulkheads: researchers are often specialists in: one step of the “*chaîne opératoire*”, a type of approach, a category of scientific analysis, a specific material or a particular geographic area or time period. It makes for research compartmentalized between different approaches such as mining archaeology, archaeometry, technology and archaeology on one hand, and, for example, between Europe and the Near East on the other. Although interdisciplinarity, which is now the norm, relativize this observation, the various specialists often have difficulty gathering and exchanging ideas due to their disparate methods, training, research traditions and questions.

Otherwise, it seems that archaeometallurgical research is developing in parallel in Europe and in the Near East, with relatively few bridges between these two regions, although some researchers navigate between these very different chrono-cultural, technical, environmental, and socio-political contexts.

This is why, in the framework of the proposed symposium, we want to create a dialogue between these two worlds. Our objective is to provoke a disciplinary, methodological, geographical, and chronological decompartmentalization to bring together researchers who are rarely in contact despite the complementarity of their approaches. We hope, in the long run, that this approach will allow us to strengthen ties, weave collaborations, and create an interdisciplinary research group on archaeometallurgy in the entire Old World.

The conference is organized around four axes, making four main sessions:

### **1. Mining and ore extraction activities**

All evidence of ore exploitation and mining activities, whether they are direct or indirect, will be considered in this session.

### **2. Tools, actors and production loci: specialization and organization**

This session will be devoted to the organization of production and will question the notion of the “workshop”. Who were the metalworkers? What was their degree of specialization? Their socio-economic status? their symbolic position? What were their tools and their work environment? How were organized different stages of the metallurgical process? Can we distinguish different types of workplaces and/or activity areas according to geographical and chronological contexts?

### **3. The production process (*chaînes opératoires*), from metal to finished product**

What were the processes and methods of manufacturing metal objects? Here, direct or indirect clues that provide information on the gestures, techniques, skills and know-how of ancient craftworkers will be used to propose reconstructions of the metallurgical production process. As metals are complex materials whose physico-chemical structures condition their reactions, approaches combining material sciences and technological studies will be favored here.

### **4. Exchanges and uses of metallic objects: from archaeological contexts to the laboratory**

All approaches that allow us to question the circulation of metals, whether in the form of ores, ingots, semi-products, finished objects, or fragments of objects, find their place here. From physico-chemical and isotopic analyses to typo-chronological studies, through use-wear analysis and tribological approaches or the detailed study of archaeological contexts, allowing us to address the question of the use, functions and circulation of metal, are considered here.

# PROGRAM

## Day 1: Wednesday 22 November 2023

14:00-14:15: Welcome: Christine Lorre & Rolande Simon-Millot

14:15-14:30: Introduction: Claude Mordant & Martin Sauvage

14:30-14:50: Between East and West – A state of the art: Zahra Hashemi & Marilou Nordez.

### Session 1 (14:50-18:30) Mining and ore extraction activities

14:50-15:10: “*Ancient Southwest Asia - a ‘heartland of metallurgy’ - but where are the mines?*” Vincent Pigott (University of Pennsylvania Museum, USA).

15:10-15:40: “*Fire setting and Herding as practices of Early Mining Communities between Europe, Eurasia and West Asia*”  
Thomas Stöllner (Deutsches Bergbau Museum / Ruhr University, Bochum, Germany).

15:40-16:10: “*The Roua mines: a Neolithic native copper extraction in the Southern Alps (Alpes-Maritimes)*”  
Romain Bussone (Université Paul Valéry, Montpellier 3 / UMR 5140 ASM Laboratory / LabEx Archimede, France).

#### **16:10-16:30: Coffee Break**

16:30-17:00: “*Did British tin sources and trade make Bronze Age Europe?*”  
Alan Williams, Kamal Badreshany, Matthew Ponting, Mia Montesanto & Benjamin Roberts (Project Ancient Tin, Durham University, Leverhulme Trust, University of Liverpool, UK).

17:00-17:30: “*The prehistoric copper mine of Veshnaveh and its relation to some ancient metallurgical sites in central Iran; A mineralogical and archaeometric approach*”  
Nima Nezafati & Thomas Stöllner, (Deutsches Bergbau Museum / Ruhr University, Bochum, Germany).

17:30-18:00: “*Chalcolithic and Bronze Age copper mining at the Internal Betic Ranges (South-East of the Iberian Peninsula)*”  
Ignacio Montero-Ruiz (Instituto de Historia-CSIC, Spain), Mercedes Murillo-Barroso (Universidad de Granada, Spain), Aaron Lackinger (Universidad de Granada, Spain) & Daniel Pérez L’Huillier (Universidad de Granada, Spain).

#### **18:00-18:30: Discussion**

## Day 2: Thursday 23 November 2023

**8:30-9:00: Reception and coffee**

### Session 2 (9:00-15:10)

#### Tools, actors and production loci: specialization and organization

9:00-9:30: *“Fine metalworking tools from Western and Northern Europe during the Metal Ages”*  
Barbara Armbruster (CNRS, UMR 5608 TRACES, Toulouse, France).

9:30-10:00: *“Economy and status of the metallurgist according to Babylonian texts of the 1st mill. BC”*  
Francis Joannès (Sorbonne University, UMR 7041 ArScAn, Paris, France).

10:00-10:30: *“The discovery of new melting furnace types at Ayn Soukhna (early Middle Kingdom) and intentional arsenic alloying for metal casting: an interdisciplinary approach”*  
Georges Verly (PhD Sorbonne university, UMR 8167 Orient & Méditerranée, France), Fr. Rademakers (British Museum, UK), Fl. Téreygeol (CNRS, UMR 3685 NIMBE et IRAMAT UMR 7065, Paris-Saclay, France) Fl. Maqueda (PhD Rennes University, UMR 6074 IRISA, Rennes, France), Cl. Somaglino & P. Tallet (Sorbonne University, UMR 8167 Orient & Méditerranée, Paris, France).

#### **10:30-10:50: Coffee break**

10:50-11:20: *“Late Bronze and Early Iron Age Transformations in South Caucasus Metallurgy”*  
Nathaniel Erb-Satullo (Cranfield University, UK).

11:20-11:50: *“From mould to object... The workshops of metallurgists of the Late Bronze Age in Montélimar and Aubervilliers (France)”*  
Muriel Mélin (Service départemental d'archéologie du Morbihan / UMR 6566 CReAAH, Rennes, France) & Eric Néré (Inrap Valence / UMR 8215 Trajectoires, Paris, France).

11:50-12:20: *“Stones in the toolkit. Contribution of use-wear and residues analysis to the identification of metals production between Europe and the Near East”*  
Caroline Hamon (CNRS, UMR 8215 Trajectoires, Paris, France) & Selina Delgado-Raack (Department of Prehistory, Universitat Autònoma de Barcelona, Spain).

#### **12:20-13:50: Lunch**

13:50-14:20: *“A Late Bronze Age settlement and its metallurgist's workshop at Saint-Avé (Morbihan, France)”*  
Stéphane Blanchet (Inrap Grand-Ouest / UMR 6566 CReAAH, Rennes, France) & Muriel Mélin (Service départemental d'archéologie du Morbihan / UMR 6566 CReAAH, Rennes, France).

14:20-14:50: *“The spatial, social and political organisation of metalworking in southern Scandinavia during the Bronze Age (1700-500 BC)”*  
Anna Sörman (post-doc UMR 6566 CReAAH, Rennes, France / Nantes Université / Stockholm University, Sweden)

**14h50-15h20: Discussion**

## Session 3 (15:10 day 2 – 10:30 day 3) The production process, from metal to finished objects

15:20-15:50: “*Precious metal work from the Early Bronze Age Maikop kurgan, Kuban region, north-western Caucasus (mid-4th millennium BC)*”  
Barbara Armbruster (CNRS, UMR 5608 TRACES, Toulouse, France).

### ***15:50-16:10: Coffee break***

16:10-16:40: “*Gold and its alloys at Middle Bronze Age Byblos*”  
Ziad El Morr (Lebanese Atomic Energy Commission – National Council for Scientific Research, Beyrouth, Lebanon).

16:40-17:10: “*The Rise and Development of Tin Bronze Metallurgy in the Iranian Plateau During the Second and First Millennium BCE*”  
Omid Oudbashi (Department of Conservation of Cultural and Historical Properties, Art University of Isfahan, Iran / Department of Scientific Research, The Metropolitan Museum of Art, USA).

17:10-17:40: “*Bronze weapons in the tombs in Talysh area (Azerbaijan, Iran)*”  
Mathias Haze (CNRS, UMR 7041 ArScAn, Nanterre, France), Christine Lorre (National Museum of Archaeology, Saint-Germain-en-Laye / UMR 7041 ArScAn, Nanterre, France) & Benoît Mille (C2RMF, Paris, France).

## Day 3: Friday 24 November 2023

### **8:30-9:00: Reception and coffee**

9:00-9:30: “*Technological study of the Atlantic Middle Bronze Age ornaments*”  
Marilou Nordez (post-doc CReAAH UMR 6566, Rennes / UMR 5608 TRACES, Toulouse, France).

9:30-10:00: “*Making Bronze Age solid-hilted swords: from chaînes opératoires to craftsmen*”  
Léonard Dumont (Ghent University, Department of Archaeology / Université de Bourgogne, UMR 6298 ArTeHiS, Dijon, France), Ivan Josipovic (Ghent University, Department of Physics and Astronomy, Belgium), Matthieu Boone (Ghent University, Department of Physics and Astronomy, Belgium).

### **10:00-10:30: Discussion**

### ***10:30-10:50: Coffee break***

## Session 4 (10:50-17:00) Exchanges and uses of metal: from archaeological contexts to the laboratory

10:50-11:20: “*Metallic deposits in Ancient Middle East during Metal Ages*”  
Zahra Hashemi (CNRS, ArScAn Laboratory, VEPMO team, Nanterre, France).

11:20-11:50: “*Metals in the Oxus Civilization and the Andronovo Community: goods, practices and exchanges in Bronze Age Southern Central Asia*”  
Élise Luneau (German Archaeological Institut, Eurasia Department, Berlin, Germany; CNRS, UMR 8215 Trajectoires, Paris, France)

11:50-12:20: “*Metrological standardisation of metallic artefacts: between production and exchange requirements. The example of Médoc axes*”

Thibaud Poigt (post-doc UMR 5607 Ausonius, Bordeaux / UMR 5608 TRACES, Toulouse, France), Nicolas Frerebeau (CNRS, UMR 6034 Archéosciences, Bordeaux), Alexis Gorgues (université Bordeaux Montaigne / UMR 5607 Ausonius, Bordeaux, France), Thibault Picard (Master université Bordeaux Montaigne, France).

**12:20-13:50 : Lunch**

13:50-14:20: “*The Bronze Age metal of Gegharot: culture, society and technology*”

Ruben Badalyan (Institute of Archaeology and Ethnography, National Academy of Sciences, Armenia), Khachatur Meliksetian (Institute of Geological Sciences, National Academy of Sciences, Armenia) & Adam Smith (Department of Anthropology Cornell University, USA).

14:20-14:50: “*Gold from the desert – artefact production at Saruq al-Hadid*”

Kristina A. Franke (Ruhr University, Bochum, Germany), Lloyd Weeks (University of New England, Australia) & Zuzanna Wygnańska (Polish Academy of Sciences, Poland).

14:50-15:20: “*Metalwork Wear Analysis: A patinated history*”

Andrea Dolfini (Newcastle University, UK).

**15:20-15:40: Coffee break**

15:40-16:10: “*Producing, using and hoarding in Late Bronze Age: multi-elemental analyses, geometric morphometry and techno-functional approach of the Late Bronze Age 3 axe blades from Auvergne (France)*”

Théo Enudde (Master, université Toulouse-Jean Jaurès, France) & Pierre-Yves Milcent (université Toulouse-Jean Jaurès / UMR 5608 TRACES, Toulouse, France).

16:10-16:40: “*Isotopical and elemental chemical analyses of french metal Bronze Age hoards*”

Cécile Le Carlier de Veslud (CNRS, UMR 6566 CReAAH, Rennes, France).

**16:40-17:10: Discussion**

**17:10-17:30: Final discussion and closing of the conference.**