

## **ASM INTERNATIONAL ARCHAEOMETALLURGY COMMITTEE: SCOPE and MISSION**

The specialty known as Archaeometallurgy embraces the history and development of metallurgy since people first started working native copper ten millennia ago. It is center on the study of the production and use of metals in human societies since that first start and extends to understanding the place of metals in past economies and belief systems. This is a discipline in its own right and is based on its inherent structures and methods and it is also highly interdisciplinary and intersects with all aspects of metallurgy, from the extractive to the physical, and with archeology and history, where they are treated as a continuum.

Archaeometallurgy in its broadest sense involves documenting historical development of industrially significant materials and material technologies is another important part of this Committee. This work is not only important for chronicling human endeavor, but also illustrates important lessons for current and future developments in materials and material technologies. This will be an interdisciplinary effort, bringing contributions from business, engineering, arts, and science fields together in one cohesive format. Chronicling historical developments in material science should also promote this field to the population in general by providing a relatively easily understood method of development and contribution to the society by this field of engineering. In this manner this Committee will link with the ASM International Historical Landmark Committee.

The Archaeometallurgy Committee is built on this framework to provide a venue for members, to meet who work on the characterisation and interpretation of archaeological and historical metallic materials, be they excavated, from museum collections, standing monuments or from industrial or maritime contexts. It also has the aim of giving archaeometallurgists access to current metallurgical data and advances in characterisation and giving metallurgists access to the long history and past experiences of their discipline.

Archaeometallurgy can also be a driver for innovation in metallurgy and materials science through its demands on characterisation, a contributor by offering a long-time frame for microstructural stability, and a source of discovery for novel alloys. Collectively the work will also inform conservation and restoration of the metallurgical heritage and its archaeological and historical context.

This Committee will promote the contribution to education and knowledge exchange between students, professionals, and the public in materials field, archaeology, history, and the cultural heritage. Within ASM this will be through participation in events such as IMAT, through publications and our online presence in ASM CONNECT, and through linking with the ASM International Historical Landmark Committee. The Committee will also develop external connections, initially through the existing link with the Historical

Metallurgy Society (HMS), and then with bodies like the Society for Industrial Archaeology (US), the Association for Industrial Archaeology (UK), and the Nautical Archaeology Society.

The proposed Archaeometallurgy Committee began in September 2020 has developed from a simple idea proposed through ASM CONNECT. A query about interest in this subject met with exceptionally positive responses and interest from ASM members, so we were able to form an Archaeometallurgy community. We now seek to broaden our vision and become a formal committee within ASM International: The ASM International Archaeometallurgy Committee, a formal Committee supported by a broader community, and we will integrate various specialties through activities focused on supporting our mission.

- The objectives of the Archaeometallurgy Committee are:
  - a) Support ASM members and others who study metallic objects from historical/archaeological sites located throughout the world.
  - b) Support cooperation and collaboration between ASM International and other entities related to the recovery of heritage sites and/or historical metallic monuments. This may include bibliographic review, metallographic and mechanical studies of artifacts, chemical compositions, statistical analyses, cleaning, conservation, preservation, etc.
  - c) Provide and help develop best practices for characterization, preventative maintenance, linking historical contexts with manufacturing technology, studying and assessments on historical infrastructure (e.g., old metal bridges).
  - d) Facilitate and encourage the preservation and documentation of legacy sample collections with associated compositional data and micrographs, location and conditions of access for reuse.
  - e) Incorporate colleagues from other fields related to the heritage studies, including pigment studies, authentication studies of ancient coins, etc.
  - f) Organize and host technical presentations on Archaeometallurgy topics for the IMAT conference.
  - g) Learn, connect, collaborate, share, and grow with like-minded members dedicated to the study of Archaeometallurgy.
  - h) Promote the identification of industrially significant materials and material technologies as the subject of further historical investigation. This will be accomplished in a collaborative manner between business and the materials community.

- i) Research, investigate, and document historical developments for selected materials and material technologies. An interdisciplinary approach between materials, arts, and other science communities will be used for this effort.
- j) Act as an Advisory Board to ASM International for selecting and establishing ASM Historical Landmarks.
- k) Promote Archaeometallurgy as a teaching aid by illustrating continuity in technological developments and providing context of the current state of technology.
- l) Promote education (use past “lessons learned” and skills to educate students in new technologies)
- m) Develop and apply artifact restoration and conservation techniques based on material and context of an artifact.

- Work areas of focus include:

- Ancient and historic metallic artifacts
- Ancient and historic maritime and transportation artifacts
- Ancient and historic industrial sites
- Ancient and historic buildings of significance
- Archaeological sites
- Ancient and historic metallurgical research, documentation, and techniques
- Ancient, historic, and modern metallurgical characterization techniques
- Pictorial works and pigments analyses
- Provenance studies of ores and metal artifacts

- Highlights of aspects of study include:

- Experimental archaeometallurgy
- Military vehicles, weapons, and armor
- Studies in historical metallic infrastructure
- Studies in historical means of transport
- Reproduction of historical items and techniques
- Ancient and historic inorganic pigments and coatings
- Impact of metallurgy on society
- Composition and quality of raw materials
- Manufacturing processes and technique
- Evidence of use, trading, and recycling

- Relative chronology and place of origin
- Corrosion and degradation
- Stabilization and conservation treatments
- Non-invasive techniques
- Mechanical properties of materials
- Metallographic analysis as a tool for understanding the ancients' knowledge of the material and its processing
- Conservation, preservation, and maintenance of historical pieces
- Modelling and simulations

The efforts of the Archaeometallurgy Committee concentrate on the characterization – description, analysis, and interpretation – of different types of metal artifacts. The focus of the Committee is to be a technological and historical reviewer from an interdisciplinary context. This perspective is integral to research within the framework of more general archaeological projects.

So, Archaeometallurgy also has much to offer in both materials and heritage education through its documenting the historical development of significant materials and material technologies and this is another important part of the aims of this Committee.

#### **ASM Staff Liaisons**

Scott Henry

Nicole Hale

#### **Officers (proposed)**

**Chair:** Patricia Silvana Carrizo

**Vice Chair:** David Sapiro

**Secretary:** James Churchill

#### **Members**

Patricia Carrizo

David Sapiro

Nassos Lazaridis

Peter Northover

Pankaj Mehrotra

James E. Churchill

Omid Oudbashi

Arsalan Ahmad

Gee Abraham

Patrick Mizik

Nihad Ben Salah

Michael Sadowsky

➤ **Executable goals**

Publish papers in AM&P

Symposium at IMAT

Host webinars

Promotion of the Community in local chapter events

Website and social media

Think about putting together an ASM handbook on “Archaeometallurgy” Methods to accomplish goals

Find speakers for webinars

Coordinate events with members’ local chapters

➤ **Quantify executable goals**

# Papers

1 Webinar

8 Promoted local chapter events (post on ASM Connect)

# Frequency and content of newsletter

➤ **Other ideas**

Webinar with multiple speakers ~15-30 minutes talks

Webinar(s) showing archaeometallurgy in museums (basement tour)

Work with school(s) to create archaeometallurgy curriculum (example at SDSMT)

Publish comment sections to AM&P papers

➤ **Status/completed goals**

2 talks arranged with Notre Dame Chapter (David Sapiro / January 2021 and Patricia Carrizo / February 2021)

1 talk arranged with East Virginia Chapter (Peter Northover / April-May 2021)

1 paper for AM&P (Patricia Carrizo / April 2021)

1 paper for AM&P (Russel Whanhill and Omid Oubashi / July 2021)

1 paper for AM&P (Nihad Ben Salah / November-December 2021)

1 paper for THE CRUCIBLE from HMS (Patricia Carrizo and Peter Northover / Issue 107 Autumn 2021)

➤ **Future goals:**

A Track for next IMAT 2022, with 12-15 works sent by members from this Community and researcher working on the field around the world and members of other communities.