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GUEST EDITORIAL

Special Issue: Archaeometallurgy

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In recent decades, archaeologists, engineers, and scientists were interested in identifying ancient and historic materials and technologies; this led to establishing a branch of archaeology known as archaeological science or archaeometry. Metals have been used since about 10,000 years ago in the ancient world for different purposes and this technology has been developed and improved over time by using native metals (gold and copper), melting and casting techniques, smelting processes of different types of ores, development of different alloys, as well as forming, shaping, and forging techniques and methods. Archaeometallurgy, or the study of ancient metallurgical processes, tries to answer archaeological and historical questions by analysis of different types of metallurgical materials from artifacts to slags, crucibles, and ores. Scientists from different fields apply modern analytical methods to study the chemistry, mineralogy, microstructure, and other properties of metallurgical materials to figure out the processes and techniques used by ancient metalworkers. The questions arising in archaeometallurgical studies are: Which metal/alloy has been used to produce the artifacts? How were the artifacts manufactured or shaped? Where are the raw material resources used to produce metallic artefacts? And where are the artifacts produced? Thanks to the development of analytical techniques in recent decades, archaeometallurgical studies are extended worldwide and we have interesting information about the ancient metallurgical and metalworking processes. Of course, there are many questions that are unanswered and it is necessary to extend field and laboratory works to characterize unidentified aspects of ancient and historic metallurgy around the world.

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This special issue includes 13 interesting, high-quality papers that report exciting results of analytical and field studies on different types of ancient and historic metals and metallurgical materials. Papers are variable from different viewpoints:

1. The subjects are different, including papers that conducted analytical work to characterize metalworking techniques used to produce ancient and historic copper-base artifacts, identifying manufacturing techniques used to produce ancient iron objects or historic steel rail-

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ways, silver embrittlement and its concepts, relationship between ancient metallurgy and glazing, as well as the study of ancient silver mining and iron slags.

2. The authors and researchers used a variety of analytical methods according to their questions and then analyzed materials to figure out scientific answers. These methods are apparently a combination of chemical/physical and microscopic techniques by which they could find interesting aspects of ancient metallurgy in different regions and periods.

The field of archaeometry remains very fascinating for further studies, as more archaeological and historical evidence of metallurgical activities are to be found now and in the future and more questions will arise. Furthermore, development of analytical and microscopic methods will help archaeometallurgists and archaeological scientists to clarify hidden aspects of ancient metallurgy and metalworking in the future. Finally, we would like to thank all the authors for contributing to this issue with their excellent research and to thank all the reviewers for performing unbiased evaluations and providing helpful comments.

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