

### **Metal Response Paper**

It is often hard to separate technology from the context in which it was developed, and so it is important to understand not only how artifacts were made but also why. The role ritualistic and spiritual beliefs can play in the production process can often drive it in a particular direction, as seen in Gordon and Killick's (1993) article and "The Last Ironmaster" documentary. In the former, iron bloomery smelting in the Eastern Adirondacks and in Malawi, Africa are analyzed, pointing out how a culture's economic or spiritual mentality can affect the direction in which technology develops. In the latter, a native, Dokwaza, reenacts a traditional smelt, including certain symbols for strength, potency, and achievement along with certain rituals to honor his ancestors and bring him luck. Though these two examples focus on different aspects of the culture, it is important to note their use of multiple perspectives in fully understanding the artifacts that represent them. Two additional articles, "Metals, microanalysis and meaning: a study of metal objects excavated from the indigenous cemetery of El Chorro de Mai'ta, Cuba" and "Metal Pollution Jordan," will demonstrate other ways of incorporating social and material relationships to describe the metal production process in greater detail and highlight areas of needed emphasis.

Martinon-Torres et al. represents how knowledge of the culture can be used in conjunction with scientific data effectively. The authors studied the manufacture, composition, and origins of different alloys in beads and small metal objects to better understand the value placed on these objects and the nature of their trade. They discovered through a combination of archaeometric techniques and ethnohistoric research that ternary alloys found at El Chorro de Mai'ta were not produced locally, but were

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rather imported from continental South America. Brass making technology was also found to be imported, this time from the Europeans, providing insight into the interactions between these two culture groups. Furthermore, they go a step further to discuss the metal symbolism among the Taino. They also explain how the natives' beliefs in metal as supernatural materials were taken advantage of by the Spanish to acquire gold for themselves. Overall, Martinon-Torres et al. used detailed material analyses as a foundation upon which to build a broader social and cultural framework.

Grattan et al. establish a strong background history of anthropogenic metal pollution at the Faynan Orefield in Jordan, however they fall short of tying social or cultural reasons to the scientific evidence they found. The authors find that the rate of production fluctuated greatly over the eight thousand year period they studied, however they do not provide reasons for this rise and fall. What events could have caused these shifts, were there social or economic factors involved, and how did other cultures influence the production in Southern Jordan? Also, the process in which copper was smelted was using wind generation. However, Grattan et al. state this was a very inefficient method. So, what spiritual, ritualistic, or other beliefs did the natives hold that would cause them to continue to produce below potential? Though the authors effectively relate their focused study on copper smelting and mining to a larger picture, ultimately they need to take their analysis one step further to add a social and cultural dimension to their already globally integrated analysis.