BOOK REVIEWS

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Review of:
Knapp, A.B., Pigott, V.C. and Herbert, E. W. (eds.) 1998. *Social Approaches to an Industrial Past. The Archaeology and Anthropology of Mining*. London and New York: Routledge. 306 pages. ISBN 0-415-18150-X.

Instead of simply presenting yet another publication on archaeometallurgical studies, this review aims to underline the importance of *Social Approaches to an Industrial Past. The Archaeology and Anthropology of Mining* by Knapp, Pigott and Herbert (1998) in terms of the latest developments in world archaeometallurgy. As an inter-disciplinary field of research, archaeometallurgy seems to have finally come of age. This gradual evolution has, however, been characterized by several methodological diversifications as well as inherent limitations in the analytical techniques it applied to materials research. More recently, theoretical advances and anthropological models have increasingly contributed to the contextualization of analytical data. A detailed evaluation of the book in question is therefore preceded by a chronological overview of the methodological and theoretical changes which occurred in the field of archaeometallurgy during the last three decades.

In her 1991 article, Martha Goodway discussed the evidence for a so-called "paradigm shift" which took place in archaeometallurgical research at that time. Until the early 1980s, metallurgical studies focused on the technical examination of metal artefacts and on the determination of site plans of metallurgical installations. Essentially, the discipline up to that moment could be seen as a part of ancient technological studies often using an art-historical approach accompanied by scientific analyses. In one of the main early textbooks for archaeometallurgy, *A History of Metallurgy*, Tylecote (1976) reviewed the material in a mainly chronological framework, adhering to the traditional view of technological progress and diffusionism.

During the 1980s and early 1990s, however, researchers started to pay more attention to other associated remains, especially by-products of metal processing such as matte and slag, and to refractory materials such as tuyères, furnace lining and crucibles. As a part of this move towards a contextual approach, Bachmann for the first time proposed a "checklist" for excavators with expected and possible classes of archaeometallurgical, geological and archaeological material (Bachmann 1982: 2-7).

Furthermore, the field of study had become more inter-disciplinary and was enlarged to incorporate materials science, social archaeology and material culture studies. On the one hand, the social significance of metalworkers and the symbolic values originating from technical production systems were studied as part of reconstructions that incorporated mining, smithing, and casting, as well as the ritual and socio-political aspects of metalworking. Eugenia Herbert's *Red Gold of Africa* (1984) is an excellent example of such an approach. On the other hand, analytical data were used to support archaeological arguments on the deliberate manipulation of technology in politico-religious contexts. Dorothy Hosler in *The Sounds and*

Colors of Power (1994) argued convincingly for the development of deliberate alloying techniques to create metals with specific symbolic properties in religious Meso-American contexts, an argument supported by an impressive list of analytical results. The reluctance to embrace social theory in a previously purely analytical field characterized by typologies seemed to have ceased and archaeometallurgy had started to adopt post-processual theories - somewhat belatedly in comparison to archaeology in general. Its newly found purpose even increased the diversity and productiveness in the study of ancient technologies.

The adaptation of new analytical techniques such as EPMA, SEM, AAS or ICP led to a simultaneous shift in methodology. Instead of simply concentrating on chemical analysis and microstructure, archaeometallurgical studies were now also concerned with materials characterization. The properties and performance of installations and materials had become the main focus, as the combination of experimental reconstruction, laboratory analysis and contextual evaluation of furnace remains in the Timna volume shows (Rothenberg 1990).

Although the discipline as it stands today seems to be firmly rooted in archaeological studies of process and context, it still has not fulfilled its true potential in most cases, as predicted in a sense by Goodway (1991). Geology, ethnoarchaeology and archaeological theory have now become a standard part of the majority of archaeometallurgical projects. The publication of the St.Veit-Klinglberg excavations is one example of such a research design (Shennan 1995). Nevertheless, in most cases archaeologists and archaeometallurgists alike still need to make the connection between the reconstruction of a production process and its socio-economic role in society. Even one of the most recent comprehensive publications on early mining and smelting (Craddock 1995) merely contents itself with a discussion of material properties and chemical reactions in the traditional intellectual framework of technological diversity and linear evolution. Although the data itself **is** extremely useful for strict archaeometallurgical analysis, the book does constitute a missed opportunity for the study of ancient industrial societies.

With the publication of the papers presented at the Bellagio Conference on the Archaeology and Anthropology of Mining, archaeometallurgy seems to have finally achieved its full potential in becoming a multi-disciplinary and inter-disciplinary field of research. As the title suggests, the anthropology and archaeology of mining are conceptualized here as social approaches to an *industrial past* and not simply as the reconstruction of ancient technologies with some obvious socio-economic implications. In an attempt to integrate such divergent approaches as the study of socio-economic, spatial and ideological dimensions of past industrial cultures, as well as the history of technology and the reconstruction of practical production techniques, Knapp points out that: "contributors to this volume focus on the social context of the mining or metallurgical community as revealed in the material, ethnographic and ethnohistoric records of various cultures worldwide, from prehistory to the recent past" (Knapp et al. 1998: 1). Therefore, from the outset the emphasis lies on mining communities as social constructs based on a shared interest and occupation rather than on a fixed location, since settlements and structures were always notoriously temporary or transitory throughout mining history.

The book not only addresses often still neglected fields of research in world archaeometallurgy (Part 1, Historical Archaeology), but equally contains new approaches to more traditional study areas (Part 2, Anthropology and Social History; Part 3, Prehistory and Protohistory). The mining community studies focus on such topics as the role of gender (Lawrence, Chapter 3 and Simmons, Chapter 4), ethnic diversity (Hardesty, Chapter 5), and colonialism and imperialism (Ehrenreich, Chapter 7) in the development of industrial societies and mining settlements. Rather than maintaining the focus on heterogeneity and conflict, the authors in this volume investigate the role of economic and social integration.

The section on pre- and protohistory spans a geographical region from Central Europe to Thailand and Egypt and contains mostly discussions of socio-political models. This does not mean, however, that the authors simply satisfy themselves with a traditional appendix on possible hierarchical systems and power strategies inferred from a proposed technological system, nor is this a return to a functionalist environmental determinism or an essay on variations in production techniques. It is rather a complete re-evaluation from a structuralist perspective of the interaction between landscape and society, in which miners and smelters create an archaeometallurgical landscape which in turn modifies their socio-economic conditions.

Examples range from the organisation of mining expeditions in Egyptian frontier environments (Shaw, Chapter 15), to innovative ways of interpreting production, value and exchange in the Bronze Age Alps. In this latter chapter, the usual relations of domination and resistance between monopoly exchange partners are convincingly replaced by models of small-scale, autonomous, and relatively egalitarian copper-producing communities (Shennan, Chapter 12). The reconstruction of a technological system in northeast Thailand, involving a less intensive and community-based mode of craft production, interestingly leads Pigott to propose the development of a heterarchical social system (Pigott, Chapter 13). It seems that hierarchy has gone largely out of fashion as an explanatory model for the socio-economic organization of metallurgical production. I would personally not like to argue for its total abolition as an explanatory framework, but merely for assigning it a more nuanced role in world archaeometallurgy.

The final section (Part 4, Overviews) contains two excellent summaries. Pfaffenberger's work has been long known amongst archaeometallurgists and students of the anthropology of technology (for example Pfaffenberger 1992). Here, he reviews some of his earlier theories on *chaînes opératoires* and sociotechnical systems, as advocated by many French anthropologists and archaeologists (see for instance Leroi-Gourhan 1943 and Lemmonier 1993), in the light of recent developments. As such, this paper (Pfaffenberger, Chapter 18) forms a welcome counterbalance to the overemphasized importance of social interaction in the community studies model for creating fields of intersubjective meaning. A reassessment of technology as "not so much a matter of *things*, but of *activities*" leads the author to conclude that through the choice of technique people are able to express both meaning and political intention (Pfaffenberger, Chapter 18, 294). Technology and society obviously need to be fully reintegrated.

Killick points out that issues such as class, ethnicity, material culture, gender and power cannot be studied on the small scale of archaeological excavations (Killick, Chapter 17). He especially notes how problematic the identification of ethnic groups can be when confusing socially defined ethnicities with biological variation, as Meyer (Chapter 16: 270) seems to do (Killick, Chapter 17: 284). Some excavations have already opted for an adapted research design in the hope of extracting far more information than usual from technological data and settlement patterns. The latest article on the St.Veit-Klinglberg Early Bronze Age mining and smelting communities markedly concentrates on the role of cost, benefit and value in metallurgical production (Shennan 1999). One of the more innovative ways of achieving this, however, is through the development of a modern inter-disciplinary survey methodology, which is suitable for the reconstruction of entire ancient industrial landscapes and informed by the latest developments in social approaches to such landscapes. The Sydney Cyprus Survey Project, for example, conceptualizes the archaeometallurgical landscape as a profoundly influential factor in the creation of personal and cultural identities. It is, in turn, used by the people who inhabit it and imbue it with personal, ideological and economic significance (Given et al. 1999 *in press*). A chapter on one such field-project might have been a welcome addition to the book.

The only serious criticism one could have regarding this publication of the conference proceedings is the complete absence of analytical data to support theoretical models or to illustrate proposed technical systems (although it could be argued that this is beyond the scope of this book). As Pfaffenberger himself states: "I shall argue that just as a fixation on technology and machines obscures the human and social dimensions of mining communities, so too does a sharp distinction between technology and society obscure some of the factors that give mining communities their distinctive dynamics" (Chapter 18, 291). Despite this handicap, this otherwise admirable book is bound to become one of the main textbooks for future students of archaeometallurgy and a milestone in the continuous development of an increasingly innovative discipline. It goes a long way towards balancing the previously prevailing views on sociotechnical systems and mining communities by finally integrating social archaeology and archaeometallurgy.

References

Bachmann, H.-G. 1982. *The Identification of Slags from Archaeological Sites.* London: Institute of Archaeology. Institute of Archaeology Occasional Publication No.6.

Craddock, P.T. 1995. *Early Metal Mining and Production*. Edinburgh: Edinburgh University Press.

Given, M.G., Knapp, A.B. and Meyer, N. 1999 (in press). The Sydney Cyprus Survey Project: An Interdisciplinary Investigation of Long-Term Change in the North Central Troodos, Cyprus. *Journal of Field Archaeology* 26 (1): 1-36.

Goodway, M. 1991. Archaeometallurgy: Evidence of a Paradigm Shift?, in Vandiver, P.B., Druzik, J. and Wheeler, G.S. (eds.). *Materials Issues in Art and Archaeology II. Symposium held April 17-21, 1990, San Francisco,*

California. Pittsburgh: Materials Research Society. Materials Research Society Symposium Proceedings, Vol. 185: 704-712.

Herbert, E.W. 1984. *Red Gold of Africa. Copper in Precolonial History and Culture*. Madison, Wisconsin: University of Wisconsin Press.

Hosler, D. 1994. *The Sounds and Colors of Power*. Cambridge: MIT Press.

Lemmonier, P. (ed.) 1993. *Technological choices. Transformations in material cultures since the Neolithic*. London-New York: Routledge.

Leroi-Gourhan, A. 1943. *Evolution et techniques: l'homme et la matière*. Paris: Albin Michel.

Pfaffenberger, B. 1992. Social Anthropology of Technology. *Annual Review of Anthropology* 21: 491-516.

Rothenberg, B. (ed.) 1990. *The Ancient Metallurgy of Copper. Archaeology -Experiment-Theory*. London: Institute of Archaeo-Metallurgical Studies, Institute of Archaeology, University College London. Researches in the Arabah 1959-1984, Vol.2.

Shennan, S. 1995. *Bronze Age copper producers of the eastern Alps: excavations at St.Veit-Klinglberg*. Bonn: R. Habelt. Universitätsforschungen zur Prähistorischen Archäologie 27.

Shennan, S. 1999. Cost, benefit and value in the organization of early European copper production. *Antiquity* 73: 352-63.

Tylecote, R.F. 1976. *A History of Metallurgy*. London: Institute of Metals.