

IA Reviews

Ancient Mesopotamian Materials and Industries: The Archaeological Evidence. By P. R. S. Moorey. Oxford: Clarendon Press, 1994. xxiii+414 pp., 24 figs., 8 plates, 5 maps, notes, bibl., index. \$105.00 hb.

This volume is a comprehensive compilation of archaeological, ethnographic, analytical, and textual evidence for the crafts and industries that were responsible for ancient Mesopotamian material culture. The compilation focuses on the raw material sources, production techniques, and functional uses of virtually every kind of material product evident from Mesopotamia c. 8000–300 B.C., from alabaster to zinc. It is a key reference not only for specialists in the ancient Near East, but also for those interested in the history of craft production and technology.

Moorey (Keeper of Antiquities at the Ashmolean Museum in Oxford) successfully provides us with a Mesopotamian counterpart to the invaluable volume on Egypt by A. Lucas (*Ancient Egyptian Materials and Industries*, 4th ed., rev. by J. R. Harris, 1962), while producing balanced interpretations based on multiple lines of evidence. This work is more comprehensive and impressive than the standard text on Greek and Roman technology (K. D. White's *Greek and Roman Technology*, 1984), and overcomes the many shortfalls of the nine-volume *Studies in Ancient Technology* series by R. J. Forbes (2d ed., Leiden: E. J. Brill, 1964–72).

The volume is divided into seven parts: a lengthy introduction; two sections on stoneworking (common and ornamental); bone, ivory, and shell; ceramic and glassworking; metalworking; and building crafts. Each section is well organized by individual material, with as many as eight subheadings for materials such as copper (support technology, sources, mechanical properties and varieties, repertory of objects, workshops and manufacturing equipment, techniques, use of metal tools, list of published analyses by site). The sections on metalworking, glassworking, and glazed materials are extensively revised versions from the author's earlier monograph (*Materials and Manufacture in Ancient Mesopotamia*, Oxford: British Archaeological Reports, 1985).

Moorey insightfully discusses the different kinds of information that texts and material evidence generally provide,

the former relating more to the craftspeople and their socio-economic role, and the latter relating more to the crafts themselves and their production technology. Furthermore, the texts tend to be concerned with elite-centered activities, whereas archaeological material may be found in both elite and non-elite contexts. Tablets from palaces and temples inform us about accounting procedures, but little about craft practices, the origins of the raw materials used, or the role of women. Workshops most likely would have been located on the periphery of or outside the palace complex, or even far away in the case of "anti-social" crafts such as tanning, and kiln and furnace firing. Moorey also argues that each craft cannot be studied in systematic isolation, since there is every reason to believe that multiple types of craft production were closely linked, especially in urban communities.

Mesopotamian craft production was almost entirely dependent on raw materials acquired from adjacent regions. The circulation of goods (e.g., obsidian) is evident as early as the appearance of food production, while the demand for materials increased enormously along with urbanization and the emergence of state-level societies in the 4th millennium B.C. Raw materials were obtained in exchange for the manufactured products of the highly organized Mesopotamian labor force and also as booty or tribute. The role of water-based transport cannot be underestimated, with both the Tigris and Euphrates rivers providing access to Turkey and Syria, and the Persian Gulf, at least up to the legendary Dilmun (Bahrain), Magan (Oman), and perhaps Meluhha (Indus Valley). The donkey was available by the 4th millennium B.C., but camel caravans came into general use only in the 1st millennium B.C.

In all cases, I found the coverage of specific materials to be excellent. Each material is fully described and discussed, along with its geological or physical properties, how it can be identified, how and where it was produced (expertly linking relevant ethnographic and technical data with archaeological evidence for workshops), where it has been found (with critical discussion of archaeological contexts), and how it was used. Moorey is fair yet cautious in interpreting limited analytical and statistical data on geological sources of obsidian, copper, and tin; he masterfully culls information on the use of ivory from historical documents, zoological and archaeological remains. There are a few

pages on the production of cylinder seals, 25 on glass and glassmaking, and a paragraph on tortoiseshell. The uses of wood and reeds as building materials are detailed and based primarily on evidence from texts and reliefs, rather than on actual archaeological finds. The sections on brickwork and plasterwork are extremely enlightening for those concerned with architectural design and execution. Lastly, Moorey's reviews of stoneworking, potmaking, faience, and metallurgy are substantial, reflecting their ubiquity and central place in the archaeological record of Mesopotamia.

The volume is hardcover, with text in a two-column format and very few typographical errors. I was surprised, however, to find so few illustrations (only 24 figures, plus 8 plates and 5 maps). There is only one graphic in the chapter on bone, ivory, and shell, and not a single illustration of ceramic or metal artifacts—just a few representations of potmaking, some kilns, and bronze-working moulds and debris. Moorey simply refers the reader to “the standard and fully illustrated books on Mesopotamian art and architecture,” including M. Roaf's *Cultural Atlas of Mesopotamia and the Ancient Near East* (New York: *Facts on File*, 1990). The bibliography is up-to-date, and its more than 2,000 items serve as a valuable reference tool in itself. Finally, one can search the detailed index for materials and industrial terminology, as well as sites and names.

The comprehensiveness of the work and the depth of archaeological and historical scholarship produced by the author ensure that this book will remain vital for decades to come. An essential reference for anyone concerned with ancient Mesopotamian material culture, it is well worth the hefty price.

Robert H. Tykot

Early Metal Mining and Production. By Paul T. Craddock. Washington, DC: Smithsonian Institution Press, 1995. xix+363 pp., illus., tables, bibl., index. \$59.00 hb.

This volume is an important addition to anyone's bookshelf who is interested in the development and details of metallurgical production from around the world. It provides a very good overview of the processes by which different native metals and ores were mined, transformed into metal, and then made into objects. Craddock focuses on recent archaeological and laboratory evidence of the earliest, often “primitive” metallurgical processes, but he also includes the inception of more “sophisticated,” industrial-scale techniques. He, therefore, is careful to cover such significant innovations as

blast-furnace technology, hydraulic mining, the change from charcoal to coke fuels, and the manufacture of brass.

Craddock seems to assume a certain level of knowledge from his readers. Newcomers to the discipline might become overwhelmed by the large vocabulary of technical terms on metallurgical production and laboratory analysis that fill the text. Craddock works hard to define many terms, which he flags by italicizing them, but he does not have a glossary for those readers who might need some reminding later on in the book. In addition, the large number of typographical errors throughout the text and index could cause some readers further confusion with the metallurgical lexicon. For those who have some basic training in metallurgy and archaeometallurgical analysis, this volume will significantly enhance and update that background.

The book is organized into eight chapters. The introduction is particularly useful for archaeologists who are relatively inexperienced in excavating metallurgical sites and determining the appropriate analyses for the remains. Craddock provides some helpful tips on how to identify and date the retrieved artifacts of metallurgical processes as well as some important advice on sampling artifacts, selecting appropriate analytical techniques, and interpreting the results. He continues to offer such insights throughout the book. Craddock groups the other seven chapters around two main foci: mining and metallurgical processes, and extraction of particular metals.

Four chapters present the primary metallurgical processes that were developed in antiquity. These include various mining techniques and tools, the treatment of native metals, the different techniques used to smelt metals, and the distinct components and materials involved in the smelting process. Notably, he does not pay much attention to specific casting technologies, such as lost-wax casting which was an important development in many parts of the world.

The last three chapters provide details on the extraction of particular metals (i.e., lead, silver, iron, steel, and volatile metals such as arsenical copper, brass, mercury, and zinc) and their manufacture into particular objects (e.g., Damascus blades). It is somewhat surprising that Craddock does not devote a chapter to copper and its alloys, but he does cover many aspects of the topic under native metals, smelting processes, and the production of volatile metals.

Discussions and hypotheses about the history of these developments around the world appear throughout the seven chapters. Craddock's distinct bias toward the Near East, Europe, and the Far East is readily apparent, yet he