



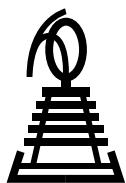
ENKI & PTAH

Journal of Technology and Trade
in Ancient Egypt and Western Asia

Vol. 1 / 2025



UNIVERSITÀ
DEGLI STUDI
DI MILANO



ENKI & PTAH

Journal of Technology and Trade
in Ancient Egypt and Western Asia

Vol. 1 / 2025



Milano University Press

Cover illustration

The workshop area of Level 3b at Logardan, ©FARMQaD, French Archaeological Mission in the Qara Dagħ

Editors in chief

Alessandro Cavagna

Luca Peyronel

Advisory Board

Pascal Butterlin (France), Stefano De Martino (Italy), Aidan Dodson (United Kingdom), Barbara Helwing (Germany), Andrea Manzo (Italy), Patrizia Piacentini (Italy), Piotr Steinkeller (USA), Myriam Wissa (USA), Gihane Zaki (Egypt - France)

Editorial Board

Michael Campeggi, Benedetta Giudici, Lorenzo Guardiano, Valentina Oselini, Ilaria Sieli, Agnese Vacca

Language Editor

Michael Campeggi

Graphic and Pagination Design

Filippo Trogi

Logo and Cover Design

Daniele Bursich

Address

Milano University Press – University of Milan

Via Festa del Perdono 7

20122 Milan, Italy

<https://riviste.unimi.it/index.php/enkiandptah>

The volume was published with the contribution of Dipartimento di Studi Letterari, Filologici e Linguistici – University of Milan

Copyright © 2025 Authors. The authors retain all rights to the original work without any restrictions, provided, however, that in the event of any republication, the authors are required to acknowledge the original venue of first publication.

The Journal, in compliance with the principles of Open Science promoted by the University of Milan, is an editorial tool for the implementation of freedom of access to scientific literature, and for the dissemination of research results. The journal are published in open access, to ensure the widest possible dissemination and circulation of knowledge scrutinized by the scientific community. Volumes are published under the Creative Commons - Attribution-ShareAlike 4.0 International License.



ISSN:

Editorial

Alessandro Cavagna, Luca Peyronel

7

Articles

Melanie Wasmuth, Tero Alstola, Ellie Bennett, Amy Rebecca Gansell, Yaser Malekzadeh, Jessica Nitschke, Gillian Ramsey Neugebauer, Jason Silverman, Joonas Sipilä, Joanna Töyräänvuori, Caroline Wallis

11

Kingship and Queenship in the Ancient Near Eastern Empires of the 1st Millennium BCE: The Economic Basis

Massimo Maiocchi

85

A Critical Examination of the Current Paradigms on the Origin of Writing in Mesopotamia

Claire Padovani and Melania Zingarello

101

An Emerging Proto-Industrial Paradigm: Recent Data on the Organisation of Ceramic Production in Ur III Mesopotamia

Ilaria Sieli

123

Trade Routes and Grave Goods: Pathways of Commercial Exchange and Cultural Hybridisation Between Early Egypt and Lower Nubia – A View from the Necropolises

Ahmed Mansour

179

Decoding Ancient Egyptian Metalworking: A Textual Analysis of Old Kingdom Iconography

Reviews

R.W. Redding (ed.), *A View from the Herd. Cattle, Sheep, Goats, and Pigs in Pharaonic Egypt. A Primer for Egyptologists and Archaeologists* (Archaeobiology V), Lockwood Press, Columbus (GA) 2024

201

Benedetta Giudici

N. Borrelli and G. Scazzosi (eds), *After the Harvest. Storage Practices and Food Processing in Bronze Age Mesopotamia* (Subartu XLIII), Brepols, Turnhout 2020

205

Valentina Tumolo

A. Bats and N. Licitra (eds), *Storage in Ancient Egypt and Nubia. Earthen Architecture and Building Techniques*, Sidestone Press, Leiden 2023

209

Lorenzo Guardiano



Editorial

Alessandro Cavagna¹, Luca Peyronel²

 AC 0000-0003-2367-4457, LP 0000-0002-4952-5401

¹Università degli Studi di Milano (00wjc7c48)

It is with great pleasure that we introduce the first issue of *Enki & Ptah. Journal of Technology and Trade in Ancient Egypt and Western Asia*, a new peer-reviewed scientific publication dedicated to the study of technology, scientific knowledge, crafts, exchange in the ancient societies of Egypt, Nubia, the Eastern Mediterranean and Western Asia. Ranging from prehistory to the Hellenistic and Roman periods, the journal offers an interdisciplinary platform for exploring the material foundations of ancient economies and the cultural dynamics that shaped them. *Enki & Ptah* was conceived with the ambition to bring together complementary perspectives from archaeology, history, and philology, and to foster a cross-regional and diachronic approach to the study of ancient technologies and exchange interactions. By placing Egypt, the Eastern Mediterranean and South-Western Asia within a shared analytical framework, the journal highlights the interconnected worlds of technological innovation, craft specialisation and long-distance trade, and the many ways in which these shaped social and economic structures over time. Rooted in the long-standing Italian tradition of Egyptology and Near Eastern studies, the journal aims to serve as an intellectual meeting ground for scholars

investigating the technological, economic and social dynamics of pre-modern cultures, while also fostering methodological innovation and new interpretative frameworks. Its scope embraces a broad thematic and chronological range, inviting contributions on raw-material procurement and processing, production and distribution systems, archaeometric and scientific analyses, as well as textual and iconographic sources on technology and know-how. Particular value is placed on studies that illuminate the transmission of technical knowledge across regions or periods, or that explore the relationship between innovation, environment, agency and local traditions. A defining feature of *Enki & Ptah* is its commitment to interdisciplinary dialogue. The journal encourages the integration of archaeological, scientific and textual evidence, offering a space in which methodological reflection and theoretical perspectives can inform new understandings of ancient technologies and economies. We especially welcome research that challenges disciplinary boundaries or proposes innovative approaches to the study of craft practices and exchange networks. Co-directed by its editors together with a dynamic board of early-career researchers from the University of Milan, *Enki & Ptah* adopts a double-blind peer-review

system and benefits from the guidance of an international scientific committee composed of leading specialists in Egyptology, Assyriology, and the history and archaeology of ancient Western Asia. The journal consists of a section of research articles and a section dedicated to reviews of recent volumes relevant to its areas of interest. Published by the Milano University Press in open access, with print-on-demand options, *Enki & Ptah* reflects the University of Milan's commitment to fostering high-quality, accessible and interdisciplinary research, according to the FAIR principles. This first issue opens with a substantial collaborative article by a team of scholars from the Centre of Excellence in Ancient Near Eastern Empires at the University of Helsinki. Their contribution offers a far-reaching comparative analysis of the relationship between kingship and economic structures in ancient Western Asia, a field of research that has recently experienced a notable revival, enriched by new methodological perspectives. The article presents a systematic diachronic comparison spanning more than a millennium, examining the economic foundations of kingship and, to a lesser extent, queenship, across seven major empires (Neo-Assyrian, Neo-Babylonian, Teispid-Achaemenid, Seleucid, Ptolemaic, Arsacid and Roman). Particular attention is given to the distinction between "state" and "royal" assets and expenditures, explored here to an unprecedented degree. Massimo Maiocchi's article addresses the methodological and historiographical challenges surrounding the study of the earliest writing systems of south-western Asia and northern Africa: proto-cuneiform, proto-hieroglyphic and proto-Elamite. A reassessment of the scholarly debate reveals persistent disciplinary biases and the modern prestige attributed to literacy, which have long

shaped narratives that overstate writing as the primary marker of civilisation. By exposing these ideological assumptions, the study advocates for a more balanced interpretive framework that situates the origins of writing within the broader cultural, technological and social dynamics of the late 4th millennium BCE. The contribution by Padovani and Zingarello examines the mechanisms of control and management of ceramic production during the late Early Bronze Age in northern Mesopotamia, adopting an explicitly archaeological perspective grounded in the analysis of manufacturing contexts, particularly in light of recent discoveries in Iraqi Kurdistan. Focusing on the site of Logardan, the authors present newly uncovered workshops equipped with large and technically sophisticated firing installations. Drawing on fresh spatial, architectural and technological data from ongoing excavations, the study reassesses long-standing assumptions about the political, technical and socio-economic dimensions of pottery manufacture under the first empires of the 3rd millennium BCE, highlighting an incipient trajectory towards proto-industrialisation. Ilaria Sieli's article investigates the relationships between Lower Nubia and Egypt through the analysis of three cemeteries belonging to different phases of the A-Horizon, the earliest cultural horizon of the region. By tracing changes in funerary customs and their implications for Nubian society, and by emphasising regional distinctions within Lower Nubia, the study highlights episodes of contact, tension and divergence with Egypt, as well as instances of creolisation that made Lower Nubia a key interface between distinct cultural spheres. The final contribution, by Ahmed Mansour, turns to the emerging field of ancient Egyptian metallurgy. Despite numerous scientific analyses on metal

composition and technology, our understanding of early manufacturing processes and working conditions remains fragmentary. By examining the written evidence that accompanies Old Kingdom metallurgical scenes, the article integrates textual and visual data to clarify technical procedures, operational stages and the demanding working environment of ancient metalworkers. Together, these sources offer a more accurate and coherent reconstruction of one of Egypt's most specialised industries.

As this inaugural issue brings together diverse perspectives on handicraft production, exchange, and economic systems across ancient societies, we invite our readers and contributors to join us in a shared space where new findings, approaches and ideas may converge, shedding fresh light on the complex interactions and cultural meanings that shaped the procurement, transformation and circulation of materials and products in ancient Egypt and Western Asia.

■ **How to cite:** Giudici, B. 2025. Review: R.W. Redding (ed.), *A View from the Herd. Cattle, Sheep, Goats, and Pigs in Pharaonic Egypt. A Primer for Egyptologists and Archaeologists* (Archaeobiology V), *Enki & Ptah* 1: 201-204.
DOI: <https://doi.org/10.54103/eap/27339>



ENKI & PTAH

Journal of Technology and Trade
in Ancient Egypt and Western Asia

Review: R.W. Redding (ed.), *A View from the Herd. Cattle, Sheep, Goats, and Pigs in Pharaonic Egypt. A Primer for Egyptologists and Archaeologists* (Archaeobiology V), Lockwood Press, Columbus (GA) 2024, 190 p, Paperback - \$69.95, ISBN: 978-1-957454-08-5

Benedetta Giudici¹

 BG 0009-0001-4118-3902

¹Università degli Studi di Milano (00wjc7c48)

Corresponding author: benedetta.giudici@unimi.it

Redding's volume is structured into 17 chapters and organized in six sections. The introductory section includes a chronological table of Ancient Egypt, spanning from the Early Dynastic to the Ottoman Period, curated by Salima Ikram. Other sections were reviewed and partially revised by contributors following the author's premature death. The book is 190 pages long and includes 42 figures (21 of which are in colour, many taken by Redding himself) and 36 tables presenting data gathered during fieldwork in Egypt. The first section (pp. XVI-22) includes a brief preface, a list of abbreviations, the chronological outline of Ancient Egypt, and three chapters. In the first one (pp. 1-4), Redding examines the evidence of the significance of cattle, sheep, goats, and pigs in Pharaonic Egypt. Their importance is reflected in the presence of these animals in tomb scenes – except for pigs –, as well as in their mention in texts, in the discovery of various zoomorphic artifacts, and in the predominance of their bones among archaeological remains from several sites in Egypt. For each of these sources, the author provides a reference bibliography, creating a comprehensive *status quaestionis* on the topic. In particular, Redding highlights studies by Salima Ikram (1995;

2005; 2006; 2015), Carol Yokell (2004), and Paul Leonard Jones (2021). The author strongly emphasizes the critical role of these animals in a context like Egypt, where cattle, sheep, goats, and pigs formed the backbone of the institutional economy. Redding briefly outlines the theoretical background underlying the study presented in the book: humans make decisions and act as agents within a Complex Adaptive System (CAS), a concept widely used in evolutionary ecology and ecology (p. 2) and applied to Egyptology by scholars such as Mark Lehner (2000), Sarah Symons and Derek Raine (2008). Using the concepts of CAS – without fully adopting it as a model – and Complexity Theory (CT), Redding seeks to investigate the information needed by herders and farmers to make decisions regarding animal management. According to Redding, decision-making was based on three factors: economic forces, environmental conditions, and knowledge of the animals. The latter is the main focus of his work: what fundamental knowledge did Pharaonic Egyptian herders possess to organize their herds and make decisions about their management? The second chapter of the first section (pp. 5-9) addresses an essential topic considering the content of the volume: taxonomy

and nomenclature. First, the author focuses on the concept of species, quoting the works of Linnaeus, Darwin, Mendel, and current studies by archaeologists and palaeontologists. He then outlines the taxonomy of the subfamilies *Bovidae*, *Caprinae*, and genus *Sus*, providing information for each category on their wild forms – whose origins are briefly discussed – and their domesticated forms. In the final chapter of the first section (pp. 11-22), Redding focuses on the domestication of cattle, sheep, goats, and pigs in Egypt. For each genus, the author first provides a general overview of domestication before focusing on the Egyptian context. The sections dedicated to domestic sheep and goats in Egypt include two noteworthy topics: the horn morphology and the representation of these animals in art, supported by photographs taken by Redding himself (Figs. 2-3, pp. 18-19). The second section, entitled *Setting the Stage*, comprises five chapters. The first chapter (*Environmental Factors: Floods, Rains, and Change* – Chapter 4) addresses the relationship between humans and animals within their environment, specifically in Egypt. Understanding how humans employed cattle, sheep, goats, and pigs requires a comprehensive study of the territories these animals inhabited. Redding focuses on rainfall and the annual flooding of the Nile, two factors significantly influencing pastoralism, including herd sizes and forage availability. Over the centuries, Egypt underwent numerous climatic and topographical changes, such as shifts in rainfall patterns, Nile flooding variations, and environmental transformations in the Delta. The author emphasizes that these changes must be considered in understanding herding decisions and, more broadly, animal management strategies in Pharaonic Egypt. Redding then examines the “ecological biogeography of pastoralism” (Chapter 5, pp. 35-43). Here, he concentrates primarily on Lower and Middle Egypt to illustrate the environmental challenges herders faced

and the adjustments they made to these shifting conditions. This discussion is supported by data on Egypt’s current environment, accompanied by a critical caveat: the assumption that present-day vegetation, climate, and environmental conditions reflect those of the past is unsustainable. The author rightly asserts that this notion cannot serve as the foundation for such studies. Following the analysis of environmental factors, Chapter 6 (*Feeding and Foddering*, pp. 45-49) explores the diet of cattle, sheep, goats, and pigs in Pharaonic Egypt. For each of them, Redding investigates the grazing areas frequented by herders and the seasonal shifts, especially during the flood season. He also discusses the evidence available for understanding animal forage in ancient Egypt. In Chapter 7 (pp. 51-56), Redding examines the herd sizes of cattle, sheep, and goats – a topic he describes as both intriguing and complex. His goal is to provide approximate herd size estimates specifically for the Old Kingdom, asserting that this issue is particularly significant to the period’s economy. With meticulous attention, the author compares his data with that of other scholars, notably Paul Leonard Jones (2021), alongside contemporary findings, offering valuable insights for future studies. Building on the previous chapters, the eighth and final chapter of this section (pp. 57-60) outlines thirteen principles – considered by the author as hypotheses – to establish a framework for pastoralism in ancient Egypt. Principles 1-4 address the general effects of the Nile’s flood, the most critical variable for herding strategies. Principles 5-7 focus on variations in flood levels across years and the flexibility required for herd movement planning. Principle 7 specifically considers long-term changes in flood height. Principles 8-10 discuss the seasonal effects on herds, particularly nutritional stress. Finally, principles 10-13 examine climate and environmental change, emphasizing how these factors compounded the challenges posed by flooding and seasonality.

In the third section, entitled *Cattle in pharaonic Egypt: herd dynamics, feeding behavior, production characteristics, and productivity*, the author focuses exclusively on cattle, aiming to develop a model for their utilization in ancient Egypt. Redding's arguments unfold across two chapters. In the first (Chapter 9, pp. 63-75), he uses the cattle breed known as *Baladi* as the model par excellence for analysing cattle growth and productivity in Pharaonic Egypt. He even provides detailed data on the growth rates of male and female specimens and their diets (cf. tabs. 3-10, pp. 69-74). In the second chapter (Chapter 10, pp. 77-81), Redding constructs a management model for cattle in Pharaonic Egypt based on the previous chapters. He hypothesizes about different factors, including herd composition, the quality and quantity of necessary feed, slaughtering schedules, and the production of secondary products such as meat, milk, cheese, fat, hides, and labor. The fourth section (pp. 85-120) mirrors the structure of the previous one but focuses on sheep and goats (Chapters 11, 12, and 13), with only one chapter (Chapter 14) dedicated to pigs. As in the case of cattle, Redding bases his study on selected breeds to reconstruct the reproductive, productive, ecological, and physiological characteristics of these animals. For sheep, he examines the local *Awassi*, *Rahmani*, and *Ossimi* breeds (Chapter 11), while for goats, he focuses on the *Baladi* breed (Chapter 12). These examples allow him to delineate a management model for these animals during the relevant period and analyses the production of meat and other secondary products. In addition to products like those derived from cattle, he includes wool (for sheep) and hair (for goats). In Chapter 13, Redding compares the data presented in the preceding chapters, establishing a decision-making model for herders managing sheep and goats based on the thirteen principles/hypotheses outlined in Chapter 8.

After extensive discussion of sheep and goats, Chapter 14 (pp. 107-111) examines pigs in ancient Egypt. The author begins with a concise but detailed history of studies on the subject, providing archaeological data and updated bibliographic references. He then delves into the maintenance of pigs, emphasizing the greater difficulty of raising them compared to cattle, sheep, and goats. Ultimately, he underlines that pigs were not a fundamental component of the economic infrastructure of Pharaonic Egypt. All the data collected in Chapters 11, 12, 13, and 14 converge in the final part of the section (Chapter 15, pp. 114-121). Based on his findings, Redding formulates twelve predictions about the management of cattle, sheep, goats, and pigs in Pharaonic Egypt. These predictions can be integrated with archaeological, textual, and artistic data to advance Egyptological studies. Finally, the author reexamines two widespread beliefs in Egyptological literature – that meat, especially beef, was consumed only occasionally and that slaughter and subsequent consumption were reserved for male specimens. He hopes to offer new insights into these topics. The fifth section of the book (pp. 125-133) is dedicated to three topics: slaughter, nutrition, and patterns of meat consumption for cattle, sheep, and goats. In particular, Redding analyses the most consumed body parts (skeletal muscle, marrow and its fat, cartilage, brain, organs, and tongue), providing information on the preservation of different types of meat and the cooking methods used in Pharaonic Egypt. Iconographic sources are also cited to support these findings. Data on cattle, being the most available and extensively studied, serve as a reference point for formulating hypotheses about sheep and goats as well. At the end of this detailed analysis, Redding includes a curious paragraph about preparing a traditional Arabic dish, *Kawarea*, as an example of the topics discussed. The final section (pp. 137-155) focuses

entirely on the analysis of zooarchaeological data from five Old Kingdom sites. These include Kom el-Hisn and four sites studied since 1988 by the Ancient Egypt Research Associates (AERA) on the Giza Plateau: Heit el-Ghurab, the Menkaura Valley Temple, the Kromer dump, and the Silo Building Complex – a structure with five silos discovered south of Khafre's Valley Temple. Using the information, hypotheses, and models outlined in previous chapters, Redding effectively explains patterns he observed, aiming to identify which sites were production hubs and which were food supply centers based on the faunal remains found in these sites. Overall, as highlighted in the opening note, the volume represents a synthesis of Redding's work in Egypt and reflects his profound and extensive knowledge of the land, gained not only through bibliographic research but also through personal fieldwork experience. This is a concise yet precise work, supported by a significant amount of first-hand data collected by the author. It provides a clear and detailed overview of the study of cattle, sheep, goats, and pigs in Pharaonic Egypt. However, as emphasized in the first section, the author argues that, while the primary focus is Pharaonic Egypt, the research and hypotheses can also be applied to farming societies in the Middle East. An additional strength of the volume lies in its rich and up-to-date bibliographic references for each topic covered, particularly in the study of animal families and species. The author frequently reminds readers (e.g., p. 25) that ethnographic sources on agricultural and herding practices in ancient Egypt must be used with great caution, especially due to significant climatic changes over millennia. Before addressing specific topics and delving into detailed analysis, Redding begins each chapter with essential reference bibliographies and highlights key authors in the field. Finally, a significant aspect of the volume

lies in revisiting topics widely accepted in Egyptology (e.g., Chapter 15, pp. 120–121), offering a new perspective with the hope that future studies will provide fresh insights and reflections. The work does not aim to be a definitive conclusion but rather a springboard for new discoveries.

Bibliography

- Ikram, S.
 1995 *Choice Cuts: Meat Production in Ancient Egypt*, Leuven.
 2005 *Divine Creatures: Animal Mummies in Ancient Egypt*, Cairo.
 2006 Through Process to Product: Studying Meat Preservation in Ancient Egypt, in B. Mathieu, D. Meeks and M. Wissa (eds), *L'apport de l'Égypte à l'histoire des techniques: Méthodes, chronologie et comparaisons*, Cairo: 125–31.
 2015 *Death and Burial in Ancient Egypt*, Cairo.
 Jones, P.L.
 2021 *Animal Husbandry in Ancient Egypt during the Old and Middle Kingdoms*, Wallasey.
 Lehner, M.
 2000 Fractal House of Pharaoh: Ancient Egypt as a Complex Adaptive System, a Trail, in T.A. Kohler and G.J. Gumerman (eds), *Dynamics in Human and Primate Societies: Agent-based Modeling of Social and Spatial Processes*, Oxford: 275–353.
 Symons, S. and Raine, D.
 2008 Agent-based Models of Ancient Egypt, in *Information Technology and Egyptology in 2008: Proceedings of the Meeting of the Computer Working Group of the International Association of Egyptologists (Informatique et Egyptologie)*, Vienna, 8–11 July 2008, New Jersey: 129–146.
 Yokell, C.A.
 2004 *Modeling Socioeconomic Evolution and Continuity in Ancient Egypt: The Value and Limitations of Zooarchaeological Analyses*, Oxford.