Enki & Ptah

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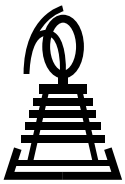

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Cover illustration
The workshop area of Level 3b at Logardan, ©FArMQaD, French Archaeological Mission in the Qara Dagh

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ENKI & PTAH
Journal of Technology and Trade in Ancient Egypt and Western Asia

Editorial

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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 southwestern 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 longstanding 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.

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ENKI & PTAH
Journal of Technology and Trade in Ancient Egypt and Western Asia

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

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Abstract

The institution of kingship, and to a much lesser degree of queenship, has long been of major interest to ancient historians. However, the focus is usually on a single empire or on a comparison between two or three empires, e.g., the Neo-Assyrian and the Roman ones. This paper provides a consistent diachronical comparison over a millennium on the economic basis of the social institution across seven major empires (Neo-Assyrian, Neo-Babylonian, Teispid-Achaemenid, Seleukid, Ptolemaic, Arsacid, and Roman) with geographical as well as chronological overlap. It further includes systematically kingship as well as queenship, explicates the scope of available sources, and explores the distinction between 'state' and 'royal' assets (and expenses) to a hitherto unprecedented degree. This elicits important insights into the long-durée dynamics regarding the roles of the 'head-of-state' and the 'leading lady' within the economic systems of the ancient Near Eastern empires of the 1st millennium BCE.

Keywords: West Asia, Egypt, Royal economy, Social history, *Longue-durée*

1. Introduction

The paper aims to fill a long overdue research gap in Ancient Near Eastern Studies, and Ancient World Studies in general, namely a systematic diachronic comparison of the economic basis of two closely interlinked political offices, the social institutions of kingship and queenship, across seven major political entities spanning nearly a thousand years: the Neo-Assyrian Empire (911-609 BCE), the Neo-Babylonian Empire (626-539 BCE), the Teispid-Achaemenid Persian Empire (550-330 BCE), the Seleukid Empire (312-63 BCE), the Ptolemaic Empire (305-30 BCE), the Parthian or Arsacid Empire (247 BCE-ca. 70 CE), and the early Roman Empire (in the East; 63 BCE-ca. 70 CE). The end dates for the Arsacid and Roman Empires are artificial; they mark the traditional end of Second

Temple Judaism with the Roman conquest of Jerusalem in 70 CE and the last attested cuneiform tablet (ca. 75 CE; Geller 1997).[1]

1.1. *Research background and collaboration*

The project originates in an internal cross-team collaboration exercise for the second Annual Meeting of the overarching research institution (see fn. 2) in 2019,[2] which developed into a publication experiment on creating a collaborative paper on king-/queenship ideology with a bottom-up approach.[3] Instead of starting from a pre-determined set of questions and structures typical for a first-author publication, the content and structure was developed from scratch and throughout at least the first major stages by an author collective that specialised in the relevant scope of empires, but not necessarily in kingship and/or queenship. This proved content-wise highly rewarding, as significantly different aspects of king-/queenship came to the fore as most doable or pertinent across the empires than would have been the case when starting from any single first author perspective (see also Wasmuth et al. forthcoming a-d). The outcome are four publications in article format with full diachronic comparison across the seven empires (the paper at hand and Wasmuth et al. forthcoming a-c on the royal presentation to the public as builder, as embodying piety, and as caretaker). A fifth publication is designed as a multi-author book that dispenses with the rigorous full diachronic comparison in favour of in-depth case studies on the question of maintaining relations with the power base (Wasmuth et al. forthcoming d). While the other three articles of the venture are much more selective in topic (see above), the paper at hand presents a condensed, but topically comprehensive macro-level view on the economic basis of king-/queenship across the seven empires. As expected, implementing the comparative analysis required the inclusion of much more particularly specialised experts. In consequence, one of the key challenges of the paper has been to create a succinct narrative out of very heterogeneous input: due to highly divergent source availability (see section 2.1), different states of research on the topic(s) at hand, and due to the scope of perspectives and approaches by the various authors. The outcome is a compromise between readability, showcasing the underlying source base and expertise, and lifting lesser known empires to a similar place of prominence in the study.

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[1] The chronological framework is set by the institutional framework, in which the study has been conducted: the Centre of Excellence in Ancient Near Eastern Empires hosted by the University of Helsinki (2018-2025; Academy of Finland grant decision numbers 298647, 312051, and 330727). For the Roman Empire sections, this means a focus on the Julio-Claudian period. For the Parthian/Arsacid empire, the end date is more arbitrary. A more poignant *caesura* from a Parthian perspective is the establishment of a new Arsacid dynasty in 10 or 11 CE, which led to a new series of wars between the Parthians and the Romans until 63 CE.

[2] The research centre assembles c. 40 specialists on various aspects of Ancient Near Eastern Studies concerning the 1st millennium BCE.

[3] Originally under the aegis of Jason M. Silverman, since 2022 under the aegis of Melanie Wasmuth. We would like to thank especially Andrea Berlin, Philip Esler, and Katrien De Graef, the international scientific advisory board members of the Academy of Finland Centre of Excellence in Ancient Near Eastern Empires (ANEE, University of Helsinki), for their continued encouragement and feedback; Rotem Avneri Meir, Johannes Bach, Rick Bonnie, Céline Debourse, Marta Lorenzon, and Saana Svärd for their input and comments throughout various stages of the overall ANEE King-/Queenship project; and all ANEE members who participated in the various presentation sessions at the ANEE Annual Meetings and beyond. Without them, the project would not have made it to publication state.

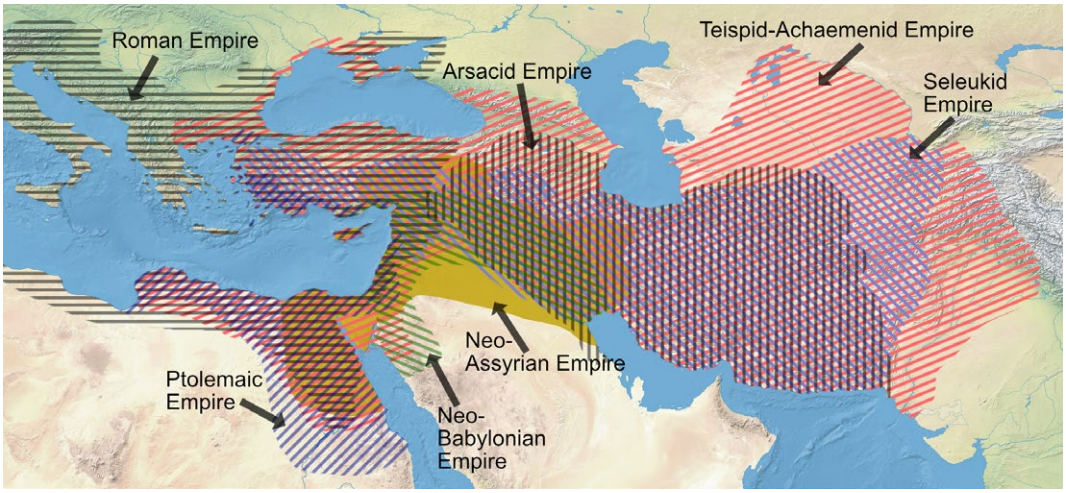

Fig. 1. Map showing the maximum extents of the empires under discussion.

1.2. *Aims and research question*

Accordingly, the aim of this paper is to provide a synopsis on the available sources and state of research on core aspects of the royal economy across the major empires ruling (major) parts of ancient Western Asia in the 1st millennium BCE. The ultimate goal is to identify which sub-topics and research questions would be best suited for future diachronic comparative analysis based on the current availability of data. A fundamental discussion of the term 'empire' is not part of the paper. As is common in ancient world studies, 'empire' is used as a code for the major cross-regional polities under discussion here. Instead, the aim is to grasp the tension between the 'state' / 'imperial' / 'crown' level and the specific roles (and/or person) of the head of the polity ('king') and his official (main) wife or most influential female figure of the polity. As the seven chosen empires consecutively overlap with each other chronologically as well as geographically in the Levant and/or Mesopotamia, they offer an excellent venue for *longue-durée* historical analyses. Key questions that we attempt to answer – or at least elucidate concerning their answerability – are: how were royal and state assets/revenue distinct from and interwoven with each other? Which natural, direct financial, and labour resources could the king/queen extract for their personal and institutional *personae*? What constituted their most prominent expenses? To what extent were income and expenses shared or separate between king and queen? And finally, what significant similarities and contrasts come to the fore when comparing the answers across the seven empires under discussion?

1.3. *Geographical and chronological frame*

The geographical focus of the institutional framework, in which this study is situated, is on Mesopotamia and the Southern Levant. This proves to be of limited suitability for this macro-historical study, as the imperial centre typically plays an essential part in royal (as distinct from 'state' or central administrative) economic agency. The imperial heartlands of various of the empires under discussion are situated outside Mesopotamia and/or the Levant (see Fig. 1 for a condensed overview of the maximum extents of the empires under discussion), and Mesopotamia and the Southern Levant constitute not

always the most insightful case studies due to the available source base. Thus, for the Teispid-Achaemenid Empire, the focus on Persia and Babylonia is complemented by occasional comparisons to Egypt. For the Roman Empire, the decision was made to dedicate the main part to the imperial centre as main seat of economic agency of the Roman emperor followed by a brief outlook on the evidence from or impact on the so-called Roman East. For the Ptolemaic Empire, but also for understanding some of the core dynamics within the Neo-Assyrian and Neo-Babylonian Empires, a look to the Kushite and Saite Empires would have been valuable, as both ruled parts of the Levant (and the Eastern Mediterranean) and are essential for understanding the Egyptian aspects of Ptolemaic rulership. This would, however, substantially shift the focus of the study, which by design of the overarching institutional framework centres on Western Asia. Accordingly, the Ptolemies are included primarily as essential counter-players of the Seleukids, and the Romans (in the East) as opponents of the Parthians/Arsacids. The chronological frame is essentially the 1st millennium BCE. While several of the empires are fully included in that time range, the beginning and end are arbitrary, but necessary for feasibility concerns (see above including fn. 2). For the earliest empire under discussion, the Neo-Assyrian, a comparison to its regional predecessors would be highly desirable; this has been decided against in favour of a comparison to the succeeding empires. Even more problematic is the end date of the study in ca. 70 CE. Due to the rather extensive body of sources available for studying the Roman Empire, the focus on the Julio-Claudian rulers provides, nonetheless, a suitable framework. Given the overall scarcity of relevant sources on the Arsacid Empire (see section 2.1), and the subsequent need for interpolating many issues from earlier, later, and contemporary but empire-external sources, this concern is not suitably solvable for the Arsacids. As this can only change by promoting Arsacid studies, we opted here for a more inclusive approach, while attempting to qualify the source base in each case.

1.4. *Paper structure*

Given the length of this paper, a brief overview of the underlying structure is provided here. Following the introduction we first highlight some conceptual and methodological concerns regarding the available sources (section 2.1), background information on the intertwined dimensions of 'state' or 'crown' versus (personally) royal (section 2.2) as well as of palace, estate, and household (section 2.3), and a terminological clarification on the handling of 'queenship' per empire (section 2.4). The following four main sections deal with the specifically royal economic assets and major expenses first for the king (sections 3-4), then for the queen (sections 5-6). Each of these sections are subdivided into major topics explored diachronically. For the king these include access to natural resources (3.2), direct financial resources (3.3), labour (3.4), estate produce (3.5), and production facilities (3.6) as well as the expenses for public relations events (4.2), travel and travel-including activities (4.3), for accessing information (4.4), and some more (diachronically) eclectic activities like compiling ancient data and specifically royal involvement in infrastructure projects (4.5). For the queens we compiled the evidence on access to personnel and specialised knowledge (5.2), to produce and production facilities (5.3), to direct financial resources (5.4), and to special places (5.5); further, as with the kings, we mapped the expenditure on public relations activities (6.2), travel (6.3), and information access (6.4). Section 7 provides a brief gender comparison per empire

regarding the aspects of portfolio comparison, couple activities and perceptions, and complementing aspects in the economic activities of the kings and queens. Finally, section 8 highlights some of the most pertinent diachronic results and an outlook on potential future research.

2. Conceptual and methodological concerns

In order to assess the diachronic comparison of key aspects of the kings' and queens' economic resources and expenses, some methodological and conceptual concerns require discussion. On a very fundamental level, this concerns the availability of sources for the empire, role, and topic in question, which has major implications on the research presentation and on the question of whether the evidence is likely representative or situative for the empire in question. Further, the issues of 'state' versus 'royal' assets, of 'state'/crown versus royal domains, and of palace versus royal households need an introductory exploration. The section finally includes a comment on who is subsumed in the term 'queen' in the following discussion.

2.1. *Source issues*

The Neo-Assyrian Empire featured a complex bureaucratic apparatus that left a lot of primary evidence for the study of the economic basis of kingship (and to a much lesser degree on queenship), deriving from various excavated palatial archives. The available textual sources include royal inscriptions, letters, deeds, records, and legal documents. Most of the direct primary evidence concerns the relationship of the king with governors outside of the capital but concerning matters of state and state officials in the heartland, inferences must sometimes be made. The available textual evidence chiefly concentrates in the second half of the 8th and the 7th century, predominately from Kalhu and Nineveh. It is complemented by iconographic evidence: depictions of economic activities on the palace reliefs as well as on ivory plaques and metal slabs of wooden gates of the palaces (Groß and Kertai 2018: 6) and visual administrative tools in the form of cylinder and stamp seals and their impressions. The latter comprise personal and office seals, including those identifying crown property (Buchanan and Moorey 1988: 55). Most evidence for the economic basis of Neo-Assyrian queenship is found in textual sources that refer to queens' activities, property, and household personnel (Kinnier-Wilson 1972; Ahmad and Postgate 2007; Svärd 2015: Appendix A, 177-221, Appendix D, 240-242). In addition, seals and seal impressions attest to the agency and undertakings of queens and their representatives. Some seal impressions bearing the scorpion emblem of the queen's household were associated with inventory records relating to the textile industry (Radner 2008: 494-502; Gaspa 2013: 29-30;). Balance-scale weights (including one incised with the scorpion emblem) were also found in archaeological contexts associating queens with the economic procedure of quantifying commodities (Peyronel 2015: 105-106; Hussein 2016: 22-23, pls. 82d-f). Rich artefact assemblages excavated from the royal tombs at Kalhu's Northwest Palace demonstrate that queens embodied imperial wealth by wearing and using items made of precious materials, especially gold (Gansell 2018a; Hussein 2016). In art, a queen's wealth was displayed in depictions of her dress, but the few known visual representations of Neo-Assyrian queens illustrate their ritual and ceremonial (not immediately economic) activities (Ornan 2002). Like the evidence for Neo-Assyrian kings, evidence for the economic roles of Neo-Assyrian queens dates predominantly to the 8th and 7th centuries BCE and mostly derives from excavated palaces at Kalhu and Nineveh.

The written, visual, and archaeological evidence for queens, however, is very limited compared to what is preserved for kings (Gansell 2018b). Comprehensive catalogues of primary source texts relating to queens (their names are rarely stated) can be found in Svärd 2015; only a sampling is cited here. Note that historical sources relating to King Esarhaddon's mother Naqi'a (who carried out the duties of queenship but was not titled 'queen' during his reign) are treated here as evidence for the economic basis of queenship (Melville 1999; Svärd 2015: 41-46). In contrast to the Neo-Assyrian empire, the state archives of the Neo-Babylonian Empire have not survived except for a group of tablets recording the delivery and distribution of commodities in Nebuchadnezzar's Babylon (Pedersén 2005: 110-132). Therefore, practical information about the royal economy needs to be gleaned from tens of thousands of legal and administrative texts from temple and private archives (Jursa 2005). Accordingly, we are relatively well informed about the aspects of royal income and expenditure that touched other parts of Babylonian society, but we know little about the inner workings of the royal economy (Jursa 2010a). Archaeology has confirmed the extensive royal building projects in the Babylonian heartland (Czichon 1999; Pedersén 2021). For the Teispid-Achaemenid Empire, we are in the lucky situation to have access to two large central administrative archives from Persepolis (the *Persepolis Fortification Texts*, PFT, and the *Persepolis Treasury Texts*, PTT), which allow direct insights into the workings of the royal and 'state' administration and economy, at least for part of the reign of Darius I. In addition, we have a large corpus of sealings associate with or depicting various Persian elite women, including the queens (Garrison and Root 2001; Lerner 2010; Root 2021). This strongly contrasts with the preserved reliefs and tiles of the royal palaces, where depiction of royal women is conspicuously absent. It has been suggested that the palaces were originally adorned with rich tapestries and humanoid statues (Schmidt 1953: 78-79; Henkelman 1995/1996: 289, Fig. 3), both of which could have depicted royal women, making the lack more apparent than real – but the evidence is debatable, as is who paid for the items. Further, various topics dealt with below (particularly travel and the queen's table) show queens did have an important public role, even if the details often escape us. Narrative sources for Persian queens currently are known only from classical authors, featuring in scandalous stories and presenting Greek preconceptions of a feminine orient (Sancisi-Weerdenburg 1983a). Introduced by classical authors (Plut. *Art.* 27.2; Heracleides, *Deinon*) and drawing on modern orientalist conceptions scholarship produced (and by now refuted) the idea of Persian kings having large 'harems' of 'concubines' (Brosius 1998: 1-5, 31, 105-122; Allen 2005: 97; Safaee 2016; Lenfant 2020). Another key challenge concerning the Teispid-Achaemenid empire sections is that in contrast to most other empires the economic basis of the empire, the king, and the queen are only very selectively studied; in consequence, the *Blackwell Companion of the Achaemenid Empire* features only sections on taxes and tributes (Hackl and Ruffing 2021), on the temple economy (Wunsch 2021), and on Babylonian entrepreneurs (Waerzeggers 2021). A key concern of each of these is the highly area-specific information, which often does not allow to determine more generic imperial traits (cf. Hackl and Ruffing 2021: 967). Thus, many of the results presented below remain preliminary and are based on (selective) readings of the available primary sources rather than summary research. The main sources of evidence for the economic basis of Seleukid kingship are

epigraphic and numismatic (Aperghis 2004: 8-18). Unlike for their contemporaries, the Ptolemies, the documentary papyri with detailed records of taxation, royal estates and their incomes and expenditures, and the people in royal service do not survive in the archaeological record, although the clay sealings which once attached to such papers in the royal archives do survive to prove they did once exist (cf. Invernizzi 1996; Ariel and Naveh 2003). Cuneiform documents do survive and provide excellent information on the economic life of Babylonia and the activities of its Akkadian-using inhabitants, some of whom were connected to the royal economy. Only a few sources give any information about the economic activities of Seleukid queens, and, as for the kings, they are epigraphic; some numismatic evidence can also be considered. In the latter case, information is obtained from surmise, but with the former we have direct input on the properties and monetary resources belonging to queens. The principal sources for the economic basis of Ptolemaic kingship include Greek and Roman literature, papyri and ostraca in Greek and Demotic Egyptian, multilingual stone inscriptions, coins, and archaeological evidence. The Greek and Roman literary sources provide general figures for wealth and revenue of the Ptolemies/Ptolemaic state (Fischer-Bovet 2014: 67-68), and details useful for reconstructing certain expenditures, e.g., the size of military forces and royal displays of wealth. The papyrological evidence from Egypt is extensive, and supplemented by ostraca, but coverage is incomplete both chronologically and geographically. Most concern taxation, regulation, and landownership and pertain to the Fayyum and Upper Egypt (Vandorpe 2000; Muhs 2005; Monson 2012; Christensen et al. 2017). Alexandria and the delta region are poorly represented in this material, as is the 1st century BCE. Stone inscriptions, such as the joint royal-priestly decrees offer information on the extent of royal expenditure in terms of benefaction and tax relief; inscriptions from Greek cities outside of Egypt provide insights on the transactional nature of the Ptolemies' relationship with their Mediterranean possessions. Coins provide data on royal monetary policy and economic health (von Reden 2007; Lorber 2012). Finally, material evidence from archaeological excavations provides information on mining activities and expenditure on city foundation, infrastructure, and building (esp. temples). In parallel to the Seleukid empire and in stark contrast to the Ptolemaic and the Teispid-Achaemenid Empire, the most important sources for the Arsacid Šāhanšāhī, and thus also the Šāhanšāh, are found in classical texts. These are complemented by some documentary evidence from Nisa, Shahr-i Qumis, Avroman, and Dura, some royal inscriptions, occasional Akkadian administrative texts, coinage, and later Zoroastrian traditions. While the primary kingship evidence is already sparse, independent evidence to determine the economic sectors specifically under the authority of the queen is not available at all. Only when the Šāhanšāh has passed away and the crown prince has not reached legal age, the evidence about the queen in the position of viceroy becomes clearer (see sections 5.3 and 7 for the cases of Rinnu, mother of Phraates II, and Musa, mother of Phraates V). One way to overcome this is to compare Achaemenid, Seleukid and Sasanian evidence, allowing in certain aspects the inference of continuity regarding the personal and public properties of the royal families within the Šāhanšāhī system. Another track is to consider the reception history of the Arsacid period in the (pre-)Sasanian period, though this is even more fraught with potential misrepresentations regarding historiographical accuracy. The most pertinent of these secondary sources are the

Sasanian legends pertaining to the mythical queen Homāy Čehrzād, who is presented as sole ruler over Persia. Renowned for her generosity and diligent charity, she communicated with elders from behind a thin silk curtain, issuing final administrative orders (Khaleghi-Motlagh 1971: 74-77; Doostkhah 2004; Mirʿābedīnī and Ṣedīqīān 2007: 364-369). Given that these directives required financing, it is inferred that powerful queens at the Arsacid the court had more or less unrestricted access to the royal treasury, at least in periods, when she acted as regent for her son in cases of the Šāhanšāh's death before the crown prince reaching majority. The sources for the economic basis of Roman emperors and 'queens' during the Julio-Claudian period are comparatively rich, covering textual sources such as histories and documents, law codes, epigraphic sources, archaeological finds and architectural remains. Much of the interpretation of the period is based on surviving narrative histories such as those by Tacitus and Suetonius. Queens are much less visible in the sources. However, central issues of the economic sphere, like the size of the Roman economy are only rough approximations and remain matters of conjecture (cf. Scheidel and Friesen 2009).

2.2. *Royal vs 'state' assets*[4]

The differentiation between royal and 'state' assets and revenue during the Neo-Assyrian period changed over the centuries, and a single dichotomy between the two is difficult to establish. Neo-Assyrian state ideology purposefully confused the separation between the person of the king and the king as representative of a heavenly mandate to rule and hence the economic basis of kingship cannot be easily separated from the imperial economy at large. An important facet in the economic dominance specifically of the king during this period was the power to institute weights and measures, systems of registration, and notarising techniques. While distinction between royal and state assets can sometimes be made, for the most part they were heavily interwoven with each other during the Neo-Assyrian period because the provincial system represented a direct political, administrative, and socio-economic extension of the central power structure (Fales 2017: 273). The economic (and political) power of the king was in fact often restricted by the seven magnates (*rabbūti*), constituting the upper tier of government hierarchy, who held in certain times more power even than the king (Mattila 2000). The queens' role in the tension of 'state' versus royal assets is even more difficult to assess. While queens may have had some personal (material) wealth, most of the Neo-Assyrian queens' economic assets can be attributed to the household of her office of queenship (Svärd 2015: 74). Ultimately her household revenue was derived from, generated within, and absorbed by the state economy. Like the Neo-Assyrian king, the Neo-Assyrian queen was viewed as an embodiment of empire; thus, her assets – personal, household, and imperial, as a whole – would have been viewed as a manifestation of the eternal prosperity of the empire. Also in ancient Babylonia, 'royal' and 'state' were not distinct categories, perhaps even less than in Assyria. There was no emic terminology to differentiate between these two concepts, and there was no 'Babylonian state' that existed independently from the king (von Dassow 1999: 241-245l; Jursa 2017; Richardson 2020: 169-170). The basic social and political

[4] Though none of the polities under discussion are 'states' in the sense of modern nation states, 'state' asset is used here as shorthand for assets of the official central administration of these polities.

organisation in Babylonia was fragmented in various kinship groups and cities that exerted significant power on a local and regional scale. Political unity to the region was brought by the king and his administration who strived to extend their authority over and extract resources from these different groups. The income and property of the king (*ša šarri*) were distinct from those of private persons and temples, but as there was no state that can be separated from the king, there was no meaningful dichotomy between royal and state assets. The same corvée labour, tribute, and tax income were used to build royal palaces and improve infrastructure in the Babylonian heartland. There was no state monopoly of land ownership, and temples and private persons also owned land. In contrast to those earlier empires, an Achaemenid royal household that is delimited from the overall state assets is visible in the *Persepolis Fortification Texts* (e.g., Briant 2002: 463-466, 469-471; Henkelman 2010: 669, cf. 712, 732). The administrators of the corpus were careful to note when commodities were received or dispensed to or from the royal household. The question this raises is the line – whether conceptual or practical – between the two, or, in other words, if the kings disposed of 'state' assets differently from those of his household. It is fairly certain that the king did not 'own' all land in the empire. He was free, however, to grant land rights to 'unused' land in return for remuneration of various kinds (Guillaume 2012). Whether such remuneration went to the 'state' or the royal house is uncertain. A similar fuzziness between satrapal estates and imperial administration is visible in the documents from one of the satraps of Egypt, namely Aršama (Tuplin 1987: 111, 116, 133-137; 2017: 622). The royal granting of land rights was a mechanism which both financially and practically tied elites to the king, even if the precise legal mechanisms are opaque (Tuplin 1987: 133-137; Henkelman et al. 2017: xxv). A currently rather singular, but potentially relevant distinction in the context of 'state' vs 'royal' asset stems from a Babylonian slave sale (VS V, 128, late 5th century; Kuhrt 2007: 725), in which a 'domain of the throne' (Akk. *bīt kussi*), arguably a crown, and thus imperial office, estate, is distinguished from the 'domain of the table' (Akk. *bīt paššuri*), arguably a personal royal estate. Though the attestations are sporadic, they show that at least certain royal women were major economic actors in their own right, with households separate from the king's over which they had control (see sections 5.3 and 6.2). These households operated in a similar way to the king's household: while apparently kept administratively separate from the 'state' resources, the queens were able to utilise the larger administrative system for their own purposes. The Seleukid kings possessed the entire territory of their empire by right of conquest, the 'spear won land,' arguably inherited from Makedonian kingship (Ma 1999: 29; Hammond 2000; Aperghis 2004: 88). The king was 'the state,' and while he maintained nominal ownership on all land, large tracts of it were gifted to private individuals, cities, and temple communities. These lands were released for usufruct, and taxes were collected based on production and fixed sums. A particular entanglement occurred between royal estates and city lands, since gift estate owners were often permitted to 'attach' their properties to city territories, giving them rights and privileges of citizens (Aperghis 2004: 100-107); to what extent these remained with the king once estates reverted to him is unclear. The king might also endow sanctuaries and cities with specific reliefs from tax burdens and other economic benefactions (see section 4.2). While a release from certain forms of taxation was common, it did not mean freedom from all royal tribute. This

was often enforced by increased royal involvement in local economic institutions, whereby the king imposed his own official on the existing hierarchies (cf. Boiy 2004: 208; Clancier and Monerie 2014: 212-213), further complexifying the relationships between the king, his state, and the independent civic and sacred communities. Similar to the Seleukid monarchy, Ptolemaic (and generally Macedonian) kingship was ideologically perceived as a 'personal monarchy', whereby the king is essentially equivalent to the state; the personal matters of the king and the affairs of the state were collectively referred to as *ta pragmata* (Mooren 1983). Similarly, in Egypt, the Ptolemies inherited earlier pharaonic ideology whereby in principle all land belongs to the king (Monson 2007a; von Reden 2020: 32). In the scholarship, the economy of the state and of the Ptolemaic king (and queen) have traditionally been treated as a single entity, '*l'économie royale*', as coined by Préaux (1939). However, this model has been challenged in recent decades based on new documentary evidence showing the existence of private markets and land rights (Dogaer 2023: 120-123 with references). Manning (2010: 124) has suggested that personal revenue of the king was separate from that of the state. However, also the ancient historians did not distinguish between Ptolemaic wealth and state wealth (e.g., Suet. *Aug.* 41.1) and it is difficult to distinguish between wealth of the sovereign and that of the state in the extant documentary evidence, especially in view of the lack of evidence from Alexandria. The Arsacid system of governance was characterised by a Šāhanšāhī structure. This modern political term, which originates from the Qājār period (1786-1925),[5] encapsulates the typical and traditional mode of governance in Iran/Persia, often likened to a confederation, network, or commonwealth state. In the Arsacid Šāhanšāhī, three primary economic sectors prevailed: the royal sector overseen by the chancellery of the Šāhanšāh, the temple sector, and the private sector. The Šāhanšāh fulfilled dual roles in the sources: as the proprietor of individual assets and household head and as the chief of the Šāhanšāhī administration. While possessing the authority to distribute treasury wealth, such revenues were deemed governmental rather than personal assets. The extent of the Šāhanšāh and their family's share of public property remains uncertain as is the question of whether they were dictated by law or tradition (Dandamayev 1997; Dandamayev and Lukonin 1989: 130). Most expenses incurred by queens and other members of the Šapistān (Parth. Špstʾn 'harem') were covered by the court. A portion of income, likely in the form of gifts or fixed salaries, particularly from dedicated temple revenue, was directly provided to the queens by the Šāhanšāh and indirectly through the pat-Šapistān (Parth. PWN Špstʾn) 'the chief of the harem,' typically a Šāpistān (Parth. š'pstʾn, a *vṛddhi* derivative of Špstʾn, 'the eunuch') (Lukonin 1983: 712-713; Lerner and Skjærvø 2006: 115). Probably, the queens received the majority of the Šapistān's revenue. The Roman emperor had several complementary methods of raising the funds necessary for enabling his rule. The funds of the empire were administered in two distinct sections: the fiscus of the state itself and the private properties of the emperor. In practice the division was more for appearance's sake (cf. Millar 1977: 189-201; Brunt 1990b; 1990c). The relation of income between the categories of private and public wealth was, however,

[5] The term 'Šāhanšāhī' has been used in pre-modern times in various forms. In modern times, Iranian scholars recognised this term as equivalent to the terms 'empire/imperial'.

mostly an issue of financial administration rather than anything else – ideologically, and largely practically, all income and expenditure was in the hands of the emperor. Thus, the emperor was the personification of Roman power and thus the ultimate powerbroker, judge and granter of favours. For example, money and taxes were perceived as belonging and being due to the emperor as in 'render unto Caesar the things which are Caesar's' (Matthew 22.15-22). The client-kings in the Roman East held their positions by imperial favour and imperial officials looked after Emperor's interest in their courts. Royal lands of the client-kings were deemed fundamentally to be imperial possessions that were in the end for the emperor to give at his discretion. That is why Herod's sons rushed to Rome to plead their case before Augustus after the death of their father (Sartre 2005: 57-58, 77-80, 93-97).

2.3. *Royal palaces, household(s), estates*

The Neo-Assyrian empire boasted four capitals: the traditional capital Assur followed by Kalhu, founded under Ashurnasirpal II, Dur-Sharrukin under Sargon II, and Nineveh under Sennacherib (Groß and Kertai 2018: 2). Each capital contained a primary and a military royal palace, albeit state administration was conducted in both (Otto 2015: 469-490; Groß and Kertai 2018: 5). The best-known of these are the Old Palace in Assur, the Northwest Palace at Kalhu, the Dur-Sharrukin Palace, and the Southwest and North Palaces at Nineveh. The Neo-Assyrian king and queen reigned from the primary palace where they also lived along with a relatively small number of unidentified additional residents (Kertai 2015; Groß 2020; Portuese 2020). A large, non-residential staff must have worked at the palace, which also accommodated a vast flow of visitors. The empire operated through a multiplicity of palaces, including sites that served specialised ceremonial, military, economic, and provincial purposes (Kertai 2013). In theory, the Neo-Assyrian king exercised ownership over the whole land, although in practice, the economic system functioned through a patrimonialist vein of rulership consisting of 'households' (*bitu*) that held economic, administrative, and military authority over their own domains with the household of the kingship being the mightiest among many (Fales 2017: 276). The Neo-Assyrian royal household consisted of the king and queen (whose royal estates are often seen as having been separate from one another), other members of the royal family, the king's magnates (among them the commander-in-chief *turtanu*, the palace manager *rab ekalli*, and chief treasurer *mašennu rabiu*), a host of other officials (chief musician, chief confectioner, wine master, etc.), as well as servants and security personnel. Especially during the 7th century, the households of the crown prince and of the king's mother (*ummi šarri*) were – or could be – separate economic entities, albeit smaller in scale (Groß 2020: 505-506). Depending on the king, the royal entourage could favour one capital or palace, or move court periodically depending e.g., on natural conditions, time of year, or the political situation in the heartland or the hinterlands. The separation of the office of king from the royal estate depends on the period and the political power of individual magnates, but at least symbolically the king and the state were considered as one and the same. Also, for the Neo-Assyrian queens an impressive number of palaces is known. Atalia, the queen of Sargon II, probably had a palace in Assur, Libbali-šarrat had a palace built for her in Kilizi, and royal letters indicate a possible further queen's palace at Arbail (CTN 3 87; SAA 1 99; SAA 16 111; Svärd 2015: 52, 63, 65-66, 71, 110). The queen's household probably conducted economic operations at these satellite locations under the

supervision of on-site administrators and staff. Royal texts also mention queens' village managers, suggesting that Neo-Assyrian queens ran a geographically distributed network of estates (Edubba 10 28; Edubba 10 30; Edubba 10 38; SAA 6 90). The Neo-Babylonian kings resided in the palaces of Babylon, with the noteworthy exception of Nabonidus's decade-long stay in Tayma. Using the tribute from conquered regions and resources from the Babylonian heartland, Nebuchadnezzar II (re)built the South, North, and Summer Palaces in Babylon, and his inscriptions emphasise the role of Babylon as the seat of kingship (Heinrich 1984: 198-229; Beaulieu 2017: 9-11; Pedersén 2021: 89-137). The structure and functions of the South Palace are best known. It was organised around five courts and contained dedicated spaces for administration, production, and king's public and private life (Jursa 2010b). The palace had a specific women's quarter (é $^{\text{mí}}$šà.é.gal; see Cousin 2023: 178-181), but it remains unclear who lived there and where the queen herself resided. The crown prince's residence (*bīt redûti*) may have been a separate building in Babylon or a part of a royal palace. In addition to the members of the royal family, a large number of officials, craftsmen, and other professionals were provided by and worked at royal palaces (Jursa 2010b; Da Riva 2013). Even if the king's high officials belonged to the royal household, the leaders of the Chaldean and Aramean populations did not, significantly reducing the king's ability to supervise them (Jursa 2014a: 126-133). Palaces in other Babylonian cities were not permanent royal residences but were intended for the use of governors and royal administration and could house the king during his travels (Jursa 2004; Miglus 2004; Beaulieu 2017: 10-11). Princes and princesses did not only reside in Babylon, and two daughters of Nebuchadnezzar probably lived in Uruk from where his family originated, and Nabonidus's daughter(s) were active in Sippar (Beaulieu 1998; Cousin 2023: 186-187). Royal estates are not well attested in our sources, and it seems that they were not the dominant source of royal income (Jursa 2010a: 442). A part of royal lands was cultivated by dependent population within the so-called land-for-service system (section 3.4). In the Teispid-Achaemenid empire, both the kings and queens are attested as having a peripatetic lifestyle (Briant 1988; Boucharlat 1997: 217-219; Tuplin 1998), inter alia travelling between the residences of Pasargadae, Persepolis, Susa, Babylon, and Ecbatana, which were continually added to by the various kings (Schmidt 1953; Perrot 2013; Canepa 2018: 297-305). Debate remains over the nature of these sites, as few of them appear to be suitably residential in nature (Boucharlat 1997; Bahadori and Miri 2021); newer archaeological work has begun to show conurbations around at least Persepolis (Boucharlat 2020); in some cases royal 'tent cities' have been argued (Bahadori and Miri 2021). Due to the find sites of the Persepolis Fortification Tablets (Stolper 1953: 3, 40-41; 2017; Hallock 1969; 1978;) and Persepolis Treasury Tablets (PTT; Cameron 1948; Schmidt 1953: 173-175; 1957: 4) in the fortifications and treasury, respectively, it is likely the palatial complexes played a central role in imperial financial administration. Notably, pre-Persian royal institutions in the subject areas were absorbed into the royal households, such as the Neo-Babylonian estate of the crown prince, attested for Cambyses (Wunsch 2000: 103-104). The queens could travel on their own or with the king (Brosius 1998: 87-90; Henkelman 2010: 696; Stolper 2018). The size and complexity of the royal households can be hinted at by reference to the institutions of the royal tables (Brosius 1998; 2021; Henkelman 2010). The large quantities of food and drink provide a glimpse of the sheer number of guests staff involved in

the households. While it is clear that royal women were not kept segregated (Lenfant 2020, cf. Lenfant 2021; against the identification of the 'southeast building' on the Persepolis terrace as 'Xerxes' Harem' see also Root 1979: 101; Brosius 1998: 31; Razmjou 2010: 243-244), the exact nature of royal family life remains poorly known. Also the Seleukid royals had several 'capitals', and other cities served as temporary royal headquarters; some of these cities had royal or governors' palaces, while others had large municipal buildings which could be repurposed as palaces. Seleukeia on the Tigris and Antioch on the Orontes were new foundations by the dynasty, and Sardis, Kelainai-Apamea, Tarsos-Antioch on the Kydnos, Mopsuestia, Antioch in Persis, and Susa-Seleukeia on the Eulaios served as royal homes for briefer intervals. The palaces excavated at Ai Khanoum, Dura Europos, Jebel Khalid, and Kedesh in Galilee also reveal the apparatus of royal economic control. These were all multi-purpose buildings, providing space for gathering and royal audiences, clerical work, archives, storage for taxes collected in both cash and kind, plus living quarters (Bernard 1974: 289-293; Downey 1986; Clarke 2002: 25-48; Herbert and Berlin 2003; Messina 2006). The evidence for royal rural estates is scarce, and there is, as yet, no evidence for Seleukid 'pleasure' palaces. In contrast to their Teispid-Achaemenid and Seleukid and more comparable to their Neo-Babylonian counterparts, the Ptolemaic kings and queens primarily resided in Alexandria, the central city of the Ptolemaic empire (Fraser 1972; Weber 2007; Strootman 2014: 76-78). They had also other palaces in Egypt, including Memphis, Siwah, and Pelousion, the most significant of which was Memphis (Thompson 1988; Nielsen 1994: 130). As for the royal household, ideologically, the entire empire belonged to the royal household. The Egyptian state operated on a patrimonial household model, whereby the king is the ultimate head of an extended household (Lehner 2000; von Reden 2020: 32). In terms of the more limited definition of 'royal household', this included the royal family, namely the king, queen, consorts, offspring, other relatives, as well as members of the court (*aule*): non-kin friends (*philoi*), guards, servants, and other advisors (Strootman 2014: 95-96, 166). As for 'royal estates', there was a fiscal category of land known as royal land (*basilikê gê*). Some of this was leased out to 'royal tenants' and some was privately owned/managed, with the king claiming fiscal rights. The Arsacid royal residence, encircled by high outer walls, consisted of interconnected palaces linked to the central main palace by corridors (Azarpay 1983: 1135-1139). This central palace served as the administrative hub of Šāhanšāhī, where the Šāhānšāh held bār ('the royal audience'), accessible to both men and women who obtained permission from the head of protocol. Queens and some other royal women had the right to seek and attend audience (Khaleghi-Motlagh and Farhūdī: 1988). As head of the household, the Šāhanšāh also possessed a 'major estate' (*dstkrty*), administered by 'stewards' (*framatārs*) (Lukonin 1983: 702). The household of the Šāhanšāh encompassed a separate area adjacent to the central palace, where his wives, children, and privileged courtiers' families resided in their Šapistān. These Šapistān areas were likely bustling with children, maidens, women, old women, and Šāpistāns. Boys were probably permitted access to most parts of the Šapistān except for women's private quarters, likely until the age of fifteen, representing adulthood initiation in Persia (ps.-al-Jāḥiẓ 1914: 125-126; Widengren 1969). The Šāpistāns (i.e., head eunuchs) served as a network system connecting various parts of the court, temples, bazaars, and gardens. They played a crucial role in facilitating interactions between the internal and external

environments to address the religious, economic, and entertainment needs of queens and other women (Harmatta-Pékáry 1971; Kolesnikov 1998; cf. Lenfant 2021 for the Achaemenid period). The Roman emperor had multiple estates and villas whereas his primary residence was in Rome. Even so, the emperor could spend considerable time away, like Tiberius who for the last decade of his reign ruled from his palace on the island of Capri. In the Roman East emperors also held vast estates in the royal tradition and got more as bequests and confiscations (Sartre 2005: 207-211). A key characteristic of the imperial household was that it was not, in a Republican manner, primarily defined as *familia*, a family underlining paternal links, but as *Domus Augusta*, household, a wider concept that included also maternal relations (Fertik 2019: 39-41). The household also included slaves, freedmen and clients. The importance of the *domus* in part reflected early imperial realities as the first emperor, Augustus, only had one child – a daughter. Membership in the imperial family and one's standing in it was thus in a sense open to negotiation and renegotiation.

2.4. *Terminology and practicalities regarding 'queenship'*

While the evidence on the male head-of-state is sufficient (and sufficiently clear) for all empires under discussion, this is not the case concerning 'queenship'. On the one hand, the various empires have different policies on who was the most influential royal female, on the other hand, the institution of queenship (however connotated) was not necessarily fix, neither ideologically, nor in practice. Thirdly, and in many ways most significant for the following sections, some empires, like the Neo-Assyrian, the Seleukid, and the Ptolemaic, are well enough attested to allow focusing on a clearly circumscribed queenship role, while others, especially the Neo-Babylonian, Teispid-Achaemenid, and Arsacid empires, require a less strict focus in order to make meaningful statements on the economic basis of the office of queenship. Arguably, this is not only due to the lack of sources, but also intrinsic to the less determined office, as is certainly the case for the Roman empire.[6] The focus of the Neo-Assyrian queenship section is on the wife of the reigning king, and, occasionally, on the mother of the king (as a regent-like figure for an under-age son, or when she continued to reign after her son has gained the throne). This reflects ancient Neo-Assyrian realities, evident also in the queen's royal title (cum administrative office): she was called *sēgallu* (MÍ.É.GAL), literally 'woman of the palace' (Parpola 1988; Svärd 2015: 39, esp. n. 213). This term differentiated her from Assyrian goddess-queens and independently ruling foreign queens, who were identified by the term *šarratu* (the feminine form of *šarru*, i.e., 'female king'), which are not included in the following discussion. The wives of the Neo-Babylonian kings are not attested in primary sources, and there is only little evidence of kings' daughters and mothers (see Cousin 2023). Therefore, the following discussion of Neo-Babylonian

[6] A full diachronic comparison of the main kingship and queenship titles across the seven empires is a major desideratum, though exceedingly challenging to accomplish due to the highly unconsistent scope of available evidence across the empires. As the evidence for the Teispid-Achaemenid empire is exceedingly pertinent to the discussion of the economic basis, the essentials are provided in two footnotes, as is the scope of relevant terms for the Parthian/Arsacid Šāhanšāhī, which are, however, not directly matched in the sources revealing insights into the economic basis of queenship (see fn. 8 for the Teispid/Achaemenid, fn. 9 for the Arsacid ruling house).

royal women is very limited and primarily focuses on Nebuchadnezzar's and Nabonidus's daughters and Adad-guppi, the mother of Nabonidus. Due to the relative overall scarcity of sources and the arguably fluid queenship conception (and/or office), the discussion focus for the Teispid-Achaemenid empire is on major female royals attested in the primary economic-administrative sources under various titles.[7] Most of the included royal females have been wives of the reigning, former, or next king at some point in their life, though they were not necessarily 'in office', when the respective document was written. For the Seleukid queens, the direct evidence for economic activities is limited and concerns mainly those queens who were wives of kings and then the mothers of their successors. Otherwise, descriptions of the economic basis for Seleukid queenship are based on comparisons and guesswork (e.g., Ramsey 2016: 91-93). For the Ptolemaic Empire, we refer by queen to the female counterpart of the Ptolemaic king. She is typically the wife of the king, and also usually (but not always) his blood relative, i.e., sister (most frequently), mother, daughter, or niece. In the Ptolemaic empire, the queen is often a co-ruler (officially or unofficially) with the king, who manage the affairs as political partners, although the extent of the involvement of the queens varied from time to time. A system of official joint rulership between male and female sovereigns emerges in the 2nd century BCE according to the Egyptian documentation (Bielman Sanchez and Lenzo 2021: 76). As showcased above (section 2.1), the Parthian sources do not allow to assess the financial assets and costs of individual female royals, but largely only – and this indirectly – on the palace/court institution of the Šapistān ('harem').[8] Thus, for the Arsacid

[7] Several terms are used for royal Achaemenid women, though none are yet extant in Old Persian (attested only in the Elamite, Babylonian, and Greek records). As they do occur in the main documents available for discussing the economic basis of the queen and are not yet studied comprehensively elsewhere, they are listed here. PF 1078 mentions the title 'lady, queen' (*bānūkā, ba-nu-ka4) without name (Hallock 1969: 312; Tavernier 2007: 417 [4.4.7.16]). PF 1795 and Fort. 6764 give Irtašduna (Artystone) the title dukšiš/*duxçīš, variously glossed as 'princess' or 'royal woman' (Hallock 1969: 490; Tavernier 2007: 420 [4.4.7.34]). It is also used for Ištin (PF 823; Hallock 1969: 239), Irrakpirda (PF-NN 812; Brosius 1998: 28), and daughters of Hystaspes (i.e., Darius I's sisters or half-sisters, PFa 31; Hallock 1978: 131-134). A woman possibly named 'mrdt is given this title in PFAT 272 (Azzoni 2017: 460. *Amardata? Cf. Tavernier 2007: 103, 603). Darius I's daughter, wife of Mardonius, Artazostre, is called 'daughter of the king' (sunki pakri) in PFa 5, but possibly was called dukšiš in Fort. 1017 (Brosius 1998: 25; Hallock 1978: 118; Kuhrt 2007: 598-599). A 'daughter of the king (Xerxes)', Rātāxšaθra-, is mentioned in rations for a wet-nurse (dated accession year of Xerxes; Brosius 2000: no. 162; Kuhrt 2007: 601; Tavernier 2007: 283). A further term that might have been used is du-iš-da ('wife'), attested for Pandušašša, wife of Bakanšakka (PF 784; Hallock 1969: 232; according to Tavernier 2007: 146 this name reflects OP *Bandu-xšaça, 'ruling over her kin'). A special case is the term 'Abbamuš/*Apamā' used for Irdabama, which has been interpreted as a second name, a throne name, or a title (Brosius 1998: 132-141; Zadok 2002: 65; 2007: 260-261; Kuhrt 2007: 597; Tavernier 2007: 474 [5.3.2.1-2]; Henkelman 2010: 697), which potentially significantly changes the reading of the relevant texts and its socio-cultural implications for Teispid/Achaemenid queenship, which is however beyond the scope of this paper.

[8] Note the following terms mostly mentioned in ŠKZ: Pahl. Šabistān /Parth. Šapistān 'harem'; Pahl. pad-Šabistān / Parth. pat-Šapistān 'the chief of the harem'; Pahl.-Parth. Duxš/Duxt, Gk. κόρης "girl, daughter, including: 'princesses', 'female rulers', 'queens', 'ladies', 'Queen of Queens', etc.; Pahl. Parth. Wisduxš/Wisduxt, Gk. κόρης 'royal girl/daughter, princess, a female member of a house'; Pahl.- Parth. Bānūg/k /Gk. Κυρίας/in Babylonian documents. bēltu, 'Lady'; Pahl.-Parth. Bānbišn, Gk. βασιλίσσης, in Babylonian documents *šarratu* 'Queen'; Pahl.-Parth. BānbišnānBānbišn, Gk. βασιλίσσης των βασιλισσων 'Queen of Queens'; Pahl.-Parth. ŠahrBānbišn, cf. Šahrbānū in later times, Gk. έθνους βασιλίσσης 'Queen of the Šāhanšāhī/land'.

Šāhanšāhī, the evidence is collated pertaining to royal women in general, with focus on those of major influence in the Šapistān. The Roman 'ideology of rulership' did not require an empress ('queen') as such, nor did it automatically attach special meaning to the wife of the emperor. There was no 'office of queenship.' The state of affairs thus allowed the role of the leading or most prominent and influential imperial woman to be held by other women than the 'female royal consort'. Consequently, in relation to Roman Empire the term 'queen' is used in this article to refer to the most influential female member of the imperial family, be that, e.g., the wife or the mother of the emperor (for leading ladies see Cenerini 2021).

3. The kings' access to resources

In this section, we explore the kings' access to resources across the empires. Following an overall assessment of which resources were most significant for the royal economy (and to which degree this can be explored based on the current state of research), we take a look at five core categories of resources: the extraction of natural resources, of (direct) financial resources, and of labour as well as the access to estate produce and to production facilities.

3.1. *Overall assessment per empire*

The economic basis of Neo-Assyrian kingship consisted of resources attained through taxation (on land, agricultural products, cattle, movement of population across the territory, etc.) and labour extraction. Countering the empire's poverty in natural resources, dramatic efforts were undertaken to reconfigure the social landscape in order to ensure that the land was agriculturally productive (Wilkinson et al. 2005: 25). The Neo-Assyrian state dominated ownership over the means of production. In addition, there was a vibrant private sector in the imperial economy (Bedford 2010: 37). For the purposes of maintaining a grip on the lands and people, in the towns and in the countryside, in the heartland and beyond, the Neo-Assyrian king wielded a variety of fiscal instruments that could – alternatively and when needed – reinforce or diminish the economic capital of high officials and other elites. In the imperial heartland, agriculture was the backbone of Neo-Babylonian economy, and the royal administration aimed to increase agricultural production by bringing new land under cultivation. The crown extracted resources primarily through taxation and labour service, royal estates and landholding were of lesser importance. Another significant source of royal income was tribute from the conquered regions outside southern Mesopotamia (Jursa 2011; 2017). The abundance of textual sources from temples and private archives and the lack of state archives may skew this assessment to some extent. Based on the current (still rather fragmentary) state of research, for the Teispid-Achaemenid royal economy we are best informed about the royal access to estate produce and labour. For tribute and gift-giving, the distinction between royal and imperial assets is likely to be blurred, the textual and visual presentation indicates the king as recipient (Descat 1997). The evidence for taxation is also challenging to assess, though here because the available source complexes do not provide a consistent picture (cf. Jursa 2011; Hackl and Ruffing 2021). This also applies to the evidence for taxation and access to estate produce, which both provide income for the royal table, but are not explicated in the expense documents for these (see section 4.2). The Seleukid royal economy was dependent on tax revenue collected in both kind and coin. The Seleukids oversaw a process of monetisation throughout

their empire (encompassing royal issues in gold, silver, and bronze as well as silver and bronze issues by city-controlled mints) which used iconography to visually identify all the metal wealth in the empire as ultimately belonging to the king. Taxation of land (in grain and coin) was also the greatest source of revenue for the Ptolemies (Monson 2007b: 259). Agricultural abundance was a major foundation for their power and influence (Buraselis 2013), something they advertised on their coins with the image of the *cornucopia*. Other sources include various capitation, trade, and production taxes as well as natural resources, war booty, and currency manipulation. The three basic economic sectors of the Arsacid Šāhanšāhī were the royal sector managed by the Šāhanšāh's chancellery, the sector owned and operated by temples, and the private sector. In all likelihood, the king had a share in all major revenues of the Šāhanšāhī. A distinct form of Arsacid royal revenue is linked to military expansion. Beginning with Arsaces I and continuing under Phraates I, the acquisition of new territories involved the establishment of cities through the renaming of existing towns with names incorporating that of the sovereign (Gyselen 1997; Brosius 2006: 110-113; Ellerbrock 2021: 176). These 'new' cities and their surrounding districts fell directly under the authority of the crown, enabling comprehensive control over the economic activities of the region, including agriculture, craftsmanship, mining, trade, and transportation. In the Roman Empire (in the East), the difference between private wealth of the emperor and public wealth of the Roman state was, to a large extent, a matter of political expediency and custom. The emperor had his private wealth, separated from the state, but in actual fact held control over both. Central to the accumulation of personal wealth was the province of Egypt which was tightly controlled by the emperor.

3.2. *Extraction of natural resources*

Beyond agriculture and animal husbandry (see section 3.5), the Assyrians extracted natural resources in the form of quarrying, mining of metals (from the Zagros, the Anatolian mountains, and Afghanistan), exploitation of forests (e.g., Lebanese timber), and the diversion of waterways through the construction of canals. For the most part, these resources had to be extracted and transported from outside of the core area of the empire, especially by prisoners of war (see section 3.5). The Neo-Assyrian state held a monopoly in the exploitation of minerals under special control of the king (Muhly 1998), and the economy was structured in a way that forced surpluses to flow to the imperial heartland (Bedford 2010: 38). Also, the Babylonian heartland was poor in natural resources except for agricultural produce. Stone, metal, and wood had to be imported from areas in the empire's periphery and outside its borders. It seems that these resources were primarily obtained through trade, in which the king and his administration were involved via their own merchants (*tamkār* (*ša*) *šarri*; Alstola 2017: 27-29), and through tribute, which flowed into the coffers of the king and was invested particularly in building projects – including the construction of canals – in the Babylonian heartland (Jursa 2010a: 750-751). The exploitation of Lebanon's cedars was a special case, as the acquisition of cedars for building temples and palaces was a feat expected from all Mesopotamian kings, celebrated, e.g., in Nebuchadnezzar's royal inscriptions (Da Riva 2012). Briant (2002: 400) appeals to (Ps-) Aristotle (Oec. II. 1345b) for the control of mineral rights belonging to satraps rather than the royal Teispid-Achaemenid

administration, but Briant emphasises the lack of the data to corroborate this. In the foundations of the palace at Susa, Darius boasts of his use of precious materials from around the empire (DSf), but this does not clarify whether these materials were part of regular imperial tribute or a special royal asset. Neither is it clear for the large number of natural materials mentioned in the Persepolis Fortification and Treaury Tablets which if any of these should be understood as distinctly royal rather than belonging to the larger 'state' apparatus. For Egypt, the primary sources indicate that quarrying remained a royal prerogative, or it was at least still executed explicitly in the name of the king (on quarry inscriptions in the Eastern Desert cf. Posener 1936: 88-130); whether it generated royal income is to be questioned. In this context, also the question of royal control of irrigation, and especially the instigation of major infrastructure projects for water access (especially qanat systems; Briant 1994; 2017: 354-355), is to be raised. For the qanat system in the Khargah oasis, this has by now to be refuted (Agut-Larbordère 2018). Through the ideology of spear-won land, the Seleukid kings, as conquerors themselves or through their patrimony, laid claim to all natural resources in their empire, including ores and timber (Aperghis 2004: 148, 153). The rise in numbers of coins circulating in the empire attests to mining activity, but there also was a significant recycling of metal from pre-existing and foreign coinages for this supply (Houghton et al. 2008). The greatest natural resource for the Ptolemies was the Nile River which facilitated their agricultural wealth (Adams 2019: 234-243). Another important resource was gold, mined in the Eastern Desert of Egypt (Faucher 2018; Redon 2018). Evidence suggests that these mines were directly managed by Ptolemaic officials (Redon 2018: §11). Gold was required by the Ptolemaic dynasts for official coinage and gifts (Fischer-Bovet 2022: 132). Papyrus documentation also mentions copper mines in the Fayuum and in Middle Egypt (Redon 2018: n. 20), important for monetisation. Stone quarrying was a significant resource for the lavish Ptolemaic building projects (Adams 2019: 234-243). Royal extraction of natural resources by the Arsacids centred around metal mining. Iron ores were indispensable for the production of weapons and armour. Other metals found in the ore deposits include copper, zinc, nickel, arsenic, cobalt, tungsten, lead, and tin. Pliny the Elder refers to the gold mines of Arsacid Šāhanšāhī. Of utmost importance was silver, predominantly utilised for coin minting. The significance of silver extraction was underscored by the founder of the Arsacid royal dynasty, who prioritised capturing territories with Seleukid mints (Olbrycht 2021c: 169). Another sought-after mined commodity in Parthia was salt (Ellerbrock 2021: 175). While the finest mineral and metal products were likely utilised in the crafting of royal ornaments, it is worth noting the absence of reports indicating direct court use for daily purposes. This suggests that this portion of Šāhanšāhī revenue was allocated towards government to control the economy of Šāhanšāhī, rather than for the economy of the courts or Šāhanšāh's personal treasure. Mines were of special interest for the Roman emperors. The empire needed metals, especially gold, silver, copper and tin, which were available only in certain areas of the empire. Thus, they were important sources of revenue, as emperors took immediate possession of all gold mines and a majority of the silver mines. Extraction of metal resources was often overseen by specially appointed officials, especially in the case of gold mines by imperial freedmen. Major mining operations were often protected by the military (Edmondson 1989; 2014: 689-690; Wilson 2002;). In

the East, a special resource of imperial interest was the Lebanese forests with their precious timber (Sartre 2005: 208).

3.3. *Extraction of financial resources*

In the Neo-Assyrian Empire, tax from the 'Land of Aššur' was paid in the form of annual gifts to temples consisting of foodstuffs, grain, and livestock paid either directly by the people or via the governor. The palace manager (*rab ekalli*) was responsible for the handling of tax payments in kind (Groß and Kertai 2018: 9), although this type of revenue might have passed the palace entirely by, going from the temples to the army. Tax under the 'Yoke of Aššur' (i.e., from areas ruled by a vassal king or other type of native regime) was collected in the form of tribute consisting of precious metals and finished products directly paid to the king (e.g., for Sam'al under Shalmaneser III cf. Maxwell-Hyslop 1974: 149). In addition, smaller taxes or fees could be levied e.g., by port officials, gate keepers, and thoroughfare operators both in the imperial heartland and in the hinterlands (Postgate 1992: 247-263). Specific individuals and groups enjoyed (divinely justified) tax and labour exemptions that protected their economic capital, ruled by the king (von Dassow 2011: 209), but typically presented as divine intervention (Pongratz-Leisten 2015: 207, 211). Tribute and taxation were important sources of Neo-Babylonian royal income, but it has to be noted that this income was quickly returned to circulation by hiring workforce in the Babylonian heartland (Jursa 2011). The conquest of Assyria and the Levant provided the Babylonian king with significant tributes that were largely invested in the salaries of people working in royal building projects (Jursa 2010a: 750-751). In the same vein, taxation aimed at extraction of labour: if taxpayers were not able or willing to perform their work obligations, a payment could be made to hire a substitute (see section 3.4). Nevertheless, there were also forms of taxation that were not directly linked to service obligations. These include the taxation of temples' agricultural produce, tax payments in the land-for-service sector, payments for using bridges and gates, taxes for selling land, and the king's share of regular offerings and his prebendary income from temples (Kleber 2008: 287-296; Jursa 2011: 433-434, 443). The Teispid-Achaemenid Empire was most interested in taxes in kind (staples) and labour, but also collected precious metals (Jursa 2011; Jursa and Schmidl 2017). The role of the king in this is difficult to assess, as the currently available sources are specific to their area of origin (especially Persia, Babylonia, 'Greek World', Egypt) with either no overlap or conflicting information (cf. Jacobs et al. 2017; Hackl and Ruffing 2021; Kleber 2021). Also, e.g., how widely the Persians expanded the land-for-service system (see section 3.4) for military service, which they inherited from the Neo-Babylonian polity, remains uncertain (Tuplin 1987: 145; Briant 2002: 75; Matarese 2021: 120-121). A noteworthy primary source specifying the king as recipient of monetary taxes is preserved in palimpsest. The written-over customs account (in Aramaic) from the 5th century. BCE lists custom duties and taxes for ships entering Egypt from the Levant and Asia minor to be paid to 'the house of the king;' however, even this explicit specification is likely to be read as going to a local treasury and storehouse (Kuhrt 2007: 670, 681-703; Folmer 2021). Historians have long laboured in the shadow of Herodotus's so-called tribute list (Hdt. III 89-97), the reliability of which is to be seriously doubted (Tuplin 1997: 373-392; Briant 2002: 399-410). In his list, Herodotus describes tribute both in silver and in kind but claims that some regions only offered 'gifts.' Few of his gifts, however, match the objects depicted on the Apadana being presented

to the king (see Root 1979: 227-284). That high-status objects were brought to the centre from the provinces is demonstrated by the finds of chert mortars and pestles in the treasury (Schmidt 1939: 61; Bowman 1970; Henkelman 2017: 102-106). In comparison, our knowledge of Seleukid extraction of financial resources is more varied. In addition to what the numismatic evidence tells us about the scale of Seleukid monetary activities, several of the Seleukid kings are famous for episodes of (attempted) temple robbery as a means to obtain financial resources (Taylor 2014); these likely need to be relativised in view of potential official royal access via financial officers, comparable to the Neo-Babylonian and Achaemenid evidence. The discoveries in the storage rooms at regional palaces like Kedesh or Seleukeia on the Tigris included jars full of coins, labelled storage vessels, and clay sealings from the papyrus receipts for collections of regular taxes and tribute, including a royal monopoly on salt tax (Invernizzi 1996; Ariel and Naveh 2003). Further, the Babylonian astronomical diary for 274 BCE refers to satraps sending supplies to the king and his army, in what seems to be an exceptional case of extra provisioning during the First Syrian War (ADART I, -273 B rev. 30-32). Under the Ptolemies, in contrast, the primary source of revenue for the monarchy/state was (once more) through the taxation/lease of land, specifically its agricultural production, which was paid either in kind (grain) or coin (see generally Manning 2003; Le Rider and de Callataÿ 2006). Such revenue (e.g., *ekphorion*, 'harvest tax') was levied on different categories of land (e.g., royal, temple, cleruchic, private) at varying rates depending on productivity and privilege/status awarded the holder/lessor/owner (Manning 2003: 54-56; Monson 2012: 75-79). Taxes on temple land were sometimes reduced or abolished (Monson 2019: 153). As to the question of whether this revenue relates more to the 'state' vs the monarchy, the distribution of large gifts of grain by Ptolemaic rulers (see also section 4.2) suggests that they had full control of this revenue and could deploy this to increase their prestige and the dependencies of others. There was also a wide range of other taxes, e.g., capitation taxes, the wool tax, special levies for the military (Huss 2011: 189-236; Monson 2019; Dogaer 2023: 122 with references). Customs duties and taxes were levied on imports; these could reach as high as 50% for luxury items (Bresson 2015: 118-119). Another source of income was war booty, used by the Ptolemies to reward ruling elite and soldiers (Fischer-Bovet 2014: 70). Finally, Ptolemaic rulers controlled the mints and accelerated the monetisation of the economy to facilitate the accumulation of wealth and centralise the country's resources (von Reden 2007). Ptolemy I introduced a closed currency system applicable to all the monarchy's territories, forcing visitors to exchange their silver and gold coins into the local standard which was of a lower weight (de Callataÿ 2005; Bresson 2015); this was a major source of silver for the regime (von Reden 2019: 220). Due to the fragmentary nature of the sources for the Arsacid period, the taxation system of that time remains largely unknown, albeit the boundaries between land obligations, tithes, tribute, and gifts were likely fluid. The primary tax was the land tax, which was paid partially to the treasury of the Šāhanšāh and partially to the royal court and could be collected in money or in kind (Diakonov and Livshits 1960: 1; Lukonin 1983: 744; cf. Allen 2005: 120; Llewellyn-Jones 2013: 78; Malek Zadeh 2020: 238). In addition, there was a poll tax imposed upon the urban inhabitants of Mesopotamia (Lukonin 1983: 745; Malek Zadeh 2020: 238). Satrapies likely had to pay silver taxes, strictly set for each province based on cultivated land and fertility, as determined by average harvest yields over several

years. Nobles exempt from direct taxation were required to deliver gifts to the kings and the Šāhanšāh (Leuze 1935: 206; Dandamayev 2000). Two other significant sources of revenue for the Parthian dynasty were booty (Gyselen 1997) and court fines. Members of the Šāhanšāh's court of justice, along with a designated financial official, were obligated to contribute to the Šāhanšāh's treasury amounts equivalent to those awarded to victims by court decisions. This practice resulted in substantial revenue for the cities and the Arsacid ruling house (Lukonin 1983: 722). The most important way of securing imperial finances and generating revenue for the Roman emperor were various taxes, levied on imperial subjects, trade and land. Indirect taxes, *vectigalia*, included tolls, customs duties, poll-taxes, and taxes imposed on citizens' inheritances and manumission of slaves. However, taxation on land provided the majority of the state's revenue (Rathbone 1996; Lo Cascio 2008). It is also important to note that a part of the taxes was exacted through the social system (as opposed to fiscal arrangements) in the form of compulsory duties. The actual collecting of taxes was the responsibility of individual cities and their curial elites, although imperial procuratores exercised oversight in the overall process alongside the provincial governor, and the emperor's army was the final guarantee of tax exaction. The procuratorial system of revenue extraction was extremely flexible. Procurators of different status operated in different areas, often covering multiple provinces or only portions of a province (Brunt 1990a; Mitchell 1993: 67 n. 57; Sartre 2005: 57-58). Further, the imperial desire for plunder and financial gain could motivate wars and annexations (see, e.g., Velleius 2.39.2; Festus Brev. 13). Plunder acquired under the auspices of the emperor as the commander-in-chief of all the Roman armies was his to distribute.

3.4. *Extraction of labour*

Labour extraction in the Neo-Assyrian Empire could take the form of military service, participation in the maintenance of irrigation systems, participation in harvesting royal fields, and participation in building projects, all of which could be described as corvée labour and were undertaken by the crown (Bedford 2010: 37). An individual with sufficient economic capital could hire someone else to perform labour obligations in their place. To justify taxes or corvée, the kings could refer to the mythological sub-strata in which the human being was created to work for the gods. The Neo-Assyrian Empire also followed a policy of forced deportations that were used, among other things, for military conscription, aggrandisement of the army, and as a source of skilled craftsmen and common labourers using the labour resources extracted from conquered areas (Postgate 1992; Liverani 2017: 539; for visual sources see, e.g., the quarry workers from the South-West Palace of Sennacherib in Nineveh, British Museum ME 124820; or the timber transportation relief from Dur-Sharrukin from the time of Sargon II, Louvre AO 19888, 19889, 19890, 19891). A further labour category were pledges, or debt slaves, who were placed to work with a creditor until the sum of their debt was covered by their (involuntary) labour (Radner 2007: 333); however, this type of labour was more typically for the private than the royal sector. A related relevant concern is the monitoring of the slave trade to restrict the drain of manpower outside of the empire (Parpas 2018: 65, 81). To which extent this was specifically a royal or a state concern is difficult to assess. The Neo-Babylonian crown was primarily interested in extracting labour. Tribute was used to hire workforce, and temples had to provide the king with soldiers and workers for royal building projects

(Beaulieu 2005; Kleber 2008: 133-235; MacGinnis 2012). The land-for-service system was also geared towards this purpose: the state reclaimed land in marginal regions by giving plots for people to cultivate, and the farmers were required to pay taxes and perform work and military service in return (van Driel 2002: 226-273; Jursa 2011: 435-437; Alstola 2020: 102-222). The taxation of urban population worked similarly, and taxpayers were supposed to provide a worker or soldier for the king, usually by means of hiring a substitute (Jursa 2011: 437-440). Deportation of skilled and unskilled labour to the imperial heartland supplied the state with additional workforce (Alstola 2020). In the Teispid-Achaemenid Empire, corvée labour was one of the main forms of taxation, inherited and continued from the Neo-Babylonian Empire (Jursa 2011; Kleber 2021). This could take the form of service obligations on land, military service, and transport duties for taxes-in-kind. Both individuals and institutions could owe labour. Owners of estates, including the king and the queen, had at their personal disposal the labour forces attached to those estates. In contrast, the Seleukid evidence on labour extraction is scarce, though it is difficult to assess whether the lack of sources is representative for ancient realities. For instance, an inscription recording the sale of a royal estate to queen Laodike in 253 BCE tells us that there was a class of 'royal peasant' (*basilikoi laoi*), who probably owed their royal landlords a certain amount of obligatory labour in addition to percentages of their harvests (*I.Didyma* 492 B, C). We might assume that this situation in Asia Minor was analogous to royal estates elsewhere in the empire. Under the Ptolemies, corvée labour was certainly in use, primarily for irrigation infrastructure (Monson 2019: 150). However, it does not seem to have been a major contributor to the Ptolemaic king's economic agency. Within Parthian society, labourers served under the direct command of the royal family (typically managing affairs related to the personal property of the Šāhanšāh and the royal household), were employed by the government for public estates and projects, and worked for local kings, nobles, and other affluent individuals within the community. The delineation of borders and the extent of the first two categories often remain uncertain. Craftsmen in Parthian royal cities were often organised into companies or affiliated with royal workshops, mirroring practices observed in Sasanian royal cities (Pigulevskaya 1963: 160; Tafażżolī 1974; Gyselen 1997). Portions of land designated as Šāhanšāhī property were likely leased by the Parthian royal family, major canals, probably under Šāhanšāhī ownership, by imperial administrators (Dandamayev and Lukonin 1989: 142-143; Dandamayev 1997). Labourers employed on these lands likely received substantial compensation paid by employers who conducted business with the royal family. In the Roman Empire, taxes could also be exacted in the form of labour, compulsory duties or *munera sordida*. A prominent example of a labour tax is in recruits for the Roman army, practiced, e.g., in the case of the Batavi, a famously warlike Germanic tribe inhabiting regions in the northern Rhine delta (Tac. *Hist.* 5.25). On the other hand, exemption from liability to military service could be also given as a favour (Josephus AJ 14.223-229).

3.5. *Estate produce*

The Neo-Assyrian Empire attempted to reconfigure its social landscape in order to maintain some degree of control over the large areas involved. The morphology of this system changed throughout the Neo-Assyrian period, but in all configurations its maintenance required resources

that were directly linked to the exploitation of the land (Wilkinson et al. 2005: 25). The distribution of so-called 'crown land' to imperial agents guaranteed their self-maintenance or covered at least some of their household needs. The exploitation of this 'crown land' by locally hired or displaced labour ensured the production of food rations then (re)distributed to the imperial agents, mostly of barley but also other goods (Fales and Postgate 1995: xxxiv). The Neo-Assyrian royal domains were involved in various economic activities, from primary production to secondary transformation, and even commercial activities (Fales 2017: 272-274). Political dominance was impossible without control especially of agrarian production, which had two separate faces, cultivation and animal husbandry (van Driel 2002: 266). The royal estate produced all manner of goods (wine, wool, grain, etc.) and finished products (clothing, metalwork, pottery, etc.) primarily for the use of the multi-tiered palace economy with personnel enough to fill a medium-sized village, and it seems to have functioned as a self-sufficient economic entity (cf. Groß 2020). Where the palace sector was dependent on outside forces was in the extraction of materials that did not exist in the heartland. Due to the absence of state archives, the evidence of Babylonian royal estates is scarce. Nevertheless, it seems that the estates could not satisfy the crown's demands, and tribute and taxation were more important sources of royal income (Jursa 2010a: 771; 2017: 46-49). Some of the estates were cultivated directly by the crown, but they were also regularly leased out to private rent farmers (Jursa 2010a: 196-197). The land-for-service sector (see section 3.4) was also a form of royal landholding, and it provided the king with tax payments in addition to work and military service. The main crops of Babylonian agriculture were dates and barley, but royal lands were primarily located in more marginal areas beyond the zones of intensive date palm cultivation around the Babylonian cities (Jursa 2010a: 756-760). Princes also had estates and land property of their own (Jursa 2010a: 423). Lacking any clear distinction between the office and person, the private estates of the former king could be taken over by the family of the usurper at the event of a coup: Before becoming the king, Neriglissar was a wealthy landowner, but after Nabonidus's usurpation of the throne, Neriglissar's former landholdings came into possession of Nabonidus's son Belshazzar (Beaulieu 1989: 85-86, 90-98; Popova 2015: 406-407). Also in the Teispid-Achaemenid royal house, the king and other household members (queens, sons, brothers) had their own estates, seemingly throughout the empire, which covered the majority of the king's and queen's expenses (and generating surplus). As the available sources on these estates are largely concerned with the royal table, they are discussed below (section 4.2). A special feature in this context is the so-called 'paradise,' a Persian word for royal walled gardens. The word already appears as a loanword in Akkadian in the fifth year of Cyrus (535 BCE; Cyr 212), implying it was already part of Cyrus's ideas around kingship. So far, Henkelman has counted 22 *paradises* within the *Persepolis Fortification Tablets*, playing a large role in the region's economy (Henkelman 2008: 430). The expansive variety of these gardens can be seen by PFa 33, which lists 6.166 seedlings for fruit trees for several *paradises* (Hallock 1978: 116, 135-6; Kuhrt 2007: 510-511; Henkelman 2021). While this institution clearly played a practical role in providing materials for the royal tables, it had several ideological functions as well. Henkelman has shown that they hosted both royally sponsored religious rituals and royally sponsored feasts (Henkelman 2008; 2011b). Ideologically, the *paradise*

presented a microcosm of the Persian Empire, one that was good, fecund, fertile, and varied, and tied all of this to the reign of the king. This ideology deepens earlier precedents of the king as gardener. Unfortunately, there is no direct evidence for what kinds of revenues the Seleukid kings collected from their royal estates, or the administrative systems they used to manage this. The idea of spear-won land meant that, in a sense, the king and his army had the right to take whatever they needed from subjects in the empire without any bureaucratic moderation (Aperghis 2004: 148). This is why tax exemptions and recognition of territorial inviolability (*asylia*) were so important to the economies of Seleukid cities and sanctuaries (Ma 1999: 179-205). Also for the Ptolemies the evidence is scarce. Because 'royal land' was leased out, rent was paid in the form of a 'harvest tax' (see section 3.3.) which made up part of the complex Ptolemaic tax system. If the Ptolemies had royal domains set aside specifically for the use and consumption of the court, we lack concrete data about any such estates. This is in contrast to the Arsacid Šāhanšāhī, which again feature personal lands of the Šāhanšāh functioning similarly to those of other Parthian nobles but on a larger scale. However, distinguishing between income from state receipts and income from the Šāhanšāh's lands and properties can be challenging. In the inscription of Kartīr at Naqš-e Rostam, the Šāhanšāh's lands are referred to as 'relating to the lands of *wispuhrs* (the house of the Šāhanšāh),' indicating their association with royal property (cf. Lukonin 1983: 702). Additionally, the Arsacid Šāhanšāh possessed irrigation facilities, forests, pleasure gardens, and palaces across various regions of the Šāhanšāhī (cf. *Vit. Apoll.* i. 38). It is likely that selected portions of the Šāhanšāh's property were leased out, including various large canals in Babylonia, which likely belonged to the Šāhanšāh (Dandamayev 1997; Dandamayev and Lukonin 1989: 142-143). Further, a significant portion of temple revenue derived from estate produce, originating from the temple estates of the Šāhanšāhī. Babylonian documents indicate that royal fiscal agents oversaw state tax payments in the temples to ensure prompt and accurate payments (Dandamayev 1979: 590-592; Dandamayev and Gyselen 1999). In the Roman Empire, the royal estates, i.e. the emperor's private property, were an important source of revenue (Crawford 1976; see also Millar 1977: 175-189; for imperial estates, see FIRA 3.100-3). Imperial interest provided predictable and constant revenues. The emperor owned directly considerable amounts of land and although emperors could donate holdings, the number of estates kept growing. The emperor further received income from the leases and rents of public property (Duncan-Jones 1990: 188-198). A central source of new imperial estates and funds were testamentary bequests and confiscation of estates and fortunes of the wealthy. This could be done as a punishment; but also remembering the emperor in wills became a standard practice amongst the elite. These wills were interpreted in the light of the conduct of the ruler, bad emperors forced the wealthy to remember them and good emperors were worthy of it (Millar 1977: 163-174; Delmaire 1989: 597-610; Sidebottom 2005: 319-330). This also held true in the Roman East with its vast imperial properties (cf. Sartre 2005: 208-209).

3.6. *Access to production facilities*

While the Neo-Assyrian palace economy did not necessarily hold monopolies over the production of goods or services, it did dominate many fields of production due to its sheer size, e.g., in agriculture, manufacture, and the exploitation of minerals,

the extraction of which was one of the few proper royal monopolies (Bedford 2010). The palace was thus an important economic agent within the system and frequently produced surplus that was distributed outside of the palace sector, which was especially the case with the profit-oriented textile industry (Groß 2020: 531). The centralisation of production was even less in Babylonia, where it was generally neither dependent on temple nor on palace institutions. The single sector in which the crown probably played an important role was the textile industry (Kleber 2008: 246-249; Jursa 2017: 48-49). Evidence on Teispid-Achaemenid royal access to produce and production facilities concentrates on estate produce (see section 3.5.), which was exchanged (at least) at Persepolis for more durable goods (i.e., cattle, kleinvieh) with local tribes (Henkelman 2005; 2011a: 10). It is likely that there have been royal monopolies, e.g., possibly on the production, filling, and/or distribution of vessels with quadrilingual royal inscriptions (Wasmuth 2017: 207-214). It is also likely that the kings had a say in the coin minting process, in seal production, or in the parchment manufacture for the royal administration at Persepolis (Kuhrt 2007: 793), but there is currently no direct evidence extant specifying royal involvement (on the coinage issue see, e.g., Tuplin 2022). For the Seleukid Empire, the most noteworthy (royal) production branch was coinage. It is, however, noteworthy that the Seleukids encouraged cities to issue their own coinages for regional circulation. To what extent royal officials had the final say over these operations is challenging to assess, but a fair degree of local idiom was tolerated in terms of the iconography (Houghton et al. 2008; Trundle and de Lisle 2022: 66-70). Ptolemaic kings controlled all aspects of minting (see section 3.3.) and of the production and trade of oil, as attested in the so-called Revenue Laws of Ptolemy II (Austin 2006: no. 207; Dogaer 2021: 316-321). Similar monopolisation of production has been suggested for other areas such as textiles and beer, but this is a matter of debate as the extant evidence is less clear (Dogaer 2023: 124-125). While the Arsacid royal household had certain monopolies, including the extension of the royal demesne and the crown lands (Lukonin 1983: 702, 713, 726; Ellerbrock 2021: 176), it appears that most economic production was controlled by private entrepreneurs. Only the minting of coins in Aryānšahr ('Iranian lands of Parthia') was entirely under the Šāhanšāh's control, while in Anaryānšahr ('non-Iranian lands of Parthia') coins were also issued by local rulers (Lukonin 1983: 702; Malek Zadeh 2023/1402sh). Whether the latter was supervised by the Šāhanšāh or if the kings in Anaryānšahr had autonomy in determining the weight and issuance of coins remains uncertain. The Roman emperor had access, in principle, to production facilities of all kinds either through direct possessions or the state. Consequently, it was not an issue of great relevance from the point of view of the formation of resource base.

4. The kings' major expenses and role in the royal economic circulation

As has been touched upon already in various sections on access (section 3), many of the financial and material resources available to the king have been collected for specific expenses and direct redistribution. Across the empires, the most pertinent expenses of the king have been for means to maintain relations with the power base, for individual and court travel, and for accessing information. Especially the latter substantially varied from empire to empire, both in scope and regarding 'state' or 'crown' funding.

4.1. *Overall assessment per empire*

Direct costs to Neo-Assyrian kingship included expenditures covering the subsistence of palace personnel and residents, luxury items like special foods, wine, jewellery, and clothing, gifts to high officers and visiting dignitaries, temple offerings, and building operations (Fales 2017: 277). Major infrastructural, administrative, and military expenses were incurred for the provincialisation of the empire, which ultimately served the king. Spoils of war flowed to Babylonia after the fall of Assyria, and the kings invested these funds in massive building and infrastructure projects that also benefited the economy and population at large (Jursa 2014c). Royal expenditure was state expenditure in the Neo-Babylonian period, and these two cannot be analysed separately in a meaningful way. It is difficult to assess what has been the highest expenditure item in the portfolio of the Teispid-Achaemenid king. Most prominent in the primary sources from the royal archives are the expenses for maintaining the 'King's Table.' However, whether this is due to the special scope of the Persepolis archives or because the distinction between 'royal' and 'state' assets is best explicated for this institution, remains uncertain. They certainly gave very valuable gifts, as well as land-rights in the form of estates to officials and elites and spent a lot of labour taxation on building projects (palaces, canals, roads, presumably way stations), military campaigns, and (state-)sponsored sacrifices (at least in the heartland; cf. Henkelman 2008). However, to which degree, these were funded from specifically royal income or were 'state' funded (in the name of the king), is again difficult to assess. The key cost for the Seleukid kings (and, at the same time, the state) was their military, and it is commonly understood that the royal coin issues were intended primarily for paying soldiers. This helped encourage the monetisation process, since wherever the armies went, a local cash economy followed (Trundle and de Lisle 2022: 57-58; Van Regenmortel 2024). The key costs of the Ptolemaic kings were directed toward maintaining relations with the power base, military expenditure, and preserving their status and image as wealthy and generous (e.g., Theok. *Id.* 17.124-125). The notion of 'abundance' was one which the Ptolemies went to great lengths to demonstrate through public displays of wealth and largess (known as *tryphe* in Greek; Strootman 2014). The key expenses of the Arsacid Šāhanšāh and local kings went into the military and into the maintenance and security of trade routes including fortress construction (Lukonin 1983: 719, 735, 740-741; Brosius 2006: 122-125; Ellerbrock 2021: 158-160), as the caravan trade served as the backbone of the Arsacid state's economy. The Roman emperor used his private wealth as well the resources of the state to advance his various goals. While the emperor had effective control over both his personal, private wealth and state funds the more important question was what the public perceived to be his personal responsibility as separated from the 'state' itself (Lo Cascio 2008).

4.2. *For maintaining relations with the power base*

The Neo-Assyrian kings used various strategies in maintaining relations with their power base. The king's entourage and the palace personnel formed a complex economy around the king, different factions constantly vying for his favour. One of the most central means of maintaining relations with dignitaries both internal and external to the empire was the banquet or royal feast (cf. Ermidoro 2015). These feasts are typically recounted in texts in an exaggerated fashion (e.g.,

the Banquet Stele from the North-West Palace at Kalhu which recounts the attendance of nearly 70,000 subjects at the feast celebrating the inauguration of the palace), but were also displayed visually in the palace reliefs (cf. the banquet scene of Ashurbanipal from the North Palace of Nineveh, BM 124920, or the ivory plaque Met 59.107.22 from Nimrud). The latter likely originally belonged to a piece of furniture, which could well have been used in an actual royal feast. The palace had a sizeable staff for the preparation of all manner of food which testifies to the importance of feeding the king's court (Groß 2020). Furthermore, the king's table was used for the redistribution of possible surplus accumulated over the season. While great feasts could accommodate hundreds or thousands of people with whom the king shared a meal, the king's table corresponded more often to his most secluded council, the place where he could talk in private with his associates. While such feasts were also lavish, their expenses were lesser. In fact, the smaller the circle was, and the more private the circumstance of the meal, the greater the trust that the king placed in those partaking in his meal (Ermidoro 2015: 98). The feasts featured domestic livestock (including hundreds of oxen and sheep), game, birds, fish, small rodents, and poultry. The greens included cereals, especially in the form of bread, legumes, *alliaceae*, vegetables, fruits, spices, and oil. The beverages included beer and wine; indeed, the presence of wine marked the difference between royal and common people's tables (Ermidoro 2015: 204). In the Neo-Babylonian Empire, three groups held significant political power: the king and royal administration, the old cities of the Babylonian heartland, and the Aramean and Chaldean population (Jursa 2014a). We know only little about the inner workings of the royal household, but the so-called Palace Archive from the reign of Nebuchadnezzar shows that a significant amount of agricultural produce was delivered to Babylon and distributed as rations to palace personnel (Pedersén 2005: 110-132; Jursa 2010b: 74-78). High officials were given estates, and the king's power was exemplified by huge palaces (Jursa 1998: 93-94; 2010a: 197; Wasmuth et al. forthcoming a). When it comes to Babylonian cities, the sponsorship of their cults was seen as one of the main duties of the Babylonian kings, and they invested significant resources in building and renovating temples and providing them with lavish gifts. The king's efforts in providing the urban population with safety and abundance resulted in the building of walls and developing the irrigation infrastructure (Wasmuth et al. forthcoming a-b). Naturally, the investments in irrigation did not only lead to increased agricultural productivity but also to increased tax income (Jursa 2017: 49-50). It is less clear how kings invested their resources in maintaining their power base among the Chaldean and Aramean populations. However, keeping them in check turned out to be difficult for the kings of the Neo-Babylonian Empire, resulting in instability and coups d'état (Jursa 2014a: 131-133). A major component of Teispid-Achaemenid royal economics was the institution known as the King's Table (Briant 2002: 200-203, 286-297, 314-315, 921-922; Henkelman 2010: 684-689; 2011b; Jursa 2011; cf. Fried 2018). This system included special taxes for commodities, their transportation to the royal palaces, and the processing of foodstuffs. Some of the vast quantities of food also derived from royal estates and *paradises* (see section 3.5). The system not only fed the king himself and his family, but it functioned as a massive redistributive mechanism for the king's loyal supporters. These included high-status elites who had the privilege to eat with the king at banquets and a wider array of guards, servants, soldiers, and animals (Briant 2002: 314-315). The numbers

of people involved in both the supply and consumption of the King's Table were vast – Athenaeus reports 15000 people fed by it (Ath. 4.146c [4.27]; Briant 2002: 315). Henkelman (2010: 680-682) has tabulated total numbers of attested quantities dispersed before the king, the grains alone totalling roughly 290,000 litres.[9] This institution therefore was an economic engine enabling the maintenance of a vast and mobile royal court. The ameliorating balance to the potential for pillaging and rapaciousness under the Seleukid regime was a practice of royal gift-giving. As already noted above, kings gave estates to their noble supporters and courtiers, and promises of security to cities and sanctuaries regarding their own traditional territories. Kings sometimes also paid for the sacrifices at individual temples, such as in Jerusalem during the early 2nd century (2 Maccabees 3.3). Gifts of land and sums of money to the local temple communities are attested in the Astronomical Diaries and chronicles (Aperghis 2004: 109). These actions, however, did not stem from mere benevolence, since they were often swiftly followed by acts of exploitation (van der Spek 1994; 2004). Some have spoken of Seleukid policies as 'predatory rule', which means that their careful fostering of king-city/temple relationships through acts of euergetism created a sense of indebtedness and obligation, and it justified their seizure of resources whenever they deemed it necessary (Taylor 2014). Sometimes we see a more formal organisation of royal control over local assets and economic systems: e.g., from the 170s onwards, the Seleukids recycled the old office of *zazakku* to supervise the Esagil temple in Babylon (Clancier and Monerie 2014: 212-213). Also, for the Ptolemaic kings, the biggest cost was maintaining relations with their various dependencies and satisfying their expectations through gift-giving, patronage, and benefactions. Amongst the elite, persons in the military and the civil administration, Greek leaders and allies in possessions outside Egypt, and the priests of the main Egyptian temples all 'expected redistributive benefits in exchange for supporting Macedonian rule' (Monson 2012: 26). This included, for example, gifts and rewards to the *philoi* ('friends'): the advisors and agents of the kings who served as liaisons between dynasty and cities, ambassadors at foreign courts as well as generals in and financiers of the army (Strootman 2014: 152-159). These rewards could take the form of land, money, war plunder, or precious objects. The Ptolemaic dynasts also incurred expenses for hosting large numbers of visitors to the palace such as the governing elites and priests who were required to visit the capital regularly (Manning 2019: 106). Hosting of dignitaries like ambassadors included the ritual of gift-exchange in addition to lodging and banquets, whereby the king would be expected to provide the more costly gift (Strootman 2014: 195). In addition to daily ceremonial rituals and holding court, the Ptolemies sponsored various special celebrations and festivals on sacred days, weddings, royal births, and anniversaries of coronations. Costs included various aspects of the spectacle itself (e.g., royal procession, sacrifices, ceremonial rituals, and banqueting/feasting), as well as the giving of generous gifts to the guests (Josephus AJ 12.2.13). Literary accounts indicate that these celebrations were lavish and theatrical, intended to wow attendees with the luxury and wealth

[9] These are partial numbers for years at a time, and only cover certain years under Darius I. With typical daily grain rations being 1-1.5 liters a day, on a conservative estimate the grain alone could have fed 190,000 people. Henkelman (2010: 687) calculates a hypothetical amount per day that reduces down to ca. 14-90,000 people a day.

of the dynasty (Rice 1983; Strootman 2014: 254-261). The Ptolemaic kings further sponsored extensive building projects (typically religious) both in Egypt and in the Greek cities elsewhere (Wasmuth et al. forthcoming a). As for the non-elite constituencies, soldiers were given land grants, especially in the Fayuum (Manning 2003: 56). The Ptolemaic monarchs also provided economic assistance in times of low flood through the disbursement of grain, for example in 239/8 BCE (Canopus Decree, see Austin 2006: no. 271). Ptolemaic euergetism also extended to its allies; they provided land, grain, money, military protection, and gifts for local cults and festivals (Gabrielsen 2013; Habicht 1992). For example, Ptolemy III Euergetes provided some 30 million litres of grain after a devastating earthquake at Rhodes (Gabrielsen 2013: 68). Throughout the Arsacid period, economic life at court was marked by the struggle between the royal house and the vassals for political and economic power. The Šāhanšāh, claimant kings, and vassals required reliable financial support not only for the army but also for the administration of court affairs. The aristocracy was hierarchically structured, including noble Parthians as well as members of the local nobility who held high positions at court, in the empire's administration, and in the military. The aristocracy were known as 'the Greatest' (Gr. *megistanes*). The 'King's Friends' formed an intimate circle surrounding the king, yet even within this group, there existed a hierarchy. Through the rank of 'First Friend,' a noble could ascend to become an 'Honoured Friend' and finally to a 'First and Most Honoured Friend.' Undoubtedly, these different grades of the King's Friend were expressed in the bestowing of royal privileges and were physically discernible in the Friend's appearance. Items of clothing, the quality of fabric, its colour and design, dress ornamentation, as well as weapons and jewellery, could all signify royal gifts expressing the wearer's status (Xen. Cyr. 8.2.8). Those nobles referred to as 'kinsmen of the king' (Gr. *syngeneis*) may indeed have been relatives of the king, but the term could also have been figurative for those acting in the king's interest. These groups, along with additional advisers known as sages (Gr. *sophoi*) and magi (Gr. *magoi*), constituted the King's Council (Gr. *synhedrion*, Lat. *senatus*). Courtiers designated as 'relatives' and 'friends' of the Šāhanšāh enjoyed privileges such as dining at the royal table or serving as body servants to the Šāhanšāh. These privileges were highly esteemed and closely monitored (discussed by Briant 2002: 308; cf. Llewellyn-Jones 2013: 31-34). For instance, they received bones from the Šāhanšāh's table, were required to prostrate themselves before the Šāhanšāh, and to bow to his statue (cf. Ath. 6.26-28; Lukonin 1983: 690). References to the benefactors of the king and the existence of a book to record their good deeds are found in texts related to the Achaemenid (Hdt. VIII 85) and Sasanian periods (ps.-al-Jāḥiẓ: 146, 158-160; Christensen 1944: 407-410) argue for the continuation of such practices also throughout the Arsacid period (cf. Briant 2002: 303-304, 333, 398-399). Stories such as the donation of a few drops of water to Artaxerxes II and the promotion of a simple soldier to the rank of benefactor (Ael. VH 1.31; 12.40) suggest a special rule and restriction to join the benefactors of the king, although these may be allegorical tales. A central expense for the Roman emperor was the free distribution of corn in the city of Rome. The *annona*, as it was called, was a core duty of the emperor, made possible by wheat transported especially from Egypt (Erdkamp 2016). The emperor could also distribute wealth such as imperial estates to his supporters as he thought necessary. Similarly essential for the power of the emperor was the army, tied to the

person of the ruler. The emperor was not only the Commander-in-Chief of the army but had a central role in guaranteeing the pensions of the veterans through the *aerarium militare*. Through this control, he was personally guaranteeing the retirement of his soldiers (see e.g., RG 17; Dio 55.25.1-6; Tac. *Ann.* 1.78; cf. Gilliver 2011: 188). This also applied in the Roman East, where colonies were established for settling veterans (Sartre 2005: 155). Soldiers expected to be remembered in the will of an emperor and donatives, especially on imperial accession, were prudent from the imperial point of view. Imperial gifts and donations by the emperor directly to the inhabitants of Rome and citizens in the provinces could be substantial (e.g., RG 15-16).

4.3. *For travel*

The Neo-Assyrian royal estate changed location periodically and (members of) the royal family could occupy different palaces or even capitals at the same time. The Neo-Assyrian court was expensive to move due to its sheer size. As the king travelled quite extensively throughout the year, a mobile staff (*zarīqī ša ḫūli*) was at his perusal. This consisted of palace officials situated throughout the empire and of personnel that accompanied the king when he was travelling or campaigning (Groß 2020: 264, 504). One of the major expenditures relating to travel came from the frequent military campaigns that were performed by most Neo-Assyrian kings on a nearly yearly basis. The financing and preparation of the military campaigns seems to have derived from the complex of taxes and personal obligations drawn upon via the system of governorships. The palatial economic structure took charge of the mustering, training, and parading of chariotry, cavalry, and infantry as well as of feeding the animals and the troops (Fales 2017: 289). While there were various expenses related to the campaigns, they were also necessary for retaining control over areas from which tribute, taxes, and natural resources were levied. From Nabopolassar to Lâbâši-Marduk, Babylon remained the cherished residence of the Neo-Babylonian kings. Nabonidus's long stay in the desert oasis of Tayma must have been an expensive endeavour – a revealing detail about the complications it brought is the fact that the leftovers of divine meals were sent from Babylonian temples to the king in Tayma (Kleber 2008: 293). In the reign of Nabopolassar, the war against the Assyrian Empire must have consumed enormous resources, but after the fall of Nineveh and the subsequent conquest of the Levant, booty and tribute turned military campaigns into a source of royal income. The king and the crownprince personally participated in the campaigns, travelling to distant regions such as the Southern Levant (Grayson 1975: 87-104; 2 Kings 24-25). Travelling has been intrinsic to Teispid-Achaemenid royal and court life, as the royal house favoured a peripatetic lifestyle keeping the court largely on the move (see also above: section 2.3; see especially Briant 1988; Boucharlat 1997: 217-219; Tuplin 1998; Waerzeggers 2010; Bahadori and Miri 2021). It probably served a practical function in feeding the large court, a cultural function in continuing as well as demonstrating inherited Persian lifeways, and an ideological function in expanding the reach of the king (and queen). To which degree the royal travel expenses were included within the household budget, from which royal resources they were funded, and what the expenses amounted to, is difficult to assess. It is likely that a substantial amount of the costs was covered by the local and regional communities temporarily housing the court. The royal coffers certainly also contributed to military campaigns, though these were arguably primarily a 'state' expense, and also substantially funded indirectly via

service obligations, which included providing one's own military equipment. According to Greek reception history, the Achaemenid king personally funded the travels of the queen and her retinue (Diod. XVII, 38.1; Kuhrt 2007: 600-601). Whether this was the exception or the rule, or only a Greek attempt to make sense of a phenomenon beyond their cultural expectations, is currently beyond the sources; however, the Achaemenid queens certainly contributed to their travels from their own funds (see section 6.3). We know that also the Seleukid royals travelled extensively, both as part of the regular consolidation of their imperial power and for specific military campaigns to rebellion regions and to face external foes, but no direct evidence survives for the expenditures they incurred while doing this. Also for the Ptolemies, the military was a considerable expense especially due to the continual state of conflict with the Seleukid Empire (Fischer-Bovet 2014: 66-83). This includes not just open war but also safeguarding sea trade against piracy (Buraselis 2013: 105). The Ptolemies had a standing army/navy (see Fischer-Bovet 2014: 71-75 for the costs of maintaining this), but also relied on mercenaries and troop levies. Although financed through taxation and spoils of war, anecdotal evidence suggests that the kings also depended on the *philoi* to help fund military campaigns abroad (Diod. 29.29). As for other forms and reasons for travel, most notable are the royal barges, based on warships but converted for pleasure-cruising (Thompson 2013). The royal barge of Ptolemy IV Philopator as described by Athenaeus was sumptuous, akin to a giant floating palace (Ath. 5.196a-204d). In the Arsacid Šāhanšāhi, expenditure allocated to travel-related ventures, especially military campaigns and securing (the monopoly on) trade routes, was primarily drawn from the general treasury rather than specifically from the Šāhanšāh (cf. Plut. *Crass.* 33). Conversely, the Šāhanšāh, in addition to the court, bore the financial responsibility for a significant portion of the major direct and indirect travel expenses of the queen and the Šāpistāns (see section 6.3). In contrast to the earlier ancient Near Eastern empires, the Roman imperial court while travelling was supported by the cities and localities the court travelled through. Imperial travel was facilitated by advance orders for preparations and gathering of supplies along the route to be travelled by the imperial court (e.g., Suet. *Tib.* 38). However, the emperor while travelling was expected not only to adjudicate but also to receive embassies and, if needed, use his resources for the benefit of the localities he visited (cf. e.g., Goldsworthy 2014: 298-300). An example is the embassy from Rhosus in Syria that the emperor received in Ephesos promising benefits for the city (*IGLS* iii, no. 718).

4.4. *For accessing information*

The Neo-Assyrian king employed a network of spies (*daiālu*) and informants (*qurbūtū*), especially following the assassination of Sennacherib. The potential of uprisings, especially instigated by the neighbouring Babylon, were a cause of concern for the kings. Thus, the crown prince, the magnates of the empire, vassal kings, and the provincial governors reported directly to the king (Dezső 2014: 222) bequeathing to us a wealth of epistolatory evidence. However, due to the baroque bureaucracy of the empire, it was difficult for the king to access unfiltered information about the conditions of the empire. Special agents reporting to the king personally and the science of divination were used to undercut this barrier between the king and information (Parker 2011: 370-371). Given the clandestine nature of the information network, the cost of the king obtaining information is not known.

Like the rulers of other Mesopotamian empires, the Neo-Babylonian king must have been well informed through the means of extensive royal correspondence, but the limited sources do not allow an assessment of the related expenditure (Jursa 2014b). The same is true for the Teispid-Achaemenid, Seleukid, and Ptolemaic Empires. Also, for the Parthian court and the Šāhanšāh's Šapistān direct evidence on the existence of a royal espionage and private spy networks is lacking. However, Demetrius II, while held hostage at the court of Mithridates I, is said to have attempted to escape twice from his palace in Hyrcania but was thwarted on both occasions and subsequently apprehended and returned to the palace (Dąbrowa 1999; Lerouge-Cohen 2005: 244). Further, the usage of the terms 'eye' and 'ear' in reference to royal spies is (secondarily) attested for the Achaemenid (Hdt. 1.100) and the Sasanian era (Christensen 1944: 129-130, no. 6). Both indications argue for a significant espionage apparatus also during the Parthian period, particularly within the circles of nobles, local kings, and the Šāhanšāh. As with the Neo-Assyrian Empire, the evidence from the Roman Empire indicates that elite interests substantially influenced the information reaching the emperor. The slowness of communication and the limited and selective information transmission meant that problems of any complexity and imperial importance required a special representative to be dispatched to the area. The emperor used his resources to gather information not otherwise available and to reward trusted advisors for information perceived as good and valid (Sipilä 2009: 39-46).

4.5. *Other*

In the context of royal expenditure, the antiquarian interests of the Neo-Babylonian kings – especially those of Nabonidus – are noteworthy including the related efforts and expenses for excavating the foundations of ancient buildings and collecting and studying objects of the distant past (Winter 2000; Beaulieu 2013). See also the major compilation requests by the Neo-Assyrian king Ashurbanipal (regarding earlier literature; cf. the Royal Library of Ashurbanipal, Robson 2010) and the Achaemenid king Darius (compilation of Egyptian laws; on the obverse of the so-called Demotic Chronicle; see Wasmuth 2017: 249, 269-270 with references), or the latter commodities collection at Susa (Silverman 2019: 262-263). In this context, also the substantial scope of patronage and benefactions for artistic and scientific efforts, especially by the first two Ptolemies, are noteworthy; they institutionalised patronage in the form of the Museum and Library (Strootman 2017). For the Achaemenians and Ptolemies, highly special major construction works ordered and supervised by, or at least explicitly in the name of, the king need to be noted, which go beyond the typical building activities like palace, temple, fortification, road, or irrigation infrastructure construction. For the Achaemenians, this concerns, e.g., the forerunner of the modern Suez Canal, a major artificial water way connecting the Red Sea with the Nile valley via the Bitter Lakes and the Wadi Tumilat. This venture, which certainly built on previous efforts from the 26th (7th century BCE) and arguably even from the 12th dynasty (19th century BCE), was completed under Darius I (see especially Wasmuth 2017: 125-200, 263-269; also Tuplin 1991; Mahlich 2020). Similar ventures are the major efforts of rock-cut paths in Fars (Kleiss 1981) or the so-called Chebar Canal of Ezekiel as access to Susa from Tigris (Waerzeggers 2010: 804). The early Ptolemies undertook an extensive land reclamation project in the Fayyum in order to provide land to (military) settlers and establish

political control over people and production (Manning 2003: 103-110). They also founded cities and military outposts throughout their empire (Mueller 2006; Fischer-Bovet 2022: 128-129).

5. The queens' access to resources

As the scope of sources for assessing the queens' access to resources is generally much smaller than for the kings and more disparate across the empires, a slightly different categorisation proves more fruitful: i.e., access to personnel and specialised knowledge, to produce and production facilities, to direct financial resources, and to special places. Though the latter did not (necessarily) generate direct economic income, they are potentially of major indirect relevance for gaining and circulating knowledge and commodities beyond (or within) the official channels.

5.1. *Overall assessment per empire*

The Neo-Assyrian queens directed a large, broadly networked, bureaucratic household that was a "permanent fixture of the Neo-Assyrian Empire" (Svärd 2015: 61-74). The queen's household was a multifaceted domain including political, military, religious, and significant economic responsibilities. The impressive wealth of the Neo-Assyrian queen's household had multiple sources, but the queen's primary economic responsibility seems to have been to direct the imperial textile industry, or at least a substantial branch of it (Gaspa 2018). There are very few sources pertaining to Neo-Babylonian royal women (Cousin 2023). Although the lack of sources may distort our view of Neo-Babylonian royal women, it seems that they possessed significant landholdings. They also owned servants and had palace and temple staff at their disposal. Finally, they had access to special places such as temples and palace areas that were closed to outsiders. As already highlighted by Kuhrt (2007: 578), the administrative documents from Achaemenid-period Persepolis "show us female members of the royal family on long journeys, in control of large estates and workforces, served by extensive retinues and using personal seals." Nonetheless, it remains impossible to assess many of the specific practices, and also how much of this was bound to the office of queenship or to the individual fulfilling this role in practice (on the fluidity of the ancient terminology see section 2.4). Whether or not Seleukid queens had access to state or royal resources is an important, albeit difficult question. Research shows the potential for Seleukid queens to have a significant hand in shaping the political culture of the dynasty and its management of empire (e.g., Coşkun and McAuley 2016). Access to material resources must have come with this political influence, but research targeted on the economics of Seleukid queenship remains to be done. The areas about which we can hypothesise the most are access to coinage and mints, military resources, and landed properties. Much better documented and in all likelihood much more prominent was the economic role of the Ptolemaic queens who wielded an extraordinary amount of power over monarchic affairs from the time of Arsinoë II, especially when they reigned as co-rulers or on their own (Carney 2013; Bielman Sánchez and Lenzo 2021; Llewellyn-Jones and McAuley 2023). Whether the Ptolemaic queens typically had the same access to royal economic resources as their male counterparts or any sort of financial independence is not entirely clear from the extant sources and likely varied in different periods (in instances of a mother-son ruling couple she may have had more access). The sources of revenue involved are similar to that of the kings: especially taxation/rent on agricultural land, other taxes, mining of metals (esp. gold), and war spoils. These were

complemented by additional taxes, such as the *apomoira*, that were earmarked for the maintenance of the queen's cult, evidenced at least for Arsinoë II (Monson 2019: 153). As previously emphasised (section 2.1.), reconstructing the Arsacid queens' access to resources primarily relies on examining expenses (see section 6) and often necessitates drawing analogies to evidence from the Achaemenid, Seleukid, and early Sasanian periods. As far as the state of evidence allows, the queen, possibly along with other members of the Šapistān, received various direct payments for their upkeep and political endeavors from the Šāhanšāh, the court, and the temples. The responsibility of balancing income and expenditure remained with the Šapistān administrators. As a member of one of the major Arsacid families, and later of the Šāhanšāh's household, the queen likely held the status of a princess and possessed personal assets ranging from jewellery and valuable clothes to land, servants, horses, and maidservants. Following marriage, her status elevated, granting her greater real and personal rights and benefits. With the birth of the crown prince, her position ascended further. The Roman evidence is again more forthcoming. As members of the imperial household, the Roman Empresses ('queens') had access to the wealth of the *Domus Augusta*. Imperial women, especially those accorded with *ius trium liberorum*, had also considerable wealth of their own that they could use to further their ambitions and fulfil their roles as primary women of the empire.

5.2. *Access to personnel and specialised knowledge*

Neo-Assyrian queens conventionally delegated top managerial responsibilities to a type of female supervisor called *šakintu* (Teppo 2007; Svärd 2015: 91-105). *Šakintu* women were elite members of the imperial administration with their own households and financial means. In service to the queen, they evidently oversaw bevies of lesser ranking *sekretu* women (Svärd 2015: 105-109). Some *šakintu* and *sekretu* women must have worked in the main palace, while others were stationed across the empire, including at the queen's satellite palaces and villages (Svärd 2015: 92, Fig. 4). A variety of additional male, eunuch, and female professionals and servants supported Neo-Assyrian queens and their household. Evincing the imperial distribution of the queen's personnel, several members of Naqiʾa's staff are included in a list assigning lodgings to royal officials who were probably invited to visit the main palace from outside of the capital (SAA 7 9; Svärd 2015: 65). There are further textual indications that the office of queenship employed treasurers, village managers, a merchant, a deputy chief of quays, and a deputy of the chief of trade (Edubba 10 1; SAA 6 90; SAA 6 140; SAA 7 9). References to shepherds, weavers, a tailor, and a chief fuller, as well as to sheep, point to the involvement of queens in the textile industry (see section 5.3). Queens also retained military staff, along with individuals holding positions such as cupbearer, bodyguard, cook, leatherworker, confectioner, and goldsmith (CTN 2 44; CTN 3 87; Edubba 10 20; SAA 6 165; SAA 6 253; SAA 6 329; SAA 7 6; SAA 7 9; SAA 16 65; SAA 16 81; Svärd 2015: 57-58, 63, 73, and 84). Queens of course had scribes, but this does not mean they themselves were illiterate (SAA 6 310; SAA 6 325; SAA 14 29; Svärd 2015: 72, 124-125). In fact, we know that at least one Neo-Assyrian queen studied cuneiform. A letter survives in which a daughter of the King Esarhaddon encourages Libbalisharrat (future queen of Ashurbanipal) to do her writing homework (SAA 16 28; Svärd 2015: 71, 88, 90, 228, 230). Neo-Babylonian royal women must have had a large entourage, and their servants and slaves appear occasionally in

our sources (Beaulieu 1998; MacGinnis 1993; Waerzeggers 2004). According to the so-called Adad-guppi stele (RINBE 2 Nabonidus 2001), Nabonidus's mother Adad-guppi, a woman of high standing at the courts of Nebuchadnezzar and Neriglissar, used her personal relations to help her son enter the service of these kings, and, according to the stele, it was her piety towards Sîn that facilitated Nabonidus's accession to the throne. After becoming the king, Nabonidus made her daughter the *entu* priestess at Ur and renamed her En-nigaldi-Nanna (RINBE 2 Nabonidus 34). As the *entu*, she had significant resources at her disposal, including the religious knowledge of a high priestess and the temple's cultic and lay personnel. Details on her resources and managing practices are currently not known. How widespread the Teispid-Achaemenid queens' access to personnel is difficult to assess. They certainly commanded a large array of *kurtaš* to work on their estates (see section 5.3) and could give orders to administrative officials as attested in at least nine letter-orders from royal women (Henkelman 2010: 702; Stolper 2018). From the Greek historiographical sources, we further glean that they had a large retinue accompanying them on military campaigns. At least, that is what Diodorus Siculus claims, when he recounts that Alexander restored to Sisygambis the retinue that her son Darius III had bestowed on her (Diod. XVII, 38.1; Kuhrt 2007: 600-601). For the Seleukid queens, we have literary sources reference handmaidens, bodyguards, and sometimes military officers in service to the queens, but their focus is not economic. We might presume that these queens had artists, clothiers, tutors, and entertainers in their employ, but that is pure guesswork. As essentially co-monarchs and members of the same family, most of the Ptolemaic queens likely had similar access to personnel as kings. Due to a lack of sources from Alexandria, precise evidence is limited, but a statue depicting the courtier Senenshepsu from the reign of Ptolemy identifies him as "overseer of the royal harîm of the Great King's Wife of the King of Upper and Lower Egypt" (Lloyd 2002: 123), indicating the queen did have her own staff. Different potential claimants to the throne – whether male or female – had different factions at court, especially from the 2nd century onwards when dynastic disputes were more common (Strootman 2014: 93). Kleopatra I, a Seleukid princess, brought her own servants and ministers which provided her some separation from the established courtiers in Alexandria (Llewellyn-Jones and McAuley 2023: 77-78). Access to personnel and specialised knowledge was crucial for the queens and princesses of the Arsacid Šapistān in fulfilling their pivotal political roles of fostering and upholding political and social connections (further elaborated in the 'expenses' section below). Though assessing the extent of their agency in recruiting personnel is challenging, they certainly had access to personal servants, guards, accountants, treasurers, counsellors, priests, maids, doctors, barbers, chefs, bearers, cupbearers, tailors, pets, gardeners, handymen, jewellers, musicians, dancers, gamekeepers, managers, trainers, tutors, teachers, heads of protocols, keepers of the curtains, head chamberlains, and indirectly, merchants, espionage personnel, and likely artisans (Lukonin 1983).[10] When moving

[10] We further have evidence of the courtiers' occupation titles and epithets in Parthian in ŠKZ such as: pat-Šapistān, Šāpistān, pat-Šāpistān, Ganzβar, pat-Ganzβar, Wāžārbed, Dibīr, Dibīrbed, Zēnbed, Aspbed, Naxčīrbed, Āxwarrbed, Dādβar, Ēhrbed, Bāmbišnān Handarzbed, Grastbed, Maδugdār, Framadār, Dizbed, Niwēδbed, Darbed, Hazāruft, Parištagbed, Darīgān Sārār, Zēndānīg.

or travelling, the nobles' Šapistān (including the 'queens') were accompanied by a retinue of guards and attendants (Plut. *Crass.* 33). Formal visits probably involved larger and better-equipped caravans. Membership of the Roman imperial household, the *Domus Augusta*, brought the queen into direct contact not only with the emperor but also to key courtiers and officers. This access, when exploited skilfully to regulate especially the access to the emperor could produce potential for gains (cf. de la Bédoyère 2021: 188). It is noteworthy that the pre-eminent lady of the Roman Empire was not necessarily the empress. This reflected on 'queenship' broadening the possible role of the queen, but also making the queen's role more precarious.

5.3. *Access to produce and production facilities*

In the Neo-Assyrian economy, entire villages were bought and sold (SAA 7 115). Texts refer to queens having 'village managers,' which suggests that queens owned and (through local managers) operated various locales (see also section 2.3). Presumably owning a village entailed controlling and consuming its resources, industry, products, and/or revenue. At least some of the queens' estates and staff (including shepherds) could have played a role in the textile industry (Edubba 10 28; SAA 7 12; SAA 12 94; SAA 19 176; Gaspa 2013: 230; Svärd 2015: 62-63, 80). A list of flax and wool allotments for various royal households, palaces, and villages indicates that the queen's household received roughly 600 kilograms of fiber (SAA 7 115). Only the capital city of Nineveh received more. Such a large allocation would have supported the production of far more textiles than the queen herself (or her immediate, residential household) could use. The queen's allotment was suited for a commercial enterprise; however, we do not know who (such as the royal family, palace officials, the military, temples, etc.) consumed and/or purchased the products.[11] Neo-Babylonian princesses also owned land and thus had access to agricultural produce. At least two daughters of Nebuchadnezzar, Kaššāya and Ba'u-asītu, held real estate in Uruk or its surroundings (Beaulieu 1998). In the same vein, one or more daughters of Nabonidus or their representatives were active in Sippar, having access to agricultural produce (Beaulieu 1989: 136-137; Waerzeggers 2004), though it remains unclear where their estates were located. Nabonidus's daughter En-nigaldi-Nanna did not only enjoy a high cultic status in Ur, but also had the temple's economic resources at her disposal (RINBE 2 Nabonidus 34; Popova 2015: 407-408). For the Achaemenid period, archival sources from Persia and Babylonia evince royal women controlling their own households and estates, much like the Great King himself. The queens also possessed their own personal seals, by which they authorised commodity distributions to and from these estates. As for the king, these were finely carved with heroic and warlike motifs (see Kuhrt 2007: 578, also 596-597, Figs. 12.4-12.5). At least three estates are attested for Irtašduna (Artystone; daughter of Cyrus, sister of Cambyses and wife of Darius I) in Fars: at Uranduš, Kuknakkan, and Matannan (Brosius 1998: 126; Henkelman 2010: 698, n. 111). For example, Irdabama had multiple *kurtaš* working for her near Tirazziš (Shiraz), Tamukkan (Borazjan), and Kurra (see Brosius 1998: 141-143). This phenomenon was not limited to the Persian heartland. Estates of queens in Babylonia are

[11] An in-depth, interdisciplinary study that analyses the involvement of queens in the textile industry and integrates the results into the bigger picture of Neo-Assyrian textile production and the overall imperial economy has potential but has not yet been attempted.

attested in the Murašû archive (Stolper 1985: 62-64), where two texts mention estates "of the lady of the Palace" (BE 9 28, BE 9 50) and ten texts estates specifically of Parysatis (Parušiyati), wife of Darius II, in the vicinity of Nippur and Babylon (Stolper 1985: 63-4; 2006: 466). Stolper argues the former included both 'crown land' and so-called bow lands (Stolper 1985: 62), and the queen had an *ustarbaru* (*vaçabara*) as an estate administrator (Stolper 1985: 63; 2006: 465). Parysatis's estate had landholdings, managers, servants, and judges. For Parysatis's estate in the vicinity of Nippur, the records on the yield 420 BCE are preserved: ca. 57,000 liters (317 kur 2 pi 3 sutu) of barley and ca. 900 liters (5 kur 2 pi 3 sutu) of wheat (TuM II/III 185; Kuhrt 2007: 820-821). If Xenophon is to be believed, Parysatis also held estates near Aleppo and along the Tigris that included multiple villages (Xen. *Anabasis* 1.4.9, 2.4.27; Stolper 2006: 464; Kuhrt 2007: 820-821). Another woman named Amisiri' also appears as an estate owner in several texts (BE 9 39; CBS 5199; BE 10 45), which is why Brosius believes she was likely related to Artaremu, satrap of Babylon, and thus a member of the royal family (1998: 128). Further, Plato claimed Amestris held vast estates (Plat. *Alc.* I 121c-123cd; Brosius 1998: 123). A noteworthy instance noted by Tuplin is that Lahiru, an estate of the Egyptian satrap Aršama (TAD 6.9), had previously hosted estates of the Neo-Assyrian Queen Mother Naqi'a and Šamaš-šumu-ukin as a crown prince (SAA 6.225; NALK 173-174; see Tuplin 2020). This raises the question whether some queenly estates were 'inherited' by Achaemenid queens from earlier empires, similar to the institution of the crown prince in Babylon. Especially in lieu of the Seleukid evidence, also 'inheritance' (or military revenue shares) of whole villages including their production facilities comes into view also for the Achaemenid queens. At least, this is a possible reading of the Greek account that the Egyptian village of Anthylla produced shoes for the queen-consort (Hdt. 2.98; Kuhrt 2007: 725). Also for the Seleukids, queenly ownership of estates and villages is attested. In 254 BCE, Laodike the wife of Antiochos II paid thirty talents of silver for a royal estate located in Hellespontine Phrygia. The purchase gave her ownership of the land, a manor-house, villages located on the land, and the peasant inhabitants, plus their annual incomes. She paid for it all in three instalments over the course of one year, presumably allowing her time to assemble other assets for the payments (*I.Didyma* 492 B, C). This purchase gives insights into Laodike's personal wealth and the type of income-generating estates she may have had at her disposal. For example, the 'Lehmann text' from 236 BCE includes Laodike and her sons as joint owners of a parcel of royal estates on the banks of the Euphrates, including the arable lands and their annual incomes (van der Spek and Wallenfels 2014). Numismatic evidence further informs us that some Seleukid queens had control over royal mints. In 175 BCE, Laodike, the widow of Seleukos IV, took over control of royal coin issues on behalf of her young son, the new king, and included her own image as the primary ruler of the empire. Similarly, in 126/5 BCE Kleopatra Thea issued coins in her own name from the mint at Ptolemais-Akko (Houghton et al. 2008: i, 35-39, 465-467). In these instances, both queens had (briefly) taken control over the Seleukid state. What is an exception in the Seleukid Empire, is the rule under the Ptolemies. Royal land belonged to the Ptolemaic monarchy jointly. As for the state monopolies in production (e.g., oil) mentioned above in the kings' section, it is not clear from the extant evidence how much the queens were involved; it likely varied depending on the relative power of the particular queen. As for coins, some Ptolemaic queens are prominent

on minted coins of the dynasty, although whether such minting is in their honour or at their behest is sometimes open to interpretation. The first coins bearing images of Ptolemaic queens were minted during the reign of Ptolemy II, showing Arsinoë II with her husband. After her death in ca. 270 BCE and the establishment of a cult, dekadrachms were issued in her name alone. Coins in the name and image of Arsinoë Philadelphus continue to be minted until the end of the dynasty; sometimes her features are portrayed as those of the current ruling queen (Lorber 2012; Carney 2013: 121). Coins were produced also in the names of other ruling queens, e.g., Berenice II and Kleopatra I (Lorber 2012; Müller 2021: 86-87). Issues by Kleopatra I (wife of Ptolemy V and joint ruler with her son Ptolemy VI) bore the queen's mint mark on the coins (Bielman Sánchez and Lenzo 2015: 425-430). Kleopatra VII, in addition to issuing her own coins, also reformed the currency by minting new denominations of bronze coins (Monson 2019: 155). In contrast, there is no independent evidence available to determine the economic sectors specifically under the authority of the queen in the Arsacid period sources. Regarding the queen's personal assets, it is important to recognise them as part of the royal family's assets, likely bestowed upon her as gifts by the Šāhanšāh or with his consent. These assets could encompass farmland, vineyards, wineries, and other properties. Particularly in cases where the Šāhanšāh died, when the crown prince had not yet reached legal age, the queen, acting as the deputy of the Šāhanšāh, assumed the duties of the Šāhanšāh until the crown prince matured, effectively occupying the Šāhanšāh's role. This exceptional situation occurred at least twice in the Arsacid period: for Rinnu, mother of Phraates II (Āssar 2003 [unpublished]; Olbricht 2021c: 233), and Musa, spouse of Phraates IV and mother of Phraates V (Phraataces; Olbrycht 2021a; 2021b). It allowed the Arsacid queen to mint coins bearing her and her child's image as a symbol of joint rule. The Roman queens had access to produce and production facilities as a member of the imperial household and could also have their own substantial private holdings. Queens could appear on imperial gold coins, as testified, e.g., by the individualised portrait of Livia, mother of the emperor (Kunst 2021: 389).

5.4. *Access to direct financial resources*

Neo-Assyrian queens had direct access to financial resources from the time they became queen into eternity. Although no marriage documents relating to Neo-Assyrian queens are known, written sources refer to elite dowries and bridal provisions during the Neo-Assyrian period (Radner 1997: 163-164; Svärd 2015: 128-129). Based on comparative sources, we can thus assume that newly-wed queen consorts would have infused the imperial economy with rich dowries. They must also have arrived with a wealth of personal assets, including luxury goods and servants. During their reigns, queens (and/or their household) profited from wealth generated through their estates and industry. Further, they received shares of palace resources, such as enormous provisions of wine (Kinnier-Wilson 1972; Fales 1994: 368-369). Queens also received substantial shares of tribute and audience gifts. The queen's second position in these allocations suggests that her household was the second-most endowed (SAA 1 34; Svärd 2015: 62). A Neo-Assyrian queen (and/or her household) also "had her own revenue from taxes or tribute which came to her directly instead of being channelled through the chief of trade of the king" (Mattila 2014: 407; Svärd 2015: 64). In death, queens took a bounty of movable assets with them. Excavations of the tombs at Kalhu reveal that the 8th-century queens Hama, Yaba/

Banitu, and Atalia were buried with troves of precious adornment and artefacts, including personally inscribed objects exemplifying personal property (Al-Rawi 2008: 136-138; Hussein 2016; Gansell 2018a). After death, queens continued to directly receive resources through libations and offerings of wine, beer, and food (Postgate 2008: 180). A cuneiform tablet from the Kalhu tomb of Mullissu-mukannišat-Ninua (queen of Ashurnasirpal II and Shalmaneser III) further instructs the living: "May someone later clothe (me) with a shroud, anoint (me) with oil and sacrifice a lamb" (Al-Rawi 2008: 123-124). Concerning the dowries of Neo-Babylonian princesses, we possess the marriage agreement of Neriglissar's daughter Gigītu and Nabû-šumu-ukīn, the *šatammu* of the Ezida temple of Borsippa. Unfortunately, the tablet is badly broken, and no information about the dowry survives (Roth 1989 no. 7; see also Cousin 2023: 186). The high status of royal women was expressed by their attire. Nabonidus reports how he studied the past descriptions of *entu* priestesses to dress her daughter accordingly, and the Adad-guppi stele narrates how he clothed and adorned his mother's corpse for burial (RINBE 2 Nabonidus 34; 2001). If the tomb discovered in the South Palace was indeed Adad-guppi's (see section 5.5), the jewellery found therein gives an impression of how the Babylonian royal women adorned themselves.[12] Cuneiform texts suggest that some queens of the Teispid-Achaemenid dynasty had the rights to prebends from some Babylonian temples (e.g., BM 29447, BM 85009, BM 28899); the income from the prebends were presumably given to members of the queen's household when she was not present (Zadok 2002; 2003; 2007; Henkelman 2010: 697). As already highlighted above, the queens certainly also possessed valuable mobile property (see especially their seals; see section 5.3). On the other hand, primary sources on their dowries are conspicuously absent, secondary ones sparse. The only currently known references stylise diplomatic marriages as dowries brought in by 'foreign' wives; thus, Media is said to be brought in as dowry of Cyaxares' daughter her marriage with Cyrus (Xen. *Cyr.* 8.5.19; Kuhrt 2007: 60), similarly, Darius III is reported to have given the territory west of the Euphrates as dowry for his daughter's marriage with Alexander of Macedonia (Diod. XVII, 54; Kuhrt 2007: 447). For the Seleukid queens, the available evidence is once more eclectic. We presume that all Seleukid queens had dowries, though we only have (literary) references to large dowries for Berenice Phernophoros 'the Dowry-bringer' and Kleopatra Thea (Jer. *In Dan.* 11.6; Josephus AJ 13.82). Stratonike dedicated at least 50 valuable collections of jewellery and other objects at Delos, some of which were inherited from her parents and must have come from her dowry (Constantakopoulou 2017: 198, 207, 288 n. 91). Access to other kinds of direct financial resources is currently not known for the Seleukid queens. As most Ptolemaic queens were members of the same family as the kings, dowries were not a significant part of their personal financial assets. However, Macedonian noblewomen could inherit and transfer their inheritance (Strootman 2014: 94). This tradition seems to have been upheld for the Ptolemaic Dynasty, and it has been argued that the main rationale behind Ptolemaic full-sibling marriage was perhaps a desire to combine two lines of inheritance (Strootman 2014: 104). That

[12] For the jewellery, see Moortgat-Correns 1996 and the corrections by Pedersén 2021: 49. The grave had been robbed, and the jewellery that remains gives a faint idea of its original splendour. The grave goods of Assyrian queens offer a point of comparison (Hussein 2016).

Ptolemaic queens had independent access to financial resources (perhaps wealth built on their personal inheritance?) is suggested by the report of Kleopatra III depositing wealth and possessions in Kos for safekeeping during the period of dynastic tension with her father (and co-ruler) Ptolemy IX (App. *Mith.* 12.23; Llewellyn-Jones and McAuley 2023: 203). As sole rulers and regents, queens presumably had the same access to / control over state revenue as their male counterpart, and there is some documentary evidence to support this. For example, papyrological evidence suggests that Kleopatra III was closely involved with temple revenues and tax concessions (Llewellyn-Jones and McAuley 2023: 204). As mentioned above, Kleopatra VII issued new denominations of bronze coins (Monson 2019: 155). It seems that the Arsacid queen's control over her movable assets, such as clothing, jewellery, coins, furniture, curtains, carpets, etc., surpassed her control over other assets like land, vineyards, buildings (such as palaces, pavilions, gardens, personal paradises), etc. Statues and sculptures portray wealthy women adorned in Parthian attire, such as long-sleeved floating robes over a long underdress, made from richly adorned and embroidered textiles. They wore elaborate headdresses adorned with jewellery, including necklaces made of pearls and precious stones, as well as earrings and bracelets. The attire depicted on female statues in Hatra undoubtedly reflects Arsacid fashion influenced by central authority (Brosius 2006: 107-108). Ownership of immovable property during the Arsacid and Sasanian periods was subject to restrictions, especially regarding sale, by family members, including both men and women. Originally, real property, cattle, and tools of production were collectively owned by the agnatic group, with families within the group serving as co-possessors, granting access to every family based on co-partnership and membership in the agnatic group. Real property could only be transferred within the group (to an agnate), with the consensus of the agnates necessary for any alienation outside the group (Perikhanian 1983: 643). Selling ancestral land and property was deemed dishonourable, and such transactions likely faced constraints during both the Arsacid and Sasanian eras. If these properties, bestowed by the Šāhanšāh, were lost for any reason, individuals would likely face repercussions, experiencing a sense of humiliation and accountability. The Šāhanšāh could further direct surplus disposal, typically allocated to his family including women; in one case, this amounted to a yearly offering of a thousand lambs (Perikhanian 1983: 643, 656-661). A key part of the Roman queen's economic independence, such as existed, were inheritances and bequests. The emperor could allow imperial women to inherit more widely than was strictly the norm, and with inheritances came connections (Dio 51.13.7). The amount of wealth possessed by imperial women could be considerable (Kokkinos 1992: 164). Powerful first ladies were in the position to ensure granting of imperial favours and could capitalise on that ability (Kunst 2021: 392-393). This could also take the form of illicit selling of imperial privileges (de la Bédoyère 2021: 188). Empresses could amass further riches by profiting from the elimination of wealthy elite individuals. Some empresses were blamed for just that and political removals of individuals were attributed to financial greed of the queen (e.g., Tac. *Ann.* 12.59). Wealth and the social gulf between members of the elite and the people at large could be enormous. Tacitus (*Ann.* 12.22) pities a senatorial lady, forced into exile by the machinations of the empress, who had to leave with the sum of only 5 million sestertii – equal to the annual pay of some 16 600 legionaries. The anecdote gives some scope of the wealth that could be in use of the more affluent empresses.

5.5. *Access to special places*

Neo-Assyrian queens must have conducted the duties of their office from special palace spaces, where they might have resided as well. An inscription carved on a sculpture at the entrance to a suite in Nineveh's Southwest Palace states in King Sennacherib's voice: "For Tashmetu-sharrat, the queen, my beloved spouse … I had a palatial hall of loveliness, delight, and joy built." (RINAP 3 Sennacherib 40: 44"b-46"b; Galter et al. 1986: 27-32). A queen's suite may also have been built into Nineveh's North Palace, where a large-scale bas-relief on the wall depicted the royal couple sharing a victory banquet (Kertai 2020: 211). At Kalhu, archaeologists have proposed the locations of possible queens' suites in both Fort Shalmaneser and the Northwest Palace (Oates and Oates 2001: 65, 186-192; Kertai 2015: 42-43). In fact, much of the southern sector of the Northwest Palace may have been the domain of the queen (Kertai 2015: 44-46). This interpretation is based on its architectural layout, the location of an archive associated with the queen's household, and burials of queens beneath its floors. It is notable that the 9th- and 8th-century Northwest Palace queens were buried beneath their royal abode, while Neo-Assyrian kings were entombed below the old, ceremonial palace at Assur (Postgate 2008: 177-178; Lundström 2009; Hussein 2016). Perhaps the Northwest Palace queens were interred at their residence because of their close relationship to the palace (given that their title *sēgallu* literally meant 'woman of the palace'; see section 2.4.; see also Wasmuth et al. forthcoming a). Indicating a possible shift in burial traditions, textual evidence suggests that Esarhaddon's 7th-century queen Esharra-hammat was buried at Assur (RINAP 4 2002; SAA 12 81; Postgate 2008: 177). Neo-Assyrian queens (formerly reigning and/or future) may have had access to the burial site of a just-deceased queen, as a ritual text refers to the presence of 'queens' at a queen's (probably Esharra-hammat's) funeral (SAA 20 34; Svärd 2015: 45-46). Queens may have had privileged access to temples, too. Royal images consistently portray queens engaging in ritual activities (Ornan 2002). Supporting this visual corpus with reference to a specific event, a letter to King Ashurbanipal states that circumstances are favourable for the queen to go into the temple and enter the sanctum of the state god Aššur (SAA 20 52). This text "suggests that although the queen's access to one of the most sacred spaces of the realm was not self-evident, it was granted" (Svärd 2018: 127). Neo-Babylonian royal tombs were typically located in palaces and were thus accessible only to a limited group of people (Jursa 2010b: 71). In the Adad-guppi stele (RINBE 2 Nabonidus 2001), Nabonidus's mother is depicted as a loyal servant of Nebuchadnezzar and Neriglissar also after their death, taking care of their luxurious, monthly funerary offerings while no one else did. It remains unclear whether these offerings were delivered at the tombs or at royal statues located somewhere else (Kuhrt 2001: 83-84). When Adad-guppi died at a high age, Nabonidus claims that he made the elite of his empire come together and organised an elaborated funeral for his mother. Joannès (2022: 199) has recently suggested that a tomb excavated at the South Palace of Babylon was that of Adad-guppi, but the evidence remains inconclusive (cf. Moortgat-Correns 1996; Jursa 2010b: 71). Royal women also had access to other special places. As the *entu* priestess, En-nigaldi-Nanna must have been able to enter the sacred temple precincts inaccessible to non-priestly people (see Waerzeggers 2011: 64-66). The women's quarter at the South Palace need not be an enclosed unit, but its existence suggests segregation at least on an administrative level (Jursa 2010b: 70-71; Cousin

2023: 178-181). Finally, Berossus tells that Nebuchadnezzar built the Hanging Gardens for his wife Amytis who longed for the hills of his native Media (BNJ 680). Even if the story is most likely fictional (van der Spek 2008: 302-313; Rollinger 2013: 147-155), the motif of the king's lavish gift-giving to his wife is believable. The question of special access to certain areas of the palaces, temples, or elsewhere reserved for the Teispid-Achaemenid queen(s) is currently beyond the sources. Separate 'harems' are to be rejected for the Achaemenid court (Lenfant 2020). Since the queens could travel independently, they probably owned tents. It has been debated (and refuted) whether the tower-like structures of uncertain function at Naqsh-e Rustam and Pasargadae were tombs of royal woman (e.g., Boyce 1984), though a non-funerary function is more likely (Sancisi-Weerdeburg 1983b; Callieri 2021: 1280), or if they were interred with their husbands in the royal tombs, most of which had multiple *astodans*, i.e., rock-cut cavities functioning as ossuaries. Henkelman (2003) has argued that sacrifices were made for Cambyses and his wife at their tombs under Darius. Other than the example of Laodike personally owning sections of royal estates, little is known about Seleukid queens' control over special economic resources or properties within the empire. The category is also of less relevance for the Ptolemaic queens. However, a separate space for the royal women is mentioned in Athenaeus' description of the royal barge in the time of Ptolemy IV Philopater (Ath. 4.204d-206d); these quarters are described as having their own symposium (dining room) with nine coaches, suggesting the queen could have her own private meetings/gatherings (Nielsen 1994: 136; Ath. 4.204d-206d). Regarding the interaction of the Arsacid queen and court women with other sections of society, it appears that there were more restrictions for men to access certain places than for women. The Šapistān and likely other areas of the court were probably inaccessible to the majority of men. Higher-ranking women, especially queens, had extensive access to the Šāhanšāh's estate and beyond. They travelled with guards and attendants, often in larger, well-equipped caravans for formal visits, and had more freedom to access male-dominated spaces. Roman empresses and other leading women had special access to some cults only allowed to women, such as Vesta and Bona Dea (de la Bédoyère 2021: 122). As highlighted above, this generated a potential for exclusive information gain and resources but did not, directly, generate economic resources. The queens could use resources for building projects in their own name, such as restoration of temples, and other benefactions for persons and activities.

6. The queens' major expenses and role in the royal economic circulation

While (our knowledge of) the queens' access to resources is much more limited than that of the kings, thus prompting a slightly different categorisation, the areas of main expenditure of the queen (and distinct from the disbursals by the king and/or the 'state' or 'crown') are similar to those of the king, though with substantially more variety across the empires. Whether these diachronic distinctions reflect ancient realities or whether they are the result of excavation traditions and preservation casualties, is currently impossible to assess, though the latter probably plays a major role in distorting the picture.

6.1. *Overall assessment per empire*

The main attested expense category of the Neo-Assyrian queen's economy is religious contributions, taking the form of temple donations and/or offerings to the

divine (Svärd 2018: 127). Diverse 8th- and 7th-century texts consistently report on resources given by the queen (or queen mother Naqi'a), not by her household. At least some of these expenses may relate to private, voluntary initiatives supported through personal resources, rather than mandated conventions of support paid through the queen's household budget. The sources on Neo-Babylonian royal women also originate almost exclusively from temple archives or are royal inscriptions that focus on royal sponsorship of temples. Therefore, the documented expenses of royal women primarily relate to the economic sphere of temples. For the Achaemenid period, there is also direct primary evidence from the palatial archives showing that (at least some of) the Teispid-Achaemenid queens could draw on tremendous economic resources. Whether these document the queens' own wealth, i.e. being produced by her estates, or derive from taxes etc. that she – as a person or qua office – had access to, is less certain. Probably, the queens drew on a mix of resources: their own estate funds, funds allocated by the king, and general treasury funds, for which ownership and access were blurred between the 'state' and individuals in official roles, whether these were the queens, the kings, the satraps, or other high-ranking officials. For the Seleukid Empire it is impossible to establish, with the present evidence, how far the financial resources and expenses of king and queen were separated. At least for the periods when the queens lived away from kings, separate travel and household budgets for queens are to be expected, but this is not explicated in the sources. Also, for the Ptolemaic monarchy it is difficult to isolate costs for the queen that were distinct from either the king or the state, though not for lack of sources, but for reasons of ideology. However, there is fragmentary evidence that Ptolemaic queens could spend in their own name in addition to jointly with the king (for example in building programs; see Wasmuth et al. forthcoming a). The most significant and perhaps the most substantial drain on the financial resources of the Arsacid queens, and/or their reallocation encompassed orchestrating banquets at the Šāhanšāhī court with courtiers from other Asian kingdoms, arranging lavish feasts, preparing gifts and dowries for courtiers, including ceremonial dresses and jewellery acquisition, as well as the procurement of slaves and their attire. Additionally, it entailed contributing to the furnishing of residences for daughters, granddaughters, brides, and distant relatives, presenting gifts with political motives during the grand court journeys, financing both non-secret and secret trips, providing resources, and extending financial support to allies of the queen and her successors for the complex political manoeuvrers of the Šāhanšāhī. Further costs were incurred for servants, guards, spies, and personnel of the 'secret service' and its associated organisations (see section 5.2). In the Roman Empire, leading imperial ladies had access to the resources of the imperial household and could have notable personal economic means that they also used to their benefit.

6.2. *For maintaining relations with the power base*

Among the religious contributions made by Neo-Assyrian queens and the queen mother Naqi'a, were provisions that potentially supported large-scale (possibly public) festivals and feasts. For example, a queen provided large quantities of beer on the seventeenth day of the wedding ritual of the goddess Mullissu (SAA 7 183). Another text, which appears to refer to a ceremonial banquet, lists a variety of meats, including a cut provided by the queen

(SAA 7 153). This menu could represent temple or ritual offerings that were consumed, food for a New Year's reception, or the spread for a secular feast (Svärd 2015: 206-207, n. 831). We do not have records of queens distributing wine, but, given the vast quantities allotted to them, they could have supplied lavish banquets (Kinnier-Wilson 1972; Fales 1994: 368-369). Neo-Babylonian kings invested considerable resources in the sponsorship of temples, and their daughters followed in their fathers' footsteps. Nebuchadnezzar's daughter Kaššāya donated jewellery, wine, dates, and land to the Eanna temple in Uruk, and Nabonidus's daughter Ina-Esagil-rīšat gave a silver bowl to the Ebabbar temple in Sippar (Beaulieu 1998; Jursa 1998: 66). These payments (*erbu*, *ešrû*) may not have been fully voluntary, but they arose from expectations of royal sponsorship and from obligations related to princesses' landholdings in the economic sphere of the temples (Jursa 1998: 87-89). Princesses had also other economic transactions with temples (Beaulieu 1989: 136-137; 1998; Cousin 2023). Sometimes the flow of financial resources was the opposite, and a text from the Eanna temple refers to rations of the king's daughter paid by the temple (Kleber 2008: 280). For expenditure on funerary rites and mortuary offerings, see section 5.5 above. The *Persepolis Fortification tablets* revealing the economic independence of at least some Teispid-Achaemenid royal women show that some had their own 'table'. Henkelman has highlighted that the same phrase used for state expenditures for the King's Table was used for Irdabama ("consumed before Irdabama", *irdabama tibba makka*; Henkelman 2010: 694). He has calculated the attested amount of commodities so used for Irdabama, with the amount of barley in five texts totalling 51,880 quarts (ca. 50,324 litres) – or 1/10th of the attested amount for the king's table – enough to feed nearly 60,000 people at average worker rations (1 litre of barley a day), not including the attested meat, wine, and beer (Henkelman 2010: 695). Texts also show Atossa had massive quantities of wine (11,300 quarts) and grain consumed before her, implying a similar queenly table (Fort 0328-101, Fort 0590-101). Such banquet expenditure is not known for the Seleukid queen. However, she could make a bequest from her personal funds. In 196/5 BCE Laodike, wife of Antiochos III, donated 1,000 *medimnoi* (nearly 60,000 litres) of grain per year for ten years to the people of Iasos, Caria (I.Iasos 4). This might suggest that she possessed an agricultural estate and was able to give from its revenues. The biggest cost for the Ptolemaic dynasts (male and female) was maintaining relations with their various dependencies and satisfying their expectations, together with the public display the Ptolemaic *tryphe* (magnificence) through lavish expenditure. The cornucopia symbol was especially associated with Ptolemaic queens. We have examples of queens engaging in euergetism, gift-giving, and patronage jointly with the king. For example, Berenike II and Ptolemy III Euergetes' imported grain at their personal expense for people across Egypt to make up for a catastrophic harvest ('Canopus' Decree: Austin 2006 no. 271, lines 13-19). Outside of Egypt, Ptolemy IV and Arsinoë III sponsored a festival and game in honour of the muses at Thespiai in Boiotia (Llewellyn-Jones and McAuley 2023: 35 and fn. 19). Queens also engaged in patronage on their own, such as Arsinoë's sponsorship of the annual Adonia festival (Theok. *Id.* 15.23-24). According to an honorific decree, Kleopatra I gave gifts of silver, gold, precious stones, and sacrifices to the Egyptian temples (Pfeiffer 2021: 99). And Kleopatra VII famously brought an abundance of gifts with her when she went to meet Antony (Plut. *Dem.* 25.4). There is no evidence of a 'Queen's Table'

in the Arsacid era. Contact with the power base and contributions to the local circulation of financial assets were primarily indirect. Probably, queens and ladies facilitated the movement of their assets through the assistance of eunuchs and trusted merchants outside the Šapistān. They engaged in profitable trade, often with political backing from the court when necessary. A portion of the queens' income went towards financing costly missions within and beyond the Šapistān, maintaining the loyalty of subordinates, purchasing gifts, and providing loans to them. More direct and notable was the practice of royal gift-giving by the queens during their travels for celebrations and various ceremonies. These gifts typically included the bride's dowry, particularly when a wedding ceremony was utilised to solidify and ensure political agreements (Bivar 1983: 56; Dąbrowa 2018: 80). This necessitated access to significant direct financial resources for the furnishings, clothing, jewellery, pearls, as well as their transportation and storage. Additional indirect expenses were incurred for the training of Šāpistāns, maids, and servants for the ceremonies attended. Some of these events were meticulously planned in advance, while others were arranged spontaneously (Plut. *Crass.* 33; Bivar 1983: 55-56; Brosius 2000; 2006: 94-95; Curtis 2007: 12-13). Roman queens could perform major roles in public events as members of the imperial family and use resources, e.g., to restore temples (de la Bédoyère 2021: 122; Kunst 2021: 390). The queen could use her resources also in other ways fitting the role of the leading lady, e.g., by providing support for orphans or dowries for destitute women (Dio 58.2.3). Having wealth of their own, 'queens' could also act independently as benefactors of cities; the honours provincial cities bestowed on queens and other prominent imperial women also belied a belief that they mattered. Queens were however always prone to be accused of usurping male spheres of activity (e.g., Suet. *Tib.* 50.2-3 on Livia). For example, in the city coinages of the Roman East leading imperial women could be regularly described as goddesses (Burnett 2011: 19).

6.3. *For travel*

The position of 'chariot driver of the queen' is multiply attested, but it probably refers to a member of the Neo-Assyrian queen's military staff, not her personal chauffeur (SAA 6 329; SAA 7 5; SAA 19 158; Svärd 2015: 63, 73). There is no evidence to suggest that queens travelled routinely or visited their palaces or estates outside of the capital. Nonetheless, Neo-Assyrian queens at least travelled under special circumstances, including for military operations, as documented on the Pazarcık Stele, a monument erected on the Assyrian frontier in south-central Anatolia. The stele's inscription declares that Queen Sammuramat (while serving in a regent-like capacity) travelled 'across the Euphrates' with her son, King Adad-nerari III to win a battle here (RIMA 3 A.0.104.3). Ritual occasions could also have required travel. For example, Ashurbanipal's queen (who would have resided in the main palace at Nineveh) was to participate in a ritual at Assur (SAA 20 52; see also section 5.5.). In addition, ceremonial rites of passage, such as a queen's diplomatic marriage (motivating her relocation to the Assyrian capital) and a king's coronation and funeral (which took place at Assur) could have necessitated a queen's travel (Dalley 1998; Pongratz-Leisten 2015: 354). More mundanely, Queen Atalia may have moved to or at least visited Dur-Sharrukin, where her husband Sargon II established a new capital (Svärd 2015: 52). If she had relocated during the last years of their reign, in death, her body was returned to Kalhu for burial beneath the Northwest Palace (Hussein 2016: 14; Müller-Karpe et al. 2008: 144). Queen Esharra-hammat's

body was also probably transited from Nineveh (where she lived) to Assur for burial (see section 5.5. above; RINAP 4 2002; SAA 12 81; Postgate 2008: 177). It is noteworthy that in the Neo-Babylonian period royal women frequently appear outside Babylon, but this may relate to their permanent residence rather than travelling. The available sources shed hardly any light on how and how often Babylonian royal women travelled. Nabonidus's mother Adad-guppi died at an otherwise unknown place called Dūr-karāši, which may have been a military camp. If this was the case, the queen mother was probably travelling when she passed away (Grayson 1975: 107; Joannès 2022: 198). Though there is substantial indirect evidence for local, regional, and cross-regional travel of the Teispid-Achaemenid queen, especially to and from her various major estates and participating in military campaigns, there is currently no evidence available how much these cost and where the resources came from that paid for these expenses, though a mix of funds including revenue from the queen's estates and funds explicitly issued or covered by the king is likely (see section 5; Diod. XVII, 38.1; Kuhrt 2007: 600-601). Given the royal peripatetic lifestyle, it would be interesting to know, whether travel itself was a major additional cost or whether it was included within normal royal household maintenance. With few exceptions, this is also the case for the Seleukids. In 274 BCE, Stratonike was at the royal palace in Sardis partnering with military commanders in providing logistical support for her husband during the First Syrian War; in this instance we might presume that she drew upon state resources, not just her own (ADART I, -273 B rev. 29). In a similar situation a generation later, a regional governor attempted to ship 1,500 talents of silver (probably coin) to Laodike, widow of Antiochos II, as she prepared for war with the Ptolemies in 246 BCE ('Gurob Papyrus'; *Chrest. Wilck.* 1, col. i 23-col. ii 13). Laodike, wife of Antiochos III, accompanied him on several of his military campaigns (Ramsey Neugebauer forthcoming), but to what extent she paid for her own travel costs is impossible to say. As regents or sole rulers, some Ptolemaic queens (Kleopatra II, III, and VII) were responsible for military campaigns (van Minnen 2010) including the provision of funds. Kleopatra III sponsored exploration through the Arabian sea and beyond for the purposes of extending trade (Strabo 2.99-2.101). Kleopatra VII famously sailed up the Knydos river to meet Antony in a lavish royal barge (Plut. *Ant.* 26.1-3). A portion of the Arsacid Šapistān accompanied the Šāhanšāh during his campaigns and travels (Plut. *Crass.* 21), allegedly travelling in curtained carriages (*harmamaxae*). This provides insights into the significance of the public life of the queens and elite women, showcasing their prestige via travels (Oost 1977/1978: 228). While the court placed great importance on the security of women, it did not (directly) cover all their travel expenses. Probably, each male courtier with family members in the Šapistān had his own private group of guardians and treasurers responsible for the personal travel expenses of his wife and children. Given the substantial value of the queen's belongings transported in their caravans for political gift-giving during military campaigns (see section 6.2.), there was a considerable risk of capture by the enemy and even death (cf. Ael. Sp. Had. 13.8), prompting the Arsacid Šāhanšāhs to take extreme precautions (cf. *Parth. Stat.* 1; Tac. *Ann.* 12.44-47 and 51, 13.6; Josephus AJ 7.7.4). These include the cost of servants and guard personnel, especially the head eunuchs (Šāpistāns) in the palace and female quarters (Šapistān) and trained military guards for the queens and their treasures during travels

(similar practices are documented from the Armenian Arsacids; Buzand. Patmut. 5.7). Roman queens were not as itinerant as emperors. However, the queen could travel with the emperor on his journeys to the provinces as attested, e.g., for Livia, the consort of Augustus (Barrett 2002: 37-38; Goldsworthy 2014: 299). During such journeys the queens could confer benefactions and receive honours. Imperial women could also have their own contact networks, especially in the provinces (Kokkinos 1992: 11).

6.4. *For accessing information*

Oracle texts and a letter reveal that when King Esarhaddon's mother Naqi'a held the helm of queenship, she accessed information directly from divine sources through oracles and prophesies (SAA 9 1; SAA 9 2; SAA 9 5; SAA 10 109). There is no evidence to suggest that any other Neo-Assyrian queen had such privileged insight into the future. Rather than representing a prerogative of Neo-Assyrian queenship, Naqi'a's access to divine knowledge may have been exceptionally motivated by the crisis context of the empire as it fell into civil war following the murder of King Sennacherib (Svärd 2015: 54; 2018: 128). The Neo-Babylonian evidence also points to the sacral sphere regarding access to specialised knowledge. Note the number of diverse objects found in adjacent rooms in Egipar, the residence of the *entu* priestess in Ur. They were found in the Neo-Babylonian stratum but are much older and were clearly brought together for a purpose (Woolley 1962: 16-17). They are often referred to as the "museum of En-nigaldi-Nanna," and it is a logical assumption that they were of interest to the *entu* priestess residing in the building. However, it is well possible that the collection was put together by Nabonidus who rebuilt Egipar and was known for his antiquarian interests (see section 4.5). The idea that Achaemenid, Seleukid, Ptolemaic queens might have paid for intelligence or logistical information is relevant, given what we know of their involvement in supporting military expeditions and other political ventures, but on the present (lack of primary) evidence the question of the queens investing funds into the acquisition of specialised knowledge is unexplorable. Arsacid royal women, particularly sisters and daughters of the king, played crucial roles in forging political alliances with local kings as well as Parthian and foreign nobles. By promoting and facilitating strategic marriages, they contributed to the expansion and consolidation of the network binding powerful nobles to the Arsacid dynasty (Brosius 2006: 106-107). To achieve this, the Arsacid queens must have relied on constant updates on the political landscape across subordinate lands such as Armenia, Georgia, Atropatene, Elymais, and their allies within these lands' courts. The establishment and maintenance of this intricate network, spanning nearly five centuries, must have required substantial financial resources. But also here, sources on the actual costs and operational mechanisms are missing. This changes with the Roman period, for which there is direct evidence that the leading ladies could use economic resources to gather information and to control it, for example via patronage of book production (Moore 2021: 379). Such patronage and benefactions were a subtle way of creating positive information and images in the relevant information space.

7. Gender comparison per empire

The following paragraphs highlight per empire, how the offices of kingship and queenship related to each other concerning their roles in the empires' economies. The aspects addressed are a brief overview of the king's and queen's portfolio

in comparison followed by the questions of whether there is evidence of explicitly joint activities and/or perceptions and in which way the king's and queen's economic activities complemented each other.

7.1. *Neo-Assyrian Empire*

King and queen in comparison: Within the Neo-Assyrian imperial hierarchy, the queen ranked second only to the king. While the king was head-of-state, his power did not necessarily trump all. Rather, it seems that the king executed his sovereignty within a heterarchical body of top officials that included the queen (Svärd 2012).

King and queen together as an entity: Some royal letters address the Neo-Assyrian king and queen together in greeting formulas and blessings (SAA 1 115; SAA 10 154) indicating that they were recognised cooperatively as the empire's top officials. Perhaps the fundamental ideological significance of the unit of king+queen is most graphically revealed by a substitution ritual in which proxies for the king and queen were killed and buried together as a means of deflecting the portended demise of King Esarhaddon and presumably his queen (SAA 10 352). The queen was a vital partner to the king, symbolically, societally, and imperially through the work – including the substantial economic contributions – of her office of queenship.

King and queen complementing each other: The Neo-Assyrian king and queen carried out complementary yet intersecting duties of their offices of kingship and queenship in a symbiotic partnership. Their complementary roles are most apparent in ritual and ceremonial imagery, where, for example, the king and queen were depicted in procession together but wearing different regalia and holding different equipment (Ornan 2002: 461-462, Figs. 1, 3). A letter to the king details a case in which the royal couple's religious collaboration entailed complementary economic donations (SAA 10 348): Esarhaddon contributed gemstones, and Naqi'a provided gold. Together, their resources were to be used to enhance a tiara for a cult statue of the god Nabu. We further glimpse a queen's contribution to the king's economy in a text tallying horses (possibly 'taxes of some kind') sent to the king by various provincial officials, including the treasurer (acting as the agent) of the queen (SAA 13 108; Svärd 2015: 64, 212).

7.2. *Neo-Babylonian Empire*

King and queen in comparison: The Babylonian king generated income especially from taxation and tribute, but also from royal estates. Significant economic resources were invested in building and infrastructure projects aimed at increasing agricultural output and royal tax income but also at presenting the king as a pious ruler and caretaker of his people. The meagre evidence of royal women may be distorted, but it seems that their income primarily originated from the land they owned. Their donations to temples are best attested in our sources, but this may not reflect the real patterns of their expenditure.

King and queen together as an entity: There is no evidence pertaining to joint economic activities of the Neo-Babylonian royal couple.

King and queen complementing each other: Kings and their children shared tasks in managing the property of the royal family, and women could also play a role in supporting their male relatives in power struggles. Daughters of Nebuchadnezzar and Nabonidus were primarily active outside Babylon, and this may be explained by the need to take care of the family's property and interests outside the capital (Beaulieu 1998: 198-201; Popova 2015; Cousin

2023). Another economy-related example of complementary activities of king and queen (mother) is once more provided by the Adad-guppi evidence. Adad-guppi supported her son's accession to the throne and (in turn) Nabonidus provided her with a sumptuous funeral after her death.

7.3. *Teispid-Achaemenid Persian Empire*

King and queen in comparison: For the (Teispid-)Achaemenid Empire, it is striking, how much of the economic activities of king and queen are similar: each having access to labour including specialised knowledge, to estate produce, to monetary tax income, to production facilities, etc. Most issues of uncertain female royal involvement, like access to natural resources or the funding procedure behind their travels, whether between their estate, as member of the itinerant court, or following military campaigns, are also uncertain for the king. In both cases, the fragmentary evidence argues for a mix of funding sources including 'state' treasury, personal, and locally resourced funds (the latter often in kind). Probably, the king had more direct access to the 'state' funds, while the queen could also draw on funds provided out of the king's property. Arguably, the queen(s) functioned much like the satraps: as representative of / replacement for the presence of the king in relation to his subjects.

King and queen together as an entity: None of the extant primary sources showcase the Teispid-Achaemenid king and queen acting explicitly together when drawing on or circulating economic resources. To which degree, this is too one-sided to fit ancient realities is difficult to assess. At least, Greek reception history maintains that the Achaemenid queens partook in parts of the banquets held by the king. According to Herodotus, Amestris, the wife of Xerxes, made a public request to her husband (and king) on the occasion of a major institutionalised banquet event (Hdt. IX.110.2-111.1; Kuhrt 2007: 569). In general, the salaciousness of many of the Greek (and Biblical) depictions of royal women in their relations with the Persian king and court is noteworthy. See in this context also the episode in Esther (1.9-24), according to which queen Vashti refused appearing in front of the court and was thus condemned and replaced by Esther.

King and queen complementing each other: As far as the sources permit assessing, the queen / influential royal women had a lesser scope of duties and resources to draw upon, but the activities more or less doubled those of the king. Assuming that the separate Royal Tables catered for different people, they may have been concerned with different segments of society. How these differed, what caused inclusion in the king's or queen's table, and whether participation in one or the other was exclusive or could be doubled, is beyond the sources.

7.4. *Seleukid Empire*

King and queen in comparison: The biggest difference between the Seleukid king and queen economically is the king's role as leader of the military, giving him the responsibility for collecting the resources and issuing the coins needed to pay his soldiers, while the queen (arguably?) collected a share of the revenue. At times, however, queens did operate as the sole or primary ruler of the empire (for example, during regencies) and thus also took on this office, as indicated by the numismatic evidence.

King and queen together as an entity: The main area where the Seleukid king and queen can be seen acting together concerns benefactions to subject communities; the preferred emphasis for the royal couple is more on the ceremonial and relationship-building aspects of these gifts, but they had an economic dimension too.

King and queen complementing each other: Generally, it was the Seleukid queen who worked to complement whatever her husband was doing, for example Laodike donating shipments of grain to a community the Antiochos III was in the process of helping after he had created problems for it with his military activities.

7.5. *Ptolemaic Empire*

King and queen in comparison: As the male head of the royal household, the king likely had more control and access to royal finances than the queen, especially earlier in the dynasty; as time progressed and the institution of co-regency became more common and entrenched, this changed. Starting with the regency of Kleopatra I, we see evidence of the potential for queens to have control over all royal finances. This is perhaps a natural result of the phenomenon of inheritance through the matrilineal line and the decision to keep the royal line within a single family.

King and queen together as an entity: The Ptolemaic monarchy was presented as a unified, conjugal couple in theory, even if that broke down in dynastic conflicts later. Practically speaking, since the king and queen had the same family origin, this meant that the dynastic wealth remained within the dynasty. The economic power of the couple as a couple was emphasised through the joint portraits on coin issues (Lorber 2012). The ideology of the conjugal couple deploying their wealth for the good of their subjects comes across especially in some of the joint decrees, such as the 'Canopus' decree of Ptolemy III and Berenike II, (Austin 2006: no. 271) and the 'Amnesty Decree' of Ptolemy VIII, Kleopatra II, and Kleopatra III (Austin 2006: no. 290), where the couple/trio is held jointly responsible for personal benefactions and tax relief.

King and queen complementing each other: Though there are aspects of Ptolemaic kingship and queenship in which they arguably complement each other regarding royal representation and the execution of specific ritual activities (see Wasmuth et al. forthcoming a), this concerns only details, not the macro level of royal economic activities.

7.6. *Arsacid/Parthian Empire*

King and queen in comparison: Given the essentially non-existent scope of direct sources on the economic basis of the Arsacid queen, a portfolio comparison between Arsacid king and queenship is precarious, at best. Accepting this caveat, it seems that the queen received (lesser) shares of most revenues of the Šāhanšāh as well as substantial shares, gifts, and allotments for special activities, both from the king's and the 'state' treasury. How much say they had in their administration in relation to the Šāpistān (i.e. the head treasurer of the 'harem'), is uncertain. As acting regents during the minority of their sons, the later Phraates II and V, Rinnu and Musa likely had full access to their own, the crown princes' and the 'state' treasury.

King and queen together as an entity: As independent individuals, the Šāhanšāh and the queen held ownership rights to a portion of their property. However, as a couple, they were considered partners in another portion of their property. They shared ownership with other royal families within the Arsacid clan, which in turn was considered a partner with other Parthian tribal families. It was incumbent upon them to safeguard these properties from external threats posed by other families, clans, tribes, and nations outside the Parthian tribe.

King and queen complementing each other: Regarding the alignment of the queen's gifts with the actions of the Šāhanšāh, these

were likely coordinated and complementary. In the Arsacid period, as in many premodern societies, certain activities were deemed exclusively feminine, while others, including economic endeavors, were considered masculine. For instance, men likely were not involved in the intricacies of funding haircuts, grooming, makeup, or selecting certain undergarments, which were traditionally within the purview of women.

7.7. *Roman Empire (in the East)*

King and queen in comparison: The Roman emperor had massive resources at his disposal as he controlled also state assets while the pre-eminent female member of the imperial household derived her means from the imperial household but could have also sizeable wealth of her own, depending on the person and circumstances. Queen's means were also more indirect, often building on capitalisation of access and information.

King and queen together as an entity: The emperor and the first lady of the empire appeared together in connection with major festivities to enhance the message broadcasted to the information domain. The queen's part used to amplify the desired message.

King and queen complementing each other: The queen could complement the support for imperial rule by fulfilling duties in the accepted female sphere like taking part in worship of deities that were restricted to females or supporting orphans. Similarly, they could, e.g., extend patronage for indirectly generating messages amenable to the imperial agenda.

8. Summary and outlook

Though many aspects discussed above yield only tentative results, some of these merits special attention and shall thus be highlighted here.

8.1. *Source base*

As has been highlighted above in the sources section (2.1) and has been permeating essentially all sections discussed above, the most major challenge for attempting a diachronic comparison on the economic basis, and essentially all topics concerning kingship and queenship across the seven empires studied here, is the discrepancy of the source base. Several of the empires are comparatively rich in primary sources, i.e. sources from their own period and socio-cultural context, though with only rather limited evidence providing an ancient outside perspective: this concerns especially the Neo-Assyrian, the Neo-Babylonian, and the Roman Empire. However, also within these three empires a significant difference is to be highlighted: while the Neo-Assyrian and Roman state administration and royal household are very well covered by the sources, the Neo-Babylonian material derives primarily from temples and private archives. The Teispid-Achaemenid and the Ptolemaic Empires are 'known' from a double or multiple set of sources with a strong base of ancient primary sources complemented by ancient secondary sources preserving their reception in the Graeco-Roman world (cf. the various quoted Classical writers). While there is substantial overlap of information, especially concerning the Ptolemies, the Teispid-Achaemenid and the Greek evidence are often in conflict or juxtaposition to each other, providing major caveats for the scholarly reception of Greek (and Latin) historiographical accounts of the Western Asian empires. In both cases, central primary evidence is, however, missing. For the Teispid-Achaemenid empire, the pertinent sources providing insights into economic specifics, especially regarding the distinction of 'royal' versus 'state' assets, are largely restricted to Persepolis during part of the

reign of Darius I; further, a lot of the evidence seems to be specific to the various regions of the empire, not necessarily representative for the empire, and its social institutions of kingship and queenship as a whole. For the Ptolemaic Empire, we are essentially lacking the evidence from the capital, Alexandria, which necessarily distorts our picture. The Seleukid and the Arsacid Empires face the other extreme. Though there is some primary evidence, especially for the kings, it is minor and often little forthcoming (coins, some royal inscriptions) regarding the topic under discussion here. Thus, the reconstruction of Seleukid and Arsacid affairs is predominantly based on ancient secondary sources: in case of the Seleukids primarily on the Classical writers, for the Arsacids also on later Iranian reception history as well as on interpolation between earlier and later evidence. While this source base has produced a rather cautious, tentative approach in Seleukid scholarship, Arsacid scholarship tends to be more positivist. This becomes evident especially in the instances, when the interpolation of Arsacid evidence inter alia from the Seleukids showcases more forthcoming results than for the Seleukids themselves (in the above, especially strong for the reconstruction of the queen's access to information, cf. section 6.4).

8.2. *Queenship*

The queenship concerns are most heavily affected by the source issues. As the Neo-Babylonian, the Seleukid, and the Arsacid Empires are exceedingly scarce on sources on the economic basis of their queens, whether as individuals or regarding the office, the distinctly diverse ideological conceptualisation of queenship in the other empires lacks important parts of comparison. Nonetheless, the following characteristics are noteworthy, and probably representative. The highest degree of institutionalised (economic) power was wielded by the Ptolemaic queens, who were fully acknowledged (co-)regents with full financial powers, at least from Kleopatra I onwards. Probably second-ranked in power within the diachronic comparison was the Roman queen, whose office, however, was not institutionalised. Most notably, in comparison to the earlier Western Asian empires, the imperial leading female and the royal consort were not necessarily identical. The role of queen, if such a role can be said to exist, was taken by the most influential royal woman of the time. Though this is highly problematic to assess based on the extant evidence, the latter may also have been the case for the Arsacid Šāhanšāhī. The Neo-Assyrian and Teispid-Achaemenid queens, on the other hand, typically were the wives of the reigning king. In case of the Assyrian and Persian empires, they seem to have largely doubled the economic role, though on a smaller and subordinate scale. In each of those two empires, exceptionally powerful queens tended also to retain major influence after the change of rule from their husbands to their sons (or in the case of the Neo-Babylonian Adad-guppi: once her son became king).

8.3. *Travel*

Another aspect of royal economics pointing to significant diachronic differences concerns the wider realm of travel, though many details remain uncertain. While in most, if not in all, empires the kings travelled substantially, the scope and reasons partially differed. For most empires, the king primarily travelled for military reasons, and to a much more regionally restricted degree for internal political *cum* religious reasons. How these travels were funded is impossible to determine for any of the studied polities, though the following partial components are noteworthy. While the Neo-Assyrian

and the Ptolemaic empires seem to have funded military campaigns including the specifically royal expenses primarily from the central treasury, the taxation system of the Neo-Babylonian empire aimed to extract labour and soldiers rather than silver. According to the evidence from Babylonia, the Achaemenid court strongly drew on the local and regional resources for their itinerant lifestyle and probably also the military campaigns. To which degree, the Achaemenid king was responsible for the travel expenses of the queen is debatable; possibly, the only available secondary sources rather reflect contemporary, i.e. Arsacid, rather than Achaemenid customs. Here, the evidence points to the male member of the court, including the king/Šāhanšāh, to provide for the travel of their female family members. Beyond military (and diplomatic?) campaigns, the scope of royal travel is rather characteristic to the various empires, especially regarding travels of the queens and the courts. The most outstanding empire in this respect is the Teispid-Achaemenid one, which did not feature a clear imperial capital and royal residence, but practiced a peripatetic, or at least seasonally migratory, lifestyle for the whole court. In addition, the imperial administrative sources preserve evidence for travels of both the king and the queen between their various estates. Whether the Seleukid court was similarly on the move, is currently impossible to assess, and has not yet been studied in detail. As members of the royal family can be traced in different places over the courses of their careers, it is at least certain that they travelled. Also, the Arsacid queens and their entourage (or the female segment of the court, the Šapistān) travelled extensively, largely following the Šāhanšāh's lead. However, they had a clear home base. Possibly to some degree similar were the travel practices of the Roman court, which accompanied the king for regional travel for maintaining relations with his power base in various localities and to dispense justice. In contrast, Neo-Assyrian and Ptolemaic royal travel was typically regional, especially for fulfilling religious obligations in the core area of their domain, Neo-Babylonian even predominantly local despite the evidence of Nabonidus's long stay in the desert oasis Tayma.

8.4. *Maintaining relations with the power base*

A significant amount of money, probably from the central administration, (whenever distinguishable) certainly from the royal coffers, went into various ways of maintaining relations with the power base. As evidence for this is likely to have been recorded and stored (also) locally, the specifics of these are prone to be heavily distorted for each empire, and in consequence also in the diachronic comparison. The current picture shows a focus on ritual offerings and sponsoring public festivals and feasts for the Neo-Assyrian (kings and) queens, sponsorship of temples for the Neo-Babylonian royals, feasts and banquets for substantial portions of local, regional or cross-regional segments of society by the Achaemenian kings and queens, respectively, and major subsistence commodities by the Seleukid queens, while the Seleukid kings gave promises of (political) security. All of the above are attested for the Ptolemaic dynasts. For the Arsacid and Roman female royals, on the other hand, much of their bounty was more individually directed, in the form of dowries, special training, or the support of orphans; though benefaction of cities is also attested. Essentially in all of the discussed empires, a typical gift at least nominally from the king, in practice probably centrally administered, was land, typically in a reciprocal land-for-service agreement (and/or invoking tax obligation).

8.5. *Exploitation of resources*

The exploitation of resources possibly gives the best insights into the differing strategies regarding 'state' versus 'royal' assets employed by the various empires. There is a strong tendency of collecting 'tax' locally and regionally in kind (typically in natural produce and livestock) and in the outer areas of the empire in durable, precious commodities (manufactured items, later especially coins). This is especially well visible in the Neo-Assyrian and Achaemenid sources, but likely a rather general phenomenon. Similarly, all empires heavily relied on labour obligations, especially for military and major infrastructure enterprises. If the sources are representative and correctly interpreted, this was most pronounced in the Neo-Babylonian Empire and least extreme in the Arsacid one, which seems to have been relying strongly on its private sector and on a strong tendency of employment rather than corvée work, though the latter certainly also played a part. Note, however, that also under the Neo-Babylonians many taxpayers did not do the service themselves but hired someone to do it. The evidence for produce and manufacture on royal estates is once more a feature probably shared by all empires, though it shows especially clearly in the Neo-Assyrian and Achaemenid empires also for the queens. For the moment, rather exceptional instances are the royal creation and maintenance of major walled gardens ('paradises') under the Teispids and Achaemenids, the high-profile status of the Neo-Assyrian queen in textile production, the official royal revenue of (alleged?) temple robbery (Seleukid) and plunder (Roman), the royal taxation of temple land and its produce by the Neo-Babylonian and Ptolemaic rulers (though this may equally be due to the discrepancies within the currently available source base), or the Seleukid royal monopoly on salt tax. Related to the latter, rather a strong tendency can be noted throughout the empires for royal monopolies or at least more direct royal involvement in mining, especially of minerals, though the source base is once more too scattered for a more detailed diachronic comparison. The same holds for minting and custom duties, where the distinction between 'royal' and 'state' tends to be heavily blurred.

8.6. *Outlook*

The most challenging question proves to be to identify which changes and continuities are specific to the region, ideology, general socio-cultural setting, or more specific political or individual circumstances. To a large extent, this is due to the fragmentary and highly diverging source base. However, it is to some extent also intrinsic to the paper's approach, which explicitly draws on a macro to structural approach. This requires condensing to the essentials. The dynamics of what is changing and why and on which level becomes typically tangible with an approach at the juncture of the macro and micro and/or the structural and micro level. To attempt this – even on a much smaller, but equally rigid diachronic scope – is beyond a single paper and even a single book project,[13] though each of the studied aspects would merit such a more in-depth study. We conclude here with an outlook, how three of them could be developed further for future research. The first sample issue is one that cannot be solved by such a more in-depth macro/micro approach, namely the distinction of explicitly royal and 'state' assets. This proves exceedingly challenging for most of the empires under discussion, even regarding the question of whether this is primarily a source issue

[13] See, e.g., the accordingly less diachronically rigid case-study focused approach of Wasmuth et al. forthcoming d on maintaining relations with the power base.

or whether it speaks to the complex relationship of king and 'state.' A comparison with more contemporary kingships featuring more complete source material might be useful in this regard. A topic with high potential for a more in-depth comparative analysis within a similar comparative scope as applied here concerns the extraction of financial resources. Though not all empires provide a good source base, most of them do. Thus, an in-depth comparison could help interpreting cases of more fragmentary or ambiguous record. It may also allow for investigating whether differences in the way the population was taxed reflected ideological differences (whether religious or imperial) or whether they were a result of differences inherent in the empire, such as geography/resources. Another aspect that would profit from including geographical concerns is the relationship between king/queenship and the landscape with regard to land ownership and exploitation *vis a vis* royal domains vs the 'state.' A similar set-up, but with different regional focus, will be needed for understanding, e.g., the derivation of exceptional economic features under the Ptolemies. This requires an in-depth contextualisation of the various practices at least in the Egyptian, Macedonian, and Western Asian traditions, which is beyond the set-up of the overarching institutional context and scope of this paper.

Abbreviations

(Ps-)Aristotle Oec.: *Oeconomica*, attributed to Aristotle.
ADART I: Sachs and Hunger 1988.
Ael. Sp. Had.: Scriptores Historiae Augustae, *De Vita Hadriani.*
Ael. VH: Aelian, *Varia historia, epistolae, fragmenta.*
AO: Louvre Middle East collection accession number.
App. *Mith.:* Appian, *Mithridatic Wars.*
Ath.: Athenaeus, *Deipnosophistae.*
BE: The Babylonian Expedition of the University of Pennsylvania. Series A, Cuneiform texts (see 9: Hilprecht and Clay 1898; 10: Clay 1904).
BM: British Museum accession number.
BNJ: Brill's New Jacoby. https://scholarly-editions.brill.com/bnjo/.
Buzand. Patmut.: Buzandaran Patmutʿiwnkʿ, *The Epic Histories.*
CBS: Penn Museum inventory number.
Chrest. Wilck.: Mitteis and Wilcken 1912.
CTN: Cuneiform Texts from Nimrud (1: see Kinnier-Wilson 1972; 2: Postgate 1973; 3: Dalley and Postgate 1984).
Cyr: Strassmaier 1890.
Dio: Cassius Dio, *Ῥωμαϊκὴ ἱστορία* / *Roman History.*
Diod.: Diodorus Siculus, *Bibliotheca historica.*
DSf: Achaemenid Royal Inscription: Darius Susa f (cf. Kuhrt 2007: 492-495 with further references).
Edubba: Edubba Studies in Ancient History (10: Ahmad and Postgate 2007).
Festus Brev.: Festus, *Breviarium.*
FIRA: Riccobono et al. 1940-1943.
Fort Siglum for unpublished or partially published Persepolis Fortification tablets.
Hdt.: Herodotus, *Histories.*
I.Iasos 4: Blümel 1985.
I.Didyma: Wiegand 1958.
IGLS iii: Jalabert & Mouterde 1950.
Jer. *In Dan.:* Jerome, *Commentary on Daniel.*
Josephus *AJ:* Flavius Josephus, *Ioudaike archaiologia* (*Antiquitates Judaicae*).
Just Epit.: Marcus Junianus Justinus, *Epitome of the Philippic History of Pompeius Trogus.*
KNR: Kartīr at Naqš-e Rostam.
ME: British Museum Middle East inventory number.
Met.: Metropolitan Museum of Art inventory number.
NALK: Kwasman 1988.
Pahl.: Persian Pahlavi.
Parth.: Parthian.
Parth.: Stat. Isidore of Charax: *Parthian stations.*

PF: Siglum for Persepolis Fortification tablets published in PFT.
PF-NN: Siglum for Persepolis Fortification tablets transliterated, but not published, by Hallock.
PFa: Hallock 1978.
PFAT: Siglum for Persepolis Fortification tablets featuring an Aramaic inscription.
PFT: Hallock 1969.
Plat. *Alc.* I: Plato, *Alcibiades* I.
Plut. *Ant.*: Plutarch, *Life of Antony.*
Plut. *Crass.*: Plutarch, *Life of Crassus.*
Plut. *Dem.*: Plutarch, *Life of Demetrius.*
Plut. *Art.*: Plutarch, *Artaxerxes.*
ps.-al-Jāḥiẓ: pseudo al-Jāḥiẓ 1914. Kitāb al-Tāj. fī Akhlāq Al-Mulūk, contributed to Abu Othmān ʿAmr Ibn al-Jahiz.
PTT: Cameron 1948.
RG: Cooley 2009.
RIMA: The Royal Inscriptions of Mesopotamia, Assyrian Periods (3: Grayson 2002).
RINAP: The Royal Inscriptions of the Neo-Assyrian Period (3/1: Grayson & Novotny 2012; 3/2: Grayson & Novotny 2014; 4: Leichty 2011).
RINBE: The Royal Inscriptions of the Neo-Babylonian Empire (2: Weiershäuser and Novotny 2020).
SAA: State Archives of Assyria (print series: Helsinki: The Neo-Assyrian Text Corpus Project; online: https://oracc.museum.upenn.edu//saao/corpus).
Sec.His.: Procopius of Caesarea, *Secret History (Apókryphe Historía, Historia Arcana).*
ŠKZ: Huyse 1999.
Strabo: Strabo, *Geography*.
Suet. *Aug.*: C. Suetonius Tranquillus, *Divus Augustus.*
Suet. T*ib.*: C. Suetonius Tranquillus, *Tiberius.*
Tac. *Ann.*: Cornelius Tacitus, *Annales.*
Tac. *Hist.*: Cornelius Tacitus, *Historiae*.
TAD: Yardeni and Porten 1986-1999.
Theok. *Id.*: Theokritos, *Idylls.*
TuM II/III: Krückmann 1933.
Velleius: Velleius Paterculus, *Historia Romana.*
Vit. Apoll.: Philostratus, *Vita Apollonii.*
VS: Vorderasiatische Schriftdenkmäler (5: Ungnad 1908).
Xen. *Anabasis*: Xenophon, *Anabasis.*
Xen. *Cyr.*: Xenophon, *Cyropaedia.*

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

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Abstract

This article explores the methodological and historiographical challenges that persist in examining the complex topic of the origins of writing in antiquity, with focus on the earliest writing systems from Southwestern Asia and Northern Africa (proto-cuneiform, proto-hieroglyphic, and proto-Elamite). A review of scholarly literature reveals a lack of consensus regarding who invented writing first and when. This disagreement seems to stem from ideological factors, as scholars in different fields often advocate for the region they specialize in as the birthplace of writing. This situation is ultimately rooted in the prestige associated with writing in modern societies, which has led to historical narratives that overemphasize the role of this technology as a marker of civilization in antiquity. This study aims to highlight this phenomenon and lay the groundwork for a more nuanced paradigm that fully considers the interconnected cultural, technological, and social factors of the late 4th millennium BCE.

Keywords: Early writing systems, Proto-cuneiform, Proto-hieroglyphic, Proto-Elamite, Late 4th millennium BCE

1. Introduction

What is the oldest known writing system? This seemingly straightforward question ultimately proves to be a challenging one to answer. Ask an Assyriologist, and the answer might be proto-cuneiform; an Egyptologist would argue for proto-hieroglyphic, while an Iranist could suggest both proto-Elamite and proto-cuneiform are equally viable. The current understanding of the emergence of literacy in antiquity is, in fact, invariably affected by a number of biases and logical fallacies, some of which are addressed below. The goal of this article is to increase awareness of the current paradigms regarding the origin of writing and to highlight the main issues that prevent a balanced view on the matter from being reached. The subject is of course vast. The key avenues of research include technological innovations (usually addressed through the lens of historical materialism), intellectual achievements and the transmission of knowledge (as part of intellectual history, but with ramifications in the fields of philology and/or epigraphy of ancient sources), the social setting of the earliest records (social history and anthropology), as well as their primary context (archaeology). Addressing such a wide-ranging subject exhaustively in a single article is exceedingly challenging; thus, the following discussion shall serve as a brief

overview and research guide, in the hope that it may be useful in the development of a revised framework for understanding the origin of writing in antiquity.[1]

2. Terminological remarks on writing and proto-writing

Before proceeding, a terminological clarification is necessary. This article makes a strict distinction between proto-writing and writing. Proto-writing is defined as a communication system composed of discrete visual elements (graphemes) and specific rules for their arrangement to convey semantic information alone.[1] By definition, proto-writing is not tied to spoken language; thus, its information can be verbalized in various ways depending on the chosen language and the syntactic structure of sentences in that language. Writing, by contrast, shares certain structural elements with proto-writing but includes the critical ability to convey both semantic and phonetic information, inherently linking it to speech. Consequently, a written text may allow only a limited range of verbal interpretations – often just one in alphabetic systems, aside from suprasegmental elements like stress, intonation, junctures, and duration. However, limited flexibility may still exist in cases where texts rely heavily on logography or fixed expressions. The definitions provided here are sufficient for the scope of this article but are not entirely satisfactory for broader generalization. Specifically, undeciphered scripts, regardless of their sophistication, fall into categories of proto-writing or pseudo-writing. This includes the debated Vinča (or Tărtăria) script[2] and the impossible Dispilio tablet script (as-yet unpublished). Additionally, the notable points of contacts between artistic representations and proto-writing remain somehow difficult to address in proper terms. To clarify the situation, further (or revised) definitions are needed, although achieving scholarly consensus may be difficult. Introducing such distinctions could also complicate this article unnecessarily, diverting focus from the primary arguments.[3] It is also worth clarifying the use of the prefix *proto-* in terms such as proto-cuneiform, proto-hieroglyphic, and proto-Elamite. In these cases, *proto-* suggests that the language, if any, underlying the inscriptions cannot be determined – either due to insufficient quality or quantity of evidence or because proto-writing was not intended to express specific spoken utterances in the first place. Tentative linguistic identifications may exist, as with proto-cuneiform, though these often remain debated (see below). As for proto-Elamite, the term is somewhat misleading because it implies a connection to the Elamite language (also known as Hatamtite), which is first attested in the mid-third millennium BCE. However, no definitive link between proto-Elamite and the Elamite language has been established, as proto-Elamite sources remain undeciphered, aside from numerical signs, metrological systems, and a few signs referring to commodities (see below, §6). The survival of certain graphemes from a proto-writing system over centuries, eventually appearing in

[1] For slightly different definitions see for instance Daniels (1996: 3): "A system of more or less permanent marks used to represent an utterance in such a way that it can be recovered more or less exactly without the intervention of the utterer"; Woods (2010: 44): "The unambiguous visual representation of speech".

[2] See most recently Lazarovici and Merlini (2016).

[3] For instance, the author is inclined to favor the label 'sophisticated semiographies' over 'proto-writing', as the latter term has unfortunate teleological connotations (Chambon 2022).

later written records (often in a modified form), does suggest a continuity of proto-literate practices. However, this continuity cannot be used to argue that the language represented by the original proto-writing was the same as that expressed in later historical sources.

3. Methodological notes on chrono-historical approaches.

Before proceeding with the discussion, some remarks on the use of absolute dating techniques in reconstructing the distant past are necessary. Establishing an absolute chronology for the vast region encompassing Southwestern Asia and Northern Africa is a challenging endeavor, requiring methodologies drawn from both the humanities and the hard sciences. Analysis typically begins with a carefully curated selection of sample evidence that meets rigorous standards. For example, samples must come from well-defined stratigraphic contexts, remain uncontaminated by recent organic material (particularly relevant for C14 analysis), and be recovered from areas free of disrupting factors. Despite technological and statistical advances over the past forty years, significant uncertainties still persist in both absolute and relative dating when evaluating evidence for the origins of writing. Terms like "old wood problem", "(chronological) plateau", and "calibration issues" frequently appear in the literature, reflecting the challenges inherent in absolute dating. Consequently, while C14 dating and similar techniques are invaluable, they alone are insufficient to conclusively answer questions like "Who invented writing, and when?". Therefore, broad historical evaluations often supplement absolute dating in discussions on proto and early writing. However, the resulting historical narratives are prone to biases of various kinds. Indeed, historical considerations often inform chronological data rather than vice versa. To an extent, refining the dating of selected archaeological samples based on existing knowledge is acceptable and even natural. However, it is crucial to be aware of the potential pitfalls of this approach. Circular reasoning, for instance, can arise, especially when historians hit the limits of probability curves in C14 dating – as seen in the accepted dating of proto-cuneiform (see §4 below). Such situations do not necessarily invalidate the proposed chronological reconstructions, but they should certainly raise caution in the scholarly community, given the potential for cascading effects on related historical topics. One way to identify potentially flawed paradigms is to revisit the *status quaestionis* and the history of research on the subject. It is important to track how academic consensus (or disagreement) has evolved over time and why. What matters is not only *what* we know but also *how* we arrived at that knowledge. As this article will show, scholarly conclusions often depend on the specific academic disciplines and methodological frameworks applied in studies of proto-writing (e.g., positivism, structuralism, post-structuralism, holism). Borrowing a concept from physics and social sciences, it may be useful to consider the notion of *intellectual hysteresis* – the tendency for current research paradigms to persist even after the conditions that produced them have changed. For instance, a recalibrated C14 date might have little impact on historical models deeply rooted in prior interpretations. In the following discussion, the author aims to outline major trends in the academic debate on the origins of writing over the past fifty years. However, readers should be aware that a complete bibliographic survey of this vast topic would require considerably more space than is available here.

4. Proto-cuneiform

Proto-cuneiform texts have been extensively described in the past.[4] As is well known, the epigraphic evidence from the late Uruk period is divided into two main groups, corresponding to the Uruk IV and Uruk III periods. The Uruk IV corpus consists of 1,790 tablets,[5] all originating from Uruk. To this collection, another 45 tablets from illicit excavations, with uncertain provenance, must be added.[6] The Uruk III inscribed materials are more numerous, comprising 4,437 items from various sites in southern Mesopotamia, including Uruk, Umma, Adab[?], Larsa[?], Jemdet Nasr, Tell Uqair, Kish, and Ešnunna. This article primarily focuses on Uruk IV materials, whose language remains a subject of debate due to the archaic nature of the texts. Based on a few selected spellings in the Uruk III inscriptions, many scholars argue that Sumerian was also the language of the Uruk IV texts.[7] Be it as it may, the consensus is that phonetic spellings in the Uruk IV tablets are at best extremely limited, indicating that the system was not well-suited to recording spoken language. Turning to the archaeological context, the Uruk IV texts were excavated prior to the establishment of stratigraphic methods, and as a result, the precise find-spots for most tablets are unknown, aside from a few exceptions (discussed below). The tablets were found in secondary contexts, used as fill in leveling the acropolis area in the early Uruk III period. Recent C14 dating of pinewood samples from the roof of the Eanna Building C (also known as Temple C), combined with dendrochronological analysis, has provided anchor points for a small group of seven proto-cuneiform tablets of administrative nature.[8] These tablets were either brought into Building C after its construction or produced there locally. The excavators unearthed them on the floor just below the collapsed roof. In terms of absolute dating, the *terminus post quem* for the roof's construction is now set at 3275-3250 BCE (1σ) or 3290-3245 BCE (2σ). Although the building's period of activity is unknown, it is plausible that these tablets were produced shortly before the building ceased to be used, as there is nothing in their content that suggests the need to keep them over a period of several years. Assuming a few decades of use, a reasonable date for the proto-cuneiform texts from Building C is around 3250 BCE, with some Uruk IV texts potentially being slightly older.[9] Highly

[4] Standard treatment by Englund (1998: 18-41), with previous references. Since then, some 650 proto-cuneiform tablets appeared on the black market as result of illicit excavations. Most materials are now published in three major volumes, namely CUSAS 1, CUSAS 21, and CUSAS 31. On the overall historical and intellectual setting of proto-cuneiform see further Woods 2010; Fales and Del Fabbro 2017; Steinkeller 2017: 24-28; 50-55; Renn 2019; Cancik-Kirschbaum and Schrakamp 2022.

[5] Data from the CDLI project (accessed August 2024).

[6] These tablets are now hosted at the Oslo Schøyen Collection. Englund (2004a: 28 wn 7) thinks of Adab or Umma as possible origin for these materials; contra Veldhuis (2014: 32).

[7] Englund (2009: 7-10) offers a systemic review of the proposed attempts of identifying phoneticism in proto-cuneiform records. His list of candidate Sumerian words in the archaic text in now to be updated as to include Monaco 2014b. On this topic see further Damerow 2006: 4-7; Cooper 2016: 54; Selz 2022.

[8] Green and Nissen 1987: 36-40, 50-51; Englund 1998: 41 wn 81-82; Ess and Heußner 2015: 22. The tablets received excavation numbers W 21300, 1-7. Photos and copies in ATU 2 pl. 1-3 and on CDLI as https://cdli.ucla.edu/P004357 and subsequent IDs (up to P004363), providing also museum numbers and additional information.

[9] Cf. also Sürenhagen (1993: 57-70) for a proposal of dating of selected proto-cuneiform texts to the Uruk V period. Englund initially expressed reservations about this idea, but subsequently considered it a potential avenue for further investigation (Englund 2004b: 148 wn 36), apparently in order to contrast the idea that Egyptian writing is older than proto-cuneiform.

pictographic inscriptions, such as the renowned Uruk tags, almost certainly belong to an earlier stage of the script.[10] Most scholars agree on a relatively swift development for proto-cuneiform palaeography. As Nissen et al. (1993: 7) observed:

> "The text corpus of script phase IV (…) seems itself so homogeneous that one is inclined to date all its tablets to a relatively short period".

As for content, all proto-cuneiform texts are either administrative or lexical in nature, with the possible exception of the so-called AD-GI$_4$ list (also known as World List C or "Tribute"), which may contain a narrative section.[11] Be it as it may, examining how the accepted dating of Uruk IV texts has evolved in scholarly literature over the past forty years is instructive. In the 1980s, the Uruk IV period was typically dated to 3100-3000 BCE and Uruk III to 3000-2900 BCE.[12] This dating was largely based on historical considerations rather than C14 data, which at the time gave an uncalibrated date of 2815 ± 15 years (Lenzen 1965: 20-21). Scholars chose to disregard this figure, aiming instead to place the Late Uruk period before the Early Dynastic period, whose absolute chronology was more securely established. At that time, proto-cuneiform was almost universally considered the earliest script, from which all other scripts either derived or were inspired. In the 1990s, the dating of the Uruk IV period was shifted back by a century to around 3200-3100 BCE, with Uruk III adjusted accordingly to 3100-3000 BCE.[13] This updated dating rested also on new C14 data, which allowed some flexibility.[14] In the early 2000s, Glassner (2000: 54-65) proposed an even earlier date for the invention of "writing" (or proto-writing, in the terminology used here). If the present author correctly reads Glassner's argument,[15] he suggests that proto-writing quickly developed from pre-existing accounting devices, such as bullae, numerical and numero-ideographic tablets.[16] He also takes in due consideration stratigraphic and C14 data from various sites where these devices have been found, including Jebel Aruda, Habuba Kabira, Tell Brak, Godin Tepe, Hacinebi, Tell Sheikh Hassan, and Tell Qraya. Taking dating uncertainties into account, Glassner concludes that 3400-3300 BCE is the most plausible range for the Uruk IV proto-cuneiform tablets, arguing that proto-writing in Mesopotamia predates that in Egypt. It is beyond the scope of this paper to fully address Glassner's work on writing's origins, which is not limited to chronology. Within the Assyriological community, his idea that Sumerian was the underlying language of proto-cuneiform encountered criticism.[17] Despite this, the idea of an earlier date for proto-cuneiform has proven influential. While 3400 BCE may

[10] See most recently Szarzyńska1 1994; cf. Englund 1998: 57.
[11] On this peculiar text see Civil 2013. Such interpretation remains controversial, but this is not relevant here. On archaic lexical lists in general see Veldhuis (2014: 27-59).
[12] See for instance Damerow and Englund 1989: viii; Nissen 1986. The bibliography is vast, only a few minimal references are provided here and in the notes below in order to substantiate the argument.
[13] See for instance Englund 1994: 11 wn 4; Englund 2001: 1 wn 2; Woods 2010: 33 still retains this dating.
[14] Boehmer (1991: 223) has data on three samples, whose combined probability distribution suggests a dating of 3510-3370 BCE for the felling of the trees used as roof beams of Building C (cf. remarks by Wright and Rupley 2001: 92, with notes on overall methodological approach).
[15] See remarks by Desset 2012: 69.
[16] Selected iconographic motives from cylinder seals also played a role in the development of the proto-cuneiform repertoire, see most recently Ross 2014; Kelley et al. 2024.
[17] See the review by Englund 2005; cf. also Selz 2000; Dalley 2005.

be ambitious, since the mid-2000s, many scholars have adopted a further revised date range of 3300-3200 BCE for the Uruk IV materials (Englund 2004a: 25-26). It must be noted that support for this revised dating came around ten years after its initial proposal, in the form of new calibrated C14 data.[18] This academic trend towards earlier dating is evident in the literature, with Englund (2006a: 2) suggesting 3350-3200 BCE as a plausible compromise. This range is presently used by the Cuneiform Digital Library Initiative (CDLI), which is the result of years of meticulous work by Englund and his team.[19] While revisions to absolute chronology are common and welcome in the study of ancient history, setting an upper limit of 3350 BCE for the earliest Uruk tablets, though not impossible, seems unlikely. The publication history of Egypt's earliest inscribed objects may, in fact, explain the apparent Assyriological community's will for positioning the Uruk IV materials as early as possible within this revised timeframe.

5. Proto-hieroglyphic

In the interest of space, the following overview of the proto-hieroglyphic script focuses on materials that most significantly influenced scholarly debates on early writing. The discussion begins with an examination of the famous Abydos tags and related items discovered in 1988 in the royal cemetery at Umm el-Qaab. Fully published a decade later (Dreyer et al. 1998), this find challenged the previously accepted chronological supremacy of Mesopotamian writing. The artifacts were found in the monumental tomb labeled U-j, dated to the Naqada IIIA period. Although looted in antiquity, the tomb still contained materials valuable for historical analysis, including pottery, luxury items, and 186 small ivory and bone tags inscribed with proto-hieroglyphic signs, carved and painted. In the early 1990s, this tomb was dated to approximately 3150 BCE, about half a century earlier than the proto-cuneiform texts from the Uruk IV period, based on prevailing scholarly views back then (Boehmer et al. 1991: 65). Prior to the complete publication of the Abydos materials, there were also those who advanced arguments in favour of an even earlier dating. For example, Kaiser (1990) suggested that (proto-)writing in Egypt could date back to the Naqada IIc period, approximately a century earlier than Naqada III. In the late 1990s, Dreyer et al. (1998) tentatively proposed a date of 3320 BCE for Tomb U-j in the Naqada IIIA period.[20] This dating was corroborated by a second set of C14 data from two wood samples found in room U-j 6, which were paired with considerations of an archaeological nature. In those years, proto-hieroglyphics appeared not only to precede proto-cuneiform but also to be more advanced in its potential to record spoken language. In fact, the excavators put forth the proposal to decipher the inscriptions on the tags and related materials in terms of toponyms indicating the place of origin of the goods shipped to Abydos, some possibly including phonetic elements. If accurate, this would imply that writing, in the strict sense, first emerged in Egypt. In 2001, the concept of a potential chronological supremacy of proto-hieroglyphic was popularised by Lawler (2001).[21] In the 2010s, however, the

[18] Ess and Heußner 2015, followed for instance by Nissen 2016: 34.
[19] Accepted in many subsequent academic studies, with nuances. For instance, Ross (2014: 298) cautiously places the earliest proto-cuneiform tablets at the very end of the available range for the Uruk IV period (i.e. shortly before 3200 BCE).
[20] Görsdorf et al. 1998; see also Joffe 2000 on the historical implications.
[21] Lawler (2001: 2420) also takes in consideration Harappan inscriptions as a possible third contender.

proposed decipherment of the Abydos tags was met with criticism from within the Egyptological community.[22] Nevertheless, this did not affect the overall argument that proto-hieroglyphic was the oldest of the proto-writing systems. Meanwhile, attention shifted to other mid-fourth-millennium BCE proto-writing candidates, such as rock inscriptions from el-Khawi and Gebel Tjauti, the Coptos colossi, decorated luxury items (e.g., ceremonial knives and combs), and motifs on painted pottery from the late Naqada II period (the so-called Decorated Ware). The current consensus is that such diverse evidence should not be classified as writing proper, as it contains no phoneticism whatsoever. Instead, it represents a visual communication code that was exploited (with modifications) later on when writing first emerged. In more detail, these symbols are to be regarded as elements of partly overlapping and restricted semiographic systems (Vernus 2016; Stauder 2022). The restriction is operative at both the semantic and functional levels. On the one hand, the system appears to be inherently limited in its capacity to convey complex semantic information. On the other hand, the deployment of such a system seems to be primarily driven by the desire to enhance power and prestige (Baynes 2007: 98-103). The earliest known examples of phonetic signs are found in the late Naqada III period, specifically in elite names and toponyms attested in the decades immediately preceding Narmer (ca. 3200 BCE). Going back to scholarly debate on proto-writing, in parallel with the re-evaluation of the U-j materials, the validity of the samples used for dating the Abydos archaeological evidence as a whole has been called into question. The revision already started in in mid-2000s, with a more pronounced emphasis in the 2010s.[23] The arguments are quite complex. It suffices to note here that uncertainties encompass not only issues with row data calibration, but also with the relative length of the 0th and subsequent dynasties. Köhler (2013) has proposed a date of approximately 3300-3100 BCE for Naqada IIIA1/2, which aligns well with the currently accepted Uruk IV period. Bayesian statistical models were employed by Dee et al. (2013: 5,8) to yield a slightly earlier dating of the entire Naqada III period, namely 3377-3238 BCE (95% highest posterior density range). In accordance with the findings of these authors, the introduction of proto-writing is likely to be placed around 3300 BCE.[24]

6. Proto-Elamite

In more recent years, a further contender has emerged in the academic debate on the earliest (proto) writing systems. The corpus of proto-Elamite texts comprises approximately 1,750 tablets. The majority of the evidence originates from Susa (1,630 tablets, according to CDLI), although smaller collections of epigraphic materials have been retrieved from numerous sites scattered across the vast Iranian plateau: Anshan (32 tablets), Tepe Yahya (27), Tepe Sialk (5[?]), Tepe Sofalin (16, plus numerous unpublished texts), Tall-i Ghazir (1), Tepe Ozbaki (1), and Shahr-i Sokhta (1). In comparison with Uruk IV, the proto-Elamite cultural horizon is undoubtedly more diverse, as expected on the basis of the extensive geographical area covered by the sources (Saeedi 2021). From a typological perspective, all the documents are of an administrative nature, with the exception of a single peculiar text that may have

[22] Regulski 2010: 53-64. See most recently Vernus 2016: 117-119; Stauder 2022: 227-31. On the earliest full-fledge sentence in Egypt cf. also Regulski 2014: 1 fn 1.

[23] See for instance the mild criticism by Baines (2004: 154, 2007: 118-121).

[24] Dee et al. (2013) speak of writing *tout court*, but it is clear they mean proto-writing, see §2 above.

originated from school practice.[25] Until recently, proto-Elamite was universally considered to be a secondary invention, derived from proto-cuneiform by cultural contact (Englund 2004b; 2006b: 22; Dahl 2012: 2; Dahl et al. 2013: 353; Glassner 2018: 450-51; Robson 2020: 26). Up until the late 1980s, the earliest texts from ancient Iran were in fact assigned a dating that was roughly contemporary to Jemdet-Nasr/ Uruk III in Mesopotamia (Damerow and Englund 1989: viii). In absolute terms, and acknowledging the typical uncertainties associated with chronological reconstruction, this would translate in a dating between 3000 and 2800 BCE. The arguments for such a late dating were based on a combination of C14 data and considerations of an archaeological nature, such as the presence or absence of Uruk material culture within Iranian sites where proto-Elamite texts had been recovered.[26] Furthermore, the presence or absence of objects deemed precursors to writing (bullae, numerical tablets, numero-ideographic tablets[27]) was regarded as a diagnostic feature for establishing relative dating, with particular reference to the proposed alignment of the Uruk and Susa stratigraphic evidence, which continues to present a significant challenge. This is particularly the case with regard to the pivotal levels Eanna IVa/b in Uruk and Acr. I 17A/B in Susa (Butterlin 2018: 309-321). Historical considerations also contributed in solidifying the idea that proto-cuneiform must precede the other scripts. In particular, (proto-)writing was conceptualised as one of numerous elements that were disseminated throughout the Ancient Near East as part of the Uruk expansion.[28] In that period, the prevailing view was that these developments were the result of a purely colonial process. This perspective posited a unidirectional, monolithic influence of the Uruk culture over all sites where Uruk material culture had been recovered, extending from Northern Mesopotamia to ancient Iran. The rationale for situating the proto-Elamite evidence in a temporal context preceding the Uruk IV period was predicated on considerations pertaining to the relative magnitude of the settlements. The argument can be summarised as follows: as Uruk eventually grew larger than Susa, it must have had a bigger political impact, which in turn implies a more complex society, as well as the need for sophisticated administrative tools, such as proto-cuneiform, which is therefore earlier than proto-Elamite (Dittmann 1986: 347). The underlying assumption is that (proto-) writing must be a product of a large urban centre, given that the majority of inscribed evidence currently available is intimately related to city administration.[29] However, the argument is flawed due to a lack of understanding of complexity in the context of network science. In particular, the relative size of a settlement may be employed as a proxy for social complexity, although this is subject to certain limitations. It is acknowledged that a settlement of a few inhabitants is less complex than a well-developed urban system. However, a city of 100,000 inhabitants or more might as well be as complex as one having half the population. Going back to proto-cuneiform and proto-Elamite scripts, there are points of contact, which

[25] MDP 26 71. The author is grateful to C. Kelley for pointing this text out to him. See further Dahl 2018: 386, with an overview of the content of the text corpus as a whole.
[26] See for instance Damerow and Englund 1989: viii on the evidence from Tepe Yahya.
[27] Englund 1998: 42-51; 2004a: 25-28.
[28] The model is of course now outdated, cf. Stein 1999: 10-64; Algaze 2005.
[29] In this view, proto-cuneiform lexical lists are primarily conceived as an ancillary tool to perpetuate the system (see Michalowski 2012); Glassner (2000) has a more nuanced view of lexical lists, conceptualising them as the outcome of intellectual endeavour by early humanists.

used to be regarded as direct evidence of the latter being inspired by the former. Elements in common include two metrological systems,[30] as well as non-numerical signs, which are remarkably similar in both their visual properties and meaning (such as for instance the sign for sheep and goats).[31] In the late 1990s, both the upper and lower boundaries in the time range of proto-Elamite were revised in order to align with the period 3100-2900 BCE (Englund 1998: 22). This dating was considered to be "almost secure" (ibid.). Such a revision was necessary in order to maintain the chronological proximity of the proto-Elamite horizon to the Jemdet-Nasr/Uruk III period, whose dating had been adjusted accordingly. The revised chronology had no impact on the contemporary understanding of the origins of writing in ancient Southwestern Asia. However, it may have contributed to familiarize scholars with the idea that proto-writing in ancient Iran also emerged in the late fourth millennium, as is also the case with proto-cuneiform. The recent reappraisal of the extant evidence appears to have been prompted by the accumulation of significant archaeological discoveries in Iran over time, which collectively constituted a substantial challenge to the prevailing paradigm. Based on ceramic analysis, already Butterlin (2003: 387-314) proposed a gradual and uninterrupted development in Susa throughout the Early Uruk period, which suggests that the urbanisation process was not influenced by external factors. In the early 2010s, the situation reached a new and more dramatic turning point. Pittman (2013: 322) presents a novel synthesis of the iconographic evidence from ancient Iran, which was previously interpreted as exhibiting clear Mesopotamian influence. This synthesis is based on the analysis of recently published materials from both Uruk and Susa (in particular, Boehmer 1999; Le Brun 1999). By filtering out the analysis of unreliable materials that cannot be dated with reasonable certainty, Pittman is able to identify the original motives in the glyptic repertoire from fourth-millennium Iran. The new evaluation demonstrates that prior to the invention of proto-cuneiform in Uruk, Susa was not culturally subordinated to Mesopotamia. As Pittman puts it (2013: 329-330):

> "The most conservative interpretation of this situation is that there was a millennium-long period of parallel cultural evolution in southern Mesopotamia and neighbouring Susiana that reflected a period of intense contact between Mesopotamia and Susiana. The most radical interpretation would be that the material forms that define Uruk administrative culture, before the invention of writing at Uruk in Eanna IVa, were borrowed from Susiana by southern Mesopotamia".

Roughly in the same years, Desset (2012; 2016) presents a further assessment of the proto-Elamite epigraphic evidence, which resonates with the revised understanding of the archaeological context. This author posits that the proto-Elamite and proto-cuneiform scripts should be considered contemporary, spanning approximately 3300-3100 BCE. In more detail, it is proposed that they should be regarded as descendants from a common

[30] Desset 2016: 76-78. On proto-cuneiform metrological systems see further Englund 1998: 111-127; as for proto-Elamite see Englund 2004b: 104-119.

[31] See most recently Kelley 2024: 82-83, providing an estimate of at least 30 signs in common between proto-cuneiform and proto-Elamite, plus another 50 signs as possible candidates. Importantly, the shared repertoire includes complex graphemes and signs that seem not pictographic in nature. These observations allow us to rule out the possibility that the visual similarity of selected proto-cuneiform and proto-Elamite signs is merely due to the fact that they represent the same object.

ancestor, namely from the accountable system(s) attested in bullae (with associated tokens), as well as in the numerical and numero-ideographic tablets from the mid fourth millennium BCE.[32] Desset's argument is based on a cumulative reading of the available C14 data. His evaluation is paired with the consideration that the stratigraphic context of diagnostic archaeological finds from ancient Iran is better understood than those of Uruk, particularly in the context of recent excavations outside of Susa. In particular, the site of Anšan appears to offer substantial evidence in support of this perspective (Desset 2016: 90). It is beyond the scope of this author's expertise to assess the soundness of Desset's interpretation of C14 data. As Dahl et al. (2013: 375) warn us:

> "The existence of a substantial plateau in the radiocarbon calibration curve has been highlighted as a major impediment to understanding the absolute chronology of the fourth millennium BC, which in turn hinders our understanding of the socio-economic dynamics of the ancient Near East at that time. Many of the extant problems of absolute chronology will only be resolved through renewed excavations targeting specific chronological problems".

With this in mind, it must be acknowledged that, to the best of the present author's knowledge, Desset's theory has yet to be disproved. The question of whether the theory is correct or not is a separate issue. Indeed, it is this author's suspicion that the theory may be incomplete, as it does not fully elucidate the intricacies of numerical and numero-ideographic (or logo-numerical) tablets, which deserve a more in-depth examination than is currently permitted. Furthermore, the historical mechanism underlying the spread of (proto-)writing technology across the vast area extending from the Zagros Plateau to Northern Africa remains unexplored. To be fair, it should be noted that Desset's arguments were never intended to address these issues in the first place. Furthermore, it is important to acknowledge that a theory that is based on a subset of available data can be highly beneficial, as it allows for future enhancements and generalisations.

7. Writing and civilization

The notion that the invention of writing represents a fundamental milestone in urban society's development is hard to debunk, especially in literate societies. This perspective is shared by many scholars across fields related to the ancient Near East and Northern Africa, as well as by linguists. Algeo and Butcher (2013: 6), for instance, state in their discussion of English:

> "If speaking makes us human, writing makes us civilized".[33]

Yet, from a historical standpoint, this claim is certainly wrong. There are numerous examples of highly civilised peoples who did not possess the capacity to encode language in visual form. For example, the Incas never developed a

[32] On tokens see most recently Bennison-Chapman (2018, with discussion on previous studies). The author makes the important point that Neolithic tokens did not originate as a means of administration. However, her analysis does not invalidate Desset's idea, which ultimately rests on numerography as attested in the proto-literate period (see also remarks by Chambon 2022).

[33] As for Mesopotamian studies see for instance Matthews (1995: 309): "Writing and civilization are inextricably connected. Today we cannot conceive of one without the other. To be civilized is to be self-conscious, critical, aware, capable of assimilating and producing large quantities of fixed and fluid information, and capable of recording, transmitting and receiving that information for contemporary and future reference."

full-fledged writing system (Urton 2003; Maiocchi 2019: 397). Defining what constitutes civilization – and determining which markers justify the term *civilized* – is a challenging task, open to numerous biases, including cultural, social, and educational perspectives.[34] Ironically, advocates of writing as a universal marker of civilization are themselves invariably literate. Alphabet users may similarly view their writing system as superior for achieving literacy.[35] The close involvement of scholars with their subject matter often shapes these perceptions, making claims about writing as a universal measure of civilization seem less objective. This is not to diminish the significance of written sources for historical reconstruction or the transformative role writing has played in cultural development. Writing enhances knowledge transmission, preservation, and symbolic representation, with important cognitive implications. However, it is notable that scholars engaged in the various disciplines of research thus far have seldom, if ever, considered the possibility that the origins of writing may lie outside the boundaries of their respective fields of expertise. This is a cause for concern, as there is a risk that such practices could result in forms of academic supremacism, whereby the remote past is appropriated for the sake of disciplinary prestige. Nevertheless, the intentions that have driven the debate thus far are undoubtedly good, and the conceptual gain to our understanding of cultural development throughout history is considerable.

8. Conclusions

The numerous issues pertaining to the origins of writing in antiquity are particularly challenging to resolve. This is not only due to the lack of conclusive data, but also because current approaches are inherently influenced by ideological preconceptions derived from the prestige attached to writing in modern societies. Nevertheless, it seems fair to say that the paradigm of proto-cuneiform as the pristine writing system *par excellence* has been significantly undermined over time. With it, the glorification of Uruk as *the* first city[36] is now in urgent need of revision. The numerous points of contact between Mesopotamia and Egypt in the fourth millennium BCE, and those between ancient Iran and Mesopotamia, strongly suggest that a significant piece of the historical puzzle regarding the origin and diffusion of writing remains elusive in current reconstructions. From a broader historical perspective, it is important to recognize that the writing technology is just one element of a shared cultural framework, which includes other significant aspects such as monumental architecture, artistic motifs, ceramic typologies, accounting devices, and so on. These elements are equally important to our understanding of the social, political, and intellectual context of the earliest written records. Questions of *who, how, why,* and *when* writing emerged may ultimately remain unanswerable, or indeed may prove to be nonsensical. Nevertheless, this should not prevent scholars from endeavouring to address these questions to the best of their ability. It

[34] On this subject see further the comments of Pinarello 2018: 12-15, which can easily be extended to most disciplines concerned with literacy in antiquity.

[35] See for instance the claims of the now outdated but very influential book by Gelb (1963: 15; 236-40), which sets the very foundations of the field of grammatology.

[36] As per the title of the influential book by Liverani (1997). Liverani posits Uruk as a case study for the investigation of urban phenomena in the fourth millennium BCE. The title of his book, however, has subsequently been repeated as a sort of mantra in numerous articles within and beyond the field of Assyriology, to the extent that a case study has almost become paradigmatic. On the topic of urbanization in Mesopotamia as product of Sumerian culture see further Cooper 2016.

is, however, important to acknowledge the uncomfortable fact that chrono-historical arguments in current historical narratives on the origin of writing are dependent on the scholarly field(s) that produced them. It is, of course, possible that future archaeological discoveries may alter the current state of affairs. In the meanwhile, the aforementioned considerations are intended to serve as a cautionary reminder to scholars, including the present author, to maintain a certain degree of emotional detachment from the subject matter of their study.

Abbreviations

ATU 2: Green and Nissen 1987
CDLI: Cuneiform Digital Library Initiative: https://cdli.mpiwg-berlin.mpg.de
CUSAS 1: Monaco 2007
CUSAS 21: Monaco 2014a
CUSAS 31: Monaco 2016
MDP 27: Scheil 1935

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

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Abstract

While cuneiform sources from the late 3rd millennium BCE Mesopotamia describe labour-intensive and structured economic systems, relations and means of pottery production remain elusive in archaeological evidence. Few studies have explored the organisation of ceramic workshops from this period, and issues related to kiln technology remain poorly addressed. The recent discovery of complex firing systems integrated into large pottery workshops at the site of Logardan in Iraqi Kurdistan, dating to the last centuries of the 3rd millennium BCE, calls for a reassessment of pottery production organisation and practices within the context of the first empires. The site is a ceramic production centre located at the margins of the Ur III empire, featuring large-scale systems of kiln connections through horizontal ducts to enhance firing efficiency and optimisation of fuel and heat. Ongoing excavations provide new sets of archaeological data (spatial, architectural, pottery typologies and techniques), which makes it possible to revise traditional political, technical and socio-economic paradigms about ceramic production. This paper investigates the integration of such mundane craft into the Ur III state economic system, highlighting an emerging path towards proto-industrialisation.

Keywords: Ceramic production, Pottery workshop, Craft organisation, Ur III State, Mesopotamia

1. Introduction[1]

1.1. *From Sumer to the Zagros: administrative structure of the Ur III state*

At the very end of the 3rd millennium BCE, the Ur III dynasty, which ruled over Mesopotamia from 2110 to 2003 BCE according to the Middle Chronology (Sallaberger and Schrakamp 2015), established a new form of political control, reorganising the economic and administrative system (Steinkeller 2021). During the reign of Šulgi (2092-2045 BCE), the

[1] This article stems from the authors' research – and the PhD dissertation of C. Padovani – on the site of Logardan (Iraqi Kurdistan) in the framework of the Mission du Qara Dagh (2015-2019) led by R. Vallet (CNRS, TEMPS) and FArMQaD (2019-ongoing), the French Archaeological Mission in the Qara Dagh, led by J.S. Baldi (CNRS, Archéorient). The research benefitted from the support of the French National Research Agency (ANR), grant ANR-22-CE27-0003 for the project FACT_WORK – First proto-industrial ceramic FACTories in the 7th-2nd millennia BCE Mesopotamia and Levant. WORK organization from the proto-urban settlements to the supra-regional kingdoms (Project Coordinator J.S. Baldi).

cadastre of provinces created by his father Ur-Namma, including regions from the Susiana Plain to the Diyala Valley, was expanded to include newly incorporated tributary territories east of the Tigris and the Zagros foothills (D'Agostino and Pomponio 2023; Colonna d'Istria and Clancier 2024). This composite domain constituted the basis of a hierarchical economic system overruled by the king. The area controlled by the Ur III state comprised two regions submitted to different tax regulations (Sallaberger 1999). The 'traditional' regions of Sumer and Akkad, the heart of the empire, were constituted of several provinces directed by governors (*ensi*$_2$, hereafter *ensi*) and overseen by military commanders through a double-entity administration (Lafont 2020). *Ensi* were named by the king and chosen from local elites. They kept relative independence, participating in the political system by paying the *bala* tax to the crown on a rotational basis according to the economic capability of each province. Through this tax, the king was recognised as the owner of the land (Steinkeller 1991; 2021). The 'peripheral' provinces were composed of the newly annexed territories in the Zagros piedmonts, governed by military officials reporting directly to the king. As a rule, they were not submitted to the *bala* tax but were required to pay annual tributes, among which the *gu*$_2$*-un ma-da* depending on the payer's military rank (Alivernini 2020). Economic networks during this period were organised in a pyramidal structure, centred around key redistribution hubs that functioned as important knots within the system. One of the most renowned centres was Puzriš-Dagān (modern Drehem), set up by Šulgi in the vicinity of Nippur for collecting livestock tributes and other goods from the northern lands, which were mainly distributed to institutional estates managed by the king (Wilcke 1992;Pomponio 2023). These large institutions were political organs of the society while also playing a significant economic role by cultivating the land and employing a part of the population in their service (Gelb 1965; Pomponio 2023).

1.2. *Behind the Ur III administration: kilns and potters in early state systems*

The primary sources of information on pottery production organisation in the late 3rd millennium BCE are records from the above-mentioned state-related institutions, including invoices, order receipts and payslips. These texts offer a one-sided, administrative perspective on ceramic production. Their interpretation has sparked a debate on the degree of centralisation and the control established by the empire over all sectors of society's economy (Steinkeller 2004; Dahl 2010). The question is whether state-run institutions and the Ur III king had total control over their specialised workforce in a highly stratified and omniscient economic system providing raw materials and employment or whether the workforce was instead compensated on a per-job basis, keeping freedom and independence. The case of the Ur III economy contributes to a broader discussion on the organisation of production during the late 4th and throughout the 3rd millennium BCE, a period marked by the rise of the first state systems and the development of urban centres. It is generally assumed that in state-run economies, production was centralised in large centres, organised through a division of labour, and controlled by an administrative authority (Childe 1934; 1942; Wright 1977; Tosi 1984; Wailes 1996; Mumford 2019 [1966]). Such organisational structures are believed to have facilitated the development of cities as political and economic centres. In these systems, workers are depicted as being heavily dependent

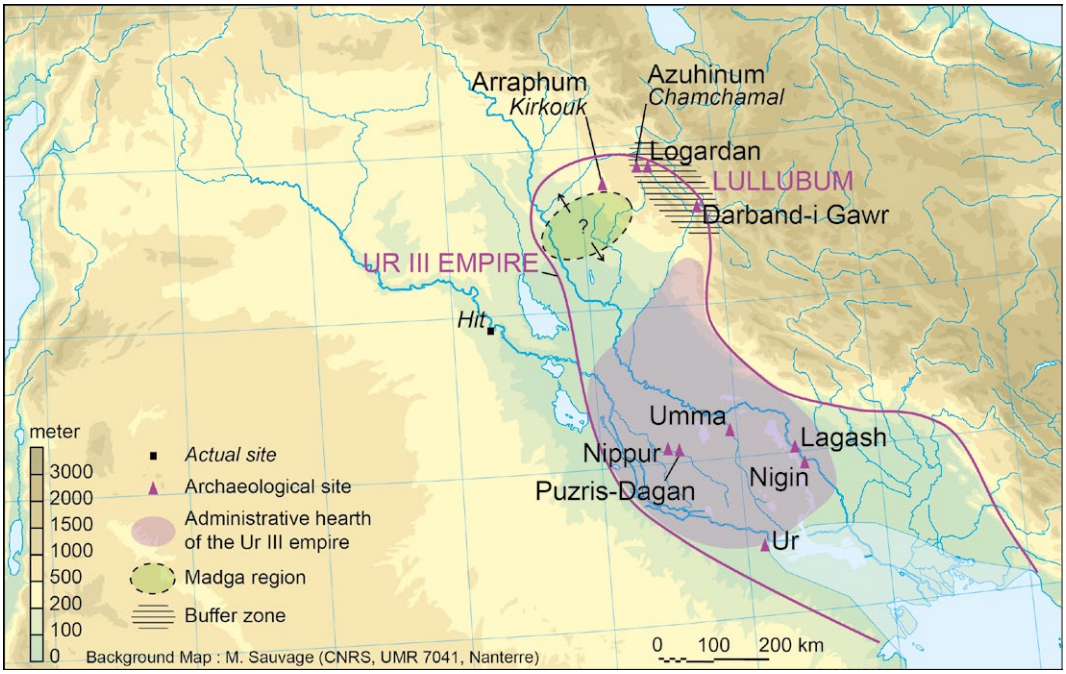

Fig. 1. Map of the Ur III empire highlighting the sites mentioned in the text ©Padovani, Zingarello.

on a hierarchical authority that dictates the economic organisation. However, only a limited number of pottery production sites from this period have been excavated (Padovani 2023b; 2024b). These assumptions are largely based on models derived from ethnographic or modern case studies, which often do not fit well with the archaeological evidence (Rice 1981; Duistermaat 2008; Forte 2019; Amicone et al. 2021). To provide new insights into the organisation of pottery production in early state systems, this paper proposes a fresh interpretation of the scenarios indicated by textual and archaeological evidence available for the Ur III period, through a bottom-up approach. Our analysis examines administrative texts on pottery production from various urban centres in southern Mesopotamia, along with the sole excavated pottery workshops from this period found at Logardan (Trench D, Levels 3a2 and 3a1) in Iraqi Kurdistan. Logardan is a relatively small site situated at the margins of the Ur III domain, 4 km away from *Azuhinum*/Chamchamal, an important urban centre in the province of *Arraphum* (the present-day city of Kirkuk) (Frayne 1999; Ahmed 2012; Baldi and Vallet 2024) (Fig. 1). In Levels 3a2 and 3a1, excavations revealed pottery production installations and innovative firing systems (Padovani 2023a), suggesting the whole site was entirely dedicated to pottery manufacturing during this period. The spatial distribution of pottery types and techniques and the architectural analysis of the operative spaces (such as working platforms, kilns, etc.) provide clues to interpreting how the ceramic production process was handled at the site within the successive workshops of Levels 3a2 and 3a1. Such an approach aims to integrate the perspective from the lower tiers of the social pyramid in a distant province of the empire. Furthermore, this case study prompts

inquiries into the potential emergence of a proto-industrial paradigm during this period. Although the concept may seem anachronistic, archaeologists working on different periods and regions use the term "industry" to describe productive systems that existed in the early stages of human history and were characterised by large-scale output, advanced technical skills (including standardisation and specialisation), technological innovations, and hierarchical management (Van der Leeuw 1977; Costin 1991; Costin and Hagstrum 1995). However, the definition of this term is derived from modern examples and does not accurately suit the reality expressed by archaeological remains. Following Pagès and Verna (2022), based on archaeological evidence, we aim to loosen the concept of industry in the ancient past from the conceptual frameworks that have been heavily influenced by its own history. If the notion of industrialisation can only be applied to the modern era as the result of a complex socio-economic process ultimately including the application of mechanised techniques and methods to a sector or branch of the economy, proto-industrialisation may be polymorphous, taking different forms that equally led to rationalisation and increased productivity to maximise output while minimising costs. Therefore, at Logardan, the large output and structuration of the production – that echoes the batches of pottery recorded in the Ur III administrative order receipts and payslips (Sallaberger 1996) – alongside the considerable size of the workshops, the spatial integration of their productive structures, and the implementation of innovative firing systems, suggest the early groundworks of a proto-industrial organisation.

2. Potters and ceramic production in the Ur III texts

Textual sources about potters from the Ur III period mainly come from the cities of Ur, Lagash, Umma and Nippur, all located in the core of the empire. In general, written evidence from outside this area is very scanty (Molina 2023; Colonna d'Istria and Clancier 2024). The interpretation of data on the job status and social position of potters in Ur III written sources has entailed two opposite views on the organisation of the pottery craft. Some scholars assume that potters were relatively independent and had time to work on their own. However, they were still required to pay an annual contribution to the above-mentioned urban institutions[2] as either potters or workers employed in other activities (Gelb 1969; 1979; Waetzoldt 1971; Neumann 1987; Postgate 1992; Sallaberger 1996; Steinkeller 1996; 2007). Others suppose that they were an enslaved, moveable workforce obliged to work on the estates of the households depending on their needs (Struve 1954; 1969; Diakonoff 1974; 1987; Dahl 2010). Relying on administrative accounts, what seems to be clear is that potters were subordinated to the city governor (the *ensi*) or military leaders, or they were under the king's direct authority (Steinkeller 1996). The *ensi* of Umma oversaw the potters who were employed for a set number of days each year by different institutional households related to the temples in the city centre. The same goes for the villages in the Umma countryside, where potters appeared to operate under the governor's control to fulfil the local ceramic demand (Steinkeller 1996). At Lagash and Umma, potters working as royal personnel, specifically called "royal potters", seem to

[2] These large institutions were political organs of society, also holding an important economic role as they cultivated the land and employed a part of the population in their service (Gelb 1965; Pomponio 2023).

belong to a separate category, working directly for the Ur III king's administration and receiving lands as payments. Potters also formed a subsidiary trade linked to different economic entities such as kitchens, breweries and mills (Waetzoldt 1971; Stein and Blackman 1993; Pomponio 2023). For these, they probably produced containers for a variety of purposes, such as preparing, transporting or storing consumables without any specialisation in the manufacture of a specific pottery type (Sallaberger 1996). In this context, a text from Umma states that "In Etena, a mill was built near the pottery" (Sallaberger 1996: 32). The different institutions employing potters did not seem to be concerned with the specific modalities of the potters' work as long as they fulfilled the orders for which they were paid. These institutions did not seem to have any control over the manufacturing process or the organisation of the production chain. They distributed rations to potters (Waetzoldt 1987) and facilitated access to some raw materials. W. Sallaberger (1996) mentions several deliveries of reeds to the Umma potters, often as leftovers from construction and basket-making activities or reed waste from the "sheepfold". Potters could also receive split branches from Euphrates poplars and small shrubbery. On the other hand, clay was probably collected directly by the potters. The soil from which it was extracted may have been part of a private estate, and at times, it was consecrated by the temples. A text from Nippur states that a potter from the temple of Inanna was employed in the clay pit at Iskurs (Zettler 1992). Sallaberger (1996) describes a ritual necessary for the creation of a clay figurine intended to be buried beneath the cella of the temple of Ninsubur: three days prior to making the figurine, an offering was presented to the clay pit in exchange for the material that would have been extracted from it. Institutional control was extended over the distribution of groups of producers across the workshops and fields they managed (Steinkeller 1996). However, the internal organisation of a pottery crew seems to be a "family affair". We know from the administrative accounts that potters usually worked in groups of relatives, sometimes with their young children (Waetzoldt 1971), following a hierarchical structure. Texts from Umma refer to a group of around twenty potters working for the city governor over a period of almost twenty years. The crew was supervised by potters from the same family, first the elder brother Pešam and, after his death, his sibling Utu-sag, both sons of Ur-Nigar "the potter" (Dahl 2010). Interestingly, each of them possessed his own cylinder seal. At least three sons of these brothers, Ur-Gilgamesh, Erraya and Aba-kala, appear as members of the same work crew. Various texts report similar circumstances for different craft activities, with teams of craftsmen who were generally men from the same extended family (Steinkeller 1987; 1996; Sallaberger 1996; Wright 1998). Administratively, potters could be reassigned to the same group from year to year unless they were required for specific orders or demanding agricultural tasks (Steinkeller 1996; Dahl 2010). These circumstances likely depended on the potters' skills and possibly also on other social criteria (Wright 1998). Within the work crew, each man had a specific task. Some were responsible for decision-making, while others were in charge of deliveries. At Umma, for instance, Ur-Gilgamesh and Erraya delivered pots to the group supervisors and received reeds (Dahl 2010). Another text from Umma, which includes parts of the same list of workers above (Sallaberger 1996; Dahl 2010), mentions Inim-Šara, the son of Lugal-itida. As superintendent potters, they both had their own cylinder seals, received bundles of reeds, and led a group of workers who responded to institutional orders for vases. Potters were also mobile at the local and regional levels, according to their abilities

and the needs of the time. At the local level, they could be assigned to collaborate with other specialists for specific orders or help with demanding tasks in the institution's fields, such as during the harvest (Neumann 1987). Moreover, they could be sent to distant areas as a backup workforce or to retrieve specific material. Inim-Šara and Lugal-itida of Umma both affixed their seals to documents reporting the departure of a worker from their gang to Má-da:ga (hereafter Madga) (Sallaberger 1996). According to recent interpretations (Ahmed 2012, *contra* Hempel 2009), the Madga region should have lain between the Lower Zab and the Diyala, likely in a defined area south of Kirkuk. It is known as a bitumen-producing region, particularly during the Ur III period (Forbes 1955; Edzard 1977; Moorey 1994). Within a craft area, bitumen could be used to repair and seal the jars but also possibly as a fuel or at least as a firelighter. Yet, bitumen sources were also accessible closer to southern cities, on the banks of the Euphrates around Hit in central Mesopotamia or in the Khuzestan region in southwestern Iran (Schwartz and Hollander 2016). However, the Trans-Tigridian route was apparently preferred by the potters from Umma. In sum, institutions gathered several groups of highly specialised workers under their control for at least a part of the year. Textual sources highlight a hierarchised and flexible system with different authorities managing the distribution of workers across the territory and local intendants keeping the production organised and operational. Thus, the primary purpose of the institutional households seems to be maintaining a network of workers, sites and economic entities that traded raw materials or finished products with one another. This network appears to have been crucial to the functioning of the Ur III economic system, and at least in the case of the potters, seems to have heavily relied on family ties (Steinkeller 2007).

3. Logardan: An archaeological view from the margins

Toward the end of the 23rd century BCE, the hilltop of Logardan was occupied by a monumental building to be associated with the Akkadian presence in the area, most likely in the framework of the Naram-Suen's military campaigns towards Simurrum (Baldi and Vallet 2024). Shortly after, a series of pottery workshops, counting dozens of kilns, were set up on the site's hilltop, reusing the vestiges of the architectural complex. The first of these workshops (Level 3b) is radiometrically dated between 2145 and 2119 BCE (calibrated medians, see Zingarello 2024). It was probably established by local inhabitants of the *Arraphum* province prior to the expansion of the Ur III empire in the region. Two additional workshop levels (3a2 and 3a1) were built on top of Level 3b, reflecting a change in the organisation of the production structures. Chronologically, they both cover the last century of the 3rd millennium BCE based on the pottery material, the more recent level straddling the turn of the 2nd millennium BCE (radiocarbon dating to come). A thick ashy layer was intentionally laid over the Level 3a1 workshop. At the turn of the 2nd millennium BCE, large-scale pottery activities continued to functionally characterise Logardan over a couple of centuries (Levels 2 and 1) until its abandonment. The architectural analysis and spatialisation of pottery shapes and techniques of the levels pertaining to the Ur III period, Levels 3a2 and 3a1, are presented here to highlight the functional organisation of the production spaces and their structural components.

3.1. *The workshop of Level 3a2*

In the main phase of Level 3a2 workshop, 45 firing structures have been identified so far (Fig. 2). They were set among

Fig. 2. Schematic plan of level 3a2 of Logardan ©FArMQaD.

stone walls and brick benches, and the whole workshop area was provided with extensive mudbrick tiling. Repetitive and intense heating has damaged the latter in some places. Three technical types of firing structures were used at the same time: single-chamber structures, superposed-chamber kilns with vertical draught, and juxtaposed-chamber kilns with horizontal draught. In most cases, only the bottoms of firing structures survived, and the specific type of structure is difficult to identify. The largest structures (k.635, k.638, k.800, k.912, k.926, k.4516 in Fig. 2) measured more than two meters in diameter and featured internal pillars or platforms, indicating they were possibly superposed or juxtaposed-chamber kilns. Other furnaces measuring less than one meter in diameter (i.e. k.651, k.806, k.807, k.804 in Fig. 2) were certainly single-chamber structures. In the filling of k.912, a block of solid bitumen was found, suggesting the use of this material in the workshop, possibly as a fire starter. The peculiarity of the 3a2 workshop is that firing structures of different types, sizes and construction models were

Fig. 3. Duct below the brick tiling, connecting k.921 and k.924 ©Mission du Qara Dagh 2018.

gathered in clusters of three, with the chambers of the different kilns connected through internal passages of 10 cm in diameter. These ducts were also found below the brick tiling of the workshop, often hardened and filled with ashes (Fig. 3). Such a ductwork system was used to transfer heat from one structure to the other within a network of heat circulation gathering almost all the firing structures of the workshop (Padovani 2023a; 2024a). Each kiln could work independently, following a classic firing cycle. Nevertheless, it was also part of a larger connection system that enabled the mutualisation of the heat produced and the optimisation of the energy consumption at the workshop level. According to a plausible reconstruction based on the results of a recent experiment (Baldi et al. forth), in each kiln cluster, the firing structures were ignited one after the other. A part of the heat produced by the first one was used to dry and pre-heat the ceramic charge of the others. Moreover, when the second and the third structures had been ignited, their combustion chambers would have been hot enough to allow the optimal combustion of the fuel. Similarly, the mudbrick structure and the ceramic materials that these kilns contained would have been dry enough to start increasing the temperature quickly and consistently (Padovani 2025). Few spaces were left around the firing structure for the various activities involved in the pottery production's operational sequence. However, one-meter-wide brick platforms were set up close to specific clusters of kilns (k.651; k.635-k.634-k.801; k.912-k.922-k.915) (Fig. 4). They might have been used for loading the firing structure or as shaping platforms. Stone tools used for ceramic shaping have been found in kiln fillings and on the platforms. The need for extensive storage space for pot drying is a serious limit in the pottery workshops' setting. Drying clay containers is, in fact, the stage of the operational sequence that requires the most space compared to clay preparation, shaping and firing activities (Kramer 1997; Senior 1998; Hasaki

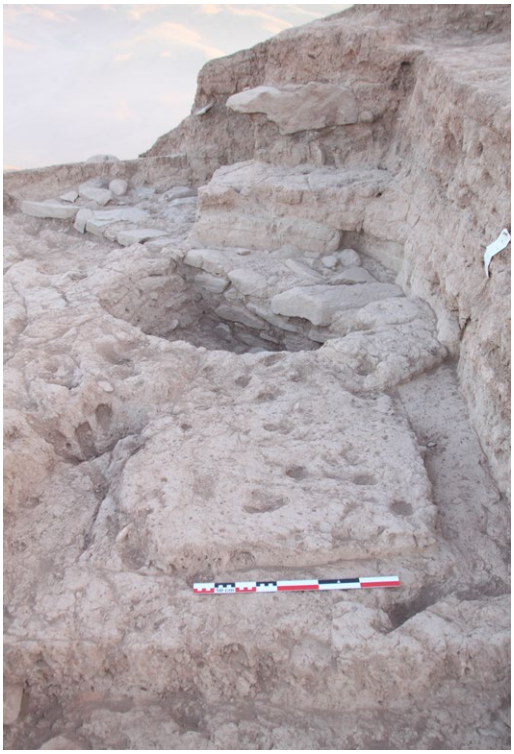

Fig. 4. Kiln 634 built above wall 636 and associated platform in the foreground ©Mission du Qara Dagh 2016.

2011; forth). At Logardan, if clay vessels had been allowed to dry slowly inside the kilns thanks to the large-scale system of heat transfer, the potters would not have needed extensive outdoor drying areas. They could have worked directly next to their kilns and loaded the firing structure as soon as the vessels had been manufactured. In other words, instead of taking place outside, the drying process would have occurred safely within the kilns for most of the required time. When looking at the ceramic material, significant data are revealed by the spatialisation of pottery morphology, function, and manufacturing technique. A preliminary analysis of the distribution of ceramic shapes in relation to the firing structures shows that no kiln-specific pattern in the distribution of material can be distinguished. The most common shapes found in the Level 3a2 workshop are different kinds of carinated bowls, a variety of wide-mouthed, bag-shaped vessels, small to medium in size with or without combed incisions, and medium- and large-sized jars with impressed ropes on elongated or globular bodies. Regular and pie-crust-like stands, cylindrical beakers decorated with incised horizontal lines and small strainers are also quite frequent in this level. Decorated vessel specimens reported as "internal-handled bowls" or trays (Bürger and Miglus 2016), common in Central and Southern Mesopotamia, can be counted among the most peculiar pottery shapes. A rare painted representation of a dancing or praying human figure is attested on a tiny jar with a globular body found close to kiln 638[3] (Zingarello 2024: fig. 9b: 7). An unusual medium-sized jar type featuring an internal extension of the rim, possibly related to the handling of liquids, appears restricted so far to Level 3a2 (Zingarello 2018; 2024). Such a wide range of morphologies, decorations and functions of the ceramic material accounts for the diversity and assortment of the assemblage produced in every sector of the firing area. By analysing the clay fabric and the shaping methods of *in situ* potsherds, J.S. Baldi (2023) has identified and spatialised five different technical traditions (*chaînes-opératoires*) used to craft the pots in the Logardan 3a2 workshop. It has been clearly demonstrated that technical traditions embody peculiar ways of doing of distinct groups of producers.

[3] An almost identical human representation, probably painted with bitumen, was found during the spring 2024 campaign on a medium-sized jar from a level of Trench E stratigraphically equivalent to Level 3a2 on the southeast side of the Logardan's hill. This area also includes a series of kilns and probably represents the southern extension of the 3a2 pottery workshop.

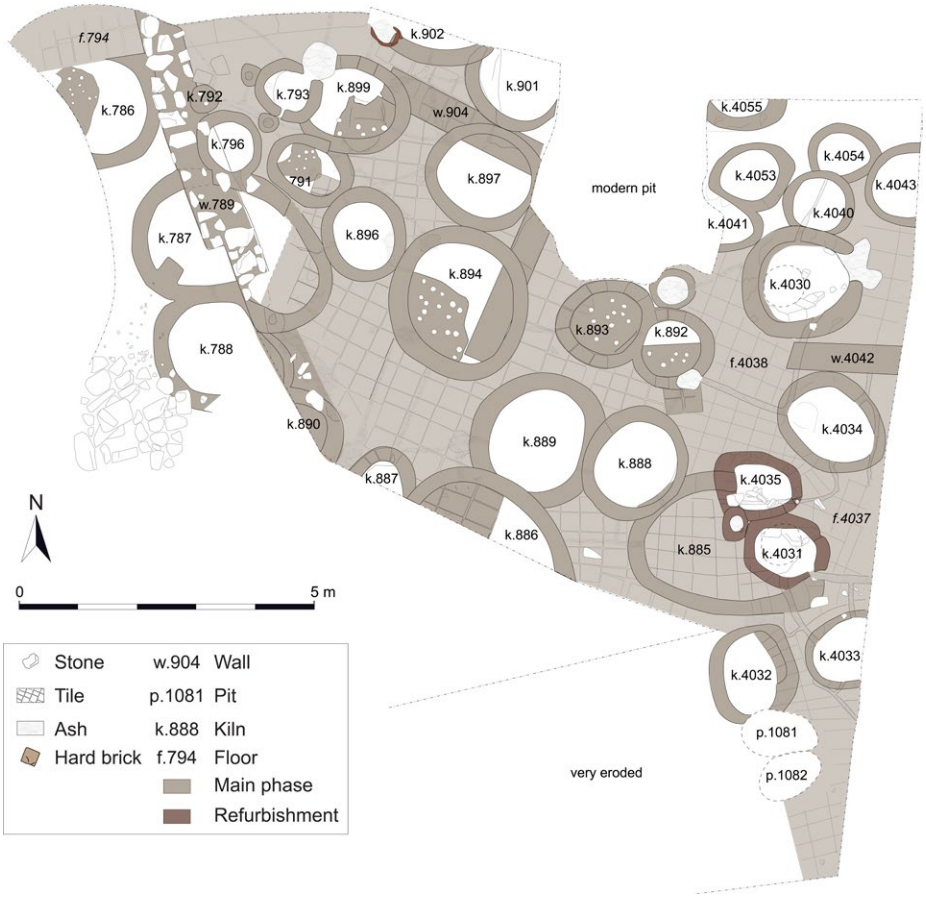

Fig. 5. Schematic plan of Level 3a1 of Logardan ©FArMQaD.

They correspond to the technical identities of the craft communities using specific *chaînes-opératoires* (Baldi 2023 and related bibliography). The distribution of the technical traditions within Level 3a2 appears to fit the clusters of kilns identified in the workshop area. This implies that at least five different groups of producers were active in the excavated part of the 3a2 workshop. Each used diversified shaping techniques to produce the same pottery shapes. Moreover, the potters of each group mastered different firing techniques and were able to cooperate in building connections between their cluster of kilns and mutualising heat production during the firing process. Interestingly, a cylinder seal was found north of Kiln 638, in the destruction layer of Level 3a2. It is a classic Akkadian seal that probably belonged to a representative of the empire. However, based on an addition to its iconography, C. Paladre (2016) has supposed that the seal may have been reused by a local elite in a later period. Thus, its presence could suggest that the teams of potters were working under the supervision of chief potters owning their personal seals and managing collective work and product orders.

Fig. 6. Superposed-chamber kiln with the mouth to the east and pieces of grates attached to the walls ©FArMQaD 2024.

3.2. The workshop of Level 3a1

There is no period of abandonment between Levels 3a2 and 3a1, but the reorganisation of the workshop is significant (Fig. 5). It is important to emphasize that the entire workshop was reconstructed as a unified structure built on top of the previous one, rather than each group of kilns being rebuilt individually. This suggests a carefully planned construction process. However, the same types of kilns are used as in Level 3a2. Examples of superposed-chamber kilns are k.791 or k.4030, measuring between one and two meters in diameter. A piece of grate was found in the bottom of their combustion chambers (Fig. 6). Juxtaposed-chamber kilns are less numerous than in Level 3a2 and seem to be concentrated in the southern part of the workshop. They are characterised by an ashy and shallow combustion chamber flanked by an internal brick platform. Overall, the kilns are arranged and connected more linearly than in Level 3a2 (Padovani 2023a; 2024a). They were still organised in clusters, but more structures were connected on an east-west axis. Some east-west oriented ducts were larger than the others (up to 20 cm wide) and used as the main channels to transport heat across the firing area. They constituted the backbone of the system, delivering heat to other kilns through secondary ducts (Fig. 7). The connections between the walls of the kilns and the ducts were protected with hard bricks or stone (Fig. 8). The ducts could have been blocked to allow certain kilns to operate independently and prevent heat loss. A very peculiar stone with a protrusion was found in the southeastern duct of k. 4030 (Fig. 9). It measures 10 cm wide, the size of an average duct and is interpreted to function as a duct plug. In Level 3a1, the ducts are not constructed as kiln extensions that simply connect one kiln to another. They take the shape of a system overcoming the architecture of the firing structures, with connecting points independent of the kilns themselves. The transformation of the connection system to mutualise heat is probably unrelated to the types of pottery produced by the workshop but rather depends on an internal and non-linear evolution of the firing technique. Functional categories of manufactured ceramics did not change in Level 3a1. Small carinated bowls, as well as deep large bowls, medium-sized wide-mouthed, bag-shaped vessels, and medium- and large-sized jars with incised or roped decorations, are still predominant in the assemblages produced. It is interesting to note, however, an increase in pottery types compared to the earlier level. Such greater morphological variety does not seem to be related to discovery chance, particularly considering the relatively poor state of preservation of the 3a1 workshop vestiges due to the later levelling for the construction of the Level 2 craft area. Especially noteworthy is the occurrence of large fragments of *dolia* found in kilns 886, 888 and

Fig. 7. Kilns 4033 and 4032 in the foreground with the 20 cm wide duct, oriented east-west, in the background ©FArMQaD 2024.

Fig. 8. Small duct oriented north-south connecting kiln 4033 to the 20 cm wide duct oriented east-west ©FArMQaD 2024.

Fig. 9. Stone with a protrusion found in the south-eastern duct of k.4030 ©FArMQaD 2024.

889, where they were positioned against the inner walls, apparently used as lining. Baldi (2023) demonstrated that only two technical traditions of pottery manufacturing, already known in Level 3a2, became dominant in the excavated part of the Level 3a1 workshop. Two other different operational sequences remained confined to the north-western part of the craft area. This continuity of technical traditions from Level 3a2 to 3a1 does not imply that the same potters worked in both levels but that potters of the same communities of practice were still operating in the working area. However, they reorganised the production site to fit their more integrated way of firing.

4. Shifting technological and socio-economic paradigms: an emerging proto-industrial Ur III workshop

Both written and archaeological evidence converge on several key aspects: (1) pottery workshops as specific economic entities, (2) the collaborative organisation of potters working in groups, (3) the presence of an internal hierarchy of the potters' crews, and (4) the mobility of workers associated with the pottery workshops. (1) The workshops of Logardan, gathering several pottery craft facilities in the periphery of *Azuhinum*, an important centre of the Zagros piedmonts, and close to a road circulating toward *Arraphum*, could have formed a "pottery" like those documented in the Umma countryside, as suggested by the written sources (cf. *supra*). The site appears to have been exclusively dedicated to pottery production, as no other working facilities or architectural structures have been identified in its vicinity up to now. The diversity of the pottery assemblage produced at the workshops suggests that its primary purpose was to meet the different needs of people in or around *Azuhinum* or possibly supply the military settlements established by Šulgi in the Zagros Piedmont, attested in written sources. Nevertheless, the possibility that the workshops also manufactured containers for specific contexts of use cannot be dismissed, as a large-scale survey around Logardan has not yet been completed. (2) At Logardan, several groups of potters worked simultaneously, as evidenced by the number of contemporaneous kilns and the distinct technical traditions of ceramic manufacturing identified. Yet, they produced the same pottery assemblages. It is now widely acknowledged that people sharing the same *chaînes opératoires* and manufacturing techniques acquired their skills within a shared learning environment and were probably family relatives (Roux et al. 2017; Baldi 2023). This configuration aligns with the organisation documented in written sources (cf. *supra*). Archaeological data show that potters were not merely passive components of an administrative system but possessed and applied specialised firing knowledge. The ductwork system identified between the kilns in both Levels 3a2 and 3a1 suggests that the different groups of potters were able to collaborate to meet a substantial demand for pottery. In addition, the transformation of the firing system – from

kilns architecturally and functionally connected in Level 3a2 to the individualisation of ductwork for heat transfer linking multiple, architecturally independent firing structures in Level 3a1 – shows an internal evolution in firing techniques driven by the dynamic expertise of the potters and not related to the type of manufactured product. The transformation of the firing processes at Logardan suggests a bottom-up development rather than the imposition of a standardised firing method by a centralised authority to meet production goals. Consequently, the archaeological evidence highlights the agency and adaptability of the potters in refining their production techniques and points to a workshop organisation based on cooperation among potters rather than coercion. (3) Nevertheless, the planning of the firing area's construction – evident from the simultaneous transformation of the entire level rather than a gradual modification of individual kiln groups – and the presence of a cylinder seal in Level 3a2 support the hypothesis of the existence of a chief potter. As suggested by the written documentation, these supervisors were likely responsible for organising the collection of clay and fuel, coordinating pottery deliveries, and synchronising the firing schedules of the various groups working within the workshop. While the system was designed to be flexible, allowing the firing structures to operate independently through the duct plugs, a hierarchical pressure on potters could only have been effective thanks to an established practice of collaboration among them. (4) It can be assumed that clay and fuel (dung, shrub, reed) were sourced locally, either around the workshop or, in the case of fuel, potentially from neighbouring agro-pastoral production units that may have also been integrated into the Ur III network. However, the presence of bitumen on pots and in kilns could indicate possible connections with the nearby Madga region, south of Kirkuk (Ahmed 2012; Schwartz and Hollander 2016). The presence of bitumen at Logardan, combined with textual records, suggests the mobility of some workers associated with the workshop to fetch material necessary for production. Building upon the previous findings, the Ur III workshops at Logardan demonstrate the capacity for large-scale production and, more significantly, the ability to enhance productivity by integrating a collaborative yet hierarchical labour organisation with innovative firing techniques. Meeting large-scale pottery demands can be achieved through various production organisational strategies, such as increasing the number of producers in centralised but segmented workshops (Padovani forthcoming). However, at Logardan, productivity is not enhanced by simply expanding the workforce. Rather, it results from a fundamental shift in the social and technical organisation. This new approach involving collaborative work between several producing units to manufacture the same pottery assemblages and innovation in firing techniques to save fuel, time and energy, is proposed as a defining example of a proto-industrial paradigm. Furthermore, the firing knowledge of connecting kilns, documented as early as the beginning of the 4th millennium BCE (Baldi and Zingarello 2021; Padovani 2023b; 2024b), is the cornerstone of this new paradigm. Running multiple connected kilns represented a significant saving of time and energy compared to operating several isolated structures at the same time. The connecting ducts enabled the transfer of heat from a kiln already in its firing cycle to another kiln still cold, allowing for the gradual preheating of the latter structure and the pots inside (without needing to wait for them to fully dry outside). Considering that the preheating of kilns and the drying of pots are the longest steps of the

ceramic production process, this heat optimisation would have saved fuel by sharing resources across staggered firing cycles. Additionally, this system would have saved time by incorporating the drying phase directly into the firing process. Moreover, the flexibility of the ductwork system enabled rapid response to bigger or smaller orders. In contrast, relying on very large firing structures would have implied more time to fill in the structures and a delay in responding to small commands, as well as more economic risks in case of accident during firing and breakage of the pottery load.

5. Conclusion

In this article, both the archaeological and textual evidence are examined and compared to fully understand the socio-economic mechanisms underlying the labour organisation of the Logardan workshop during the Ur III period and define the proto-industrial paradigm. It is assumed that the potters working at Logardan belonged to local communities that were fully integrated into the Mesopotamian *koiné*. The analysis of the technical and spatial organisation of the workshops shows that the different groups of craftsmen were able to organise themselves together for a coordinated large-scale pottery production. These groups were probably managed by a supervisor working on the site, possibly accounting directly to the state representatives of the imperial power in charge of the Zagros Piedmonts regions. It is not possible to definitely state whether the potters working in the workshop were juridically enslaved people or free men. On the one hand, envisioning a low-skilled workforce recruited outside the stable family-based crews of specialised artisans and assisting them during peak demand periods for fuel gathering or kiln loading and unloading may not be mere speculation (cf. Dahl 2010). Personnel with varying degrees of labour involvement in craft activities might have been subject to different work obligations and penalties, under the legislation in force. Be that as it may, all these people worked under the Ur III administration, being part of a reticulated economic network more than a centralised production located in urban centres. The analysis here presented recontextualises the role of the state administration, suggesting that its function was not to make decisions at all levels – such as the techniques and methods of production that characterise the proto-industrial paradigm – but rather to oversee the management of the labour force, raw materials and finished products. One should emphasise that the change infiring organisation between Levels 3a2 and 3a1 at Logardan must have been generated internally by the potters themselves rather than being imposed by the central administration, which probably exploited their deep knowledge of coordinating specific firing techniques. The success of this configuration at the end of the 3rd millennium BCE is possibly due to a long-standing southern and north-eastern Mesopotamian tradition of collaborative work rather than to an increasing hierarchisation of an administrative controlling system. Thus, the proto-industrial paradigm appears to be less associated with state influence and more deeply rooted in a long-standing tradition of collaborative labour within specific regions, which fostered the development of firing innovations. We suggest that the bureaucratic framework of pottery production emerged through bottom-up development, driven by the progressive cooperation and integration between groups of potters in Southern and North-East Mesopotamia. The tradition of gathering in shared production areas and working together

using duct connections between a limited number of kilns was already observed at Girdi Qala in Early Uruk contexts at the beginning of the 4th millennium BCE and Ur at the end of the 4th millennium BCE (Vallet et al. 2017; Padovani 2023b). Therefore, we suppose that the different family-based producing groups that were probably in charge of the production for their respective lineages during the 4th millennium BCE – and accustomed to collaborative work under a familial hierarchy – became incorporated into full-fledged economic production units at the service of political institutions during the 3rd millennium BCE. Despite the utilitarian nature of pottery, ceramic manufacturing became an incorporated political factor in the Ur III economic structure, not only in the core area of the empire but perhaps even more so in the peripheral regions. The Ur III workshops of Logardan provide the first archaeological evidence of a specific kind of hierarchy systematically integrated with a central administration in pottery craft activities. Pottery remained a politically *uncharged* commodity (Brumfield and Earle 1987) in this period and, as such, was certainly not fully centralised. One can observe, nonetheless, the overcoming of the city-states' "dual" economy model proposed for the mid-3rd millennium BCE (Stein 2001; Stein and Blackman 1993). This model could be applied to the Central and Southern Mesopotamia workshops, yet to be excavated but already identified in some places such as Tell Zurghul, ancient Nigin (Zingarello 2022). In these regions, the conditions necessary for the emergence of a proto-industrial organisation of pottery production could have been in place at the end of the 3rd millennium. Until these Ur III pottery craft areas from the core of the empire will not reveal hidden differences or similarities, one might imagine a relatively similar labour organisation to that of Logardan.

Credit authorship contribution statement

Claire Padovani: Conceptualisation of the paper, writing – original draft writing – review and editing.
Melania Zingarello: Pottery analysis, writing, review and editing.

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

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Abstract

The aim of this paper is to provide a comprehensive overview on the A-Horizon, the most ancient Lower Nubian culture, and on its relationship with the emerging Egyptian State, overcoming the long-standing colonial perspective and adopting the post-colonial approach currently applied in the MENA region. To better understand the different developmental trajectories between Egypt and Lower Nubia, it is necessary to review the geographical framework of the region, also considering paleoenvironmental research, focusing on the prehistoric premises of Nubian cultural facies. Then, a concise overview on the challenges scholars face in determining an absolute chronology for the transitional age between prehistory and protohistory is crucial to set the incipient statalisation in the Nile Valley against a solid background. Furthermore, the analysis of the A-Horizon culture must be conducted by highlighting the episodes of contact and divergence with the Egyptian world, addressing both instances of mutual hostility and elements of creolisation which made Lower Nubia a key interface between different cultural horizons. The paper focuses on three A-Horizon cemeteries, which share strong hybrid Egyptian-Nubian features: Cemetery 7 at Shellal, dating to Early A-Horizon, the Classical-terminal A-Horizon Cemetery 137 at Sayala and Cemetery L at Qustul, chronologically set within the full Terminal A-Horizon. The purpose is twofold: displaying the transformations in funerary customs (and, consequently, in Nubian society) through time, and highlighting regional differences between lower and upper Lower Nubia. This aims to encourage renewed research in an area currently submerged by Lake Nasser, hence no longer investigable through direct archaeological fieldwork.

Keywords: A-Horizon, Protodynastic, Trade, Hybridisation, Necropolis

1. Geography and paleoenvironment: from Pleistocene to the Neolithic human groups

Lower Nubia stretches from Aswan, on the First Cataract, down to Wadi Halfa and the Second Cataract, however sharp boundaries with Egypt and Upper Nubia are not clearly defined. Nowadays, the whole region politically belongs to the Egyptian State, excluding the portion spanning between Addindan and Wadi Halfa, placed under the administration of the Sudanese Government (Emery 1948: 5; Arkell 1955: 1; Williams and Emberling 2020: 2-3). To frame the peopling process in the area, a paleoenvironmental background

must be provided: both Africa and Europe experienced climatic fluctuations throughout the Pleistocene (Said 1993: 45-46; Harrell 2020: 59). In Europe, this resulted in cycles of glacial and interglacial periods, which are more easily documented than climatic fluctuations in Africa, where dry and wet phases alternate. There is still not consensus on the duration of these phases, for which studies highlight two plausible scenarios: a predominance of dry climate marked by short wet periods especially along the Nile banks or, conversely, a generally more humid climate characterised by savannah landscapes (Adams 1977: 102-103). Despite challenges in identifying the chronological range of the interpluvial phases, however a correlation can be suggested between paleoclimatic variations in Europe and North Africa. The advance of glaciers in Europe likely increased the average humidity rate across the Mediterranean, leading to greater precipitation, while interglacial phases resulted in corresponding aridification in North Africa (Arkell 1955: 6). Furthermore, Sudan exhibits significant environmental variability, influenced by inconsistent rainfall and the continuous shifting of winds – dry, cold or warm depending on the season from the north, and generally humid from the south (Williams 2020: 64). This explains the stark contrast between the desert landscape of Lower Nubia and the growth of vegetation in Upper Nubia, impacting settlement types and subsistence strategies. The Nile Valley and the surrounding deserts have been intensely populated since the prehistoric period, laying the groundwork for the development of society from Predynastic to Protodynastic and ultimately to the fully dynastic periods (Hendrickx and Huyge 2014; Hintze and Hintze 1968: 9-10; Valbelle 1990: 24-28). The earliest artistic evidence dates to the Neolithic, with multiple attestations both in the Sahara and in the fluvial valley. The oldest examples of petroglyphs,[1] belonging to the Abkan and Khartoum Neolithic cultural *facies*, show clear similarities to the Magdalenian counterparts in France and Spain, suggesting a common origin or derivation possibly mediated by the Strait of Gibraltar (Winkler 1938; Dunbar 1941; Curto 1965; Basch and Gorbea 1968; Smith 1972; Adams 1977: 115; Davis 1984; Curto et al. 1987; Manzo 2007: 39-40; Piquette et al. 2017). However, unlike the Saharan rock carvings, the depictions in the Nile Valley between the First and Second Cataract tend to be smaller in scale and more stylised (Adams 1977: 116). Concerning the subjects, the depiction of wild animals, giraffes and elephants (Gaballa 2006: 23) attests a faunal variety typical of the Neolithic savannah landscape, soon to disappear due to the desertification of the region.[2] Remnants of the greater faunal diversity, however, persist in historical periods, as it is clearly shown by the conservative nomenclature of Upper Egyptian *nomoi*: for example, the *nomos* of the Elephant, or the very name of Elephantine Island;[3] plus, the

[1] Such petroglyphs, made by hammering and with outlined or painted figures, of both symbolic and narrative meaning, remained in use for the entire Egyptian history.

[2] Yet, it is important to consider that not all the petroglyphs recorded in the region belong to pre- and protohistoric times, as well as the fact that the depiction of animals may convey ideological meanings rather than depicting the real world. Nonetheless, concerning the neolithic rock carvings, the author believes it possible that, in this specific case, the animal subjects may reprise the contemporary faunal variety, *per se* or more likely embedded with symbolic (or proto-symbolic) significance.

[3] The latter being more problematic, since its Egyptian name (*3bw*) both stands for "elephant" and "ivory", hence it may as well metonymically refer to the ivory trade in the region.

zoological nomenclature itself is a legacy of a tribal past, characterised by the worship of totem animals (Anselin 2004). By the end of the Pleistocene, the rapid aridification of the Sahara entailed a significant depopulation, resulting in migrations toward tropical regions, coastal areas and along the Nile Valley. In this context the agricultural revolution, the domestication of new animal and vegetal species, pottery production and further development of rock art occurred (Donadoni Roveri and Tiradritti 1998: 19; Lamb et al. 2007; Marshall et al. 2011; Williams 2020: 67). To understand the environmental framework for this massive population shifts, sedimentological and chronological research projects were initiated in the 1980s to clarify the river's behaviour during the Late Pleistocene. These studies reconstructed temperature records and rainfall patterns in the Ethiopian highlands (White Nile, Blue Nile, Atbara) and lake basins. Indeed, the river flow directly depends on precipitation on the Ethiopian plateau, reflecting climatic variations beyond Lower Nubia and therefore unpredictable for the Neolithic human groups (Williams et al. 1978, 2015; Butzer 1980; Donadoni Roveri and Tiradritti 1998: 19; Castiglioni and Castiglioni 2006: 194; Lamb et al. 2007; Marshall et al. 2011; Williams and Jacobsen 2011; Williams 2020: 68-69). Concurrently, investigations into the Nile's depositional stratigraphy identified a chronological limit of 9500 BP, marking a transition from sedimentation to progressive erosion of the riverbanks (Castiglioni and Castiglioni 2006: 194; Williams 2020: 69-70). During the mid-Holocene, improved environmental conditions due to increased water resources[4] prompted the incipient sedentarisation of human groups, alongside the development of cattle pastoralism (Williams 2020: 64-71). The domestication of plants and animals, begun at first in seasonal settlements in the Western Desert and especially in the Wadi el-Obeyid, later spread to the Nile Valley. This occurred alongside a new arid phase of the Holocene, which triggered another migratory wave toward areas close to water sources (Leclant 1990; Donadoni Roveri and Tiradritti 1998; Wilkinson 1999: 45-46; Lamb et al. 2007; Largacha 2008; Marshall et al. 2011; Nelson and Khalifa 2011; Raue 2019; Williams 2020: 64). Nonetheless, climatic change cannot be seen as the only factor of sedentarisation, neither the latter must be conceived as solely related to settlement patterns: the development of pastoral strategies during the 5th millennium, on a south-north axis which involved both the Sudanese and Egyptian regions of the Nile Valley, led to peculiar forms of territoriality, which were expressed not by proto-urban sedentarisation phaenomena, but rather through funerary and cultural practices. In this framework, evidence of attachment between the human groups and their living place lays in the presence of burial grounds, whose repeated use became a major feature in the archaeological record of the region. Among the other features, the increase of personal ornamentation in the funerary equipment and the presence of animal remains in burials, probably due to ceremonial feasting (related to the prominence of domestic fauna in the pastoral society) stand out (Wengrow et al. 2014: 96-104; Manzo 2020: 109-111). Even since prehistoric times, the extreme variety of the Nile Valley's landscape is evident and influenced both settlement typologies and means of subsistence (Manzo 2007). In Egypt the Nile flows through fertile alluvial plains and limestone plateaux. Otherwise, in Lower Nubia the

[4] The so-called "wet phase".

riverbanks are flanked by rugged sandstone (also common to Upper Egypt) and granite cliffs,[5] rarely interrupted by narrow strips of cultivated land (Manzo 2020: 106). Furthermore, the scarcity of docks enables navigation in the Cataract area. The diverse landscape, combined with the difficulties of navigating the Cataracts, underpins the ambivalent nature of the Nile: both communication route and geographical boundary amongst different cultural *facies* (Emery 1948; Fahmy 2004; Castiglioni and Castiglioni 2006; Gaballa 2006).[6] The latter ones, however, are not to be conceived as fixed entities, each provided with its own set of features: they were rather different expressions, on a local level, of a shared sociocultural foundation, which eventually developed following varied paths (Wengrow et al. 2014). This feature contributes to the radical heterogeneity of populations during the Neolithic. In subsequent historical phases, a trend toward increasing homogenisation and centralisation emerges, with early evidence dating to the Pastoral Neolithic. The gradual diminishing of cultural differences coincides with the rise of different typologies of social hierarchies, particularly evident in funerary rituals: the widespread use of valuable grave goods and the appearance of the first mace heads as symbols of individual power mark the rising of an élite amongst the early agropastoral communities, around 5000 BCE (Trigger 1965; Wenke 1989; Haynes 1992: 17; Wetterstrom 1993; Donadoni Roveri and Tiradritti 1998: 23-31; Castiglioni and Castiglioni 2006: 194-197; Wengrow 2006; Manzo 2007: 27-31). Beginning with a shared settlement pattern characterised by scattered, autonomous villages without hierarchical ties, the trajectories of social development in Egypt and Lower Nubia began to diverge, each one emphasising different specific traits which originally belonged to a shared cultural milieu, thus repercussing on the sociopolitical relations between the two regions over the following millennia (Trigger 1965; Bard and Carneiro 1989; Gatto 2011).

2. Studies on chronology and the development of statal entities

The reconstruction of Egypt's earliest history, while rooted in the late XIX century with the excavations led by Petrie at Naqada and Ballas in 1895-1896 (Petrie 1896, 1920 and 1939), has long been affected by a Eurocentric perspective (Manzo 2020; Williams and Emberling 2020). This approach often marginalised prehistoric African cultures. Initially, Petrie himself attributed the predynastic material culture to a so-called "New Race" of invaders, before revising his stance based on comparisons with similar artifacts discovered by De Morgan at Naqada (Petrie 1920; 1939). In the 1910s, Reisner and Firth ascribed Nubian civilisation to an allochthonous origin, but it was only with the next generation of scholars, notably Sandford and Arkell, that continuity between prehistoric African communities and the historical populations of the Nile Valley was recognised. Moreover, paleoenvironmental and protohistoric studies gained further momentum in the post-World War II period, particularly within the UNESCO campaign in salvage of Nubian monuments (Adams 1977: 101; O'Connor 1987; Manzo 2020: 101-102; Näser 2020: 36-38).

[5] Sandstone formed during the Cretaceous and varies in colour: black, dark brown, yellow, grey and white. Granite and gneiss formed during the Precambrian

[6] The interruption of fluvial navigation compelled by the presence of the First Cataract might be one of the features which prevented Lower Nubia from being incorporated in the Egyptian State formation (Manzo 2020: 106-107).

The first attempts to date predynastic cultures were based on typological methods, leading to the development of a relative chronology. Petrie's sequence dating, applied to the progressive standardisation of pottery, allowed him to identify three phases, corresponding to distinct cultural *facies*: Amratian (from the site of el-Amrah), Gerzean (from the village of el-Gerza) and Semainian (Willoughby and Stanton 1988: 12-15; Mortensen 1991: 13-14). Changes in material culture were attributed to systematic waves of invasions by foreign populations. In the post-World War I period, archaeological investigations by Brunton and Caton Thompson at the sites of Qau and Badari enriched and refined Petrie's periodisation, leading to the identification of the Tasian and Badarian cultures (Brunton 1927; 1928; 1930). Other pioneers in Protodynastic studies include Quibell and Green, Amélineau and, later, Leclant and Emery (Hendrickx 1994; 1995). Concurrently, analysis conducted in the necropolis of Armant led Kaiser to propose an internal subdivision of Petrie's sequences, breaking each into different sub-phases (*Stufen*), designated by letters of the alphabet (a, b, c) (Kaiser 1957; Hayes 1964: 147-148; Mortensen 1991: 15). The connection of relative periodisation to absolute chronological terms was achieved by Hassan in the 1970s, through radiocarbon dating (Hassan 1988: 140-142). However, these analyses are partial, as most pre- and Protodynastic sites have not yielded sufficient material in terms of both quantity and distribution. Nonetheless, the contributions from C14 dating have established a valid absolute chronology still in use nowadays, complemented by specific calibrations at the local level. The results of Hassan's dating identify the following periods (Midant-Reynes 2000):

- Badarian (4500-3900/3800 BCE)
- Amratian or Naqada Ia-c (3900/3800-3700/3500 BCE)
- Gerzean or Naqada IIa-d (3700/3500-3300/3200 BCE)
- Protodynastic or Naqada IIIa-c (3300/3200-3050 BCE)
- First Dynasty (3050 BCE onwards)

During the Naqada IIIc phase the unification of Egypt occurred. Its foundations can be traced back to the Naqada IIc phase, whose burials display clear signs of social hierarchisation, evidenced by the presence of luxury grave goods such as Afghan lapis lazuli and gold, traditionally believed to be supplied from Wadi Allaqi (Bard 2000; Emery 1948), however more recent studies suggest that the mines of the Eastern Desert were principally exploited during the most ancient phases (Klemm and Klemm 2013: 1-6). The emergence of the Egyptian State is currently the subject of a lively academic debate aimed at clarifying its internal and external causes, both in terms of social innovations and the relationship with surrounding political entities (Massoulard 1949; Emery 1961; 1965; Moorey 1970; Hoffman 1979; Trigger 1983; 1993; Needler et al. 1984; Bard 1987; Hassan 1988; Wenke 1989; Mortensen 1991; Wengrow 2006; Teeter 2011; Hendrickx 2014; Williams 2016; Barich 2020; Cialowicz 2020; Hendrickx and Förster 2020; Jucha 2020; Köhler 2020; Manzo 2020: 105-111; Maczynska 2020). In the Late Predynastic, Egypt served as the hub of a complex system of exchanges involving material goods, technologies, and ideological aspects (Guyot 2008: 707-708). From the Saharan world came herding techniques and styles of rock art. The Levant, besides being a key region for developing mercantile enclaves, provided new domesticated plants and animal species originally wild in Egypt, such as goats, barley and wheat, essential for the growth of an agropastoral economy. Nubia contributed a continuous supply of precious raw materials and luxury goods, while Mesopotamia

influenced the use of lapis lazuli, cylindrical seals, and the iconography of power, particularly represented by the "lord of animals" motif (Trigger 1983; 1993; Donadoni Roveri and Tiradritti 1998: 31). During the transitional phase between the predynastic and the Protodynastic, it is challenging to pinpoint the (often blurred) boundaries between the social structures of chiefdoms[7] and the rise of proto-states, both regarding economic causes and political ideology. However, this preliminary operation is essential for understanding the relationships between the Egyptian State and its Nubian counterpart. We will take for granted Childe's perspective on urbanisation, as well as Wittfogel's and Carneiro's monocausal and Renfrew's multifactorial hypotheses on social development (Childe 1950; Wittfogel 1957; Renfrew 1972; Carneiro 1978; 2004), to focus directly on the definition of proto-*nòmos* proposed by Flannery: the emergence of a chiefdom depends on the ability of leaders from larger communities to disrupt the independence of smaller social groups, with military conflict acting as a development catalyst (Flannery 1997).[8] From this premise arises the formation of complex chiefdoms, or federations of villages integrating populations on a regional scale. This phenomenon occurs in Egypt during the Naqada I period, marked by the rise of cantonal communities centred around the settlements of This/Abydos, Abadiya, Naqada, Gebelein and Hierakonpolis, with smaller centres like el-Kab, Edfu and Elephantine also emerging. In the subsequent Naqada IIc phase, these centres further join into a politically asymmetrical confederation, whose leader promote military expansionism both towards the Delta region and the south.[9] The outcome is the political unification of Egypt and the subsequent centralisation of power (Trigger 1983; Wenke 1989; Bard 1994: 281; Andelković 2004: 535-537; Wengrow 2006). On the other side, in Lower Nubia the Neolithic innovations are the framework of the cultural turmoil of the 4th millennium, which marks the appearance of new social groups. Their material culture includes new pottery typologies (black-topped ware), funerary offerings and permanent domestic architecture in perishable materials (Curto et al. 1985; Baba and Saito 2004; Gaballa 2006). The Nubian population clusters are designed according to the nomenclature proposed by Reisner, who identified four population waves in Lower Nubia based on material culture and funerary practices, labelled Groups A, B, C, and X, spanning from the predynastic period to the post-Meroitic era (Reisner 1910; Haynes 1992; Gratien and Le Saout 1994: 17; Midant-Reynes 2003; Gaballa 2006: 23-24; Gatto 2006a: 61; Honegger 2010: 78; Manzo 2020: 103; Näser 2020: 34). Further archaeological research allowed a revision of Reisner's classification, by reattributing the B-Group evidences to the Early and Terminal A-Group, and by focusing on the inner heterogeneity of each cultural *facies* (Gratien and Le Saout 1994: 30).[10] Gatto, for example, specifically suggested the new definition of "A-Groups" (Gatto

[7] For the definition, structure and development of the chiefdom, see Carneiro 1981 and Earle (ed.) 1991, and related bibliography.

[8] On the role of violence and warfare in social development in Egypt, further information and useful interpretations can be found in Andelković 2004 and in Hendrickx and Förster 2020 with related bibliography.

[9] On the key role played by contacts with the Levantine region and the exclusion of Nubia from the aggregative process of the Egyptian State, see Manzo 2020: 105-109 and related bibliography. On the problematisation of the Naqada expansion, see Maczynska 2020, Jucha 2020 and related bibliography.

[10] H.S. Smith correctly assigns some of the B-Group tombs to the Early A-Group (Gatto 2006a: 62).

1995: 101; Gatto and Tiraterra 1996; Gatto 2000: 107), to emphasise the multiple trajectories within the same population cluster: in northern Lower Nubia agriculture and trade played a key role, whilst in southern Lower Nubia subsistence mainly depended on animal breeding, and the local communities reached a high degree of social differentiation, as the élite cemeteries of Sayala and Qustul clearly display (Gatto 1995: 100). Later, Gatto reprised Adams' "A-Horizon", a more fluid definition, which could be easily applied also to the other Reisner's Groups (B, C, X).[11] the latter designation will be adopted in this paper, since in the writer's opinion it best reflects the hybrid nature of Lower Nubia's population, while Reisner's Groups seem to designate fixed entities with established features. The A-Horizon population, whose chronological definition still bears issues (see Tab. 1),[12] geographically spanned with blurred boundaries between the First Cataract and the Batn el-Haggar (Emery 1965: 24; Curto et al. 1985: 26; Gatto 1995: 99; 2006a: 62). Currently 193 sites have been identified: 87 on the west bank of the Nile, 99 on the east bank and 7 on the islands of the First and Second Cataracts, comprising 126 cemeteries and 67 settlements (Gatto 2006a: 62). This population cluster traditionally represents an agro-pastoral transitional element between hunter-gatherer Mesolithic groups, evidenced by sporadic burials between Shellal and Dhakka, and the subsequent mainly agricultural economy pertaining to the C-Horizon, which developed since the VI Dynasty, peaking during the XII Dynasty (Emery 1948; 1965).[13] Alongside the cultivation of wheat, barley and legumes (peas and beans), hunting and fishing remained predominant, supplemented by early goat domestication (O'Connor 1993: 12; Gohary 1998: 6; Gaballa 2006: 23; Gatto 2006a: 71). Territorial division among semi-nomadic tribes is a prehistoric feature fully kept by the population, whose economic development relied more on pastoralism, craftmanship and trade, rather than on primary production. The main activities included stone, copper and leather manufacturing, as well as basketry and pottery production. Additionally, a specialised warrior class emerged, particularly skilled archers, which in historical times earned Lower Nubia the name of *Ta-Sety* ("Land of the Bow") from the neighbouring Egyptians[14] (Curto et al. 1985: 67; O'Connor 1993: 12-13; Gatto 2006a: 71).

[11] The revision of the A-Horizon's chronology owes a lot to the Scandinavian Joint Expedition (Nordström 1972 and 2006), and to the Oriental Institute of Chicago mission, which both operated amidst the UNESCO campaign, as well as to the concepts expressed in Trigger 1965 and Adams 1977 (Gatto 1995: 97; 2006a: 62).

[12] The relative and absolute chronologies are based on a pottery seriation, sticking to the model offered by pre- and Protodynastic Egyptian sequence dating. The only C14 dating samples come from three sites: Afyeh, Debeira and Halfa Dagheim, from which it is possible to locate the beginning of A-Horizon culture by the end of the 5th millennium BCE (Gatto 1995: 99-100; 2006a: 66; Vercoutter 1992: 138-140). Nordström (1972; 2006) identified three phases pertaining to the A-Horizon: Early (corresponding to Naqada Ic-IId), Classical (Early Naqada III), Terminal (Late Naqada III/I Dynasty) (Flores 2004: 741; Gatto 2000: 105; Midant-Reynes 1992: 206-208; Trigger 1976: 32-39).

[13] The general lack of adequate archaeozoological archaeobotanical analyses and the partial and discontinuous nature of data, however, makes it difficult to properly evaluate the exact weight of each economic activity in both the aforementioned cultural *facies*. On the prominence of the pastoral feature in social development in the Nile Valley since the 5th millennium BCE, see Wengrow et al. 2014.

[14] However, in more recent years, the geographical framework of the populations named *Ta-Sety*, *Nehesy*, *Medjay* and *Maga*, traditionally labelled as Nubians, has been questioned. The toponym *Ta-Sety* itself originally referred to the First Nome of Upper Egypt, and it included Nubia only since the Middle Kingdom. For further information, see Michaux-Colombot 2014 and related bibliography.

Egyptian Chronology	A-Horizon Chronology
Naqada Ia-c (3900-3700 BCE)	Early A- Horizon (3750-3200 BCE)
Naqada IIa-d (3700-3200 BCE)	Classical A-Horizon (3200-3050 BCE)
Naqada IIIa-b (3200-3050 BCE)	
Naqada IIIc/I Dynasty (3050-2900 BCE)	Terminal A-Horizon (3050-2900 BCE)

Tab. 1. The synchronisation between Egyptian pre-/Protodynastic and Nubian A-Horizon chronologies. The Egyptian chronology is reprised from Piacentini and Pozzi 2023; the Nubian chronology is based on Nordström 1972; 2006.

In predynastic Egypt, abundant cereal production allowed for rapid artisanal specialisation and the development of a class of artists and bureaucrats (Kemp 1983; Wenke 1989; Wetterstrom 1993; Allen 1997; Wengrow 2006). On the other hand, Nubian social development resulted from gradual adaptation to resources and an environmental backdrop similar to oasis models, in which agricultural innovation never became a revolutionary factor. Indeed, the sedentarisation of A-Horizon did not stem from a shift in food production methods, as agriculture and centralised control on animal breeding on a wide scale (beyond pastoralism) remained collateral factors in its economic (hence social) model. Due to the climatic generosity provided by the persistence of more humid conditions comparing to Egypt, the A-Horizon population did not feel the urge to adapt to a fully-agricultural economic model; instead, the pre-historic features of a hunting-fishing society were able to survive (Adams 1977: 117; Bard 2000: 62-65; Gatto 2006a: 71; 2020; Manzo 2020: 108-109). Furthermore, in Lower Nubia the cultivable land consists of a very narrow strip wedged by rock gorges, therefore the region lacks the agricultural potential which characterised Egypt. The absence of cereal surplus, essential for sustaining specialised urban classes, hindered early State formation conceived as urban development, and prevented the transition beyond cantonal state chiefdoms bearing nomadic features.[15] Trigger estimates an overall population of 4500 units for the entire A-Horizon age, with pastoralism emerging as the primary form of subsistence for lower classes. These conditions allowed the development of a certain degree of social hierarchisation and a wealth trade-based economy, yet they were insufficient for the emergence of a fully-fledged urban state (Bard and Carneiro 1989: 21; Bard 2000: 67; Manzo 2020: 108).[16]

[15] Here the author employs the hard-to-die terminology related to the traditional model (i.e. "proto-state", "chiefdom" etc.), which considers urbanism and State formation as (at least partially) intertwined. However, the relationship between urbanism and State formation is still currently debated, with different models having been proposed in more recent years. In this sense, the A-Horizon society bears typical pastoral features which can be related to nomadic states, retained both in Africa and in Asia during the following ages. Nonetheless, the aforementioned lack of complete data, also biased by its main provenance from necropolises rather than settlements, makes it difficult to clearly distinguish between chiefdom-like features and those proper of nomadic states. However, the absence of the urban model in A-Horizon society and the persistence of nomadic traits are a typical feature diverging from the Egyptian State formation and attest the different development trajectories between the two social entities. On this topic, see Manzo 2020, and related bibliography.

[16] Gatto offers a different perspective, focusing on the evidence of a transition from local chiefdom to regional or cantonal chiefdom with proto-statal features (1995: 101).

These statements have been partially revised following the publication of Cemetery L at Qustul, which attests a high level of social differentiation during Classical and Terminal A-Horizon,[17] consistent with a proto-State organisation centred on Qustul in the Second Cataract area.[18] Meanwhile, in the Dhakka plain, the centres of Sayala and Naga Wadi appear as hubs of a cantonal scale chiefdom (O'Connor 1993: 10; Gatto 2006a: 72). However, the coexistence of different subsistence activities (rather than the prominence of the agricultural-urban model), the persistence of social mobility and intracultural variability, the peculiar settlement pattern are not to be interpreted as features of a "less complex" or "less developed" society: a nomadic or pastoral State is a complex political entity, which displays a different complexity from the one typical of societies which follow an urban polity model (on this topic, see Wengrow et al. 2014, Gatto 2020, and Manzo 2020). Finally, it is crucial not to approach the study of A-Horizon solely through its relations with Egypt, but rather considering the broader network of long-distance contacts which engaged the Eastern and Western Deserts as well as the Upper Nubian world.[19]

3. Protodynastic Egypt and A-Horizon: from the frontier to the interface

Over the millennia, the relationship between Egypt and Nubia mostly appears as a succession of expansionist and retreating episodes, alternatively led by both populations involved, for the control of trade routes and cultivable land (Emery 1965: 15; Midant-Reynes 2003: 301-302). The earliest evidence of interregional contacts traces back to the Neolithic: Egyptian manufacture is attested in numerous Nubian burials, whilst during the Protodynastic a network of commercial routes developed, aimed at the supply of raw materials, mainly from the diorite quarries of Toshka and the gold mines of Wadi Allaqi, where Gerzean necropolises have been identified (Curto et al. 1985: 25-29; O'Connor 1993: 11; Gohary 1998: 6). Furthermore, archaeological research has revealed a system of resting points on the route towards Upper Egypt, mainly located near water wells or *gueltas*: these were temporary storerooms employed by Nubian merchants to stock pottery (Castiglioni and Castiglioni 2006: 198). The rising predynastic Egyptian élite employed the importation of luxury goods from distant countries as part of a strategy of political ascent, as the coexistence of precious items and markers of social hierarchisation in the main cemeteries of Upper Egypt attests (Guyot 2008: 717). Similarly, A-Horizon chiefs, whose prominent graves have been found in Cemetery L of Qustul (the so-called "royal burials") and in Cemetery 137 of Sayala, consolidated their power by holding a major role as commercial intermediaries between the upper Nile Valley and Sudanese Nubia (O'Connor 1993: 2-3; Donadoni Roveri and Tiradritti 1998: 33).

[17] The same is attested for gender roles: Qustul tombs show women played a key role in society and, subsequently, in the ideological and religious sphere. Children too were held in consideration, as it clearly appears from the richness of grave goods in infant burials (Gatto 2006a: 72).

[18] On the problematisation concerning the hierarchic social organisation at Qustul, see Manzo (2020: 109-11) and related bibliography.

[19] S.R. Rampersad's exhaustive PhD thesis is entirely focused on this topic; hence reference should be made to Rampersad 1999 and the subsequent article Rampersad 2000. Also, see Gatto 2011 and related bibliography. Finally, the anthropological debate would beneficiate from further investigation on social organisation in the Middle Nile and, especially, in the Eastern and Western Deserts, which would provide a new dataset on the paths to social complexity (Manzo 2020: 110-111).

In exchange for incense, ointments, exotic animal skins, ebony, ivory and gold,[20] the A-Horizon traders obtained from the Egyptian élite cereals, beer and wine, oil, cheese, stone vessels and hammered copper artifacts (O'Connor 1993: 14-15; Gatto 2006a: 71). The composition of funerary equipment clearly shows the commercial nature of these contacts: Cemetery L attests a wide range of imported jars, seals, and clay tokens, which are markers of mercantile activity, as well as fine pottery and lithic vessels, clay figurines, lapis lazuli, ornaments and mirrors, cosmetic palettes similar to the more famous Protodynastic Egyptian samples, mace heads and spearheads, sceptres and incense burners with royal iconographic motifs (Haynes 1992: 25; Castiglioni and Castiglioni 2006: 198; Gaballa 2006: 23; Gatto 2006a: 69). Furthermore, in A-Horizon settlements between Kubbaniya and Faras numerous Naqada goods have been recovered: mostly wine jars, wavy-handled jars, copper tools and small *faïence* objects. Likewise, the typical Nubian, black-topped ware is attested in multiple Upper Egyptian sites (Bard 1994: 281; Gatto 2000: 107; Gaballa 2006: 23). The similarity between Early A-Horizon and Naqada graves[21] has fuelled a debate on the ethnicity of Egyptian and Nubian populations: Trigger argues for the autochthony of A-Horizon, while Kaiser emphasises the commercial and colonial relations between the involved regions. Finally, Williams ascribes the unification of Egypt to the Qustul rulers, thus tracing a distinctly African origin in the Pharaonic civilisation (Williams 1978; 1986b; 1987a). However, the massive presence of Naqada material culture devoid of Nubian features in the Delta region dismisses the latter hypothesis (Adams 1985; Bard 1994: 281; 2000: 67; Gatto 1995: 100). In the aftermath of the Egyptian unification, the pharaohs immediately adopted aggressive policies towards Lower Nubia, to replace the local chiefs in the monopoly of trade routes to Central Africa (Curto et al. 1985: 25; Bard 2000: 77; Castiglioni and Castiglioni 2006: 199), by the foundation of both sanctuaries at the norther border, and military outposts in the region, especially at the northern and southern borders. This proves the case of the Protodynastic temple of Satet at Elephantine[22] (Emery 1965: 112-113; Dreyer 1986; Seidlmayer 1996: 111-115; Wilkinson 1999: 18; Bard 2000: 83; Midant-Reynes 2003: 262-264; Manzo 2007: 54; Bussmann 2011: 748-750; Gatto 2016: 238) and the Buhen fortress, the oldest known Egyptian outpost associated with the exploitation of copper deposits (Emery 1965: 112-113; Curto et al. 1985: 25-59; Bard 2000: 77).

[20] The toponym Nubia traditionally is considered to refer to the richness of gold mines: in fact, *nbw* means gold in Ancient Egyptian (in Coptic: *noub*) (Capriotti Vittozzi 2021: 13). However, based on linguistic studies, Claude Rilly elaborated a more convincing etymology for the toponym and for the population *Noba* itself: the root *nob-* derives from the proto-nubian **nogu*, attested in modern forms (as well as in Meroitic) with the meaning of "slave". Its etymology may derive from the root **log*, *i.e.* "man of the land", derogative name for the agricultural tribes, considered as potential slaves by pastoralists populations. For further information, see Rilly (2008: 217-219).

[21] These are oval or rectangular pits with rounded corners, sometimes flanked by a niche, without a superstructure. Inside, the bodies were usually buried in foetal position on the left side, the head pointing towards south and facing west. Funerary equipment is standardised, and it includes carnelian and shell jewellery, pottery, an alabaster or calcite palette and a flint dagger (Emery 1948: 18; 1965: 125; Gatto 2006a: 68-69; Gatto 2006b: 225-226; Haynes 1992: 40; Musée des Beaux-Arts 1988: 24-25).

[22] For information about the fortified urban centre, see GIA (1998: 9-10), Hendrickx (2014: 272), Wilkinson (1999: 23), Ziermann (2002) and related bibliography. For an interesting analysis on the organisation of workforce in Egypt, which takes the I Dynasty fortress of Elephantine as a case study, see Ormeling 2016 and related bibliography.

The First Dynasty rulers commemorated their military victories against the Nubians on graffiti and ivory plaquettes: namely, Aha led an expedition in the region, celebrated on a plaque found in Abydos (Emery 1965: 125; Curto et al. 1985: 25; Hatier et Musées de Marseille 1990: 79; Bard 2000: 77). A seal impression dating to his reign was found the Cemetery B of Toshka West by the joint Pennsylvania-Yale Expedition directed by Simpson in the 1960s (Simpson 1962: 39; Emery 1965: 100; Valbelle 1990: 61; Gatto 1995: 97). Aha's successor, Djer, commemorated a military victory against the Nubians in a graffito from Gebel Sheikh Suleiman: it shows a typical Protodynastic Egyptian ship, from whose prow hangs the body of an enemy. Another prisoner is depicted with his hands tied by the typical double-curved Nubian bow. Finally, below the ship there are other bodies, whilst on the left side the symbols of defeated villages appear (Arkell 1955: 39; Emery 1965: 125; Needler 1967: 87; Hintze and Hintze 1968: 11; Trigger 1976: 40-41; Curto et al. 1985: 25; Hatier et Musées de Marseille 1990: 79; Bard 2000: 77; Gaballa 2006: 24; Manzo 2007: 54).[23] Another petroglyph from the same place documents an earlier expedition, probably led by the Scorpion King: it depicts a prisoner with his hands tied behind his back with a rope, held tight by scorpion's claws. Another figure brandishes a weapon, while the third one holds a bow (Wilkinson 1999: 178-179). In the Second Dynasty, Khasekhemuy led a new military campaign towards the South, as it is attested by an inscribed lithic fragment from Hierakonpolis, on which the king is depicted subduing some Nubian warriors (Arkell 1955: 40; Curto et al. 1985: 25). Echoes of the early war actions by Egyptian rulers appear under a symbolic guise in the mythological tradition: a Ptolemaic inscription from Edfu mentions the multiple battles fought by Horus in Nubia (Blackman and Fairman 1944: 12-13), where the god has also been worshipped since the most remote times. In the following ages, the rivalry between Egypt and its southern neighbour consolidated. Meanwhile, the diverse Nubian human groups coalesced in the kingdom of Kush,[24] which successively developed around the long-lived centre of Kerma (whose first archaeological evidence traces back to 2450 BCE), Napata (since 730 BCE) and Meroe (580 BCE onwards). However, the connection between the two regions transcends conflict, especially in the area of the First Cataract, where cooperation and cultural unity prevailed over differences. For example, Nubia was the cradle of the annual Nile flood, the cornerstone of Egypt's economic, ritual and administrative system; the mythological tradition sets Osiris' sepulchre on the island of Bigeh, a sacred place for both Egyptians and Nubians; on the nearby island of Philae, the great temple of Isis and the smaller temples devoted to Nubian deities coexisted (Capriotti Vittozzi 2021: 13-14). The Egyptian and the Nubian clergy shared places and temples, the cult itself bore hybrid features, as well as the prerogatives of some deities. For example, the goddess Anuqet, particularly worshipped in Sehel,

[23] For a revision of the petroglyph, see Somaglino and Tallet (2015) and related bibliography.

[24] The kingdom of Kush developed following a different trajectory comparing to pharaonic Egypt: it embedded multiple cultural groups with different degrees of autonomy, especially the peripheral regions and/or populations, which followed local trajectories: Kush was the core of a diplomatic network involving Punt, Lower Nubia, Upper Nubia, the Medjay and the oases. For further information, see Emberling (2014) and related bibliography. The model persisted also during the Napatan age, when there was a decentralised State control over the peripheries, as well as during the Meroitic age. For the latter, see Edwards (1996).

was part of the Egyptian Cataract triad with Satet and Khnum. However, during the millennia, she developed new features and was conceived as a Nubian goddess, rather than Egyptian. Nonetheless, her cult involved both populations. Philae itself was a realm of peace, where the Nubians could pray their own deities alongside the Egyptians. The same could be applied to the island of Bigeh. Apart the general political trend, a border can be both an area of conflict and reciprocal tolerance. The complex relationship between the two neighbouring lands in the disputed Lower Nubia region has traditionally been interpreted in light of the definition of frontier, borrowed from "colonial" archaeology, which defined a clear border between two areas both characterised by unique cultural markers, where the relations amongst different *facies* followed the core-periphery model: colonising people were conceived as innovators, apporting technological, scientific and cultural progress, whilst the autochthonous substratum was seen as passive.[25] Given the most recent discoveries, nowadays it is more appropriate and consistent to overcome the colonialist approach by recognising the geographical boundaries between two regions as an interface area: a fluid, hybrid context where new cultural constructs develop under continuous and ever-changing phenomena of syncretism and creolisation (Williams and Emberling 2020). As it will be explained in the following sections, the first chiefs of Lower Nubia buried in the cemeteries of Sayala and Qustul adopt and re-adapt the Egyptian royal iconography, Shellal cemetery attests hybrid burials in the Protodynastic. During the Old Kingdom, the First Cataract was the ultimate outpost which led Egyptian merchants towards the quarries of the desert and it equally hosted small Nubian commercial hubs. The Middle Kingdom fortress of Mirgissa, on the Second Cataract, housed a small Kerma culture necropolis. During the New Kingdom, Nubian funerary practices (probably Medjay) are attested in the First Nome of Upper Egypt and up to the Hierakonpolis region. Otherwise, the Nubian pharaohs of the Twenty-fifth Dynasty build pyramids in the Napata region, re-arranging the shape in the thinner way, according to their own sensibility and building techniques (Ciampini 2021: 29-31; Yellin 2020). During the Ptolemaic-Roman age, Elephantine was the perfect example of a melting pot *ante litteram*, where Egyptian, Nubian, Hebrew and Greek communities shared a living place, between conflict episodes and collaboration, sometimes ending up in mixed marriages. Also, the post-Meroitic population belonging to the X-Horizon adopts hybrid funerary practices, which involve the typically Nubian tradition of the horse burial, alongside the employment of Egyptian iconography, though mediated by its adoption by the Meroitic tradition, on the royal crowns found in the cemeteries of Ballana and Qustul.[26] From the aforementioned examples, it seems clear that Lower Nubia has always been not only the setting for a series of conflicts, but also an area where merchants, travellers, clergymen, officials and even soldiers had to live together and shared skills, cults and know-how. It seems pointless, nowadays, to focus

[25] For further information about the core-periphery model and a critical analysis of the capitalistic model of globalisation, see Wallerstein (1982). For the application of the world-system model to ancient society see the works of Andrew and Susan Sherratt (1991).

[26] On the Late Meroitic kingdom and the subsequent post-Meroitic age, see Török (1988). For the royal tombs of Ballana and Qustul, apart from Emery's excavation reports and publications, see Trigger (1969).

research on a prominence of Pharaonic Egypt over Nubia or vice versa towards an attempt to demonstrate Nubian roots for the Egyptian civilisation: both the approaches imply a supposed superiority, alternatively assigned to one or the other civilisation due to their prior antiquity, to be exploited in contemporary politics. Archaeological research should avoid being involved in contemporary political revindications. Instead, it should aim to the reconstruction of the past, following its own models and not by uncritically applying theories and models conceived for different époques. In the end, if we decide to confront the Lower Nubia situation to other similar cases around the Mediterranean,[27] it appears evident that there are usually unclear boundaries between different cultures, and the interface regions should be analysed through the lens of undefined categories and conceived as "gray zones". Therefore, the archaeological research in Lower Nubia, both past and present, should be conducted and interpreted considering this theoretical background.

4. Shellal: corridor to Nubia

4.1. Early A-Horizon in Cemetery 7 at Shellal

Immediately south of Aswan lies the village of Shellal: surrounded by rugged granite sun-blackened cliffs which shield it from desert winds, it marks the border between Egypt and Lower Nubia. Like throughout the entire First Cataract region, the landscape's rocks bear traces of ancient granite quarries[28] and they are dotted with petroglyphs and inscriptions, from the predynastic up to the Christian age. As a frontier region, the First Cataract has been characterised by a fluid interface among different human groups since the prehistory. Specifically, during the Naqada age the Nubian substrate coexisted with numerous commercial enclaves, initially in an equal relationship. During the Classical A-Horizon, the Egyptian enclaves gained increasing power, whilst the local population slipped into a subordinate position (Guyot 2008: 719-720). The First Cataract region has yielded significant late predynastic necropolises, whose findings helped scholars to partially reconstruct the hybrid nature of contacts between the Egyptians and A-Horizon people in the area: Kubbaniya and Sheikh Mohamed on the west Nile bank; Shellal, Khor Bahan and Ambukol on the east bank. It is important to note, however, that the excavated cemeteries are not representative of the entire social body, but rather of the élite members, their entourage and their family members and servants (O'Connor 1993: 15; Gatto 2016: 237). At Shellal, George A. Reisner, during the First Nubian Survey, identified Cemetery 7, which is of primary importance for population studies, since it remained in use continuously from the protohistoric to the post-Meroitic age. It has provided substantial evidence from Horizons A – first identified by Reisner here –, C and X, and it continues to serve as the main database for research on the region's history. The cemetery was fully investigated during the first ten weeks of excavation in the 1907-1908 campaign, with preliminary cleaning operations starting in February. Excavations reports indicate the tight schedule under which Reisner's team had to work, as they

[27] Like the cultural interface between the Delta region and the nearby Sinai and Levant; the relationship between Greece, Cyprus, Anatolia and the Etruscan world; the Roman Empire and the so-called Barbarians etc.

[28] It is the valuable pink granite of Aswan, employed in many Egyptian monuments, as well as Rome's Pantheon together with grey granite.

concurrently explored ten other necropolises dating between the A-Horizon and the Middle Ages, which yielded numerous skeletal and mummified human remains, as well as animal burials, which will be further discussed in the following paragraphs (Reisner 1908; 1910; Smith 1908; Smith and Jones 1910; Emery 1965: 41; Adams 1977: 74; Rampersad 1999: 3-15). The osteological material was collected and analysed by the anatomopathologist Grafton Elliot Smith, alongside his colleague Douglas Derry, who began a systematic statistical study to organise the vast amount of disposable data, and to gather information regarding the main population's features from a total of six thousand bodies: ethnicity, sex, age, social status, pathologies and traumas. Furthermore, Smith initiated a pioneering large-scale epidemiological study, which served as a model for subsequent archaeological missions in the region. In terms of accuracy and productivity, the results achieved during the first season remain unmatched, as later campaigns directed by Cecil M. Firth did not produce equally comprehensive reports, and a significant percentage of the human remains unearthed are currently untraceable (Metcalfe et al. 2014: 4-9; Raue 2019: 103-104). Concerning the types of burials and grave goods, none of which include any Egyptian materials, they mainly consist of leather remains (possibly clothing), hats and baskets, alongside rare jewellery. The latter includes a luxurious necklace with six round gold beads and another one with gold beads decorated with spiral motifs, as well as the only known example of a bronze mirror attested for the entire A-Horizon, which had been found together with a folded linen cloth. Due to the relative simplicity of the grave goods, Reisner initially misattributed Cemetery 7 to B-Horizon, and it was not until the 1960s that the chronology was corrected (Rampersad 1999: 229-231; Gatto 2016: 237). Cemetery 7, alongside the necropolises of Kubbaniya South and Khor Bahan, is the primary evidence of A-Horizon in the First Cataract region, and it shows strong hybridisation features with the Naqada culture. The materials discovered in the northern cemeteries do not significantly differ from those identified in the Dhakka and Sayala regions. However, in northern Lower Nubia the practices of animal offerings and animal burials are more widespread: this feature is clearly influenced by the Badarian tradition, and it is typically found throughout Upper Egypt, up to Hierakonpolis (Gatto 2006b: 229).

4.2. From fishing-gathering to agriculture: evidence from the burials

The organic and inorganic materials discovered in Shellal burials have proven crucial for studying food production and the introduction of agricultural practices in the Early A-Horizon. Regarding cereal production, only the micro-botanical remains from Afyeh have been analysed so far, to determine their wild or domestic nature, although numerous specimens have been discovered in burials. Sometimes stored in vessels, otherwise in layers scattered underneath the body, or, as in the case of an intact infant burial from Cemetery 7, arranged in a rain-like pattern over the deceased. This peculiar method of deposition, besides being examined in relation to the role of cereals in the diet and, by extension, in society, might also be linked to a ritual significance that remains unclear (Reisner 1910: 39; Rampersad 1999: 161). Furthermore, there are not any records of baking practices for the Early A-Horizon, as cereal production was conducted on a small scale, and it did not constitute a primary resource. Therefore, it is reasonable to suppose the importation of

bread from nearby Egypt. Currently, the only evidence, albeit questionable, of possible bread remains was uncovered by Reisner in Cemetery 7, without further investigation (Reisner 1908; 1910). During the Early A-Horizon, the introduction of agricultural practices coexisted with the previous economy based on hunting and gathering, for which the main evidence, though scarce, unexpectedly comes primarily from funerary contexts: for example, in the absence of records concerning the domestication of date palm, the collection of such fruits can be inferred from their discovery within burials as offerings. Cemetery 7 at Shellal provides two interesting examples: two date pits found in tomb 107 and a large fruit from the dum palm, associated with a seed of the same species, from tomb 262 (Reisner 1908; 1910). Finally, the practice of fishing is clearly evidenced by the discovery of fish bones in the settlements of the Early A-Horizon, as well as baskets (prototypes of fish-traps) used as nets, fount both in settlements and graves. Shellal, in particular, yielded an example described by Reisner as similar to modern Nubian baskets, characterised by a decorative pattern of red and white stripes (Reisner 1910: 38-42; Rampersad 1999: 169-173). The data provided by Cemetery 7 thus confirm what was stated in the previous paragraphs: the predominance of hunting, fishing and gathering economies over agriculture, the latter remaining (unlike in Egypt) a secondary factor. This was due both to the unique environmental conditions and to the different developmental trajectories of the Nubian world.

4.3. Animal burials: ritual sacrifice or symbolic value?

A distinctive feature of Cemetery 7 is the presence of a significant number of animal burials, whose interpretation is still debated. This practice was relatively common during the Early A-Horizon, particularly in the First Cataract region as well as the northernmost part of Lower Nubia, despite the absence of clearly defined chronological boundaries. Animal burials are often not associated with human remains and they lack direct dating elements. Therefore, they can only be dated in relation to surrounding human graves with offerings. Concerning Cemetery 7, the presence of a human burial from the Early A-Horizon adjacent to an animal burial demonstrates that the interment of animals in human cemeteries has been observable since the earliest archaeological evidence (Flores 2004: 742; Gatto 2006a: 70). Moreover, almost all the evidence appears in the area north of Dhakka, which aligns with the spatial limits of the Early A-Horizon. So far, there are not any attestations of this particular type of burial for the Classical and Terminal phases, except for Sayala and Qustul, which indicates a change in practice overtime: alongside the variation in the animal species involved, by the decline of the A-Horizon this practice became exclusive of the southern Lower Nubian élite. In addition to Shellal, where ten animal burials are documented within an isolated cluster of human graves, a substantial number of animal graves has also been discovered in the contemporary Cemetery 17 at Khor Bahan, which shares similarities with Shellal in terms of period, geographical location, composition and type of funerary structures (Gatto 2000: 107; 2016: 238; Flores 2004: 742-743). Concerning the practice of animal burial in prehistoric and proto-historic times, although its meaning has been recently successfully rediscussed (Colonna 2021), scientific literature traditionally distinguishes between two types, based on their presence within human graves or in independent pits within the cemetery area: sacrificial rituals or early cult practices

related to sacred animals.[29] However, the former has been postulated only deductively, given the lack of direct connection between animal and human graves, that could serve as a supplementary element. The absence of a demonstrated link, nonetheless, does not preclude the sacrificial nature of the practice or a ritual value within the funerary customs of the time (Flores 2004: 731-733; Gatto 2006a: 70). The animal species represented include dogs, gazelles, goats and cattle; the two latter are also found in the élite cemeteries of Sayala and Qustul. Notwithstanding, the majority of faunal remains consists of dogs: a total of thirty-three individuals are distributed among twenty-five burials at Khor Bahan and Shellal. In Cemetery 7, in particular, one of the graves contained the remains of a dog associated with goat bones, whilst only four of the remaining graves did not contain canids: these were four individual burials, evenly divided between goats and cattle. The nine dog graves from Cemetery 7 are clustered within an isolated group of fifty human graves, and they include single, double and triple burials. In his excavation reports, Reisner mentions a double burial of dogs as well as a triple burial. He did not notice any peculiarities in the arrangement or in the orientation of the remains, although he highlighted the practice of beheading[30] in three specific contexts: tombs 223 and 224 both contained canids, tomb 144 contained a goat. Decapitation would later be documented also in Qustul's Cemetery L (Flores 2004: 742-743; Gatto 2006a: 70; Hartley 2015: 67; Rampersad 1999: 183-188). Concerning the interpretation, it is crucial to underline the existence of similar contexts in Upper Egypt,[31] albeit

[29] A more up-to-date problematisation of animal worship in Egypt has been elaborated by Angelo Colonna, who points out how, in Egyptian society, the phenomenon was not a relic from prehistoric times, instead it continuously reshaped, as long as it remained meaningful to the pharaonic culture. The author also notes how the recent works of Diane Flores on animal burials has reassessed their religious significance, questioning their traditional interpretation as attestations of a cult of sacred animals or as theriomorphic hypostases of the divine (Colonna 2021: 3-26).

[30] A precedent for dog decapitation in the Nile Valley is attested for the Neolithic: Cemetery C at el-Kadada includes sixteen tombs which contain dog skeletons. The remains are usually incomplete in their primary deposition, mostly featuring only the head. The phenomenon of animal dismemberment is equally attested in the same cemetery for goat burials. The deposition of the animals (canids *in primis*) beneath the deceased and only in single or double inhumations (but not in triple ones) suggests a ritual purpose, perhaps related to sacrifice. It is worth remembering that also human sacrifice is well attested in Cemetery C, unlike the other almost-coevals cemeteries of el-Kadada (Bonnet et al. 1989: 26-28). However, even if a supposed continuity between the Neolithic canid inhumations of el-Kadada and the A-Horizon dog burials might be intriguing, the author shares the perplexity of Bonnet et al., since in Shellal and Khor Bahan animal burials are autonomous and not related to human ones. The sacrificial nature of dog burials appears clearly, supported by the (even sporadic) practice of beheading, however the exact purpose of the sacrifice itself likely differs between the Neolithic el-Kadada canid inhumations and the A-Horizon Shellal ones.

[31] Upper Egypt displays an apparent major concentration of the phenomenon. However, it is worth remembering that the studies on the distribution of animal burials in the Nile Valley are conditioned by the disparity of collected data. The same issues involve the apparent disparity between necropolises and settlements, the latter ones having yielded fewer animal tombs than the former ones. The reasons are to be found in the general scarcity of evidence related to settlements and the usually better conservation conditions of cemeteries (Hartley 2015: 19). Furthermore, even if widely explored during the three Archaeological Surveys of Lower Nubia, currently fieldwork in the region is not possible, hence the impossibility to collect new data. Concerning the possibility to review the data collected during the previous surveys, Nordström correctly pointed out that "A documentation by modern standards of this archaeological find material is not yet completed however, especially in view of the fact that much of it is still difficult to gain access to in museum stores " (Nordström 2004: 134).

characterised by major differences. Both the late predynastic cemeteries of Naqada and Hierakonpolis, as well as the First Dynasty royal necropolis of Abydos, provide evidence of animal burials in subsidiary graves. Among the main examples, a multiple dog burial from Naqada's Cemetery T, exotic animal tombs connected to élite graves in Cemetery HK6 at Hierakonpolis, seven lion subsidiary graves in the funerary complex of Aha in Abydos' Cemetery U, and four funerary stelae of canids dating to the reign of Den. Lions and bulls are easily identifiable as symbols of royal power, with bulls also having explicit religious connotations: the cult of Apis, while flourishing in later periods of Egyptian history, has its roots in the Protodynastic (Petrie 1896: 26; Wilkinson 1999: 39; Flores 2004: 745-749; Hendrickx 2014: 267-269). The role of the dog is more complex to define, due to its multiple functions in ancient societies: pet, work animal, hunting companion. The latter activity, a typical feature of the élite throughout the pharaonic age, is well documented by a significant number of petroglyphs as well as on ceramics. In the case of dog burials within human graves, it is reasonable to postulate a domestic relationship together with the economic value of the animal as a status symbol. In this framework, Reisner's interpretation of the single dog burials in Shellal and Khor Bahan, where the presence of collars suggests their role as pets, should be considered. In their publications on the subject, Ikram (2013) and Friedman et al. (2011) do not rule out the hypothesis of the joint burial of a master alongside his pet. However, they emphasise that this theory is not applicable to multiple burials lacking direct association with human graves, which constitute indeed the vast majority of the discoveries, and which could instead serve as markers of boundaries in the cemetery area, with the dogs acting as symbolic guardians (Flores 2004: 751-755; Hartley 2015: 58-69). Concerning Cemetery 7, human burials can be divided in two categories: simple graves with scant offerings, primarily found intact, and richer burials which have undergone severe looting. The evidence shows the incipient hierarchisation during the Early A-Horizon, and the resulting inequality in accessing luxury goods. In this context, the placement of a cluster of isolated animal graves between the two main groups of human burials could be interpreted as an ideal boundary between different social classes. According to the author's opinion, the most convincing interpretation, which unifies the diverse typologies of animal burials, is the one proposed by Hartley, who identifies the dog as a guardian and protector: of its owner in the afterlife, in the case of human burials where the animal is typically placed at the feet of the deceased; of a group of élite burials, as a symbol of the hunting activities which were a major feature of the élite and distinguished it from the commoners; of the entire cemetery, in the case of clusters of dog burials not associated with human graves and distributed along the perimeter of the necropolis.

5. Sayala: the rise of local princes

5.1 The Sayala cantonal chiefdom through the analysis of Cemeteries 137 and 142

The history of Nubian studies is relatively recent within Egyptology, since Nubia has traditionally been considered as an appendage of the Egyptian State, which periodically sourced raw materials, exotic artifacts and human labour. The three main Nubian Surveys which took place during the last century have provided scholars with the opportunity to deepen their understanding of the region, in an attempt to reconstruct its social structure and cultural development as comprehensively as

possible from the earliest phases. While the previous section highlighted the Early A-Horizon, the current section will focus on the transition between the Classical and Terminal ages, through the joint analysis of Cemeteries 137 and 142 in Sayala, a major centre of southern Lower Nubia around which a cantonal chiefdom coalesced. These are two high-ranking necropolises which have yielded valuable grave goods, both locally produced and imported from Egypt (Rice 1991: 136-137). The Sayala district has been the focus of the archaeological mission directed by the University of Vienna as a part of the UNESCO campaign for the salvage of Nubian monuments. The aim was the systematic excavation of cemeteries and settlements, and it recorded and dated the petroglyphic cycles belonging to the A-Horizon as well. The concession extended along both Nile banks, from the village of Khor Nashryia in the north to Khor Sobakha in the south. The field director was Karl Kromer, and his team included paleoanthropologist Wilhelm Ehgartner and students Manfred Bietak, Reinhold Engelmayer and Peter Gschaider, who later became prominent Egyptologists, alongside skilled workmen from Quft (Kromer and Ehgartner 1963: 72; Emery 1965: 96; Gatto 1995: 97; Rampersad 1999: 109). The first excavation season lasted eight weeks, from December 4th, 1961, to January 26th, 1962, and its primary aim was a general review of what had been overlooked during the previous Nubian Survey by Cecil M. Firth.[32] Since the osteological remains found by Firth had neither been collected nor fully examined, Kromer deemed it necessary to systematically explore all the necropolises scattered on the eastern bank in the northernmost district of the concession area, focusing on the anthropological analysis of human remains. This effort resulted in the discovery of a significant number of burials belonging to C-Horizon, to the so-called "pan-grave" culture,[33] as well as Roman and Byzantine periods, along with the A-Horizon settlements in the Khor Nashryia area. Human settlements in the region first took the form of rock shelters, in association with a wide variety of petroglyphs. During the first excavation season, five shelters and two storerooms set between the rock were uncovered, where hearths, mortars, fragments of lithic vessels and black-topped pottery, cosmetic palettes and ostrich eggshells were found (Kromer and Ehgartner 1963: 72; Rampersad 1999: 109).

5.2. Cemetery 137 and Cemetery 142

In the Sayala district, two main necropolises stand out, both initially investigated by Cecil M. Firth, then by the Austrian archaeological mission: Cemetery 137, belonging to Classical A-Horizon and located half a kilometre south of Sayala on the east bank, and Cemetery 142 of Naga Wadi, dated to Terminal A-Horizon. Both pertain to the local élite, though they differ in the size of the tombs, the wealth of grave goods and their chronology (Trigger 1965: 74-75; Hofmann 1967: 123; Smith 1994: 361; Rampersad 1999: 202; Flores 2004: 742; Gatto 2006a: 70). Cemetery 137, as detailed in Firth's reports, is located at the entrance of a small wadi and it includes thirty-one tombs, of which thirteen have been published[34] (Firth 1927: 204-212). These are wide structures which form a small élite necropolis, containing multiple burials resulting from successive interments over a limited time span. The

[32] For the excavation reports redacted by Firth, see Firth (1927).
[33] For further information about the "pan-grave" material culture, see de Souza 2018 and related bibliography.
[34] The published tombs may indeed be fourteen: for further details, see Appendix C.

graves, sub-rectangular in shape, were cut into the alluvium and they originally featured heavy roofs made of stone slabs, most of which have collapsed overtime. The cemetery suffered multiple looting episodes, then it has been repurposed as a stone quarry and finally disturbed by sebâkh diggers (Trigger 1976: 42; Midant-Reynes 1992: 209; 2003: 303-304; Smith 1994: 361-363). Firth, however, emphasised that, despite the systematic looting, the high quality of grave goods discovered exemplified the high social status of the occupants, whether they were local chiefs or, as in the case of Tomb 1's owner, rulers from the Early Dynastic period (Firth 1927: 204). Tomb 1 is indeed the most significant of the cemetery, and it consists of a huge burial shaft. The collapse of one of the roof slabs on the northern portion of the structure occurred before the earliest looting, effectively sealing its content, thus allowing the preservation of the remaining grave goods and of the lower portions of two skeletons belonging to the occupants (Trigger 1976: 42; Adams 1977: 130; Smith 1994: 361; Rampersad 1999: 202-203; Teeter 2011: 84). Amongst the valuable goods discovered in Tomb 1, there were seven copper chisels, an axe, a copper bar ingot, and a harpoon tip.[35] The presence of copper artifacts marks a significant difference compared to the almost contemporary Cemetery L of Qustul, which yielded only a single spearhead of that typology.[36] Also, two noteworthy cosmetic palettes were unearthed, respectively large and medium-sized, featuring a double-headed bird protome, similar to well-documented Egyptian samples. Between the two heads, there was a suspension hole. Other burials in the cemetery contained sub-rectangular palettes, a typology widespread in the Sayala region, suggesting the need for a comparative study (Rice 1991: 136-137; Midant-Reynes 1992: 209; 2003: 303-304; Rampersad 1999: 202-203; Smith 1994: 364-368; Teeter 2011: 84). Additionally, Tomb 1 yielded a green-glazed quartz lion protome, of a type typical of Naqada III, especially in the crafting of small amulets and beads. Concerning this particular sample, it is unclear whether it served as an amulet on its own or it was associated to another ritual artefact. Finally, of particular interest is a thin mica slate with a suspension hole, possibly employed as a mirror, which has parallels in Qustul's Cemetery L. Amongst the other findings, a significant collection of stone vessels, both locally produced and imported from Egypt, of exquisite craftmanship. Additionally, both Naqada-type[37] and Nubian pottery vessels are attested, especially the black-topped red ware, typical of Classical and Terminal A-Horizon. Conversely, the thin-walled "eggshell" ware, the hallmark of Terminal A-Horizon widely attested in Qustul, is absent, thus suggesting a slight chronological precedence for Cemetery 137. Finally, the main discovery of Tomb 1 consists of two ritual maces with pear-shaped heads, respectively made of white marble and quartz, as reported by Firth (1927:

[35] Copper harpoons are extremely rare within the A-Horizon, with only two specimens discovered to date (Rampersad 1999: 234).

[36] However, this can be related to the severe plundering which affected Cemetery L overtime. The same phenomenon should be considered concerning Cemeteries 137 and 142 as well, which both suffered extensive looting.

[37] Through the analysis of the Egyptian pottery distributional pattern throughout the A-Horizon region, it has been possible to highlight differences on geographical basis: the northern cemeteries (7-148 according to Reisner's nomenclature) yielded wavy-handled jars, while the southern necropolises (215-277) yielded wine jars. Finally, Cemetery 137 yielded different shapes of jars, varying in size, and a fair percentage of bowls. For further information, see Takamiya (2004) and related bibliography.

206-207). Their handles were covered in very thin gold leaf, one of which decorated with animal motifs. The latter was briefly housed in the Cairo Museum, before being stolen in the Twenties and never recovered. These two maces are among the most refined artistic products ever discovered for the period, and they have specific decorative parallels in Naqada IIIa ceremonial knife handles and ivory artefacts. The iconography features wild animals confronting in pairs, such as an elephant trampling snakes, a bull attacking a wild donkey, a lion and a lioness respectively battling a deer and a hyena. This imagery embodies typical royal symbolism: the sovereign, depicted as a lion or a bull, symbolises the cosmic order which subdues enemy populations and chaos, depicted as wild animals typical of the desert. The symbolic meaning is reinforced by the object it adorns: a mace, the traditional tool with which the sovereign is depicted in the act of the "smiting god" (Trigger 1976: 42; Rice 1991: 136-137; Midant-Reynes 1992: 209; 2003: 303-304; Smith 1994: 364-367; Rampersad 1999: 202-203; Manzo 2007: 43; Teeter 2011: 84). Two other significant tombs are those numbered 2 and 5 by Firth (1927: 206). Tomb 2, similar in length to Tomb 1 but narrower, yielded a stone incense burner similar to those found in Qustul, featuring a hemispherical shape and incised decoration. Tomb 5, on the other hand, shows more archaic features comparing to the other two ones. The remaining, smaller tombs belong to high-rank people, but not as much as the owners of tombs 1, 2 and 5. Overall, Cemetery 137 appears to serve as the burial ground for approximately three generations of local chiefs,[38] accompanied by their family members and entourage, who lived during Naqada IIIa1-a2, like the earliest rulers buried at Qustul (the owners of tombs L-29 and L-24). The other main necropolis in the district is Cemetery 142 of Naga Wadi, which includes forty-six burial structures and shafts, of which only eleven have been published by Firth, along with five animal tombs. The cemetery suffered extensive damage from looters, however it has been possible to infer the existence of at least two princely graves: Tomb 1 and 6, both dating slightly later than those in Cemetery 137. Tomb 1 yielded copper implements, such as a chisel and an axe, together with ivory items and imported carnelian beads. Tomb 3 is noteworthy because a mortar, or perhaps a censer, was included in the funerary equipment. Finally, Tomb 6 yielded a fragmentary alabaster vessel, a piece of decayed wood likely belonging to a bow stave, which remarks the importance of archery in the Nubian world, and an ivory comb carved with two giraffes (Firth 1927: 215-216). Thus, Sayala's surroundings provide evidence for the existence of five or six local princes, belonging to two different families[39] who succeeded one another in power and were buried in almost contiguous necropolises, thus manifesting ideological continuity (Smith 1994: 372-375). Like the older necropolis of Shellal, also in Sayala animal burials are recorded. Specifically, two distinct clusters emerged during fieldwork in Cemetery 142, one consisting of three goat graves, and the other of two cattle tombs. While the first cluster appears to be contemporary to the adjacent Terminal A-Horizon human burials, the dating of the cattle burials is more problematic. Due to their wide size, unusual for the period, it has been suggested that these may be intrusive interments in an area of earlier tombs. However, the debate is still ongoing (Flores 2004: 743; Smith 1994: 376).

[38] Exemplified, in chronological order, by tombs 5, 1 and 2 (Smith 1994).
[39] Lived between the Naqada IIIa1 period and the reign of Aha or Djer (I Dynasty).

Based on the massive findings of Naqada pottery in both cemeteries, it is possible to suggest contacts between the chiefs of Sayala[40] and Upper Egyptian rulers. These connections likely involved not only long-distance trade, but also ceremonial gifts, a typical practice of archaic societies, as it is attested by the presence of royal artefacts (mace heads, fine stone vessels) in the tombs.

5.3. Hierarchisation and development of the complex chiefdom

Archaeological evidence attests the prominence of the Sayala district since the Early A-Horizon, when numerous burials featured Naqada artefacts alongside Nubian grave goods, thus suggesting strong commercial ties with Egypt. Trade itself could have strengthened the development of an élite of merchants in the region, whose wealth was based on trade. During the Classical A-Horizon, the Dhakka-Sayala plain emerged as a centre for the development of Nubian culture, and it expanded its influence onto surrounding areas (Gatto 2006b: 223-229; Guyot 2008: 717-720). On this era is focused the debate over the possible development of a cantonal chiefdom, of which Cemeteries 137 and 142 would be the primary evidence. While Trigger (1965) asserts that Cemetery 137 served as the burial site for a family of local leaders and their entourage, however the settlement patterns in the region do not reflect the typical chiefdom form. In fact, there is not any evidence of minor centres grouped around a principal settlement, nor is there differentiation in rank and function amongst the supposed secondary centres.[41] Similarly, although the A-Horizon has been long depicted in scientific literature as an egalitarian society, nonetheless Nordström pointed out a certain degree of hierarchisation as early as the 1970s.[42] In this context, settlements and cemeteries of Sayala and Afyeh have been interpreted as the evidence of a rising class of chiefs who gained increasing prestige and power through control over trade routes towards Egypt and over the redistributive system of Egyptian imported goods in Lower Nubia (Hofmann 1967; Rampersad 1999: 201-203). In supporting the hypothesis of proto-monarchical hierarchisation, it is important to note that child burials from Classical and Terminal A-Horizon are not inferior neither in placement nor in quality of grave goods to those belonging to adults. Grave goods usually include leather fragments, possibly from clothes, as well as pottery, *faïence* beads, bracelets and anklets, necklaces. Notably, Tomb 3 from Cemetery 137, belonging to a very young woman, yielded numerous gold beads, Nubian pottery, cosmetic palettes, as well as a clay steatopygia figurine, likely a doll. The equivalence in type and quality of grave goods between child and adult burials is a clear indication of high status being conferred by birth rather than by merit. Based on the richness and quality of

[40] These chiefs obtained a prominent role in the region thanks to the strategic position of the settlement, on the route controlling access to the gold mines of Wadi Allaqi and to the stone quarries located in the desert. For further information, see Guyot (2008) and related bibliography.

[41] This feature, however, does not automatically exclude the existence of a chiefdom or of any form of nomadic state, following a different development trajectory from the urban model of statalisation.

[42] In his 2004 contribution, Nordström describes the A-Horizon as an «elaborate and mature social structure, perhaps organized around a female core with strong matrilinear tradition. […] A persistent pattern of the A-Group cemeteries is certainly a shift towards a more complex structure characterized by material affluence and social inequality, evident during the Terminal A-Group. […] There is a clear shift from early centres in the northern part of Lower Nubia towards an advanced chiefdom structure emerging around the Qustul complex in the southernmost part» (Nordström 2004: 134, 140-141).

funerary goods also in female burials, we are also able to infer that women did not played a subordinate role in A-Horizon society: on the contrary, the female status was central in the trajectory of A-Horizon hierarchisation, and it was related to prosperity and rituality, as well as the transmission of knowledge through generations. The major role women occupied in society is a shared feature within the Middle Nile Valley which also persisted in historic times and can possibly stem from the peculiar social structure of African pastoral societies (Gatto 2020: 132-133; Nordström 2004; Manzo 2020: 110). However, the debate concerning the precise nature of this privileged status has not reached definitive conclusions yet. While Trigger, like Firth, posits the existence of royalty, Adams suggests it may configure itself as an elective rather than hereditary monarchy, a typology linked to those semi-nomadic traits the A-Horizon always kept. The most plausible hypothesis, supported by the author, assigns the élite cemeteries of Sayala not to the rise of political leaders with kingship features (who acquired their status by warfare, for example, or by political conquest of neighbouring territories), but rather to wealthy commercial intermediaries. These intermediaries eventually gained wealth through their structuration in family clans, leveraging the strategic placement of the district at the entrance of Wadi Allaqi to begin a process of centralisation and redistribution of imported goods. During the latest phase of Classical A-Horizon and throughout the Terminal A-Horizon, alongside the growing social hierarchisation, the members of these clans gradually adopted models and ideology borrowed from the Egyptian élite, while simultaneously emphasising typical Nubian features. The hybridisation of cultural elements clearly appears in the rich burials of Cemetery 137 at Sayala.

6. Qustul: A "Land of Kings"?

6.1. Cemetery L of Qustul and the problem of the origins of pharaonic royalty

Qustul's Cemetery L is a significant archaeological site for understanding the origins of pharaonic royalty. Fieldwork was directed by Chicago Oriental Institute in the 1960s, and it unearthed artefacts and burial practices which provide crucial insights into the social and political structures of the time. The first campaigns revealed numerous graves, many of which contained luxurious goods, including metalwork, pottery and jewellery. These findings suggested a high degree of complexity and hierarchisation within society, indicative of emerging leadership roles that could be linked to later pharaonic practices. The artefacts yielded by Cemetery L have prompted discussions about the connection between Nubian and Egyptian cultures, particularly in terms of trade, political influence and ritual practices. The analysis of materials and their contexts has led scholars to reevaluate the dynamics of power and authority in early Nubian society. The evidence from Qustul suggests that the local leaders, besides being Nubian, were also engaging with and influenced by their Egyptian counterparts, laying the groundwork for the royal traditions which would characterise later Dynastic Egypt. As part of the UNESCO campaign for the salvage of Nubian monuments, the Oriental Institute was granted permission to excavate on both Nile banks in the region stretching between Abu Simbel and the Sudanese border. The first season began in January 1963, Keith C. Seele was appointed field director. His main purpose was to uncover the earliest A-Horizon evidence in the same region investigated by Emery during the Second Nubian Survey. Seele believed that the important discovery of the post-Meroitic

cemeteries of Ballana and Qustul (Emery 1938; Habachi 1981: 271) had inevitably diverted the archaeologists' attention from earlier periods (Seele 1974; 1981). The first, substantial evidence of A-Horizon in the Qustul area primarily consisted of a series of mostly empty shafts within Cemetery 220, together with further findings dated to X-Horizon and the Meroitic age. Soon, Seele decided to dismiss the numbering of cemeteries assigned by Reisner during the First Nubian Survey, since the location of cemeteries from 220 to 227 on the map was incorrect. Instead, he used the letters Q, R, S, T, U, V, W, J, K, and L. By the end of the first excavation season, new attestations of A-Horizon were unearthed in Cemetery VF, a subsection of Cemetery V,[43] despite the context being partially disturbed. The archaeologists discovered numerous large burials, all featuring the typical sunken side chambers, where various cosmetic palettes, jewellery items and pottery vessels were found. New circular shafts, likely linked to a nearby settlement, also emerged in the area (Seele 1974: 19; Rampersad 1999: 102). It was not until the second excavation season, in the winter of 1963-1964, that the main Terminal A-Horizon cemeteries, designated as L and W-1, were discovered. The latter was particularly rich,[44] yet the former, although smaller,[45] is still unparalleled for its richness (Williams 1982; 1986a; 1989; O'Connor 1993: 20; Rampersad 1999: 103). Cemetery L was discovered in January 1964, and it had been completely overlooked by Emery. Even before Williams published the excavation reports in the 1980s, interpreting the exceptional findings as indicative of the existence of a Nubian monarchy prior to the unification of Egypt,[46] Seele himself immediately attributed the findings to Nubian rulers, due to the huge size of the structures and the richness and variety of grave goods (Seele 1974: 29-30; Williams 1982: 2-8; Rice 1991: 137; O'Connor 1993: 20). Almost 60% of the tombs are rectangular shafts with a sunken side chamber, typical of élite burials,[47] where the deceased was (or were, for multiple burials) placed on a funerary bed.[48] The dimension of the structures often doubles those of other known A-Horizon burials, thus underlying their owners' high status. This status is likely linked to the severe looting the cemetery suffered, which eventually led to the combustion and collapse of the burial wooden coverings (O'Connor 1993: 20; Midant-Reynes 2003: 304; Manzo 2007: 43). However, the destruction of the superstructures did not irreparably damage the grave goods, which included rare artefacts for A-Horizon, especially in such large quantities: cosmetic palettes, gold and shell

[43] Cemetery V, together with S and T, yielded less material than Cemetery L, probably also due to the extensive plundering all the necropolises suffered overtime. Cemetery S includes twelve large graves with subsidiary burials, yielding traces of sacrifices (Rampersad 1999: 105; Teeter 2011: 87; Williams 1989: 42-43).

[44] It was a high-ranking necropolis which yielded numerous intact tombs ad huge amounts of pottery (Seele 1974: 40).

[45] It included thirty-three tombs, of which seven were cattle burials (Flores 1999; 2004; Gatto 2006a: 69; Rampersad 1999: 104; Seele 1974: 29-41.

[46] For the complete publication of Cemetery L, see Williams 1986a. for the publication of Cemeteries W, V, S, Q, and T, see Williams 1989. For Williams' hypothesis on Nubian royalty, see Williams 1978, 1986a, 1986b, 1987a, and 1987b.

[47] Similar to Cemetery 142 at Naga Wadi and, in Upper Egypt, Cemetery HK6 at Hierakonpolis.

[48] The employment of funerary beds is witnessed only in Qustul for the entire A-Horizon (Gatto 2006a: 69-70).

beads, ivory, semi-precious stones, clay tokens and cylinder seals, mace heads[49] and numerous dozens of incense burners. Alongside the precious items, archaeologists also found significant quantities of fine pottery: 75% was locally produced, 25% was imported from Egypt and the Levant. Notably, a class of wine jars decorated with painted bands were recovered in the cemetery, but are absent in northern Lower Nubia, thus suggesting direct contact between Qustul and Egypt, without the involvement of additional Nubian intermediaries (O'Connor 1993: 20; Midant-Reynes 2003: 304; Takamiya 2004: 55; Gatto 2006a: 69-70; Manzo 2007: 43). Tomb L-1, subjected to looting in ancient times, however yielded fine alabaster vessels and ceramic fragments, as well as the first of a series of incense burners (Seele 1974: 29-30; Gatto 2006a: 70). Tomb L-2, equally looted, belonged to a high-rank woman. Her grave goods included ivory, shell and bone ornaments, mostly earrings and lip piercings, alongside numerous First Dynasty jars and two fragments of *faïence* of exquisite craftmanship (Seele 1974: 30). Tomb L-11 yielded a fragmentary mica slab, employed as a mirror, and the so-called "Archaic Horus" incense burner, decorated with Egyptian motifs: a typical Protodynastic boat and a sovereign wearing the White Crown and surmounted by a *serekh*, depicted smiting a prisoner (Williams 1986a: 115; Rampersad 1999: 230; Manzo 2007: 43; Teeter 2011: 88). L-17 is known as the "jeweller's tomb". The owner's body had been so heavily vandalised by looters that neither its age nor sex could be determined. Around the neck, archaeologists found a necklace composed of sixty gold beads and a gold fly-shaped pendant. In a jar, five thousand complete and unfinished pieces of jewellery were recovered, including beads of various materials, earrings and lip ornaments. Amongst other grave goods, well-preserved pottery, cosmetic palettes bearing traces of malachite,[50] a copper drill employed to pierce beads, and an ivory cylinder seal. The latter features a theriomorphic motif: a flock of birds topped by a harpoon and flanked by a human figure. The artefact suggests the existence of a network of workshops and a form of administrative organisation of craftsmen (Seele 1974: 33; Rampersad 1999: 229-249; Gatto 2006a: 69-70). During the excavation of Tomb L-19, two unusual artefacts were discovered: a thirty-five centimetres length terracotta hippopotamus protome, presumably part of a complete model of the animal, and an incense burner. This peculiar class of incense burners at first was not recognised as such: it has been interpreted by Säve-Södebergh as a type of lamp, whereas Seele, based on the presence of red and black traces un the upper concavity, believed it to be a peculiar palette for mixing pigments employed in pottery decorations, which featured red and black motifs (Seele 1974: 33-34). Currently, the black pigmentation is attributed to combustion traces, while the red one is associated with the type of incense that was burnt. Numerous examples also bear fire cracks. This class of materials

[49] Mace heads have been previously attested in Cemetery 17 at Khor Bahan, but their connotations are not linked to royal power, unlike in Qustul. The semantic shift occurred due to the intensification of cultural contacts between A-Horizon and Naqada culture, which led the Nubians to adopt and re-adapt Egyptian imagery (Gatto 2006a: 71).

[50] From the analysis performed on those traces, it has been possible to determine that malachite was applied with a brush. The palettes were usually carved in quartzite, schist, limestone, diorite, amethyst, and white or pink quartz. A reused alabaster palette, carved from a plate or a bowl, is also attested for Cemetery L (Rampersad 1999: 231; Williams 1986a: 114-115).

is widely represented in Qustul, for a total of thirty samples: twenty-eight from Cemetery L and two undecorated specimens from Cemeteries W and S. Nine more attestations come from other Lower Nubia sites. The artefacts are typically truncated conical or cylindrical in shape, with a height of 8-9 centimetres and a diameter of 10-14 centimetres (Nordström 1972; Williams 1989; Rampersad 1999: 240-241). Finally, the second excavation season led to the discovery of the main burial, Tomb L-24. It is the largest structure of the entire cemetery, and it consists of a shaft with an irregularly shaped burial chamber on the western side, which had been breached in ancient times by thieves, who accessed it through a tunnel. The owner's body had been severely damaged by looters, who fully destroyed it. Based on the remnants, it was inferred that the owner was a prince or even a sovereign, whose remains were laid on a wooden funerary bed adorned with copper inlays, one of which was papyrus-shaped (Seele 1974: 36; Rampersad 1999: 238) The exceptionally rich grave goods included two weapons: a gray stone pear-shaped mace and a triangular-headed spear with a copper tip[51] featuring two holes for inserting rivets. Numerous pieces of jewellery were also found, including necklaces made of cylindrical gold, carnelian and *faïence* beads. Furthermore, the tomb yielded an assortment of cosmetic palettes, including one made of quartz, alongside a huge variety of pottery, whose decorative motifs were comparable to Egyptian and even Mesopotamian specimens (Seele 1974: 36-38; Rampersad 1999: 104-239). However, the main discovery consists of the renowned incense burner (OIM 24069) adorned with typical Egyptian pre- and Protodynastic royal motifs, incised with sunken relief during an age when in Egypt high relief was predominantly employed. Thus, Seele interpreted the artefact as a monumental cylinder seal and believed it had been destroyed not by looters but deliberately by the owner to prevent misuse after his death (Seele 1974: 39).[52] The decoration depicts a sacred procession of boats heading towards a palace façade motif topped by a falcon, comparable to an Egyptian *serekh*, under the guidance of a sovereign dressed in pharaonic attire seated on a throne, prominently wearing the White Crown of Upper Egypt. Alongside the procession, there are figures of deified animals, including the aforementioned falcon and an animal which Seele identified as a lion and Gatto interprets as a baboon (De Vries 1976: 55-74; Midant-Reynes 2003: 304; Gatto 2006a: 71; Manzo 2007: 43). Finally, tomb L-24, alongside L-23, yielded gameboards: rectangular limestone slabs featuring sixteen transverse incisions. The contextual finding of small *faïence*, carnelian and amethyst spheres led Williams to deduce that they were likely the playing pieces (Rampersad 1999: 252). The less wealthy burials in cemetery L suffered less damage from thieves and yielded numerous samples of thin-walled "Eggshell" ware (Seele 1974: 31). Concerning the orientation of the burials and the bodies, Qustul shows a change in funerary customs compared to earlier periods. During the Early and Classical A-Horizon, tombs generally tended to be oriented along a north-south axis, with the deceased preferentially laid on the left side, with the head oriented towards the south and the hands in front of the face. In contrast, the cemetery of Qustul showed a

[51] This is the only discovery of copper artefacts in the entire cemetery.

[52] Seele, referring to his different interpretations for what appeared to be a unitary class of artefacts, stated that objects similar in shape do not automatically share the same label.

wide variety of orientations, particularly in the positioning of the upper libs, which could be extended, bent with the hands in front of the pelvis, bent with the hands above the pelvis, or gathered towards the chest. Multiple burials, whether double or triple,[53] displayed different combinations of gender and age: two or three women, two or three men, two women and one man, two men and one woman, or one man, one woman and a child. Therefore, it is not possible to definitively assert whether these interments pertained to family groups or not (Rampersad 1999: 178-179). Finally, the cemetery includes seven cattle burials, which Seele initially interpreted as evidence of the social role of the people buried at Qustul, suggesting an élite comprised of livestock owners.[54] However, the animal remains were eventually attributed to wild species, and faunal analysis, if they were performed, are still unpublished. Cemetery L is the only documented case of animal burials associated with grave goods, similar to those found in human tombs. Tomb L-6 yielded storage pottery and shells, and the inhumated animals showed signs of beheading. The same was noticed for those buried in tombs L-3, L-7, and L-27. Animal decapitation is attested in tombs 144, 223 and 224 of cemetery 7 at Shellal, but not In those contemporaneous with Cemetery L (Rampersad 1999: 178-179). Unlike Cemetery 137 at Sayala, Cemetery L exclusively yielded cattle burials, which appear to be contemporary to human graves, based on their type and distribution (Flores 2004: 742-743). Williams suggested a sacrificial context for tombs L-3, L-6, L-7, and L-27, not due to the practice of beheading but because of their apparent association with two nearby human tombs, L-2 and L-5, located slightly further north. However, the proximity itself is not sufficient to confirm the hypothesis. Additionally, tomb L-33, isolated from the human burials, is the only specimen in the entire cemetery with orientation east-west rather than north-south, thus suggesting a prominent role, however Williams never elaborated on this (Rampersad 1999: 187-188).

6.2. Nubian royalty in Cemetery L: different interpretations

Considering the extremely rich discoveries at Cemetery L, in a region previously considered peripheral to Egypt, a debate emerged in the 1970s and in the 1980s, concerning the sociocultural aspects of A-Horizon, primarily addressed by Williams. However, this perspective is somewhat partial and focused almost exclusively on the supposed existence of Nubian rulers employing iconographic motifs typical of the emerging Egyptian monarchy (Rice 1991: 137; Gatto 1995: 100). Williams posits that centralisation of Nubian State preceded Egypt's one, even suggesting that Nubian kings conquered Upper Egypt during the years immediately before Dynasty 0 (1986a; 1986b; 1987a). While the latter hypothesis is currently unsustainable (Adams 1985 and related bibliography; Manzo 2020 and related bibliography), Williams correctly identifies elements of pharaonic iconography at Qustul (1987b), particularly regarding the

[53] The existence of multiple burials in Nubia is attested since the 5th millennium BCE and can be considered a local feature. Among the major examples stands out the cemetery of Kadada (Reinold 2007). The presence of multiple burials may refer to the administration of power: not exclusively held by a powerful male individual (i.e. a king) but rather shared at a communal level by an élite group (Gatto 2020: 133).

[54] For the social and economic role of cattle in African cultures, from the Neolithic up to the post-Meroitic era, see Dubosson 2020 and related bibliography.

incense burner from Tomb L-24, however, it is now established that such stylistic features were already in use in Egypt prior to this period.[55] Given that the burials at Qustul are contemporary with tomb U-J and Cemetery B at Abydos, it is plausible that they entered Nubian territory as a result of the expansionist efforts of the Abydos-Hierakonpolis coalition towards south, leading to contact with merging local power structures and the onset of hybridisation phenomena (Adams 1985; Manzo 2007: 43; Hendrickx 2014: 267). In this context, one must interpret the significant presence of Egyptian imported artefacts in the burials of Cemetery L, particularly 271 pottery items, including 123 high-quality stone vessels, as well as 11 jars of Syrian and Levantine origin – the latter being unique within A-Horizon. However, this is not an Egyptianised cemetery: the types of burial structures are Nubian, as are the 800 examples of thin-walled "eggshell" vases found, along with the cosmetic palettes made of amethyst and quartz (O'Connor 1993: 20-21). The same hybrid features are exemplified by the incense burner from Tomb L-24, which combines a typical Nubian shape with Egyptian decorative motifs, for which parallels have been highlighted with the processional scene depicted in Tomb 100 at Hierakonpolis. This suggests that the incense burner might have been decorated by an artist who may have worked for the Egyptian court (or had assimilated the Egyptian royal iconography), but the patron must have been a Nubian, because this type of artefact is not attested in Egypt, plus it bears symbolic features which are meaningful only in the Nubian cultural horizon (Gatto 2020: 133-134).[56] Therefore, the importance of Cemetery L is not related to its supposed precedence in the formation of the Egyptian State, instead it lies in the evidence of a local proto-royalty (accompanied by a proto-administration, whose evidence consists of seals), which, in light of the absence of contemporary cemeteries of similar significance, indicates that Qustul must have played a prominent role in the political control of Lower Nubia. This represents not merely a cantonal-size chiefdom, as we already saw in the case of Sayala, but rather a proto-state governance, resulting from a gradual process of centralisation, reflected in social stratification. In this context, the large tombs of Cemetery L are surrounded by more modest burials belonging to family members and subordinates of the local chiefs. In conclusion, the Egyptian royal iconographic features observed at Qustul are the result of a phenomenon of imitation and cultural appropriation by a nascent social élite, showcasing their ability to achieve dominance comparable to that of Egyptian rulers, even extending into the southern regions of Upper Egypt (O'Connor 1993: 21-23; Rampersad 1999: 205-212; Midant-Reynes 2003: 304; Takamiya 2004:

[55] The features of Egyptian royal iconography develop from internal factors after a long gestation, whilst in Lower Nubia there is no evidence of social hierarchisation prior to Terminal A-Horizon. However, even during the latter, it is fully attested only in Qustul, Sayala, Afyeh and Tunqala West (O'Connor 1993: 21; Rampersad 1999: 211-212; Wegner 1996; for further details on Afyeh and Tunqala West, see Stevenson 2012a and 2012b).

[56] Concerning the material, Williams claims it is Nubian quartz, whereas other scholars believe it to be Egyptian limestone. To date, diffractometric analyses have not been performed yet, to confirm or deny the hypotheses. Furthermore, there is not information available relating to the other artefacts found together with the incense burner. Williams was not present during fieldwork, hence he had to formulate his hypotheses based on the material collected by Seele, who had since passed away. For further information, see Huyge (2014), O'Connor (1993), Rampersad (1999), and Teeter (2011), and related bibliography.

60; Manzo 2007: 43; Teeter 2011: 87). These attempts at conquest would provide a compelling explanation for the increasing political aggressiveness displayed by Egypt towards its Nubian neighbour: no longer a mere trading intermediary, but rather a political rival.

7. Conclusions

Based on the information presented so far, it is possible to draw some preliminary conclusions regarding the transformations in political and commercial relations between the tribes of A-Horizon and Early Dynastic Egypt. Firstly, an analysis of the distribution of animal burials across the three cemeteries (Appendix A) reveals a marked shift in burial practices between the Early and Terminal phases of A-Horizon. At Shellal, dog burials predominate, exhibiting the features discussed in the previous sections, with only a single instance of caprine remains. In contrast, at Naga Wadi, only caprine remains are present, along with two cattle burials, although the dating of these remains uncertain. Finally, cattle burials are the exclusive type recorded at Qustul. The practice of animal burials is attested in Badarian Egypt, as well as in late Predynastic Hierakonpolis, and it continues into fully Dynastic times at Abydos. Given these parallels, it is reasonable to hypothesise a shared origin for this practice between Nubia and Egypt. Regarding the animal species involved, the role of the dog as a hunting companion – and, by extension, as a symbol of élite practice – was a notable feature of Early Dynastic Egypt, as exemplified, for instance, by the famous spinning top of Hemaka (JE 70164) (Piacentini and Delli Castelli 2023), and by the aforementioned funerary stelae of canids dating to the reign of Den. However, over the course of the Old Kingdom, the significance of the dog as a symbol of royal power gradually waned. Similarly, at Cemetery 7 in Shellal, the presence of dog burials within a distinct cluster of tombs may suggest the high status of the individuals interred there, within the broader context of an emerging process of social stratification. At a later period, the cemetery of Naga Wadi, located in the heart of the Dhakka-Sayala district, features the exclusive burial of goats. Within A-Horizon, there are notable differences in the economic trajectories of northern and southern Lower Nubia: to the north, trade and manufacturing are predominant, whereas to the south, animal husbandry plays a central role (Gatto 1995: 100). The prominence of livestock farming is also evident in later phases, both in Lower Nubia with the advent of C-Horizon, and in Upper Nubia throughout the Kerma culture. In this context, the presence of goat burials in an élite cemetery in upper Lower Nubia may be interpreted as an assertion of economic power by the local chiefs, who base their wealth on the ownership of livestock. A similar process can be applied to the presence of cattle burials in Cemetery L at Qustul, where the proto-rulers established their political dominance on a dual foundation: pastoral and commercial. This is further reinforced by a strong ritual significance, evident in the presence of grave goods in the animal burials – a unique feature among the cases under analysis. Since its domestication in 6500-5500 BCE, cattle soon played a major role both in economy and society of African human groups, and it became integrated in food producing as well as in funerary contexts. The first evidence belongs to the Neolithic cemetery of el-Barga, where a tomb belonging to a man and a child yielded a bucran. The deposit of bucrania inside graves spread across different Nubian cultures between 6th and 4th millennia BCE: in particular, the Kadruka cemeteries yielded, together with cattle skulls, also

horns and skins (Dubosson 2020: 909-912). Animal deposits reflect the way society dealt with death (Dubosson 2020: 920): animal remains are often placed in contact with the deceased, and cattle deposits can be related both to the status of the tomb's owner and to the effective possession of livestock during life. The major role played by cattle in Nubian society also persisted in historic times, from the C-Horizon up to the post-Meroitic era. In this sense, the presence of cattle burials in Qustul, together with the practice of animal beheading, may be interpreted indeed as a further development of the Neolithic bucrania inhumations: the interment of heads may express a metonymic significance (the head for the whole) and underpin the sacrificial nature of the ritual. In Qustul, the sacrificial aspect is highlighted by the ritual action of beheading, strengthened by the presence of funerary equipment in animal tombs. Nonetheless, the peculiar form of cattle interment in Qustul may be related to a further interpretative layer which partially overlaps and partially mingles with the aforementioned one, that involves the meaning of the bull not only as a symbol of economic wealth but also of political power. The bull in Egypt holds religious connotations, as evidenced by the cult of Apis, which has its origins in the Early Dynastic period (Colonna 2021: 31-37).[57] Furthermore, the bull is a symbol of sexual power, associated with royal authority and the more archaic aspects of certain male deities (in historical times, the blue bull is the animal hypostasis of Osiris-Min, in his most ancient and primordial connotations). In the petroglyphic cycles of the Aswan region, the figure of the bull crushing its enemies appears, oriented differently from other animal figures, thereby emphasising its uniqueness and symbolic value. However, the major role played by the symbolism of the bull in the Egyptian religion and display of power is not reflected by an analogous central role in Egyptian economy and society: hence, it may pertain to the substratum of cattle pastoralists which developed during the Early and Middle Holocene especially in the Western Desert:[58] in this sense, the cult centre of Nabta Playa is a clear example. The contact between cattle pastoralists and early Nilotic Neolithic groups with an agricultural economy, as well as the coexistence and functional separation between the two economic models, eventually impacted on the Egyptian social development (Wendorf and Schild 1998: 114-116). Given the common background of cattle pastoralism between Egypt and Nubia, which eventually developed following different trajectories, and taking into account the social and ideological meaning related to cattle in Lower Nubia since the Neolithic, it is therefore reasonable to hypothesise that, within the context of commercial exchanges between the chiefs of Qustul and the early rulers of Upper Egypt, as evidenced by the hybrid iconography of the censers from Cemetery L, the Egyptian royal symbolism of the bull, like other iconographic elements (white crown, serekh, falcon, etc.), also became incorporated into the Nubian world as a familiar element enriched of new semantic features, partially overlapping the autochthonous

[57] The first attestation of the Apis bull, already embedded in a ritual framework and in a strong association with royal authority, dates to the reign of Aha. Other major testimonies of the role the animal acquired in relation to kingship are provided by a sealing of Den from Saqqara, a broken ivory label from Den's tomb at Abydos and two ebony labels of Qaa from Abydos, as well as iconographical traits featured on the Narmer palette (Colonna 2021: 31-35).

[58] For the development of cattle pastoralism and the "African cattle complex" in the Sahara, see Di Lernia et al. 2013.

ones. The censer from Tomb L-24, which depicts a bull above a sacred boat, serves as an exemplary case in this regard. The orientation of Tomb L-33, which differs from that of the surrounding burials and is aligned along an east-west axis, may be interpreted in this symbolic context: the bull, a symbol of kingship, generative power and rebirth, is buried in alignment with the sun's path, facing the dawn, or the rebirth of the celestial body after the night. However, one must be cautious not to assume that the Nubian world passively adopted the iconographic and symbolic elements of Egypt, replicating them identically. On the contrary, in light of the centrality of cattle pastoralism in southern Lower Nubia as a primary economic element, and consequently, of political dominance, it is reasonable to hypothesise that the chiefs of Qustul actively assimilated the Egyptian proto-monarchic meanings of the bull, adapting them to their own cultural background: the bull, associated to other symbols of kingship, became not only a symbol of wealth and status on a local scale, but rather the expression of royal dominance of divine ascent, able to conquest and subdue, like the politically strong Egyptian neighbour was doing at the time. Therefore, we can conclude that the depictions of bulls at Qustul allude to an iconographic system of power and kingship of Egyptian origin, yet closely intertwined to the traditional Nubian socioeconomic symbolism of cattle as a status symbol, linked to the actual possession of such livestock (hence the burials of bulls) – the foundation of Nubian pastoral wealth and power.

With regard to the grave goods, those from Cemetery 7 at Shellal are relatively simple (Appendix B), predominantly consisting of local objects: shell jewellery, ivory artefacts, and pottery. Mace heads are attested in two tombs: one male and one that has been heavily looted, making it impossible to determine the number, sex, or age of the individuals buried there. In the latter, the mace head is associated with an axe, of which a second specimen was found in a shared tomb containing the remains of a man and a woman. The grave goods from this tomb included distinctive items, such as the so-called "reptile rings". The modest presence of weapons suggests the development of an emerging social hierarchy. In this context, further support for this idea can be drawn from the burials of infants, whose grave goods are as elaborate as those of adults, and in some cases even more so. Thus, social status appears to be linked to birthright rather than being acquired through merit. One child's tomb contained a beryl bead, a mineral also attested by three pendants and fourteen beads found in another burial. Beryl was sourced in Egypt, but not in Nubia, making it one the rare imported materials recorded at Shellal. From the same tomb also came eight carnelian beads, which were also discovered in another tomb, possibly belonging to an infant. Likewise, carnelian was an imported luxury item, mined and worked in the Indian subcontinent, and its trade routes to Africa partially overlapped with those if lapis lazuli, first reaching Egypt and then Nubia.[59] Based on the available data,

[59] One carnelian mine was active near Gebel el-Asr, however it was exploited mainly during the Middle Kingdom, with traces from the Old Kingdom and the Roman age. For other periods, Harrell posits "[…] one or more undiscovered sources in Egypt's deserts or, perhaps, in southern Egypt's and northern Sudan's Nile River terrace gravels". Hence, an Indian provenance for the A-Horizon age, mediated through Egypt, cannot be completely excluded, since during the pre- and Protodynastic age Egypt imported lapis lazuli, whose trade followed almost the same routes. Nonetheless, it is equally plausible to hypothesise carnelian importation from the deserts or sporadic forms of local exploitation in Nubia. The two provenances could even have coexisted. For further information, see Harrell 2012.

it can be hypothesised that Shellal hosted Egyptian merchants and imported certain categories of luxury goods. However, the majority of the population during the Early A-Horizon period displays distinctly Nubian traits in their burial customs. Cemetery 137 at Sayala (Appendix C), in addition to the aforementioned copper artefacts and mace heads from Tomb 1, also yielded a censer (Tomb 2), a type that would gain particular significance in the subsequent Terminal A-Horizon. The presence of a lion-head amulet suggests the symbolic importance of this animal, possibly already associated with royalty, as the amulet was found in one of the three princely tombs of the necropolis. As previously discussed, Sayala was the centre of a canton-sized district, a chiefdom with its own ruling élite. Sayala also yielded imported goods, including notable examples of Egyptian transport jars and beads. The latter are particularly noteworthy: Tombs 2 and 6 yielded cowrie shells, typically marine and therefore imported. Similarly, there were imported samples of beads made from turquoise, garnet and carnelian. Turquoise was mined in the Sinai, so it is reasonable to assume Egyptian mediation in its acquisition, and the same applies to carnelian. Garnet, however, was sourced from the metamorphic rocks in the Eastern Desert and the Sinai, as well as in placer deposits near the Fourth Cataract and Central Africa (Harrell 2012), highlighting Sayala's role as a commercial intermediary between the Egyptian and Saharan worlds and sub-Saharan Africa. Likewise, a high concentration of carnelian was found in Tomb 1 at Naga Wadi (a necklace, beads, and amulets), the only burial to also contain copper artefacts, including an axe (Appendix D). the correlation between symbols of power and imported goods is clear, within the context of the gradual social stratification during the transitional period between the Classical and Terminal A-Horizon. The process of social stratification at Qustul has already been discussed in previous sections, both in terms of the types and wealth of artefacts, and the pharaonic symbolism depicted on the censers found there. With regard to imported artefacts, 25% of the pottery is of Egyptian or Syro-Palestinian origin (Appendix E), predominantly consisting of transport and storage jars, which attest the importation of grain and wine by the Nubian chiefdom in exchange for exotic goods. Among the imported items, marine shells, garnet and carnelian reappear, the latter in the form of beads, amulets, and rubbing pebbles. Turquoise, which is present at Sayala, is not attested here, while amethyst, also sourced from Central Africa,[60] appears in fairly significant quantities. The percentage of imported goods at Qustul is notably higher that at the previous cemeteries, and the variety of grave goods is also greater, with the inclusion of model objects, amulets in distinctive forms, numerous cosmetic palettes, and various types of jewellery. Based on the evidence presented so far, it can be concluded that the phenomenon of social stratification and the presence of imported goods in Nubian territory go hand in hand, with trade and cultural hybridisation emerging as one of the driving forces – or perhaps the primary driving force – behind the development of complex societies.

[60] Amethyst mines are reported also in Egypt: at Abu Diyeiba (near Wadi Waseef) and near Wadi el-Hudi. However, the former was active during the Ptolemaic-Roman age, while the latter during the Middle Kingdom (Harrell 2012). Since in Egypt amethyst was rarely used before the Middle Kingdom, the author believes the Central African provenance for Nubian amethyst as more plausible than an Egyptian one.

As early as 1995, Gatto already highlighted the stagnation in prehistoric and protohistoric research in Lower Nubia, primarily attributed to the objective impossibility to reprise fieldwork due to the presence of Lake Nasser. Moreover, the data collected and published by archaeological missions in the region is often fragmented and, to a considerable extent, has not undergone systematic analysis yet. Thus, a re-examination of the existing documentation proves desirable, both regarding excavation reports and for a thorough comparative study of the recovered materials (Gatto 1995: 101). However, during the last twenty years Nubian archaeology has experienced a boost in fieldwork activity, with the salvage project related to the construction of the Merowe Dam and the beginning of the Qatar-Sudan archaeological project, both involving the Middle Nile Valley (Näser 2020: 39). Additionally, as Rampersad noted (Rampersad 1999: 436-438), many aspects related to the culture of A-Horizon remain unclear. Firstly, it is necessary to provide absolute radiocarbon dating for its earliest phase, which is currently lacking. Similarly, archaeozoological and archaeobotanical analyses of faunal and floral remains are warranted, both for studying distribution and clarifying the domestication process of plants and animals. Thirdly, a quantitative study on pottery and its associations is needed, as the only serious typological classification available at the present day was conducted by Nordström and it solely pertains to the material discovered by the Scandinavian Joint Expedition during the UNESCO Campaign in the 1960s (Nordström 1972; 2006).[61] Furthermore, regarding the nature of animal burials in human necropolises, a deeper examination would be beneficial to clarify the numerous ambiguities and to enable effective comparisons with animal symbolism in nearby Egypt, in the Western and Eastern Deserts and in the Middle Nile Valley. Finally, moving beyond Williams' hypothesis concerning the royal status of Qustul's tomb owners would allow the site's detachment from its unique status, thus facilitating its analysis within the social development of Terminal A-Horizon. This would shed a light on social transformations and recontextualise the artefacts within a broader framework, overcoming the current interpretation of them as anomalies, more akin to antiquarianism and the cult of "museum-worthy artefacts" than to a proper analysis of their archaeological context. Ultimately, the author believes a comprehensive survey of the material retrieved during the three major Nubian Surveys is essential, together with research into the exact location of dispersed artefacts and osteological remains, to create a detailed corpus which would serve as a foundational basis for future studies in Nubian archaeology.

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[61] More recently, two notable works include Nordström, Bourriau 1993 and the slightly different and more general work of Romain David on ceramic studies (David ed. 2022).

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Appendix A – Animal Tombs

PERIOD	CEMETERY	TOMB	DOGS	GOATS	CATTLE
Early A-Horizon	Shellal 7	223	1 (beheaded)		
		224	1 (beheaded?)		
		227	1		
		228	1		
		231	2		
		252	3		
		255	1	1	
		256	1		
		264	1		
Classical/Terminal A-Horizon	Naga Wadi 142	14			1 (uncertain date)
		15			1 (uncertain date)
		16		1	
		17		1	
		17a		1	
Terminal A-Horizon	Qustul L	L3			1 (2 bones)
		L6			1 (beheaded)
		L20			1 (beheaded)
		L25			1
		L26			1
		L27			1
		L33			1 (unusual orientation E-W)

Adapted from Flores 1999: 134-141 and Reisner 1910: 39-45.

Appendix B – Shellal Tombs

N.	Bodies	Gender	Age	Necklaces	Bracelets Anklets	Clothing (leather)	Beads	Pendants Amulets	Palettes	Pottery	Malachite	Resin	Needles pins	Ivory items	Bone items	Rubbing/ grinding implements	Maces	Axes	Baskets	Grains seeds	Ostrich
201	1	N.D.	child	1 shell		1 bunch	1 ivory 1 beryl														
202	2	M; F	adult	1					1 slate	2 bowls (fr.)	bits										
203	1	M	adult				shells			fr.											
204						1 cap (?)	1 bone/ shell														
205	1	M	adult			1 bag (?)															
206	1	F	adult																		
207	1	F	adult	1 shell					1 granite 1 hard speckled stone			1 lump				1 diorite stone					
208	1	M	adult			1 pudenda sheath (?)															
209	2	F; N.D.	adult; foetus										2 bone 1 wood			1 black stone 1 pebble					
210	1	N.D.	infant																		
211	0						14 beryl 8 carnelian 35 jasper 6 steatite	3 beryl													

N.	Bodies	Gender	Age	Necklaces	Bracelets Anklets	Clothing (leather)	Beads	Pendants Amulets	Palettes	Pottery	Malachite	Resin	Needles pins	Ivory items	Bone items	Rubbing/ grinding implements	Maces	Axes	Baskets	Grains seeds	Ostrich
212	1	N.D.	adult																		egg-shells (fr.)
213	1	F (?)	child			1 cap (?)				1 bowl											
214	1	M	adult						1 slate												
215	1	N.D.	adult							1 bowl (fr.) 1pol-ished ware (fr.)											
216	1	N.D.	adult						1 slate (half)												
217	1	F	adult				2 shells				1 bit										egg-shells (fr.)
218	1	M	adult																		
219	1	M	adult																		
220	0?	N.D.	infant?				shells carnelian			1 cup 1 bowl 1 sieve		1 lump				1 pebble					
221	1	M	adult		1 ivory		shells									1 flint chip					
222	2	M; F	adult adult				shells		3 granite 1 flat stone	1 bowl	bits		1 bone	1 spoon		2 pebbles					
224	2	F dog	adult			mass (?)	shells			pot-sherds				1 figu-rine		1 pebble					
225	N.D.	N.D.	N.D.			1 thong	shells			pot-sherds	fr.										
226	1	M	adult																		

N.	Bodies	Gender	Age	Necklaces	Bracelets Anklets	Clothing (leather)	Beads	Pendants Amulets	Palettes	Pottery	Malachite	Resin	Needles pins	Ivory items	Bone items	Rubbing/ grinding implements	Maces	Axes	Baskets	Grains seeds	Ostrich
229	1	M	adult									1 lump			1 worn bone		1 speck-led stone head				
230	0				ivory (fr.)	sewed cloth	shells		2 slate	1 cup (half)					1 goat horn	1 pebble	1 speck-led stone head 1 handle bit	1 black stone head	1		
233	1	M	adult	2 shell	2 ivory	twisted cord	2 shells		1 pebble	pot-sherds						1 pebble					
234	2	M; F	adult adult		1 ivory		ivory 1 shell reptile rings (?)			1 open pot						1 stone 2 speck-led stone		1 black stone head			
235	1	N.D.	child													1 pebble				multi-ple	
236	?	N.D.	N.D.																		
237	1	F	adult		1 tortoise shell		shells														
238	1	F	adult													1 pebble					
239	1	N.D.	child																		
240	1	N.D.	child				shells		1 stone	2 cups		1 lump				1 pebble					
241	1	M	adult							pot-sherds	fr.										
250	1	F	adult	1 seeds	1 shell	1 bag (?) 1 cap (?)			1 stone		fr.		1 bone		1 horn spatula	1 pebble					feath-ers
251	1	N.D.	child																		

N.	Bodies	Gender	Age	Necklaces	Bracelets Anklets	Clothing (leather)	Beads	Pendants Amulets	Palettes	Pottery	Malachite	Resin	Needles pins	Ivory items	Bone items	Rubbing/ grinding implements	Maces	Axes	Baskets	Grains seeds	Ostrich
253	1	M	adult		1 ivory		shell	1 pendant		1 pan (half) 1 cup (fr.)	fr.				1 spatula 1 horn						
254	1	N.D.	infant	2 shell	1 jasper/ shell	1 bag 1 mass		2 pebble 4 tortoise shell crescents	1 stone				1 wood			2 stone 1 pebble			1		
257	1	M	adult																		
258	1	N.D.	infant				4 shells														
259	1	N.D	infant																		
260	1	F	adult				2 shells														
261	1	F	adult																		
262	1	N.D.	adult																	1 dum nut 1 seed	
263	1	F	adult	1 shell/ coral		1 coil of twisted thong	shells								1 sharpened rib 1 horn spatula						
265	0																				
266	1	N.D.	adult											1 spoon (fr.)							
267	1	M	adult																		
268	0													1 spoon (fr.)							

Table elaborated basing on Reisner's excavation report (Reisner 1910: 39-45).

Appendix C –Sayala Tombs

N.	Bodies	Copper implements	Ivory items	Maces	Stone objects	Bracelets	Piercings	Beads	Amulets/ Pendants	Malachite	Resin	Pottery	Palettes	Stone vessels	Rubbing/ grinding mplements
1	2	4 chisels 3 adzes 1 bar 1 harpoon	1 handle	2 gold handles 1 marble head 1 quartz head	1 slate dipper			turquoise shells garnet carnelian	1 quartz lion's head			9 bowls 4 jars 2 *situlae* 1 pan 1 pot	2 slate double bird 1 quartz 1 granite	1 bowl porphyry	1 slab 1 pebble 1 quartz pebble
2	0				1 granite censer 1 granite mortar (fr.)	mother-of-pearl (fr.)		1 cowrie shells				2 jars 1 bowl potsherds	1 pebble 1 diorite		2 sandstone slabs 1 quartz rubber
3	0				1 mica mirror	1 shell (fr.) 1 mother-of-pearl 1 ivory		shell			quantity N.D.	4 bowls 1 toilet jar 1 jar potsherds	3 quartz		1 pebble
4	3				2 sandstone mortars 1 quartz pounder 1 stone mortar 1 mica mirror (fr.)	4 10 shell bone green glazed		2 shell 1 carnelian	1 quartz pebble	quantity N.D.		1 bowl 1 pot	2 speckled porphyry 1 b/w porphyry 1 b/w stone 2 quartz		5+ pebbles 1 slab 2 sandstone slabs 1 quartz slab
5	0						1 shell (nose)	shell green-glazed				6+ bowls	1 speckled stone	1 alabaster	1 sandstone table

N.	Bodies	Copper implements	Ivory items	Maces	Stone objects	Bracelets	Piercings	Beads	Amulets/ Pendants	Malachite	Resin	Pottery	Palettes	Stone vessels	Rubbing/ grinding mplements
6	2	1 chisel			flint flakes	1+ shell (fr.) 1 mother-of-pearl (fr.)		shell cowries		quan-tity N.D.	quan-tity N.D.	1 shallow ware 2 jars potsherds 1 toilet jar 2 bowls (fr.)	1 quartz 1+ speckled stone		3 pebbles
6b*	0					1 shell (broken) 1 ivory		shells				2 bowls 1 jar	3 speckled stone 1 quartz		
7	0					mother-of-pearl (fr.) shell (fr.)		carnelian				1 bowl (broken)	1 quartz (broken)		

* In Firth's excavation reports, Tomb 6 is described in the following terms: "Grave: Parallel sides and rounded ends, 140 × 80-120 cm. Sealing slab in position across foot of grave. Burial: Skeleton contracted on L. side. Head WSW. Bones of a second burial B. in debris". Then, before the description of Tomb 7, another grave description is provided, however the tomb is not designated by a number: "Grave: Parallel sides with rounded ends 180 × 105-140 cm. Burial: Removed". Subsequently, the report mentions tombs 7, 8, 9, 10, 12, 15, 23, for a total of thirteen published tombs. It seems unlikely that the second grave mentioned together with Tomb 6 is the "second burial B. in debris", since the description both involves grave shape and burial content. Furthermore, subsequent burials within the same grave are usually given by Firth in the section focused on burial content. In this case, we have a brand-new description of both grave shape and burial content, without a tomb number assigned. It is unclear whether the unnumbered tomb cuts or superimposes Tomb 6, neither Firth mentions any kind of stratigraphic relation between the two structures. In recent bibliography, I have not found any information about this anomaly, since most authors state that, out of thirty-one tombs in Cemetery 137, Firth published only thirteen, whereas, apparently, number 6 includes two different structures, for a total of fourteen published tombs. Hence, I decided to treat separately Firth's descriptions, by assigning the number 6b to the unnumbered tomb.

N.	Bodies	Copper implements	Ivory items	Maces	Stone objects	Bracelets	Piercings	Beads	Amulets/ Pendants	Malachite	Resin	Pottery	Palettes	Stone vessels	Rubbing/ grinding mplements
8	0									frag-ments		potsherds			
9	0											1 bowl			
10	0				1 mica mir-ror							1 bowl (boat-shaped) 1 bowl	1 speckled stone		
12	0											2 bowls (fr.) 1 bowl	1 quartz		
15	0											2 bowls 1 jar	3 b/w stone 1 quartz		
23	0							gold garnet glazed steatite							

Table elaborated basing on Firth's excavation report (Firth 1927: 204-211).

Appendix D –Naga Wadi Tombs

N.	Bodies	Age	Copper implements	Ivory items	Wooden items	Stone objects	Necklaces	Bracelets	Piercings	Beads	Amulets/ Pendants	Malachite	Pottery	Palettes	Stone vessels	Rubbing/grinding implements
1	2	adult child	1 chisel 1 axe	egg-shaped cup knife handle (?)		1 mortar	1 carnelian			carnelian garnet 1 cowrie	1+ carnelian		4 jars 8 bowls 1 bottle 1 toilet jar 1 cup	3 quartz		2 tables 1 rubber 1 quartz stone
2	1													1 speck-led stone		4 pebbles
3	2	adult child				1 mortar/ censer							1 bowl 1 toilet jar	1 slate double bird 1 speck-led stone 1 quartz		
4	0															

N.	Bodies	Age	Copper implements	Ivory items	Wooden items	Stone objects	Necklaces	Bracelets	Piercings	Beads	Amulets/ Pendants	Malachite	Pottery	Palettes	Stone vessels	Rubbing/grinding implements
6*	1			1 wand/ throw stick 1 boat-shaped shid (?) 1 comb with carved giraffes	1 bow stave (?)			1 mother-of-pearl (fr.)				quantity N.D.			1 alabaster (fr.)	
7	0												pot-sherds			
8	1												2 bowls			
9	1					1 mortar							1 bowl			
11	1															
18	1												1 toilet jar 2 bowls			
19	0								1+ shell nose/lip studs		1 mother-of-pearl crescent					

Table elaborated basing on Firth's excavation report (Firth 1927: 212-216).

* Firth suggests the possibility that Tomb 6 may date to the Old Kingdom. The absence of pottery makes it difficult to ascribe the tomb to a specific date, however the shape and decoration of the comb suggest its pertinence to the Terminal A-Horizon.

Appendix E –Qustul Tombs

N.	Bodies	Sex	Age	Copper implements	Tools	Models	Shell hooks	Ivory/bone items	Censers	Necklaces	Bracelets	Studs	Beads	Amulets/ Pendants	Mica	Pottery	Palettes	Stone vessels	Rubbing/ grinding implements	Maces
L-1	0							1 worked bone (fr.)	1 lime-stone		1 deco-rated (?)		3 gold 9 faience 55 feld-spar	4 resin		Potsherds (E/N)	1 quartz	1 jar 2 bowls 1 bowl base	19 pebbles	
L-2	2	F; N.D.	adult adult		2 stands (E)* 1 strai-ner (E) (fr.) 1 carved wood (fr.)		2	1 horn comb (fr.) 1 horn-core	2 (fr.)		8 ivory (fr.) 3 shell (fr.) 1 "stone" (fr.)		Shells 5 sea-shells			3 jars (N) 3 jars (E) 3 miniature cups (fr.) 1 faience jar potsherds	6 sand-stone	23 jars 12 bowls 1 boat (?) 1 alabas-ter fragments	Pebbles 4 pestles 2 mortars (fr.)	
L-4	0						1											1 fr. 5 bowls	1 mortar	
L-5	0				1 pot-stand (E) 1 carved wood (fr.)		9					1+	2 square (?)		fr.	1 faience jar (fr.) bowl sherds potsherds (E/N)		6 jars 3 bowls	1 mortar	
L-7**	0						2					2								
L-8	0						1	1 ivory jar (fr.)			1 ivory (fr.)		shell carnel-ian			1 pot potsherds			2 stone balls	

* E stands for "Egyptian", N for "Nubian"; S-P for "Syro-Palestinian".

** Due to the absence of pottery, Williams posits L-7 to be an animal burial. However, subsequent works (Flores 2004; Hartley 2015 and related bibliography) do not include this grave amongst animal burials. Given the doubt about the nature of this tomb, I decided to include it amongst the human burials.

N.	Bodies	Sex	Age	Copper implements	Tools	Models	Shell hooks	Ivory/bone items	Censers	Necklaces	Bracelets	Studs	Beads	Amulets/ Pendants	Mica	Pottery	Palettes	Stone vessels	Rubbing/ grinding implements	Maces
L-9	0								2 fr.							2 bowl (N) 1 storage jar (N) 1 jar (E) 2 bowl (E) 1 S-P 5 cups 4 miniature cups 2 pots potsherds	1 pottery	3 jars 3 bowls		
L-10	2	M: N.D.	adult adult			1 carved wood (bovine leg?)			1							1 jar (E) 1 bowl (E) 2 bowls (N) potsherds		1 jar 1 alabaster jar (fr.)	1 mortar 1 pestle 1 carnelian pebble	
L-11	0				"incised piece of stone" (?)	1 food model (earth/ clay) 1 hippo foot (pottery) 1 eye inlay	9	1 ivory stick (fr.) ivory (fr.) 2 bone handles	1 "Archaic Horus" 1 incised 1				19 carnelian gold garnet 4 crystal		fr.	10 miniature cups 4 bowls 7 bowls (E) 6 jars (E) 8 pots potsherds (E/N)		7 bowls 1 bowl base 15 jars alabaster (fr.)	1 carnelian pebble 1 mortar (fr.) 4 pestles pebbles	1 head (fr.)
L-12	2	M?: N.D.	adult child								1 ivory (fr.)					potsherds				
L-13	0						13						shells 2 beads (?)			5 bowls (N) 3 bowls (E) 3 jars (E) (fr.) Potsherds (E/N)		1 jar	1 carnelian pebble	
L-14	1	F	adult				2		1		1 ivory (fr.)	3					1 amethyst		1 carnelian pebble	
L-15	2	M; F	adult adult	1 tray							10 shell (fr.)		1 quartz/ agate			5 storage jars (E) 1 jar (E) 1 cup 1 bowl	1	1 double jar 3 bowls 1 bowl (N) 1 jar	pebbles	

N.	Bodies	Sex	Age	Copper implements	Tools	Models	Shell hooks	Ivory/bone items	Censers	Necklaces	Bracelets	Studs	Beads	Amulets/ Pendants	Mica	Pottery	Palettes	Stone vessels	Rubbing/ grinding implements	Maces
L-16	0				1 pot-stand				1 calcite (?)		1 ivory (fr.)					4 bowls (E) 1 miniature cup				
L-17	1	N.D.	adult	1 awl 3 rings			1673	1 ivory spoon 2 points 1 ivory seal		2 shell 1 gold	1 gold 31 shell 15 ivory	2642 plugs 128	*nerita* shell 741 carnelian 313 garnet 231 shell	3 bag-shaped 3 carnelian (globular) 2 carnelian (cone) 1 gold fly		1 storage jar (E) 2 storage jars 1 strainer jar (E) 8 bowls 2 cups 1 miniature cup 1 boat (?)	4	6 jar 2 bowl	Pebbles 1 mortar 1 pestle 1 green pebble	
L-18	1	F	adult													1 bowl (E)				
L-19	0			1 awl fragments	3 pot-stands	1 "piece of open tile" (?) 1 hippo head (terra-cotta)	4	2 burnt ivory (fr.) 1 ivory casket leg 1 ivory pin (fr.) 2 ivory jars (fr.) 1 ivory cup (fr.) 1 ivory inlay	2 incised 1 blackened (?) 2 fr.		2 ivory 1 ivory (fr.)		7 carnelian shells		7 fr.	1 strainer (E) (fr.) 5 miniature cups 1 jar (N) 1 jar (E) 1 double jar 1 tricorner boat 5 bowls (E) 7 pots 1 cookpot 1 sherd (S-P) potsherds (E/N)	1 amethyst 1 fr.	alabaster fr. 6 bowls 2 jars 1 porphyry jar	3 pestles pebbles 7 polished pebbles	
L-21	0						fr.													
L-22	1	M?	adult				6	1 ivory hook (fr.) 2+ ivory fr.	1 decorated 1 1 fr.				4 shell 4 carnelian 3 amethyst 1 "long" 1 "white"			1 flask (E) 1 faience 5 miniature cups 1 saucer (E) 1 pot 1 jar (N) 1 jar (E) (fr.) potsherds	2	3 jars 2 bowls 1 bowl base alabaster fr.	6 pestles 3 pebbles Polished pebbles	

N.	Bodies	Sex	Age	Copper implements	Tools	Models	Shell hooks	Ivory/bone items	Censers	Necklaces	Bracelets	Studs	Beads	Amulets/ Pendants	Mica	Pottery	Palettes	Stone vessels	Rubbing/ grinding implements	Maces
L-23	0				3 pot-stands	26 tokens (clay) 1 hippo head spout 1 game-board (alabas-ter)	3						3 shell 1 car-nelian 1 gold			22 storage jars (E) 1 miniature cup 2 bowls 1 bowl (E) 1 pot potsherds	1 (fr.) 1 with feet 1 quartz-ite 5	4 jars 1 jar (S-P.) alabaster (fr.)	1 flint blade	
L-24	1?	N.D.	N.D.	1 finial 1 spearhead 1 bed inlay	4 pot-stands	14 gam-ing balls (carnel-ian, faience, am-ethyst, b/w stone) 1 token 1 stone inlay 1 game-board (lime-stone) ochre-ous clay 1 hippo ear (ter-racotta)	1	1 bone ring 3+ ivory gaming pieces	1 lime-stone 2 1 fr.				87 gar-net 2 crys-tal 252 faience 7 globu-lar 307 carnel-ian 1 gold	2 car-nelian (fr.) 1 hippo (minia-ture)		2 jars (E) 1 storage jar (E) 2 jugs (S-P) 5 bowls (E) 2 bottles (E) 6 miniature cups 3 pots Potsherds (E/N/S-P)	2 3 quartz	1 vessel (“unusual form”) 1 jar 1 bowl sherds	1 carnelian pebble 2 mortars pebbles sandstone fr. 5 pestles 2 quartz peb-bles	1 head
L-28	0				pot-stand (fr.)														1 polished pebble	
L-29	0															1 bowl 1 biconical jar (fr.) potsherds		1 vessel	pebbles 1 mortar (fr.)	

N.	Bodies	Sex	Age	Copper implements	Tools	Models	Shell hooks	Ivory/bone items	Censers	Necklaces	Bracelets	Studs	Beads	Amulets/ Pendants	Mica	Pottery	Palettes	Stone vessels	Rubbing/ grinding implements	Maces
L-30	0								1							1 pot/bowl potsherds (E/N)		3 jars 1 bowl 1 vessel 1 base	1 quartzite pestle	
L-31	2	F; N.D.	adult child					scattered animal bones								1 bowl 1 jar potsherds		1 bowl (?) 6 bowls*** 1 jar***		
L-32	0							8 bone awls								1 ladle				

Table elaborated basing on Seele's excavation report and Williams' publication of Cemetery L (Seele 1984; Williams 1986: 198-388).
*** The six bowls and the jar were found in two unnumbered and unlocated shafts, west of L-31. Ac-cording to Williams, it is plausible that the objects originally were part of the funerary equipment of tomb L-31.

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

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Abstract

The study of ancient Egyptian metallurgy is an emerging field. While hundreds of analyses of the chemical composition and technology of metal objects have been conducted, there is incomplete knowledge about the techniques, manufacturing processes, and working conditions of the early metalworkers in the region. The metalworking scenes in ancient Egypt, are, on one hand, informative, since they depict several stages of metalworking, from the weighing of crude metal to the production of metal sheets for the fabrication of vessels. On the other hand, the accompanying texts delve into critical aspects of the depicted activities, offering valuable insights into technical details. This paper examines the texts accompanying the metalworking scenes from the Old Kingdom to offer a clearer understanding of the various stages in the metalworking process, the technical treatment involved, and the working conditions in one of the most demanding industries of ancient Egypt. It will also cross-reference visual depictions with existing textual sources to assess the accuracy and depth of knowledge regarding metalworking practices.

Keywords: Accompanying texts, Workshop scenes, Metalworking, Metals, Old Kingdom tombs, Vernacular language, Ancient egyptian metallurgy

1. Introduction

Ancient Egyptians were neither the inventors of metallurgy practices nor the most innovative in its development. However, metals, particularly copper and gold, held significant importance in their culture (Odler 2021). The tomb paintings and reliefs of ancient Egypt, even if created within a specific funerary context and reflecting particular religious purposes, nonetheless serve as a significant source of evidence for reconstructing the history and culture of ancient Egyptian society. Metalworking scenes are among the areas that have frequently lacked attention. Although influenced by artistic conventions and often stylized, the details depicted in ancient Egyptian metalworking scenes can offer valuable insights into their methods of production, labor organization, tool design, and usage. When analyzed carefully, these scenes reveal subtle variations that might otherwise go unnoticed – especially in cases where they cannot be confirmed through the archaeological record alone. General surveys, such as those by Petrie, Lucas and Harris, and Nicholson and Shaw, provide some context. In the realm of ancient Egyptian industry-specific monographs, recent studies include analyses of metalworking scenes by Jungst, Scheel, and Davey, as well as commentaries on

specific production aspects by Davey, Altenmüller, Bamberger, Garenne-Marot, Kuhlmann, Odler, Verly, and Hampson. The early studies of the accompanying texts of metalworking scenes in the Old Kingdom are those of Erman et al. (1919) and Montet (1925). Although these works still provide useful information for the understanding of metalworking stages, they are considered out-of-date, because a large quantity of new evidence has provided a more extensive knowledge, as it will be discussed later. The cornerstone of the studies on ancient Egyptian craftsmanship is the work by Drenkhahn (1976) which contains very useful information about metalworking. In addition, Scheel (1985; 1986) published in more elaborated interpretation of metalworking inscriptions. For over four decades, the standard reference on craftsmen in workshop[1] settings has been Rosemarie Drenkhahn's *Die Handwerker und ihre Tätigkeiten im alten Ägypten*. However, her research was focused neither on analyzing how craftsmen were depicted nor conducting a stylistic or chronological breakdown of workshop scenes. Instead, her goal was to shed light on the professional status and social roles of the various occupational groups represented, as well as their work practices, designations, and organizational structures (Odler 2023). Furthermore, much of her analysis has been supplemented or updated by the discovery of over 60 additional scenes since her initial study (Hampson 2022). Recently, Odler (2023) published his encyclopedic monograph on copper in ancient Egypt. The book provides a comprehensive examination of copper's role in ancient Egyptian society across a significant chronological span. It also explores the use, production, technological development, and significance of copper in ancient Egypt from the prehistoric period through the Pyramid Age and beyond. In addition, Hampson published a detailed study on workshop scenes from Old Kingdom. The first section examines the context, distribution, and tomb placement of the scenes in question. This is followed by a detailed analysis of the scene content, organized alphabetically according to the seven major industries identified in the corpus. A further chapter is devoted to the analysis of all inscriptions pertaining to the scenes and includes a summary of their transcription, application and distribution. Meanwhile, part two consists of a comprehensive catalog that centralizes all research data relevant to the study for the purpose of cross-referencing (Hampson 2022). With the recent publications by Rademakers et al. (2020-2021), Davey (2022), and Hampson (2022), Odler (2023), alongside the ongoing excavations by the French mission at Ayn el-Sukhna on the Red Sea coast (Claire Somaglino and Georges Verly) and the works of the Belgian Archaeological Mission of the Royal Museums of Art and History in Brussels at el-Kab (80 km south of Luxor), it is an ideal moment to consolidate these findings into a unified narrative. Additionally, archeometallurgical research and experimental archaeology offer different insights into the processes of metalworking in ancient Egypt. From 2004 onwards, the Ayn el-Sukhna (Sorbonne University, Ifao, and Suez Canal University Mission) conducted metalworking reconstructions based on experimental archaeology principles to reduce malachite to copper prills. Later, they melted it inside a crucible using

[1] One of the most valuable sources from the Middle Kingdom is Papyrus Reisner II, a work log from a metalworking workshop dating to the reign of Senusret I. It offers valuable insight into what ancient Egyptians valued in metal objects.

wood charcoal and blowpipes, aiming to produce liquid copper at a temperature of 1200°C. This experiment primarily relied on the metalworking scenes from the tomb of Rekhmire (TT 100, 18th Dynasty). However, the experiment did not succeed due to the insufficient information about the process that the scientists gathered from the accompanying texts. This paper analyzes the texts accompanying the metalworking scenes[2] from the Old Kingdom, to provide a clearer understanding of the various phases of metalworking process and technical treatment, along with the working conditions in one of the most challenging industries in ancient Egypt. It will also correlate visual representations with existing textual sources to evaluate the accuracy and depth of knowledge about metalworking practices.[3]

2. Metalworking accompanying texts: A quantitative assessment

The first appearance of a metalworking scenes in the Old Kingdom can be observed in the 4th Dynasty in Giza. The tombs of Khuenra (MQ 1), Meresankh III (G 7530-7540) and Nebemakhet (G 8172 and Lepsius 12) show for the first time metalworkers in two-dimensional representation. Nevertheless, such scenes were devoid of any texts. The remarkable inquiry when studying the metalworking accompanying texts is their occurrence during the Old Kingdom. It is important to clarify the reason for choosing the Old Kingdom period. Unlike the metalworking scenes from the New Kingdom, those from the Old Kingdom include significant technical details and accompanying texts. Examining these scenes and their texts is essential for understanding the development and continuity of metalworking practices over time, as well as their impact on technological advancements. These scenes reflect techniques that differ from those used in the New Kingdom. In a recent article, Motte (2021) examined the speech genres of daily life scenes in the Old Kingdom as part of his PhD research. He concentrated on defining the identity of these speech genres by addressing three key aspects: the mode, which relates to the rhetorical dimension; the themes, which pertain to the space-time framework and recurring patterns; and finally, the forms, which explore the interplay between the first two axes (Motte 2021: 296) The analysis of metalworking texts is based on representations from 32 tombs of the Old Kingdom.[4] Through a detailed analysis

[2] I had personal communication with Christopher Davey in 2014-2015, during which he mentioned that he was preparing to publish and comment on the metalworking texts from the Old Kingdom. However, this work was never published.

[3] This paper is extracted from my PhD thesis *Metalworking Scenes during the Old and Middle Kingdoms: A Linguistic, Iconographic and Analytical Study*, Faculty of Tourism & Hotels Department of Guidance Alexandria University (2016).

[4] In the last two decades the compilation of material has been acknowledged as a vital research tool by the Universities of Oxford and Leiden, along with the Museum of Fine Arts, Boston. This recognition has led to the development of prominent online platforms such as The Oxford Expedition to Egypt Scene Details Database, MastaBase, and The Giza Archives. The author utilized the Oxford Expedition to Egypt Database (OEE) to compile a list of tombs featuring metalworking scenes. Altogether, 37 metalworking scenes have been discovered, depicting the processing of gold, silver, electrum, and copper, as well as other unspecified metals. The most recent of the tomb of Ptahshepses at Saqqara. Additionally, a metallurgical scene in the tomb of the funerary priest Wahty at Saqqara is yet to be published. The author then turned to The Leiden MastaBase to gather essential statistics, aiming to better understand the significance of these scenes in the decoration programs of Old Kingdom tombs. It is worth noting that the author benefited from the Leiden MastaBase when it was initially published as a CD, and it is now available online.

of the texts during the Old Kingdom (Fig. 1), it has been noted that throughout that period metalworking scenes include 61 texts in the form of titles, captions, and dialogues. These texts serve to complement the associated imagery by clearly identifying the depicted actions, personnel, or objects. In some instances, they also offer additional technical details about the processes shown, utilizing industry-specific terminology and workshop-specific idioms. The peak of the use of different genres of speech captions in private tombs lie between the mid-5th Dynasty to the 6th Dynasty (Motte 2021: 299). They are divided into four main categories (Fig. 2):[5]

- Captions: 29.51%
- Damaged: 3.28%
- Names/Titles: 18.03%
- Dialogues (Spoken): 49.18%[6]

The distinction between narrative texts and discourse genres is essential when analyzing metalworking texts in context. These texts align more closely with the discourse genre than with narrative forms. Discourse focuses on active, ongoing communication or instruction, primarily employing the present tense to convey immediacy and relevance. It also frequently utilizes first-person (I/we) or second-person (you) perspectives, emphasizing interaction, directives, and self-reference (Motte 2021: 300). In general, when examining the texts associated with the theme of workshop activities, several key points related to their structure, content, and purpose would emerge. Firstly, the majority of workshop scenes include inscriptions, appearing in about 75% of the tombs on Old Kingdom. Among these, the most significant texts are dialogues between workers (Hampson 2022).

3. Phases of the metalworking process and its accompanying texts

The metal, *i.e.* copper or gold production process involves four main stages: ore procurement and transport, metal storage and transactions, melting and object production, and the use and reuse of artifacts. The most expansive treatments of the industry occur in the tombs of Nebemakhet (LG 86), Mereruka (LS10, Teti Cemetery, PM III, 525-534), Niankhkhnum-Khnumhotep (PM III, 641-644; Hampson 2022). This article focuses on the technical aspects of metalworking as reflected in the accompanying texts and scenes. Below, I will list the texts from each work phase and analyze them to enhance our understanding. The work phases are organized as follows:

3.1. *The weighing of the crude metal/metallic objects*

Weighing plays a pivotal role in metal production, serving as both the initial and final stage of the process. At the outset, the processed ore or semi-finished product (such as an ingot) is weighed, while at the end, the finished items are weighed before being handed over to the supervising official and

[5] The Leiden MastaBase Project, launched in 1998, created a database of iconographic programs in Old Kingdom elite tombs from the Memphite area (2600-2150 BCE). The MastaBase CD-ROM, released in 2008 and now available for free on Zenodo, provides detailed analysis of themes, their organization, and placement within tombs. It explores variations in tomb art, focusing on regions like Saqqara and Giza, and offers insights into Old Kingdom funerary culture. A user guide is included to assist with navigating the database. More information can be found on the project website.

[6] Regarding the calculations of text occurrence statistics, the database is organized into main themes and subthemes, each with a specific abbreviation. We are focusing on the main theme "trades", which is abbreviated as TR. Under this theme, the subtheme for metalwork is designated with the abbreviation M. You can have more information. https://digitalegyptology.org/mastabase/test/.

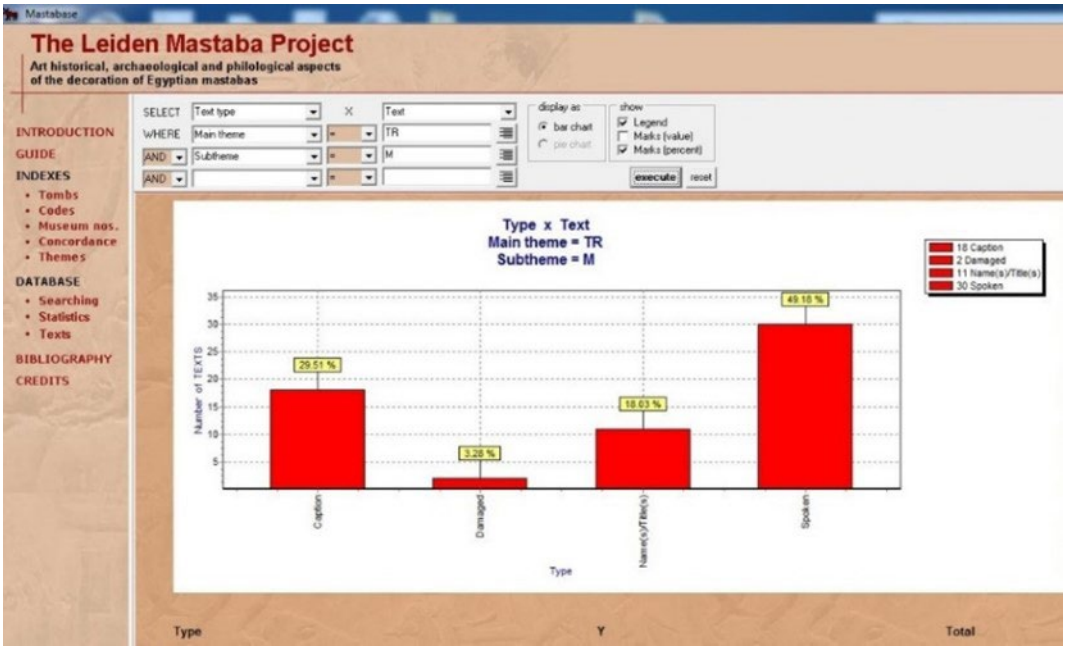

Fig. 1. Distribution of Metalworking text types over Metalworking texts. After the Leiden MastaBase Database.

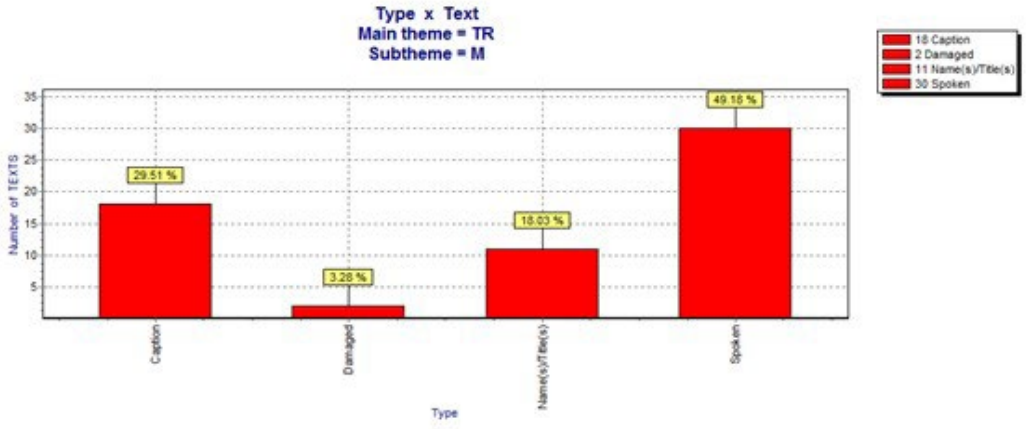

Fig. 2. Statistics were gathered by first selecting the "text type", which was set to "text". Next, the user chose "where", aligning it with the main theme of "TR" (trade themes). Finally, the subtheme was selected as "M" for metalworking.

ultimately delivered to the tomb owner or the treasury (Odler 2023). There are four tombs -Iymery (G 6020, LG, PM III, 170-174), Mereruka (LS10, PM III, 525-534), Ibi (TT 36, PM IV, 243-244), and Senedjemib (G 2378, LG 26, PM III, 87-89) – that feature weighing scenes of the crude metal. According to Figure 1, the accompanying texts are divided into four main categories: captions, damaged texts, names (titles), and spoken dialogues. The phase of weighing crude metal or metallic objects encompasses all four categories. The metal which is being weighed is designed

as *bỉꜣ* 'metal', and the weighman which is called *'mḫꜣtỉ'* 'Weighman' Mereruka (LS10, PM III, 525-534). Meanwhile, in the tomb of Senedjemib (PM III, 87-89) the text reads: *ỉmy-rꜣ … Ffỉ* 'The Overseer … Ffi'. This legend appears between the weighing scene and that of the hammering scene. In the tomb of Ibi (TT 36, PM IV, 243-244), a similar process can be seen in weighing the finished objects. The scene title is *f(ꜣỉ)t bỉꜣ*, 'Weighing the metal' (Valbelle 1977). Here, nevertheless, there is no dialogue, but the text reads: *mꜣꜣ sỉ ỉ(w).s m ỉnr*. It infers that the scale is 'in weight' and therefore the weighing process is over. The previous sentence has different interpretations as follows:

- Erman: 'Check, if it is from stone' (Erman et al. 1919);
- Montet: 'Look at it! It is in stone!' (Montet 1925);
- Kuhlmann: 'Look at it (*i.e.* the scale)! It is in weight' (Kuhlmann 1976);
- Scheel gives another interpretation. He suggests that the position of the inscription and the posture of the persons involved in the weighing scene could be interpreted as a call from the overseer who stands to the left of the scale to the weighman who stands to the right. The translation could then read: 'Check it (the scale) [to see if] it is in weight (if it is in balance)!'. The weighman leans towards the scale at this request, in order to obey the order!' (Scheel 1985).
- Altenmüller provides a new interpretation. He suggested that the text must be translated as 'Look at it (*i.e.* the indicator of the scale)! It is on the side of the stone weights' (*mꜣꜣ ỉw.s m ỉnr*) (Altenmüller 1986). The overseer, to whom it is addressed concerning lack of metal, touches with his hand the string to which the scale-pan with stone weights is attached (Motte 2021: 300). He is checking the correct weight of the stone weights and convinces himself of the preciseness of the scale, his task being now to determine exactly the difference between the weights and the delivered metal and thus to secure the actual height of the shortfall of metal.
- Hampson recently referred to this text as a method of dating. She suggests that the close similarity between these accompanying texts suggests that the artists copied the decorative designs from one tomb to another (Hampson 2022).

However, the significance of this phase lies in the dialogues and exchanges among metalworkers. These conversations are crucial for understanding the working conditions. These dialogues are found in the tombs of Kaemrehu (D 2, S 905, PM III, 485-487) and Mehu (G 2423, PM III, 94) In Kaemrehu a dialogue starts: *n wnt ỉ(w).s n bỉꜣ* and the answer *ỉ(w).s m ỉnr*. Khulmann suggested that these are vernacular expressions. He interpreted the dialogue as follows (Khulmann 1985):

- The left worker: *n wnt ỉw.s n bỉꜣ*, 'There is no more metal' as the beginning of the dialogue
- The right worker: *ỉw.s m ỉnr*, 'It (*i.e.* the scale *mḫꜣt*) is in weight (=it is balanced)' as the answer.

However, Altenmüller suggested another interpretation. He starts with the right statement (Altenmüller 1986: 7-14).[7]

- *ỉ(w).s m ỉnr*, 'It (the indicator of the scale) is on the side of the stone weights' (Valbelle 1977);

[7] He suggests that the expression "iw.s m inr" refers to an imbalance in the scale, where the scale pan with stone weights is heavier than the one with metal objects. This causes the scale to tilt toward the side of the weights rather than the metal. Conversely, the expression "iw.s m inr" indicates the opposite situation. In this case, the scale is again imbalanced, with the stone weights causing the scale pan to hang lower than the one containing the metal objects. It is worth mentioning that stones are still used for weighing in Egypt today, primarily among villagers and ordinary people.

- *n wnt i*(*w*).*s n bi3*, 'Really, it is not in favor of the metal'.
- Hampson translates the last sentence as *iw.s m inr*, "It leans to the weight' (Hampson 2022).

It is noted that the crude metal to be weighed is represented on the left pan of the scale. The person acting on the left of the scale starts the dialogue: 'There is no more metal!'. His colleague on the right of the scale is filling the right pan of the scale with rectangular stone weights 'inr' until it is perfectly balanced.[8] The man engaged in weighing holds an additional stone weight in his left hand, which is unnecessary for achieving balance, as the scale is already 'in weight'. The weighman informs his colleague saying: 'It is in weight'. The weighing process is finished and the weighman clearly tells his colleague the number and value of the weighing. His colleague takes note of the result. According to Altenmüller (1986), the result of the weighing process is not in the side of the metalworker. This can be inferred because of a detail of the representation of the weighing man. He holds a stone weight in his free hand which he has taken from the pan with the weights (that in a previous moment hung lower). In other words, he is trying to determine exactly how much metal is missing. If he were to put the stone weight he is holding on the scale again, it would show the deficit in metal.

In the tomb of Mehu (G 2423, PM III, 94), the weighman addresses his speech to the overseer of metalworkers. The dialogue reads: *f3 nw r m3ˁ ḥr-tp mḫ3t*, 'O overseer, weigh this correctly!' (Hampson 2022);[9] *iw s nỉ Mnw ḥr mḫ3t*, 'The 'Senmenu' is on the scale!'. The dialogue is structured in two distinct parts:

a) *The first part*: It contains an instruction directed at the overseer of the metalworkers, emphasizing the need to carefully measure the discrepancy between the amount of metal delivered and the amount returned. The order stresses that this measurement should be fairly conducted, ensuring that the weighing process remains unaffected by any external influence.

b) *The second part*: It addresses an issue related to the imbalance of the scales. It deals with the concerns or discrepancies regarding the accuracy of the balance used for weighing the metal, highlighting the need to address and rectify any inconsistencies in the weighing equipment. Finally, the lack of some metal is recorded by the scribe. He is the 'Judge and scribe Baefba' in office. His duty as officer is explained as the text reads *sš m f3ỉt bi3* 'Writing down (the result) of metal weighing'(Altenmüller 1986; Piacentini 2002).[10]

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[8] Odler (2023) proposed that the rectangular weighing stones, used as a determinative for concepts related to weighing, depicted in Old Kingdom metalworking scenes be identified as *dbn*. This term refers both to the unit of measurement associated with these stones and to the objects themselves, crafted by artisans. Furthermore, the shapes of semi-finished metal products – such as rings, coils, or spirals – can be inferred from the semantic associations of the term *dbn*. Moreover, Odler noted that silver bracelets from the burial equipment of Queen Hetepheres were referred to as *dbnw*, and the term 'Craftsman of Deben' was mentioned in the tomb of Nyankhkhnum and Khnumhotep as a circumstantial designation rather than a full-time category of Old Kingdom craftsmen (Odler 2023).

[9] Hampson mentioned that the scribe used an adverb to indicate that the expectations regarding quality have been satisfied.

[10] Mehu held the highest positions in administrative, priestly, and judicial fields during the 6th Dynasty. Several scribes were also part of this prominent family's staff. In his tomb, some scribes are depicted as bearers of offerings, while one is shown in the traditional scene of weighing the ingots.

3.2. *The Melting Process of the Metal*

The accompanying texts of melting scenes provided a more detailed description of the melting process itself, specifically referencing the metals intended to be melted such as *bi3*, 'metal/copper'[11] or *ḏʿm*, 'Electrum'. The action of melting is expressed as: nbit *bi3*, 'Melting metal' and *nbit ḏʿm*, 'Melting electrum'. Gold and silver are heated, as it is expressed by *fst nbw*, 'Heating of gold' and *fst ḥḏ-nbw*, 'Heating of silver'. Similarly to the weighing phase, the four categories of accompanying texts were also present in the melting process, offering a detailed and comprehensive overview of the entire procedure, as it follows:

a) *Melting process*

The melting scene is a common feature in the majority of tombs within the metalworking scenes, serving as the standard representation of the industry. This aligns with its role as the foundational stage preceding all other phases of production. Its consistent inclusion is further highlighted in the tombs of Mehu (G 2423, PM III, 94) and Kagemni (LS 10); where it was chosen for decoration despite spatial constraints (Hampson 2022). After the weighing phase, the crude metal[12] was placed in a crucible and set over the fire. The metalworkers were then required to blow air with considerable force into the charcoal under the crucible, in order to melt the metal prills.[13] The notable accompanying texts of the melting process are found on the wall tombs of Mereruka (LS10, PM III, 525-534), Iymery (G 6020, LG, PM III, 170-174), Ankhmahor (PM III, 512-515), and Hem-re (PM IV, 243) presented as dialogues between the metalworkers. The accompanying text "*ds mɜ pw sɜḥ mnḏwt.f nti ḥnʿ.i*" in the tomb of Mereruka (LS10, PM III, 525-534) is identical in meaning to "*wdi r ṯbwt.f ds mɜ pw*" in the tomb of Iymery (G 6020, LG, PM III, 170-174). In both statements, there is a request to blow air into the crucible, as it is new and the metal inside requires further work to be melted. The different modes of expression for the same content may reflect variations across historical periods, with the tomb of Iymery (G 6020, LG, PM III, 170-174) dating to the 5th Dynasty and that of Mereruka (LS10, PM III, 525-534) to the 6th Dynasty (Forbes 1972; Weinstein 1974).[14] According to Davey, the sentence *ds mɜ pw* should be interpreted as: 'It is a new

[11] The widespread use of arsenical copper in Old Kingdom Egypt is well-documented, with evidence of its presence at nearly all Egyptian sites. This suggests that either the copper came from arsenic-rich ore deposits or arsenic was intentionally introduced during processing (Odler 2023). Arsenical copper was favored for its silver-like sheen, making it a luxury item in ancient Near Eastern cultures, including Egypt (Chen 2021).

[12] I should clarify that smelting metal refers to the process of extracting metal from its ore by heating and melting (reduction process), while melting metal refers to the process of heating metal until it becomes liquid (refining process). The metalworking scenes represent only the melting process, not the smelting process. This means that the ancient Egyptian artist depicted the initial phase, such as weighing the crude metal, but omitted the smelting process in order to showcase the melting process using blowpipes and crucibles.

[13] Copper prills, common in production and often alloyed in crucibles, lack a specific name in texts. The plural sign of three small circles may reflect their droplet-like shape, with the term nws from Amenemhat II's annals being a potential designation (Odler 2023).

[14] The sentence 'nbt biA wdi r tbwt.f ds m3 pw' is used by Forbes (Forbes 1972) erroneously interpreted as: 'It is molten, knock hard at its bottom, here is a new pot!', which probably means that copper has been melted and the foreman is summoned to thrust open the clay stopper at the bottom of the melting pot to let the copper flow into a new pot.

crucible'. It is commonly observed in metalworking scenes. It is typically used when a new crucible or pot is employed for the first time. During its initial use, a substantial amount of extra heat is required to initiate and sustain the endothermic reactions within the ceramic material (Barsoum 2003).[15] This is necessary as the pot is heated to approximately 1100°C for the first time, ensuring that it can effectively handle the high temperatures needed for metalworking processes. Therefore, the expression serves as a directive to increase effort from the blowpipers during this critical initial phase, highlighting the importance of their role in managing the extra energy needed (Davey 2011: 25-36). Similarly, in the tomb of Iymery (G 6020, LG, PM III, 170-174), it reads: *wdi r ṯbt.f ds mꜣ pw* Give to its bottom,[16] mate, it is a new crucible!'. Therefore, it is understood that air or oxygen should be blown to the bottom of a new crucible in order to raise the temperature. To stress this point the metalworker used *ds mꜣ pw*, 'It is a new crucible'.[17] The word *ds*, 'Jug' (*Wb* V) can therefore be directly seen as a synonym for *bḏt*, 'crucible'. In the tomb of Ankhmahor (PM III, 512-515), the statement occurs, but it is presented in the form of a dialogue: worker 1: *mꜣꜣ ḥr.f ds mꜣ pw* 'Look at it, it is a new crucible' (*w*)*di m ṯbt.f wrt nt*(*y*) *ḥnᶜ*.(*i*) *ḥn.k m ᶜnḫ* 'Give well to its bottom, mate, as much as possible', meanwhile, worker 2 *ʾIri r ḥst.k mꜣꜣ* 'Yes, Sir!' Similarly, in the tomb of Hem-re (PM IV, 243), the text reads: '*wdi r kbwt ds mꜣ pw wnì.kw r ḥr nfr*'. Scheel suggests interpreting it as 'Give to the bottom, it is a new crucible; hurry up to the beautiful face!'. The second part *sꜣḥ mnḏt* along with the term *mnḏt* warrants a thorough examination, as various interpretations have emerged in scholarly discourse. Previous interpretations of *mnḏt* have ranged from "crucible wall" to "pouring out the hole of the crucible" (Montet 1925; Drenkhahn 1976; Hampson 2022), "melting mass" (Moussa and Altenmüller 1977), "nasal-hole" (Erman et al. 1919), and "cheek/wall" (Westendorf 1961; Meeks 1977). If 'cheek' is seen as a metaphor, surely right, for 'wall' ('crucible wall'), then *sꜣḥ mnḏwt.f ntì ḥnᶜ.ì* should be translated in this case as: "Come (close) to its walls, mate!" (Grapow 1960). Similarly, Hampson interprets it as "Reach its cheeks, comrade!", describing the outer walls of the crucible as "cheeks" in the context of workshop terminology (Hampson 2022). Grapow suggested that *mnDt* should be understood metaphorically, similar to the expression *ḥr nfr*, which describes the shiny appearance of molten metal within the crucible (see below). This metaphorical interpretation encouraged a deeper exploration of the term's significance beyond its literal meanings. *i.e.* the melting operation. To achieve an accurate interpretation of *mnḏt*, it is crucial to consider the specific context in which it appears, particularly during the melting operation. The nuances of the melting process, including the physical characteristics of the materials and the environmental conditions involved, can inform our understanding of how *mnḏt* is interpreted. It is known that the temperature of burning charcoal increases with the intensity of breath; thus, blowpipe nozzles were designed with small apertures to maximize air velocity. However, this restriction in the air jet limited the area of the fire being ventilated. Consequently, the

[15] The endothermic reactions within the ceramic material refer to processes that absorb heat during chemical reactions.

[16] Hampson translates it as: "Place at its sole".

[17] With this is obviously meant that air must be blown on the charcoal lying on the bottom of the crucible, so that the hearth goes up more quickly.

expression likely serves as an instruction to direct the blowpipe at the small opening above the temporary barrier, allowing the breath to effectively ventilate the fire inside the crucible, just above the molten metal. Therefore, a translation such as: "Point (the blowpipe) at the gap (above the barrier)" seems plausible (Grapow 1960). Drenkhahn suggested the translation as follows: 'Touch this pouring hole!'. The equivalence of the crucible walls with the pouring hole must nonetheless be doubted, since the blowing by the six melters[18] (in Mereruka tomb LS10, PM III, 525-534) around the crucible walls is much more effective for the melting process than it would be blowing air to the pouring hole (Davey 2009: 37-46).[19]

b) *The expression nfr ḥr/ḥr nfr 'Beautiful Face'*

It is important to discuss here the expression *nfr ḥr/ḥr nfr*, meaning 'Beautiful face'. The expression literally means 'beautiful face', but it serves as a metaphor, generally thought to refer to the bright color of the molten metal's surface (Hampson 2022). This suggests that the phrase encourages the metalworker to act quickly with the molten metal to prevent it from freezing (Davey 2011: 25-36). Scheel further elaborates on this point, suggesting that the crucible and its contents were metaphorically perceived by the melters as real individuals (Scheel 1985). They noted that the surface of the molten metal – its 'face' – became 'beautiful', indicating that its appearance was favorable. This transformation signified that the metal was ready for further work, thus indicating that the melters had successfully completed their task (Edel 1955). This example illustrates how language in ancient Egyptian texts not only conveys practical and technical information but also enriches the narrative surrounding the melting process, imbuing it with human qualities and emotions. In this context, it is easy to imagine that the melters may have referred to the filled crucible itself as a 'head'.[20] This personification further highlights the close relationship between the metalworker and the crucible, underscoring the crucible's vital role in the transformative process of metallurgy. Therefore, the melters needed to observe the crucible closely to determine the precise moment when the metal begins to liquefy. A text reads: *wnỉ.ṯw wrt r ḥr nfr ỉ pḫr m bḏ*, 'Be quick, mate! (my fellow worker), hey, stir well in the crucible!'. The metalworkers were asked to blow more intensively into the hearth, in order to reach the melting point. Such text highlights different aspects of performance, including speed, efficiency, teamwork, and quality production. For example, the emphasis on rapid task completion is most clearly demonstrated by the repeated use of the directive "Hurry!", conveyed in the form *wnỉ.ṯw* (Hampson 2022). In the same time, after the liquefying phase, it is necessary to stir the metal properly in the crucible. According to Drenkhahn (Drenkhahn 1976), the stirring doesn't mean to mix crude metal with

[18] Estimated groups of the metalworkers comprised ten men, within it also their supervisors.

[19] Indeed, the crucible shape in Mereruka tomb was designed to concentrate heat, conserve charcoal, and facilitate pouring molten metal. This design likely evolved into the crucibles of the First Intermediate Period and Middle Kingdom, retaining the front hole but featuring a bowl-shaped base.

[20] Regarding the use of the word "head", Grapow suggests a connection between '*ḏꜣḏꜣ*' (head) and '*ḏꜣḏꜣw*' (pottery container) (*Wb* V). This implies that a bowl or crucible can symbolically represent one another. Additionally, the crucible often has a rounded shape reminiscent of a head (Curto 1962; Forbes 1972). Consequently, the contents of the crucible, which the metalworkers observe during their process, can be viewed as the "face", while the walls of the crucible represent the 'cheeks' of this metaphorical face.

the rest, in order to speed up the melting process. More probably, according to Scheel, the 'Stirring of the molten metal' (with a wooden stick) is a procedure of refining, by which specific elements loosely present in the molten metal should evaporate or be modified (Scheel 1985). An accompanying text, in the tombs of Iymery (G 6020, LG, PM III, 170-174) and Senedjemib (PM III, 87-89), reads *sḳ pḫr mnḫ* 'Hey, mix/stir properly!' which serves as a directive for refining the molten metal (Scheel 1985). According to Hampson, these texts strongly prioritize the importance of completing tasks swiftly and effectively, presenting efficiency as a key objective (Hampson 2022). A relevant statement appears in the tomb of Niankhkhnum and Khnumhotep (PM III, 641-644), which reads: *šmšm ṯ3w ḥr sn.f w3 mnḏt im nḏrw* (Hampson 2022). The first part reads: *šmšm ṯ3w ḥr sn.f* 'The air is hot due to its brother' (Altenmüller 1984), 'The air is hot because of breathing' (Hampson 2022). This part is attested, also, in two other tombs, both dating to the 5th Dynasty: Ptahshepses in Abusir, and that of Kaemrehu (D2; PM III, 486 [2]) in Saqqara. The second part of the statement *w3(i) mnḏt im nḏrw* should be interpreted: 'The walls of the crucible glow, do not touch!' wAi would therefore be translated with the meaning of 'To dry', (*Wb* I) where the *Wörterbuch* refers to *w3* 'Embers'. Possible synonyms to 'Dry' are, among others, 'Roast', 'Simmer/Carbonize at low temperature', 'Burn' and 'Glow', so that *w3i* can surely be translated as 'Glow'. *Nḏri* has to be translated in its original meaning of 'hold' or 'touch'. (*Wb* II). The text asserts that the metal's liquefied state is most distinctly depicted by a figure leaning or bending toward the furnace while holding a rod or stick. This tool is used to maintain the flame's intensity and stir the molten metal (Hampson 2022). In summary, the melting scenes typically feature interactions among colleagues, often involving directives aimed at ensuring the work is performed flawlessly. Control over the fire in metalworking was more effectively achieved using blowpipes rather than pot-bellows, which were heavier and less commonly employed. While bellows, especially when used with tuyeres, were better suited for larger fires requiring a more general application of heat, blowpipes provided greater precision in blaze control. However, the efficiency of blowpipes came with a drawback: the physical effort needed to operate limited the duration for which a worker could use them continuously. Thus, blowpipes were preferred for their control and precision, despite the physical strain they placed on the operator (Davey 2011: 25-36).

c) *The pouring of molten metal*

There is one unique inscription describing the pouring of the molten metal. It occurs in the tomb of Wepemnefret (PM III, 281-282) *wdḥ bi3*, 'Pouring of the metal'. It describes the scene itself. The pouring action is marked by a high level of standardization in the scenes corpus. Most examples typically feature the bending of the back and the holding of the crucible by its sides, with some variations showing the inner elbow raised to illustrate the turning motion of the arm as the crucible is emptied (Hampson 2022). As mentioned above, the molten metal should be of 'Beautiful face', *i.e.* liquid enough to be poured. This stage is expressed by *iw nfr ḥr ir wrt*, 'The face is beautiful, very much' The metaphor appears in the inscriptions of the melting scenes and has been explained extensively in that section. A rare evidence is the depiction of cooling molten/casted metal by dousing it with water, which occurs in the tomb of Pepyankh (PM IV, 125-126). A text reads: di *h3i nšnw ḥr skbb* (Edel 1955).

According to Scheel, it could be translated 'Give, that the vessel part rises up in order to cool it!'. Another suggestion for translation, according to Kanawati, is "Put the material down that it cools: (Kanawati 2014), or 'Let the liquid go down on it to be cool!' (Hampson 2022). The metalworker asks his colleague to rise up and put down the crucible in order to cool it, so that they can handle it. The answer is given by the seated metalworker: *ỉry.ỉ ỉr ḥst.k*, 'Yes, Sir' or 'I am acting according to your praise'. The metalworker had evidently to fasten or to oversee the cooling down of the molten metal (by moistening it with water?; Scheel 1985). This particular formula appears in the metalworking accompanying texts, expressing a positive response to specific orders or calls. In the tombs of Mehu (G 2423, PM III, 94) and Ankhmahor (PM III, 512-515), it reads: *ỉrỉ.ỉ ỉr ḥst.k*, 'I am acting according to your praise' (Erman et al. 1919; Montet 1925). In terms of meaning, this call is most accurately translated as "Yes, sir!". Projecting the Western view onto Egyptian genres would inevitably lead to misunderstanding(s), since each epoch has its own system of genres. Indeed, the dialogues of metalworkers are still reflected in colloquial Egyptian. For example, the master is always giving instructions to his pupils, directing them to the adequate process of fulfilling their tasks. The previous sentence can be understood in the frame of colloquial Egyptian *"Irỉ.t hr hst.k"* "Yes, sir", «يمل عم اي رضاح». An interesting detail shows the use of pads to carry the burning metal pots. Indeed, the use of insulating pads to carry the crucible, thought to be made of wood, stone, or clay, is a detail found only in Memphite tombs. Without the use of holding pads, the hands are positioned flat against the crucible to represent the cupping action, even though this does not reflect the actual process.[21] Usually, crucibles were made from a refractory and insulating but weak ceramic, new crucibles were fired lightly to about 700°C or were made from a thicker sun-dried clay. The creation and operation of these crucibles required expertise and skillful manipulation, which must have been acquired from by a well-defined craft tradition. That tradition appears to be depicted in several Old Kingdom tomb reliefs. During the reconstruction experiment of melting copper prills at Ayn Sukhna site, by the French mission, the craftsmen used plant reeds to carry the crucible. Moreover, the angle of pouring may indicate specific technical and regional variations. The vertical pouring position, found at Giza (Wepemnefret PM 282 [6]), suggests a relatively high level for pouring such hot liquid. In contrast, the curved flow is a distinctive feature of tombs at Saqqara, such as that of Mereruka. The height from which the metal was poured seem to have been exaggerated, for artistic purposes (Hampson 2022). Davey mentioned that the craftsmen used sticks to remove the impurities of melting action. This is confirmed by the depiction of such process on tomb walls. The use of a stick to hold back impurities in the molten material and to regulate the flow is uniquely illustrated in the tomb of Mereruka (LS10, PM III, 525-534). The size and shape of the crucible and mold depicted in the pouring scenes support Davey's argument that this procedure was necessary for casting a larger volume of material. Moreover, the tomb scenes reveal that molten metal was not

[21] Crucibles were typically made from a refractory, insulating, but fragile ceramic. New crucibles were either lightly fired to about 700°C or crafted from thicker sun-dried clay. Their creation and use demanded expertise and skill, likely developed within a well-established craft tradition, which is depicted in several Old Kingdom tomb reliefs (Davey and Hayes 2023: 13-14).

poured into a mold but onto a flat surface, where it flowed out and was hammered as it cooled to form a sheet approximately 20 cm in diameter and 1.5 mm thick (Davey and Hayes 2023: 17).

d) *The hammering/beating of metal foil*

Like the previous inscriptions, the hammering/beating scenes also include inscriptions that label the activity: 'Beating or hammering foils (metal sheet)'. These inscriptions were short and conveyed easily comprehensible statements. For example, on the Unis causeway, the inscriptions in the tombs of Mereruka (LS10, PM III, 525-534) and Mehu (G 2423, PM III, 94) each read as it follows: *sḳr ḏˁm*, 'Beating the Electrum'. The molten metal was shaped by beating it with round or ovoid hammer stones and using anvils made of metal, stone, or wood. Three common lower body postures are depicted for the beating action: squatting, kneeling, or sitting with knees drawn up. These postures are shown with various arm positions (Hampson 2022).

4. The work circumstances

4.1. *Dry and hot environment*

Due to the challenging working conditions, the workers sought to drink liquids to endure the hot air. The text in the tomb of Kaemrehu (D 2, PM III, 485-487) reads: *'ḥnḳt(n)skr ỉtỉ'*, which translates to 'Beer of Sokar, prince/mate.' This response reflects the intense circumstances under which the melting process took place, characterized by strenuous work and the hot breeze from the hearth. The metalworkers requested their overseer to provide them with refreshing beer, specifically the beer of Sokar (Helck 1971). The reference to the god Sokar is not surprising, as Sokar is associated with Ptah (Roccati 1982), the patron of craftsmen and artists, making him also responsible for all metalworkers. Additionally, the domain of Sokar, the deity revered by metalworkers, extended beyond copper and gold to include iron – particularly celestial iron and copper derived from stars and meteorites (Odler 2023). Another statement connects Sokar to the metalworkers. An inscription from the tomb of Djadjaemankh (PM III, 483-484) reads: *'ḥw(ỉ) ḥmsw n skr ḥmww pw'* (Erman et al. 1919; Montet 1925; Hodjash and Berlev 1982; Altenmüller 1984: 7-14). Scheel interprets it, albeit with some reservations, as: "Ah, that there were no faults for/in Sokar, oh, these craft (these arts)!" (Scheel 1985). This statement can be seen as an appeal from the metalworker, lamenting that there can be no rest or errors in the service of Sokar. Meanwhile, Hampson translates it as "Drive off sloth for Sokar, this craftsman!". This suggests that invocation was a prevalent feature of the workshop vernacular (Hampson 2022).

4.2. *Fatigue and burden work*

One interesting detail in the metalworking accompanying texts is that metalworkers often expressed their fatigue from the intense and laborious work involving high temperatures. For instance, in the tomb of Mehu (G 2423, PM III, 94), the text reflects the challenges and exhaustion faced by these workers, highlighting the demanding nature of their craft. It reads: *ỉw.(ỉ) wrḏ.kɜ(ỉ) ḥr kɜt m pr m ḥnḳ.ỉ*, 'I am tired due to the work in the house of my friend'. Motte noted that these speech captions emphasize the workers' bravery and sacrifice. (Motte 2021: 303). Meanwhile, Hampson interprets this statement as a requirement for prompt action to meet a production deadline, as demonstrated in a conversation between the two stringers. It indirectly highlights how expectations for the swift completion of tasks are communicated. (Hampson 2022).

4.3. *Motivation to work properly and teamwork*

According to Hampson, references to teamwork, both explicit and implicit, frequently appear in the inscriptions. These include workmen addressing each other affectionately with terms like sn 'brother', mry 'my dear', or *ḥnʿ.i* 'comrade', or instances where a partnership between them can be inferred (Hampson 2022). Different requests to improve work quality were found. For example, in the tomb of Mehu (G 2423, PM III, 94) the text reads: *hɜ(i) ir.k nti ḥnʿ.i*, 'Fall down, mate!' (Moussa and Altenmüller 1977); 'O, come down, comrade!' (Hampson 2022). It is a request to hit very hard on the metal foil in order to flatten it well. Various requests aimed at improving work quality have been identified. For instance, in the tomb of Mehu (G 2423, PM III, 94), the text reads: *iḥɜi in.(i)*, 'Fall down, and bring!', where ini serves as a support for the request. The worker to whom the speech is addressed answers to the call: *ini.(i) ḥm* (Edel 1955), 'assuredly, I will come on!'. In addition, direct requests to *sḳr*, 'Beat' the foil can be found in the tombs of Ptahshepses (PM III, 460-461) and Ibi (PM IV, 243-244). The call in the tomb of Ptahshepses (PM III, 460-461) reads: *sḳr wrt n* ..., 'Beat hard, not/without ...!' (Erman et al. 1919; Montet, 1925), and *skr ir(i) m pɜḳt* 'Beat, make (it) a foil/a sheet metal!' (Erman et al. 1919; Montet 1925; Hampson 2022). Meanwhile, the call in tomb of Ibi (PM IV, 243-244) mentions the type of metal to be worked *sḳr ḏʿm ir(i) m spr*, 'Beat electrum, make (it) a foil/a sheet metal!' (Erman et al. 1919; Drenkhahn 1976; Montet 1925). It can only be presumed if spr (*Wb* IV) as opposed to *pɜḳt* indicates the probably more precious electrum foil. The answer to the call in the tomb of Ibi (PM IV, 243-244) confirms the final result of the work *i.e.* that the work has been completed as desired: *wnn nfr* 'It becomes beautiful' (Erman et al. 1919).

In the tomb of Wepemnefret (PM 281-282), there is a dialogue starting with *psi nn iw wsr biɜ sšp pw*, 'Anneal this, it is hard, it is light (colored) metal!' (*Wb* I; Jungst 1982), and the answer was n wnt *šd pst.f mnḫ*. Scheel interpreted it, even if with some reserve, as: 'There is no hollow (?), when its annealing is excellent!' (Scheel 1985). The challenge with this sentence lies in the fact that the word Sd is not clear. The expression becomes clear when connected with experimental archaeology concepts. It is known that during the hammering phase, metal hardens after a certain amount of work. "Hard" refers to the disturbance of metal particles – the smallest units of metallic elements, which can include single atoms – across the surface. These disturbances can eventually be removed with further strikes. However, excessive hammering may cause the metal foil to break. Workers were particularly aware of this risk due to the formation of "bubbles" or "fractures." This issue can be mitigated by properly annealing the worked piece (Weinstein 1974: 23-25). When a worker responds affirmatively to a colleague's call, the term "*šḏ*" can likely be translated in this context as "Hollow" (referring to an air bubble). Its determinative may also suggest a "Hole" or "Hollow space" (Meeks 1977). Similarly, in the tomb of Ty (D22, PM III, 468-478), the texts reads: *di spr pw r fsi iw.f twɜ(w)*. The translation of *twɜ* is problematic (Erman et al. 1919), Montet and Jungst (Montet 1925; Jungst 1985) interpreted *twɜ* as 'hard'. Meanwhile, Scheel translated the term as 'hard,' similar to the word *wsr* in the inscription from the tomb of Wepemnefret (PM 281-82). He noted that *wsr* ('dry, withered') is a synonym for 'hard' (Scheel 1985). Additionally, *twɜ*, meaning 'raise, lift, elevate' (*Wb*, V), serves as a way to express the hardened state of the metal. Another interpretation is given by Scheel.

When the metal foil becomes hot it can be uniformly being hammered until it becomes flat. But when it cools down, it shouldn't be hammered. As a result, it becomes wavy, curvy, and the foil must be annealed again in order to be easily hammered. The expression *i̯*(*w*).*f twꜣ*(*w*) explain perfectly this very state. Scheel suggests translating it 'it is curved' (Scheel 1985). Therefore, the accompanying text of the hammering scene in the tomb of Ty (D22, PM III, 468-78), reads: *di̯ spr pw r fsi̯ i̯w.f twꜣ*(*w*), 'Give (bring) this foil to the annealing, it is curved!'. In the tomb of Niankhkhnum and Khnumhotep (PM III, 641-44), the accompanying text reads: *hꜣ*(*i*) *nw ḥr sprwi̯ sḫ wnw ḥˁ ḥmww*, that Scheel translates: 'This falls for (both) foils, the beating is present around the workers'(?) (Scheel 1985). The inscription is clearly related to the hammering stones held by the workers in their hands. With very high blows directed on the foil the metal is flattened by the hammering stones. The tomb of Niankhkhnum and Khnumhotep (PM III, 641-44) expresses the hammering by a scene caption. It reads: *srḏ m ḫr*, 'Hammering to the lower side' (Drenkhahn 1976); 'Beating the underside' (Hampson 2022).

5. The vase manufacture, polishing, gilding, and secondary activities

5.1. *Vase manufacture*

In the metalworking scenes, texts related to the manufacture and polishing of vases appear sporadically. An example of an accompanying text can be found in the causeway of Unis, but this limited evidence prevents any definitive conclusions. One scene depicts a metalworker engaged with the pouring spout of a washing vase, accompanied by the text "*wdi̯*(*dw*) *sḫꜣt*", which translates to "Fastening of the (spout of the vase) *sḫꜣt*". Likely, *sḫꜣt* refers specifically to the pouring spout itself. The second text related to vase manufacture appearing on the Unis causeway is also unclear. It reads: *tpi̯ n ḏˁm*, 'Making-*tpi̯* – the utensil for washing hands – in electrum'.

5.2. *Vases polishing*

Concerning vases polishing, there is one representation in Unis causeway that describes it as *si̯nt*, 'Polishing' (*Wb*, IV).

5.3. *Metal gilding*

The accompanying texts of gilding are attested in the tomb of Niankhkhnum and Khnumhotep (PM III, 641-44). The activity of gilding is expressed by the verb *sšr*. (*Wb*, IV; Drenkhahn 1976). According to Jungst (1985), it is best translated as 'Wrapping', since a 'Coating' of wooden objects with liquid gold is not possible. It is more probable that the objects to be gilded were 'Wrapped' with a thin gold foil or with a gold leaf.

5.4. *Secondary activities (not directly related to metalworking)*

There are two scene captions in the tomb of Ibi (PM IV, 243-44) that describe the manufacture of beads. The first inscription reads: *snᶜᶜ ḥrst i̯n ms-nḏdw*, 'Polishing of the beads by the workers of ornamental stones' (Montet 1925). The second inscription reads: *wbꜣ ḥrst ms-nšdw*, 'Drilling a hole in the beads by the workers of ornamental stones'; 'Drilling the carnelian by the jewelry makers' (Hampson 2022).

6. Discussion

During the Old Kingdom, the metalworking scenes accompanying texts represented 13.91% of the total available sub-themes' texts (115 texts) attested in elite tombs. This percentage is based on MastaBase. When analyzing statistical data, it is crucial to recognize that such data is subject

to change. Statistical data provides valuable insights based on current trends, patterns, and observations of the accompanying texts. However, its dynamic nature means that it evolves over time as new information becomes available and as conditions shift. This fluidity can impact the interpretation and relevance of the data, making it essential for any analysis to consider the temporal context and potential for change. The currently available data is expected to change in the following years, upon the discovery of new tombs. Metalworking scenes should be understood within the broader context of tomb decoration, as part of the "scenes of seeing". In these depictions, the tomb owner is shown standing or sitting, observing craftwork performed on his behalf. The scenes primarily depict the production and use of objects within the economy of delayed return. While most items produced were part of burial equipment, they may also have been used in daily life. Notably, Old Kingdom metalworking tomb scenes depict the creation of metal sheets for crafting prestige vessels rather than the casting of metal tools for tomb construction. Workshop scenes in tombs likely symbolize the role of the work in sustaining the *kꜣ* of the deceased, portraying tasks performed for the tomb owner in life as continuing in the afterlife. While none of the metalworking depictions are identical, they share consistent elements. All scenes show blowpipes directed at the front of the crucible to ventilate the fire above the metal charge, not beneath it, with two or three operators involved. Some scenes also depict crucibles being carried and molten metal poured from knee height onto a flat surface, where it was hammered into sheets. The most detailed metalworking scenes are found in the tombs of high officials, such as Ty of Saqqara, whose proximity to the king likely secured access to the best craftsmen. Tombs in central locations like Giza, Memphis, and Abusir feature the most elaborate reliefs and captions, a style that extended into the 5th-6th dynasties and influenced tombs in Meir and Deir el-Gebrawi. In contrast, tombs further south contain more minimal and descriptive captions. While these scenes offer valuable insights, many remain insufficiently published (Motte 2021: 309). In the meantime, the accompanying texts of the metalworking scenes from the Old Kingdom provide a vivid and near-authentic portrayal of workshop activities. These texts not only depict the processes and techniques employed but also offer a dynamic glimpse into the daily life of metalworkers. The frequent and sometimes peculiar captions – featuring calls, dialogues, and responses between workers and overseers – shed light on the interpersonal interactions and daily routines within the workshops. Such detailed inscriptions not only document the material culture but also reflect the evolving practices and social dynamics of the time. Analytically, the captions of each specific scene can be categorized according to their content as follows:

- the scene caption, which provides a brief title or description of the activity depicted in the wall paintings.
- the title or profession of each metalworker involved in the scene, identifying their roles and responsibilities.
- the remarks, exclamations, or dialogues expressed by the metalworkers as portrayed in the scene.
- the responses or exclamations from colleagues and overseers are detailed, reflecting the interactions and dynamics within the workshop.

This structured approach allows for a comprehensive analysis of the textual and visual elements of the metalworking scenes, facilitating a deeper understanding of the depicted activities and interactions. This subdivision aims to facilitate the distinction of the inscriptions of all

the attested sources with respect to each of the specific activities of metalworkers. For example, working instructions as well as dialogues were expressed, in addition to the complaints of the hard work, the request for beer in order to get some refreshment in the difficult conditions, such as the high temperature and the smoke caused by melting. Such inscriptions reflect a social and real life during the metalworking activities. It is observed that technical details were most frequently conveyed in the form of commands. For instance, commands recorded in the tombs of Wepemnefret (PM III, 282 [6]), Ty (D22; III, 473-4 [36]) such as *psi nn biȝ* '(Re)heat this metal!' and *di spr pw r fsi* 'Let this sheet reheat!', appear to describe the annealing process, in which metal is repeatedly heated and cooled to enhance its ductility. Although the inscriptions inherently contain a range of technical jargon, the existence of a coherent metalworking jargon cannot be readily assumed. The grammar and specific modes of expression – aside from the technical terms unique to each field – show no significant differences when compared to other textual genres. It is noteworthy that certain forms are preferred, such as the imperative used in calls and the infinitive in scene captions. From a linguistic perspective, the imperative and the initial subjunctive form *sḏm.f* are the most commonly used. The imperative serves as the standard method for commanding someone to take action. This preference is also observable in other specialized jargons within the Egyptian language (Motte 2021: 307). To conclude, this paper had shed light on the relationship between text and image. The key finding is that an object's identification is determined by its common attributes rather than the context in which it is depicted. Decorative programs in tombs highlight the owner's elite status for both contemporaries and future generations. Motte identifies seven recurring themes with speech captions from the Old Kingdom to the Late Period: agriculture, animal husbandry, butchery, crafts, dance and music, food preparation, and hunting. These scenes often depict ongoing or anticipated actions, where the imagery and text work together, with the visuals serving as determinatives and sometimes substituting for first-person pronouns (Motte 2021: 303). The use of a general term for metals, *biȝ*, highlights that the defining feature of each designation, regardless of its specific use, is the shared characteristic of the raw material. The copper production process involves four main stages: ore procurement and transport, copper storage and transactions, melting and object production, and the use and reuse of artifacts This analysis explored the role of scene inscriptions in shaping the physical and social context of ancient Egyptian craftsmen, as well as their contribution to the overall thematic presentation. Generally, the titulary of metalworkers indicates a low rank, as they could only afford smaller tombs, reflecting their relatively modest social status among Memphite officials. The texts can be categorized into several sub-groups, serving either descriptive or explanatory purposes. Notably, certain categories, especially those presented as conversations or commands, also provide insights into the workshop's organization and practices, offering additional context to the viewer. For example, the social distinction between workers and their superiors is evident in the titles used in both calls and responses. Workers of equal status address each other as *nt*(*i*) *ḥnꜥ*.(*i*), "My comrade" or "mate." In contrast, the overseer is referred to as *ỉtỉ*, 'meaning "Prince"/ "Patron"/ "Chief". The overseer issues commands using the imperative form and addresses subordinates directly with "You." The overseers were called 'chief' *ỉtỉ*, a term etymologically derived from *ỉt*, meaning father. This

designation may have been metaphorical, but it often also reflected a real sense, as the craft was passed down through generations of artisans (Odler 2023). Furthermore, the social position of specific groups of workers can be determined by titles and profession names. For example, in the representations of weighing the crude metal and metallic objects, the person in charge appears with the title of scribe, or director of metalworkers or officers with high-ranking titles. When the title is missing, the social position can be established easily in the iconography, for example the man who is busy with the weighing in the tomb of Senedjemib (PM III, 87-89), wears a wide, lightly projecting kilt which clearly denotes him as an overseer. In the tomb of Kaemrehu (D 2, PM III, 485-87) the overseer is distinguished as a member of the administration with respect to the 'Ordinary' worker through his writing instruments, reed pen and palette. No melter bears a title indicating membership in a higher social class. The clothing of melters consists of a simple, short leather kilt typical of a laborer, or at times, just a loincloth.[22] Melters, who often represent the majority of the workforce in metalworking scenes, clearly belong to the lowest social class, below the metal smiths. Unlike the hammerers or the coarsely or finely-working smiths, no specific manual expertise is expected of the melters, nor do they possess the higher education associated with scribes. It is likely that they were selected for their strength and endurance to perform this hard and unpleasant work. Consequently, it is not surprising that melters often urged one another to work through calls, while also expressing their complaints about the physical demands of their labor to their overseer and loudly requesting beer for refreshment. Similar to the metalworking activities on wall scenes, the metalworking process and crucible shape were reflected in three-dimensional art. A statue of a man melting metal in a crucible is preserved in ISAC (E10631).[23] It is carved in fine limestone and painted. The man holds a blowpipe in his hands which extends from his lips to the open side of a crucible. His cheeks are puffed out to indicate that he is in the act of blowing air into the blowpipe (Davey 2009: 37-46). On the same social level as the melters were the pourers, who likely lacked specialized manual skills, as pouring molten metal is often considered a dirty job in forges. There are no titles associated with their work, and their clothing is similar to that of the melters. The gilders appear to belong, on the contrary, to a higher level among the group of metalworkers. The title of 'Overseer of metalworkers' is attested several times among the hammerers. The hammering required, contrary to melting and pouring, more specific knowledge on the characteristics of the different types of metal like silver, electrum, gold and copper.[24] In ancient Egypt, royal expeditions were sent to mine precious metals and quarry valuable stones. The kings of ancient Egypt commissioned mining expeditions to Sinai to extract copper and turquoise (Mansour 2014). After obtaining copper as a raw material, it was melted on-site to produce ox-hide ingots, which facilitated transport to royal metallurgy workshops in the Nile Valley for use in various products. Recent discoveries by the Egyptian mission

[22] Servant statue, ISAC (E10631) depicting one of these workmen.

[23] The Institute for the Study of Ancient Cultures is the new name of Chicago Oriental Institute. Height 110 mm, length 100 mm, width 50 mm.

[24] Copper main production areas in ancient Egypt are: the eastern desert, Sinai in both Serabit el-Khadim and Wadi Nasab and Tell el-Dab'a. See Abdel-Motelib et al. 2012; Rademakers et al. 2021; Verly et al. 2022.

support this view (Mansour 2024: 87-101).[25] Although the hammerer belongs to the group of hardworking smiths, had to be able, for example, to decide if a metal piece needed to be annealed again in order to avoid severe damage to the metal foil while hammering it. The specialization of work among the hammerers on specific metals can be brought back to the different reaction of the several types of metal during hammering and other working techniques. As mentioned above in Unis Causeway and in the tomb of Mehu (G 2423, PM III, 94), all the metals were worked by a "Metalworker". Starting from the 6th Dynasty (or later) gold was hammered by a 'Goldsmith'. A clear social structure can be observed in the metalworking activities of the Old Kingdom, as evidenced by both the accompanying texts and the iconography. In this hierarchy, gilders and hammerers hold the highest positions as "hard and soft working smiths", followed by polishers. At the lowest level are the melters and pourers. The weighmen of crude metal and finished metallic objects represent an exception; while their role involves weighing, it is not strictly part of metalworking but rather an administrative procedure. Consequently, scribes and officers are categorized within the administrative personnel. Another key feature metalworking accompanying texts, besides the limited space for inscriptions – usually no more than two or three sentences – is the size of the hieroglyphs. The hieroglyphs in the speech captions are smaller to distinguish the common workers from the tomb-owner, who is depicted with larger hieroglyphs. This smaller size acts as a form of separation, much like the use of quotation marks. The accompanying texts, often considered representations of vernacular speech, are actually formalized texts found in private tombs. According to P. Vernus, these texts mimic the phrasing of autobiographies from the Old Kingdom and Late Period tombs, serving as stylized imitations of colloquial language rather than authentic examples.

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[25] Moreover, in his recent book, Odler analyzed the discovered in different archaeological sites in Egypt, such as the predynastic ingots from Maadi, Saqqara, Bet Khallaf, southern limit of Royal cemetery at Abusir, and Tell el-Daba. He reported that the ingots were made of arsenical copper. The general shape of the ingots is: flat ingots, bowl-shaped ingots, disc-shaped ingots, and plano-convex ingots as well (Odler 2023).

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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 wells 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.

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Food is a quite popular topic in cultural studies and for decades archeological research has been extensively focused on this matter. This includes broad perspectives that draw together archaeological and ethnographical case studies, deeply relying on anthropological theoretical frameworks (e.g., Hastorf 2017). The essential importance of food in defining societies as well as landscapes, shaping politics and material cultures, has always been central to the archeology of Southwest Asia. Studies have largely investigated how food consumption permeated each aspect of people's lives in the Mesopotamian world and beyond (e.g., Milano ed. 1994; Pollock 2012). On the other hand, besides some groundbreaking works (e.g., Paulette 2015; 2016), investigations regarding the collection, sorting and storage of food, as well as preparation of meals and beverages, are usually centered on specific case studies or single proxies (e.g., texts, architecture, archaeobotanical macroremains). The great importance that food production and consumption had in the history of Southwest Asia necessarily requires more interdisciplinary and broader investigations. This volume, which builds on a workshop organized at the 11th International Congress on the Archaeology of the Ancient Near East (Munich, April 2018), is the response to a much-needed wide-ranging overview of the topics of food storage and preparation. It brings together diverse research strands via the expertise of specialists from various research fields. The contributions are centered on evidence from the Early Bronze Age, including a large area from Northern Mesopotamian to the Gulf, and investigate both public and private spheres, as well as their overlap. The volume, including eight contributions, is a well-organized publication consisting of approximately 150 pages of both text and illustrations, the latter sensibly placed within the contributions themselves. These are equally divided between papers dealing with food storage and those focusing on food preparation. The authors, although mainly considering specific methodological perspectives, successfully compare the main results of their own research with evidence stemming from other kind of records and investigative approaches. In the Introduction (pp. 1-5), the editors explain the genesis of the volume following the organization of the workshop, centered on the pivotal role that food played in Mesopotamian

socio-economic organizations. The integration of diverse research fields and investigative methods regarding food preparation and storage constitute the response to the necessity of obtaining precise and complete overviews on these topics. K. Wagensonner (pp. 7-28) explores, with an abundance of detail and also via comparisons with later documents, the contribution that the still largely elusive proto-cuneiform word lists and lexical texts offer on the topics of food gathering, processing, and storage. A fundamental role is also played by administrative texts that deal with production, management, and use of plants and animals, representing a central source of information for our understanding of mechanisms of storage and mobilization of staples by centralized institutions. The author organizes the text in a rational, clear, and, at the same time, captivating structure that comprises sections corresponding to steps of food practices ('Gathering Food', 'Preparing Food', and 'Storing Food'). Within the first macro-section, sub-sections correspond to types of raw materials and, if documented, their products (e.g., 'Grain and Grain Products', 'Fruit, Vegetables, and Other Pants', etc.). As a whole, the paper has the merit of treating the texts from a broad perspective, highlighting the information given on diverse plants and animal taxa, as well as various food processing procedures, including less popular (and less documented) aspects, such as preservation and storage of meat and fish. A. Pruß (pp. 29-36) illustrates the organization of food production, storage, and mobilization at the EJZ IIIb (ca. 2425-2340 BCE, Middle Chronology) Upper City of Tell Beydar, ancient Nabada, provincial center of the kingdom of Nagar, with capital at Tell Brak. The contribution brings together information given by the administrative texts uncovered at the site and the analysis of the surrounding landscape, as well as the architectonic and material culture remains, in order to investigate how grain was produced, stockpiled, and distributed to the inhabitants under the administrative organization of the centralized institutions. In particular, the analysis is organized through a clearly arranged sequence of topics, dealing with the organization of labor, the productive potential of the fields, the redistribution system among diverse classes of inhabitants, and the configuration of food storage between domestic and super-household structures. The article of A. Bramanti (pp. 37-44) focuses on a specific case study represented by the "land-grain" texts of the Early Dynastic Umma corpus. These accounts consist of a relatively small number of texts (40) offering information about the extension of cultivated land and the amount of yield (barley) gathered. Through a careful and detailed analysis of the texts, the author demonstrates that these were the administrative accounts connected to two moments surrounding the harvesting process, the projections of expected yields and the actual amount of the harvested grains, which are then compared. This contribution thus demonstrates how central administration put efforts into the identification and managing of surplus as well as possible food loss. N. Borrelli (pp. 45-63) illustrates the administrative processes surrounding the centralized storage of grains in the province of Girsu/Lagash in the Ur III period, in a contribution articulated through many points supported by a great number of specific in-depth details. This is done through the analysis of textual documentation that records the land cultivation, as well as the amount of yield and how the grain was used, including both the movements of the goods from the provincial areas toward the capitals and storage for local usages. A large space and particular attention is given to the analysis of facilities for grain stockpiling quoted by texts. Diverse aspects are considered, including structural

features also identifiable on the basis of comparative archeological materials, as well as the location of the facilities across the natural, social, and political landscape. Textual analyses reveal the actors, and the mechanisms of supply and disbursement of goods contained in the storage facilities. This reveals a complex system of co-sharing food production and use, in which many diverse social parties participated, and that was ultimately managed by centralized administrative networks. The crystal clear and intriguing contribution of T. Paulette (pp. 65-89) opens the second half of the volume, dedicated to foodstuff preparation. The paper focuses on beer in Mesopotamia from the Late Uruk period to the end of the Bronze Age. It encompasses diverse aspects, from the brewing ingredients to the social and cultural role played by this beverage. The author offers a careful and precise analysis of evidence related to beer production and consumption, as it emerges from multiple types of proxies: textual, archaeological, and biological/chemical. The nature and the features of the beverage itself are analyzed, questioning the comparison with the western modern beer products. Through a particular focus given to the brewing ingredients in Mesopotamia in the central part of the paper, the author integrates the textual and archaeological evidence with ethnographic documentation and the results of ethnoarchaeological experimental methods. This reveals as yet unclear aspects of brewing, suggesting the necessity of rethinking the nature of it as belonging to a large spectrum of fermented beverages, such as those known from ethnographic comparisons. Moreover, the evidence about types of brewing spaces, equipment, and people involved reveal not only differences, but also similarities among diverse types of brewing manufacture, from household-level to institutionally managed ones. The paper of M. Zingarello (pp. 91-112) is dedicated to the "four-part set", a specific group of vessels found in the rich graves of Abu Salabikh and other sites of central-southern Mesopotamia and the Hamrin region, as well as in deposits of unclear nature from Mari. This set consists of a strainer bowl, a cylindrical perforated stand, a large bowl or vat, and a tumbler, usually found in assembly, even one inside the other, and thus considered as functionally related. This set, to which a spouted stand was possibly also associated, is interpreted as being aimed at the preparation and consumption of some sort of liquid food or beverage, possibly a specific type of beer. This paper offers a fresh view on the set, thanks to a careful and deep investigation of the evidence, also obtained through a coherent re-evaluation of the results published following diverse archeological expeditions over several decades. As a result of this analysis, the author highlights the social and cultural value of the ceramic set in association with the specific Late Early Dynastic and Akkadian horizons, suggesting that it could have been specifically manufactured for funerary rituals centered on drinking practices. A. Sołtysiak (pp. 113-123) highlights the advantages of bioarcheological techniques, and in particular isotope methods, for research on subsistence in Mesopotamia. The author describes how these investigative methods allow direct insights into food-related practices, especially regarding subsistence strategies, land-use patterns, and mobility/food transportation. The papers offer an overview on the diverse bioarcheological techniques that can be used for addressing farming and herding practices. It critically assesses the effectiveness of these methods with respect to the archaeological investigations in Mesopotamia, also using first-hand research conducted on pivotal case studies, such as Tell Barri and Tell Ashara. The contribution thus calls for in-depth considerations of the opportunity of systematically

adopting integrated investigative methods into archaeological studies that bring together diverse research strands. The paper of G. Scazzosi (pp. 125-142) focuses on the role of small- and large-scale bread production in the late 3rd to the early 2nd millennium BCE in the Khabur basin and central-southern Mesopotamia. The author investigates diverse types of installations and tools for bread-baking, using archaeological and textual evidence as well as ethnographic parallels, and also based on new results that were obtained from ethnoarchaeological research conducted first-hand in southern Iraq. The comparison among small- and large-scale bakeries highlights the existence of diverse food production systems respectively aimed at household consumption and their utilization at central institutions, such as palaces and temples. While all the aspects of large-scale productions were managed by central authorities, small-scale baking installations were associated with private households, and they could have been also used for commercial purposes. In the latter case, the author suggests the possibility of the involvement of private households in the bread production for institutions through commercial activities. Integrating a large selection of evidence, this paper thus contributes to highlighting aspects of the nuanced socio-economic relationships between households and centralized organizations in the late 3rd to the early 2nd millennium BCE. In conclusion, the volume offers assorted articles that consist of coherent overviews, fresh perspectives, and stimulating suggestions regarding diverse aspects of food storage and production in Mesopotamia, highlighting the potential of much-needed integrated investigative approaches and collaboration among diverse areas of research on these topics.

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In 2019, Adeline Bats and Nadia Licitra, members of CNRS UMR 8167 Orient & Méditerranée, founded the *Research Group on Storage in Ancient Egypt and Sudan*, with the aim of studying storage structures in the ancient Nile Valley and Nubia. The group organised two workshops dedicated to the topic, entitled *Architecture et techniques de construction des bâtiments et aménagements de stockage en Égypte et au Soudan anciens*, held online on the 28th and 29th of September 2020 and on th 21st and 22nd of June 2021. Two years later, Adeline Bats and Nadia Licitra collected nine interesting contributions of the two workshops in a beautiful volume published by Sidestone press, consisting of 196 pages with 80 figures (65 of which in colour) and 14 tables. The Preface (pp. 19-20) is authored by Thierry Joffroy, architect-researcher at Université Grenoble-Alpes and Director of the équipe CRAterre (*Centre international de la construction en terre*), a group founded in 1979 by some students of the École d'Architecture de Grenoble. Joffroy briefly describes the objectives of CRAterre and explains the reasons why the group decided to support the organisation of the two workshops conceived by Adeline Bats and Nadia Licitra: the construction of storage warehouses is fundamental for meeting the economic needs of ancient and modern settlements, and the hope is that multidisciplinary studies in this field can contribute to the identification of the durable solutions that the world urgently needs for its future today. Joffroy's words well describe the spirit of the workshops and, therefore, of the book, whose content is implicitly organised into two main cores. On the one hand there is archaeology, and on the other, the application of this study to the present context and its problems. This is the most innovative aspect of the book, which thus presents itself as original and different from other, albeit excellent, studies on the subject, developed mainly in France, such as those dating from the late 1970s and early 1980s by François Sigaut and Marceau Gast (see in particular Gast et al. 1971; 1981; 1985) and by Adeline Bats herself (in particular Bats 2017; 2019), although there has also been no lack of works on the subject by Italians (see, for example, Geraci 2008; 2015; Geraci and Marin 2016). This new book, however, offers readers an unprecedented dialogue between archaeologists and architects

where one discipline contributes to solving the problems of the other and vice versa. For this reason, it seems to me that the nine contributions can be divided into two main sections. The first, consisting of the first six essays, has a properly archaeological focus and is centred on Egypt, while the second brings us back to the present. The first contribution, by Adeline Bats and Nadia Licitra, entitled *Storage buildings in ancient Egypt and Nubia. Issues and perspectives* (pp. 25-53), constitutes an ideal introduction to the subject matter of the book by presenting the main issues and perspectives related to the study of storage construction in the ancient Nile Valley and is the only essay to refer in part to Nubia. It is to the authors' credit that they have devised a suggested sheet (table 3, pp. 52-53) for recording and analysing the deposit buildings, for the use of the researchers excavating these structures. After this first essay with an introductory character, the following five contributions present five case studies arranged, according to a wise construction of the material, along a chronological line from the 4th millennium BCE to the Imperial Period. To the Predynastic and Early Dynastic site of Elkab is dedicated the contribution by Wouter Claes, Stan Hendrickx and Elizabeth Hart entitled *Pits, pots and silos. Storage facilities at the Predynastic and early pharaonic settlement of Elkab* (pp. 55-67), which illustrates in detail the excavations conducted since 2009 by the Musées royaux d'Art et d'Histoire in Brussels at this site, which have made it possible to identify various storage methods (pits, jars, domestic silos and a late Early Dynastic public storage facility that testifies to the presence of an organised economy under the control of the local or central government). The essay by Marie Millet, *Les structures circulaires de stockage à Karnak aux XII^e^ et XIII^e^ dynasties* (pp. 69-82) is dedicated to a series of circular mud-brick structures to the east and north of the temple of Amun at Karnak datable to the 12th and 13th dynasties (indicating the presence of a civil quarter around the temple in the Middle Kingdom). The contribution examines structures already known in the literature and those that came to light during excavations between 2001 and 2007. A small multifunctional storage building, organised around a circulation space leading to storage rooms and a courtyard with silos, built during the Late Period at Kom el-Nogus (the ancient village of Plinthine) west of Alexandria, is the subject of Bérangère Redon's contribution, entitled *Le bâtiment BAT 603 de Kôm el-Nogous/ Plinthine: un édifice de stockage polyvalent de l'époque saïto-perse ?* (pp. 83-95). The text is detailed and well documented, but perhaps a reconstruction of the building's elevation (even if hypothetical) would have benefited the reader, who can nevertheless enjoy excellent colour photographs and a plan of the sector in which the building was found. Also very rich in colour photographs and plans is the contribution by Gisèle Hadji-Minaglou, *Le* thêsauros *ptolémaïque de Tebtynis (Fayoum)* (pp. 97-105), which takes the reader to Graeco-Roman Egypt and describes a 2nd or 1st century BCE *thēsauros* to the east of the dormitories of the temple of Soknebtynis, excavated between 1999 and 2000 by a joint mission of Ifao and the University of Milan. The chronological line of essays concludes with the contribution by Loïc Mazou, entitled *Un* thêsauros *à Bouto. Architecture et organisation d'un bâtiment de stockage dans le Delta nord-occidental à l'époque impériale* (pp. 107-115), devoted to a large food storage building in Buto datable to the early stages of the Roman Empire, which according to Mazou would have belonged to a private individual, a landowner. This supposition remains, however, in the realm of hypothesis as there are no written sources that testify , and the author prefers not to answer the question of who the beneficiaries of the surplus were stored in this building.

Anne Mayor and Thomas Pelmoine's contribution, *Variabilité des dispositifs de stockage en Afrique de l'Ouest: approches ethnoarchéologiques* (pp. 117-139), leads us to the second part of the book (although this division is not expressed in any way in the structure of the volume). The essay proposes a study of granaries in West Africa, through a first part linked to the analysis of scientific literature (see also Mayor 1989, which has two important precedents: Brasseur 1968; Bedeaux 1982) and a second part reporting the results of a field study conducted thirty years later in eastern Senegal, a region characterised by contrasting cultural groups and environments favourable to documenting the architectural variability of structures (which was the subject of Pelmoine 2020). The complex relationship between archaeology and architecture has recently been discussed in a miscellaneous book edited by Philippe Fraisse (Fraisse 2020), which however focuses on the exchanges between the two disciplines since the Renaissance. In our book, some members of the Association CRAterre (David Gandreau, Thierry Joffroy, Philippe Garnier, Nuria Sanchez Muñoz, Majid Hajmirbaba and Mauricio Corba Barreto) return to the subject. The CRAterre team has cooperated with archaeologists in the past, e.g. in Mari in Syria for the preservation of archaeological remains in mud bricks. The essay *Intérêts croisés des échanges transdisciplinaires entre architecture, archéologie et développement durable* (pp. 141-149) has the double merit of illustrating well the advantages that archaeology and architecture derive from mutual cooperation and of presenting concrete proof of this through an experimental archaeology project: the NGO Entrepreneurs du Mond commissioned CRAterre to construct an onion storage building in Senegal, in the Matam region, which the architects built after a careful study of past sources and local techniques, taking into account the environmental characteristics and the real economic and practical possibilities of the local inhabitants. The building was realised between 2019 and 2020 and is well illustrated by several floor plans and a 3D reconstruction (figs 2-4, pp. 146-147). The last contribution, *The Egyptian mud-brick silo. Technical and functional analysis of a grain storage device* (pp. 151-171), by Adeline Bats, Nadia Licitra, Thierry Joffroy, Bastien Lamouroux, Aurélie Feuillas and Julie Depaux, presents an excellent case of experimental archaeology. Adeline Bats led a team of archaeologists and architects in a project funded by the *Fondation des Treilles* to build two grain silos in France using ancient Egyptian techniques. These techniques, which Adeline Bats had dealt with in her PhD thesis (Bats 2019) and so had Leslie Anne Warden (Warden 2017), are well documented in the first part of the contribution, while the second part describes how the two silos were built in May and June 2021 with the collaboration of Roland Feuillas' bakery *Le Maîtres de mon Moulin*, which makes products using ancient grains. On the whole, all the contributions in the volume are well documented: the bibliography is always up-to-date and also takes into account many contributions that were in print at the time and were published later (e.g., Choimet 2023). Instead, as it was not published at that time, it was not possible to take into account the miscellaneous volume edited by Mennat-Allah El Dorry (El Dorry 2023), in which there are a number of essays on storage buildings from different areas and periods. Slightly more space could be given to philological discussion of the terms used for these buildings (see, for instance, Eissa 2023, not included in the bibliography). Finally, in order to better fulfil the promise of the title, more space should have been devoted to Nubia, which remains almost totally absent. Beyond this, the book is of great interest

above all because through a multidisciplinary approach it provides concrete evidence of how the study of the past is useful to the present and vice versa and, in particular, how archaeology can provide architecture with the key to understanding how people in the past respected the criteria that architecture today defines as "sustainability", proving useful in responding to the needs of the present, as Thierry Joffroy rightly states in the preface. The construction of a storage building for onions in Senegal through the study of ancient techniques, for example, far from being a purely academic exercise turned out to be an intervention of considerable importance in solving pressing problems for the region's economy. The book is on the whole well-structured and very well documented, and each contribution is interesting. The efforts of the two editors did not fail to yield remarkable results.

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