



نظام کشاورزی در دوره آغاز ایلامی شوش: تحلیلی بر گل‌نیشته‌های آغاز ایلامی موجود در موزه ملی ایران (MDP.26) روح‌الله یوسفی زشک، حسن افشاری و دنیا اعتمادی فر

چکیده

دوره آغاز ایلامی در شوش (حدود ۳۱۰۰-۲۹۰۰ پیش‌از‌میلاد) مرحله‌ای کلیدی در توسعه جوامع پیش‌حکومتی در جنوب غرب ایران را رقم می‌زند. در این دوره، شوش به عنوان یک مرکز مهم ظهور کرده و نقشی حیاتی در فعالیتهای اقتصادی، سیاسی و اجتماعی منطقه ایفا می‌کند. یکی از مهمترین ویژگی‌های جامعه آغاز ایلامی استفاده از خط بوده است، که یکی از نخستین سیستم‌های نوشتاری شناخته شده در جهان باستان محسوب می‌شود. اگرچه گل‌نیشته‌های آغاز ایلامی تا حد زیادی رمزگشایی نشده باقی مانده است، اما کلیت این گل‌نیشته‌ها و بخش‌هایی که کشف رمز شده‌اند، اطلاعات ارزشمندی را در خصوص کارکرد اداری و اقتصادی این دوره را در اختیار باستان‌شناسان قرار می‌دهد. بخش قابل توجهی از گل‌نیشته‌های آغاز ایلامی، اسناد اقتصادی هستند که در ارتباط با مدیریت منابع و فعالیتهای کشاورزی و دامپروری بوده‌اند. دامپروری و کشاورزی ستون فقرات اقتصاد دوره آغاز ایلامی بوده و نیازهای جمعیت وابسته به این نظام سیاسی را تأمین می‌کرده و مازاد محصول لازم برای تجارت، پرداخت خراج و در نهایت شرایط را برای رشد مراکز پیچیده‌ای مانند شوش را فراهم می‌کرده است. سازماندهی نظام کشاورزی، کشت محصولات و جمع‌داری انبارهای مملو از محصولات کشاورزی، موضوعاتی هستند که به کرات در گل‌نیشته‌های آغاز ایلامی به آن اشاره شده است و آنها را به منابعی ارزشمند برای درک اقتصاد معیشتی در دوره آغاز ایلامی در شوش تبدیل می‌کند. این مقاله بر پایه تحلیل گل‌نیشته‌های آغاز ایلامی شوش موجود در موزه ملی ایران (MDP.26) متمرکز است که بسیاری از آنها به طور خاص به موضوعات کشاورزی می‌پردازند. نویسندگان نشانه M56 و سایر نشانه‌های مرتبط با موضوع فعالیتهای کشاورزی را در این مقاله بررسی کرده و سپس انواع محصولاتی را که در این متون به آنها اشاره شده است را تحلیل کرده و سپس ساختار نظام کشاورزی در دوره آغاز ایلامی شوش را بر اساس این گل‌نیشته‌ها بازخوانی خواهند کرد. علاوه بر این، این مقاله به بررسی ماهیت اقتصادی و سیاسی جامعه آغاز ایلامی، از جمله نقش نظام‌های سیاسی پیش‌حکومتی در تنظیم و سازماندهی تولیدات کشاورزی، خواهد پرداخت.

واژگان کلیدی: شوش، آغاز ایلامی، نظام کشاورزی، گل‌نیشته، سیستم اداری.

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Agricultural Practices in Proto-Elamite Susa: An Analysis of Proto-Elamite Tablets at Iran National Museum (MDP 26)

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Abstract

The Proto-Elamite period at Susa (circa 3100–2900 BCE) marks a pivotal phase in the early development of the pre-state communities, situated in the southwest Iran. During this period, the Susa emerged as a major center, playing a crucial role in the region's economic, political, and social activities. One of the defining features of Proto-Elamite society is the use of clay tablets, one of the earliest known writing systems of ancient world. Although the tablets remain largely undeciphered, numerous texts have survived, offering a glimpse into the administrative and economic functions of the time. A substantial portion of these Proto-Elamite texts are economic records, many of which are believed to be related to the management of agricultural resources and activities. Agriculture and animal husbandry were the backbone of the Proto-Elamite economy, sustaining the population and providing the surplus necessary for trade, tribute, and the growth of complex centers like Susa. The organization of agricultural labor, the cultivation of crops, and bookkeeping of stores filled with agricultural crops are recurring themes in the surviving tablets, making them invaluable sources for understanding the agricultural practices during the Proto-Elamite period at Susa. This article focuses on analyzing Proto-Elamite tablets from Susa exist at Iran national Museum (MDP.26) that many of them specifically deal with agricultural topics. The authors will inspect sign M56 and attached signs to the topic of agriculture activities and then will examine the types of crops referenced in these texts, and the organizational structure of agricultural labor. Moreover, the article will explore how these tablets reflect the integration of agriculture within the broader economic and social framework of Proto-Elamite society, including the role of the pre-state in regulating and organizing agricultural production.

Keywords: Susa, Proto-Elamite- Agricultural practices, Clay tablets, administration system.

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Introduction

Susa, the most significant centers of the Proto-Elamite period, played a crucial role in the early development of complex society in southwestern Iran (Le Brun & Vallat, 1978; Damerow & Englund, 1989; Potts 1999; Álvarez-Mon, 2020). Situated in a geographically strategic location between the Mesopotamian alluvial plains and the Iranian highlands, Susa functioned as a hub between different cultural and economic zones (Amiet, 1986). By the late 4th millennium BCE, Susa had developed into a major administrative center, with archaeological evidence suggesting centralized control over resources such as agricultural produce, livestock, and labor (Damerow & Englund, 1989; Amiet, 1986). The Proto-Elamite phase at Susa is characterized by the emergence of bureaucratic institutions that relied on record-keeping for managing the community economy. These developments coincided with an increase in urbanization in neighboring lowland Mesopotamia, social stratification, and the expansion of long-distance trade networks (Alden 1982; Dittmann, 1986; Steinkeller, 2013; Desset, 2016; Dahl et al, 2018).

A defining feature of the Proto-Elamite period is the introduction of the Proto-Elamite tablets, the earliest known writing system in Iran (Englund, 2004; Desset, 2016). Unlike its Mesopotamian counterpart, which developed into cuneiform, the Proto-Elamite script remains largely undeciphered (Englund, 2004), presenting a significant challenge to researchers. Despite this, its primary function appears to have been administrative, evidenced by the types of texts discovered, which primarily deal with accounting, lists of goods, and labor allocation (Damerow & Englund, 1989; Dahl, Hawkins, & Kelley, 2018; Etemadifar & Ahmadiadzadi, 2022). The use of seals and seal impressions alongside these texts further underscores the connection to resource management and economic control (Amiet, 1986). While the intricacies of the texts and the full extent of its usage remain veiled due to the lack of decipherment, the available evidence strongly suggests its crucial role in the bureaucratic institutions managing the community economy of Proto-Elamite Susa (Englund, 2004).

Farming and animal husbandry were the foundation of Susa's economy during the Proto-Elamite period, providing the surplus necessary to support a growing population and an emerging administrative elite (Potts, 1999). The region's fertile lands, nourished by the Dez and Karun rivers, made large-scale farming possible, with crops such as barley, wheat, and legumes playing a central role in the subsistence economy (Potts, 1999). The presence of irrigation systems, a crucial element for maximizing agricultural output in the region, suggests that water management was an important aspect of agricultural production, ensuring stable yields despite seasonal variations (Hole, 1987). Evidence for this irrigation comes from both archaeological remains and the analysis of ancient agricultural practices in the region (Wright, 2006). Additionally, administrative records, including Proto-Elamite texts, indicate that agricultural workers, possibly organized into labor groups, were responsible for maintaining fields, harvesting crops, and managing food supplies (Dahl, 2005; Dahl et al, 2018). These texts often detail rations and distributions of agricultural products, further highlighting the organized nature of agricultural labor (Damerow & Englund, 1989). The communities' involvement in agricultural oversight, including grain storage and redistribution, points to the increasing complexity of economic management in Proto-Elamite society (Pollock, 1999). This centralized control of agricultural resources likely played a significant role in the development of social hierarchies and the emergence of an administrative elite (Johnson, 1982).

In this paper, an attempt is made to examine and describe a number of texts related to agricultural activities. One of the most important signs for recognizing this activity is M056~f, which is generally written on a group of Proto-Elamite tablets, most of which are kept in the National Museum of Iran. Perhaps due to being far from the bulk of the currently available Proto-Elamite tablets, kept in the Louvre Museum, it has received less attention from researchers.

Review of literature

The first Proto-Elamite tablets (2 texts) were discovered in 1899 by Jacques de Morgan, the French head of excavations at Susa. A year later, Vincent Scheil, cuneiform specialists, considered them as cuneiform texts and published them (De Morgan, 1900). During the 1901 excavations, more clay tablets were found, until Scheil published a large collection of clay tablets in 1905 under the title "Proto-Elamite" (Scheil, 1905). After excavating in the northern trench of the Acropole, Scheil published 490 new clay tablets in 1923 (Scheil, 1923). Then, in 1935, another 655 clay tablets were published (Scheil, 1935), and in the following years, more tablets were discovered, but no special effort was made to read these texts until the 1970s, when, with the stratigraphic excavation of Susa (Acropole I) by Le Brun, various attempts were made to decipher was made by François Vallat (Le Brun & Vallat, 1978; Vallat, 1971; Vallat, 1973; Vallat, 1985).

In 1978-79, the Swedish mathematician Jöran Friberg proposed an initial decipherment of a group of Proto-Elamite texts using specific counting systems similar to those in Mesopotamian texts (Friberg, 1978-79). A few years later, Peter Damerow and Robert Englund began their research on the Tepe Yahya texts and achieved interesting results (Damerow & Englund, 1989). Englund developed his research with the Susa texts (Englund, 1998; Englund, 2004). At the beginning of the 21st century, the research work of Jacob Dahl began, and in 2005, he presented an initial decipherment of the terminology of sheep and goats in the Proto-Elamite texts of Susa. His decipherments are based on numerous observations such as herd size, the relationship between males and females in the herd, the number of offspring, the relationship between mature females and milk by-products (Dahl, 2005).

The Proto-Elamite Tablets

The Proto-Elamite tablets, the earliest known writing system in Iran, remain largely undeciphered despite extensive scholarly efforts (Englund, 2004; Desset, 2016; Hessari & Yousefi, 2023). Emerging around 3100 BCE at Susa, it

consists of hundreds of unique signs, many of which appear to represent numerical values, commodities, and administrative categories (Englund, 2004; Dahl, 2005). The script shares some structural similarities with Proto-Cuneiform from Mesopotamia, suggesting a common developmental trajectory, yet it remains distinct in its sign repertoire and organization (Damerow & Englund, 1989; Cooper, 2016). While decipherment efforts have faced significant hurdles, some progress has been made in understanding the numerical system and certain logographic signs related to commodities (Damerow, 2012). This limited understanding, combined with the context of the tablets' discovery (often in association with administrative tools like seals and seal impressions), reinforces the interpretation that the Proto-Elamite tablets primarily served an administrative function (Englund, 2004; Amiet, 1986). The ongoing work of scholars analyzing the script's structure and comparing it with other early writing systems holds promise for future breakthroughs in decipherment (Desset, 2018).

Proto-Elamite tablets are flattened pieces of clay, shaped by hand and often lightly fired or simply sun-dried (Englund, 2004). These tablets vary in size, ranging from small examples measuring approximately 2 x 5 cm to larger ones exceeding 17 x 22 cm (Damerow & Englund 1989). The relatively simple nature of the Proto-Elamite script and its administrative function likely influenced the form and preparation of these tablets (Potts, 1999).

The main difference between these tablets and numerical tablets is the presence of signs, which might be called word shapes or ideograms, and also that the number of seal impressions has been reduced (Arfaei, 1387: 20; Hessari and Yousefi 2022). While numerical tablets primarily recorded quantities using numerical signs and often included numerous seal impressions to authenticate transactions (Damerow & Englund, 1989), the Proto-Elamite tablets in question incorporate logographic or ideographic signs representing words or concepts (Englund, 2004). This development reflects a shift towards recording more complex information beyond simple numerical counts (Des-

set, 2016). It's also possible that the presence of the word signs themselves served a function beyond just recording quantities, potentially indicating the nature of the transaction or the parties involved (Dahl, 2005).

These tablets were used in the Iranian plateau from around 3300 to 2800 BC (Englund, 2004:104 - Dahl, et al, 2013:358; Hessari & Yousefi Zoshk, 2022). Proto-Elamite tablets share a general resemblance in shape and proportions to Mesopotamian clay proto cuneiform tablets of the late 4th millennium B.C, including Uruk IVA and Uruk III proto-cuneiform tablets (Damerow & Englund, 1989; Englund, 1998; Green & Nissen, 1987). Similar to the earliest proto-cuneiform tablets, Proto-Elamite scribes utilized both sides of the tablet. The tablets were often rotated around a vertical axis to record totals along the upper edge of the reverse side, regardless of the remaining space on the obverse (Damerow & Englund, 1989). While sharing some similarities with proto-cuneiform tablets, Proto-Elamite tablets have several distinguishing features, including a linear layout (Desset, 2016), a header representing the household at the beginning of the text (Dahl, 2005), and an entry order consisting of an ideogram followed by a numerical notation, which differs from the proto-cuneiform sequence (Englund, 2004).

Internal Organization of the Proto Elamite Tablets

Proto-Elamite tablets can have multiple entries with varying levels of internal organization (Damerow & Englund, 1989). Some tablets may contain a simple sequence of identical entries, while others may exhibit a hierarchical order of information, such as alternating entries of workers and their corresponding grain rations (Dahl, 2005; Etemadifar & Yousefi 2023). Entries in Proto-Elamite texts correspond to the physically encased notations on proto-cuneiform texts (Englund, 1998). However, the hierarchical structure of individual Proto-Elamite entries is not reflected in a syntactical structure, unlike Mesopotamian texts (Englund, 2004). Despite different graphic forms, Proto-Elamite texts share the same general semantic structure as proto-cuneiform texts (Damerow, 2012).

They primarily function as administrative documents, recording receipts, transfers, rations, and other economic transactions. Most Proto-Elamite tablets begin with a header sign or string of signs that serves as a title for the entire text. The header most likely represents the household or individual to whom the content of the tablet relates (Dahl, 2018; Damerow and Englund, 1989: 13). After the header, the text contains an entry or entries, most often in the form of a string of ideograms or non-numerical signs (Englund, 2004: 127), which are believed to be standard concrete objects, animals, workers and professions or titles that existed and were used among families or households and modify by different numerical systems¹. Based on the structure of the string of signs, which is probably a name, it can be assumed that they have a syllabic structure that identifies an individual who has a responsibility (Hawkins, 2015:4), and finally, the total: most Proto-Elamite texts contain accounting entries, and the total was written on the back of the tablet. Many of the object signs in Proto-Cu-

1. The simplest known signs in the Proto-Elamite script belong to the numerical system, which, with the exception of the decimal counting system, are identical to the proto-cuneiform examples, since both are rooted in an ancient administrative system in the Middle East (Afshari and Yousefi, 1399: 29). Numerical value signs are transcribed with the letter N followed by a number, which is listed by Damerow and Englund (1987: 166). The meaning of the value of numerical signs depends on the numerical systems in which it is used and, consequently, the object being counted. Depending on the numerical system used, a sign may actually reflect different numerical values (e.g., N51 means 1000 units in the decimal system, but in the sexagesimal system it gives the semantic value of 120). The relationship between two signs may have a different numerical load in each counting system. For example, the signs N1 and N14 (in the decimal, sexagesimal, and bisexagesimal systems mean the numbers 1 and 10, respectively), but these two signs in the volumetric system have the numerical values of 6 and 1, respectively (Desset, 2016). Several numerical systems have been identified in the Proto-Elamite tablets: three systems used to calculate objects: decimal, bisexagesimal, and sexagesimal systems; and one system used to count continuous objects (capacity and volumetric system) such as liquids or grains, which were calculated according to their weight or volume.

neiform texts are deciphered using their pictorial value, which are generally pictograms, due to the quality of their image. However, this method is not applicable in Proto-Elamite because Proto-Elamite signs are generally very abstract (Dahl et al, 2013:366). Each tablet is probably divided into various advanced and simple forms. Unfortunately, since the archaeological contexts where each tablet was found is not clear, researchers today categorize these tablets according to their apparent evolution or textual content. The authors mainly divide the tablets of Susa into 6 main groups.

Group I; which itself is divided into two sub-groups, has the simplest textual content and tablet formation. Unfortunately, all the tablets of this group were found in classical excavations without stratigraphy, and it is not possible to give a correct opinion about their time period, and perhaps this group of texts, along with the texts of groups II and III, were used simultaneously by a different and not very educated class of scribes at Susa.

Group I.A; These are tablets that are relatively large quantity in textual content. All of these texts have very simple text, or in some cases only one ideogram with a string of numerical signs is mentioned (Fig. 1).

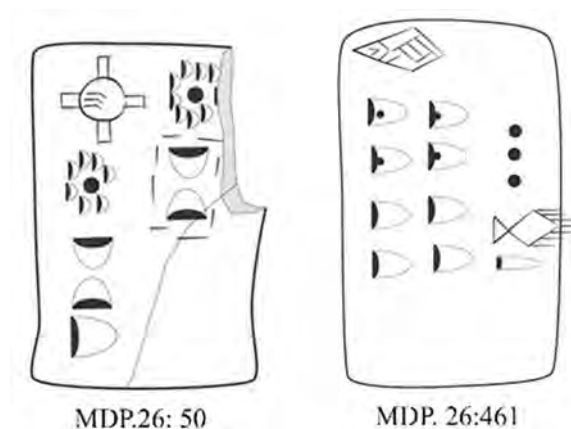


Fig. 1. Examples of tablets in the form of group I.A, image from the CDLI website.

Group I.B; These are tablets that are relatively large in size and textual content. This category of texts has several input entries (Fig. 2).

Group II: This group of tablets all have textual rules that are known as standard tablets and are divided into two parts A and B. Applying

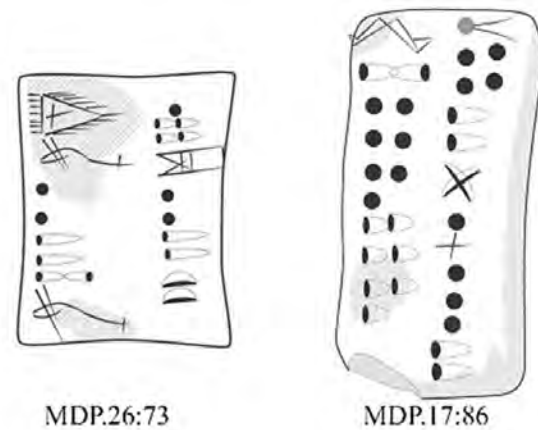


Fig. 2. Examples of tablets in the form of group I.B, image from the CDLI website.

seal impressions on Proto-Elamite tablets belong to this collection.

Group II.A: Slender and rectangular tablets whose longitudinal part is always in the main writing direction and parallel to the text direction. It is written with a thin stylus and has one or two initial signs with one or more text entries that may be summed up at the end. These types of tablets have been found in layers 16c-14b of Acropolis I (Dahl et al, 2013: 366) (Fig. 3).

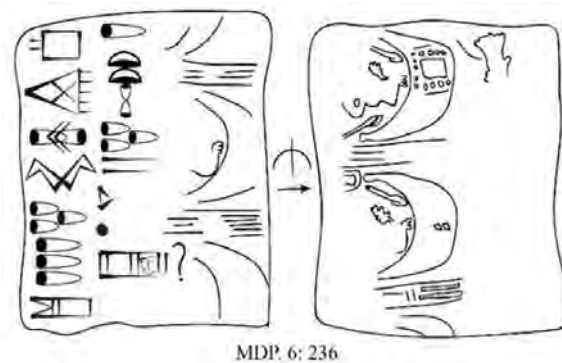


Fig. 3. An example of a tablet in the form of group II.A, known as standard texts, designed by the authors.

Group II.B: The tablets in this group, like group II.A, mostly have a regular textual structure, but they also have some differences. For example, their size and shape may be slightly different, and the way the signs are written may also vary slightly. However, in general, these two groups of tablets have many common features and seem to have been used for similar purposes. For a more detailed study of these differences, it is necessary to examine the images of the tablets and the information related to their place of discovery.



Fig. 4. Examples of tablets in the form of group II.B, designed by the authors, 1399.

Form of group III.A: Large tablets with long texts that often have one entry, and all of them were found in the classical excavations of Susa (Dahl et al, 2013: 366). This group of tablets is known for their large size and long texts. They usually contain one entry, which may include various information such as a list of goods, their quantity, etc. Since these tablets were found in the classical excavations of Susa, there is no precise information about their exact date. However, considering their appearance

and content, it can be assumed that they belong to late Proto-Elamite period (Fig. 5).

Group III.B: Large tablets with long texts and multiple entries that are classified as special tablets. This group of tablets is distinguished from other groups by its large size, long texts, and having multiple entries. Each entry can contain various information about goods, their quantity and other details related to the transaction. Due to the complexity and volume of information contained in these tablets, their study and decipherment is of particular importance and can provide valuable information about the economic, social, and administrative systems of ancient societies (Fig. 6).

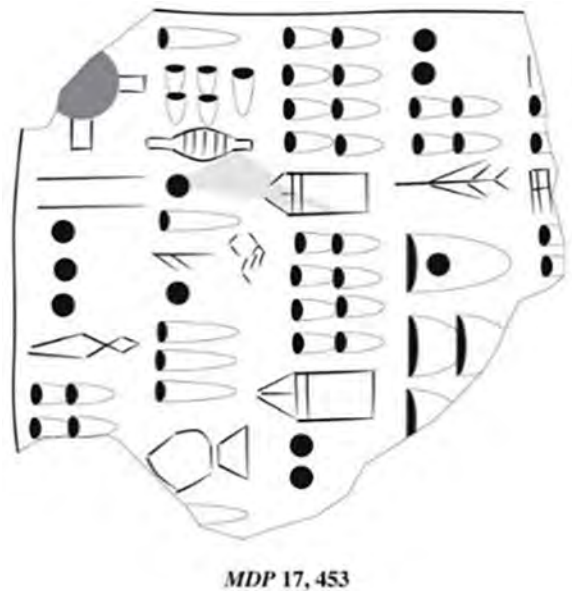


Fig. 5. Examples of tablets in the form of group III.A, image from the CDLI website.

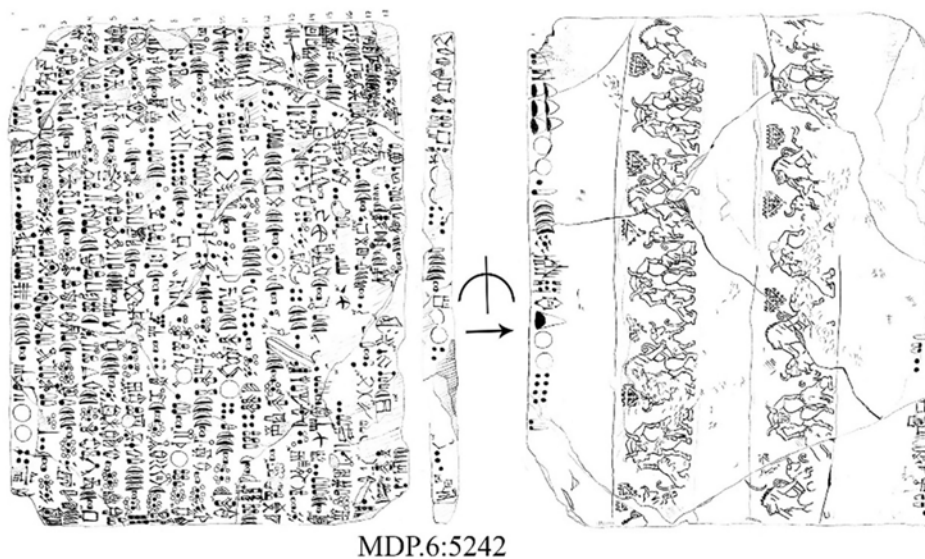


Fig. 6. Examples of tablets in the form of group III.B, image from Scheil 1905.

Proto-Elamite Tablets from Susa in the National Museum of Iran (MDP. 26)

The first excavations related to the proto-literate period in Susa were carried out by Jacques de Morgan. He was a mining engineer who visited Susa during an exploratory mission in Iran in 1889-1891 AD (De Morgan, 1900). After the French government signed a contract with Naser al-Din Shah and the monopoly of excavations in Iran was granted to France, he arrived in Susa in December 1897 AD and started excavations two days later (De Morgan, 1900). At the southern end of the Acropolis, he excavated 5 galleries equally and vertically, and in 1897 and 1898, he opened nine trenches there. He divided the layers metrically with a depth of five meters (Dahl, 2005:83; De Morgan, 1900). De Morgan's early work, while pioneering, also reflects the archaeological practices of the time, including the metrical division of layers, which while providing a basic stratigraphic framework, might not meet modern standards of stratigraphic recording (Pollock, 2012). His contributions, however, laid the foundation for future research at Susa (Amiet, 1986).

In 1903 AD, Roland De Mecquenem, with the introduction of Vincent Scheil to De Morgan, joined the Susa excavation team. Like De Morgan, he was a mining engineer and took responsibility for the excavations in De Morgan's absence. His excavation continued in the same style and method as De Morgan (De Mecquenem, 1924). With the start of the World War, the excavations were stopped and then resumed in 1920, and the previous trenches were deepened. De Mecquenem focused his excavation in several parts of Susa. From the excavations of 1907 to 1923 AD, he had obtained a large number of Proto-Elamite tablets, most of which were discovered from Sondage I in the north of the Acropolis hill at a depth of eight meters from the surface of Acropole mound, and along with part of the tablets obtained from Trench 7 (the same large trench of De Morgan) at a depth of minus 17 meters from the surface of the mound, he published them. This collection included 490 tablets, which were published in 1923 AD (Dahl, 2005; Scheil, 1923).

The excavation of Sondage I was started by Mecquenem and was excavated to a depth of minus 25 meters from the surface of the mound in the years 1911 to 1913 and 1922. With the new agreement between the governments of Iran and France from 1927 onwards, all the findings were divided equally between Iran and France (Dahl, 2005: 85). The tablets obtained from the excavations of Sondage II was given to the Iranian government. This trench also reached the virgin soil with five layers in the south of the Acropol mound. In 1935, Scheil published 485 tablets and their fragments that remained in Iran in volume MDP 26 (Scheil, 1935; MDP 26; MDP.26S; Dahl, 2016). This collection included two parts called MDP.26 with 485 proto-Elamite tablets that were given to the museum of Tehran, which were obtained from Sondage II and the third layer of the Acropol I. It seems that these tablets were obtained from the upper layers of the proto-Elamite settlement in Susa, and probably belong to a different "archive" context from the rest of the published tablets. According to (Scheil, 1935: also see Steve *et al.* 2002: 395), these tablets were found from the "sud" probe at the southeastern end of the Acropol (Dahl, 2016). But the collection of texts MDP.26S was part of the tablets that were obtained in the excavation of de Morgan's large trench and part of MDP6, in which the numbering of the tablets continued (Scheil, 1935: I). The MDP.26 tablets appear distinct from the MDP.17 archive, as none of the owner signatures present in the latter are found in the former. It's conceivable that the MDP.26 texts, which focus on agricultural matters, represent a different, and possibly later, ethnic group residing in Susa compared to the people represented by the MDP.17 archive.

The transmission of information in Proto-Elamite tablets occurred in three forms: unwritten and oral, and written. Today, due to a lack of knowledge of the oral traditions, the interpretation of the texts is problematic. One of the simplest examples that can shed light on some of the unwritten aspects of this script is the tablet MDP, 6: 217. For example, in this tablet, a number of owners probably

paid a certain volume to a specific person or center, and the sign M288 is written only once, in the first entry. All five other entries contain only the ownership sign and the volume paid, which probably indicates that the repetition of this sign was accepted as unwritten and oral between the parties².

In the image (B) below, the repetition of the unwritten sign M288 has been reconstructed. The author suggests that the repetition of this sign was probably understood orally between the parties involved. In other words, they implicitly knew that all the payments were of the same type, making it unnecessary to write the sign M288 in each entry. Image A shows the original tablet with the sign M288 appearing only in the first entry. Image B is a reconstruction where the sign M288 has been added to all entries. This illustrates how we can, by using logic and available evidence, reconstruct unwritten information and gain a better understanding of the tablet's content.

Agricultural Practices in Proto-Cuneiform Tablets;

The core of proto-cuneiform agricultural vocabulary revolves around key signs. ŠE serves as the general sign for grain, encompassing staples like barley (ŠE.BAR) and emmer wheat (ŠE.GIG) (Green & Nissen, 1987). The plow, a fundamental tool, is represented by APIN³

2. The connection between this numerical system and this sign is so complex that scribes sometimes felt no need to write the sign M288, as if the capacity system itself was involved until this sign was calculated. To explain the existence of two graphic variants for the capacity system, Robert Englund (Englund, 2004a: 117) suggested that they might be used for accounting specific grains.”

3. Research on Proto-Cuneiform, while hampered by the script's incomplete decipherment, generally agrees that the APIN sign represents a plow. This identification stems from its visual similarity to the agricultural implement and its contextual appearance in administrative and economic texts. Early studies, like those by M.W. Green and H.J. Nissen, focused on cataloging signs and identifying their potential meanings based on later Cuneiform forms. More recent work, such as the quantitative analysis by [Born & Kelley, 2021 in *Cuneiform Digital Library Bulletin*], has employed statistical methods to analyze sign co-occurrences, shedding light on APIN's usage within specific administrative contexts, particularly

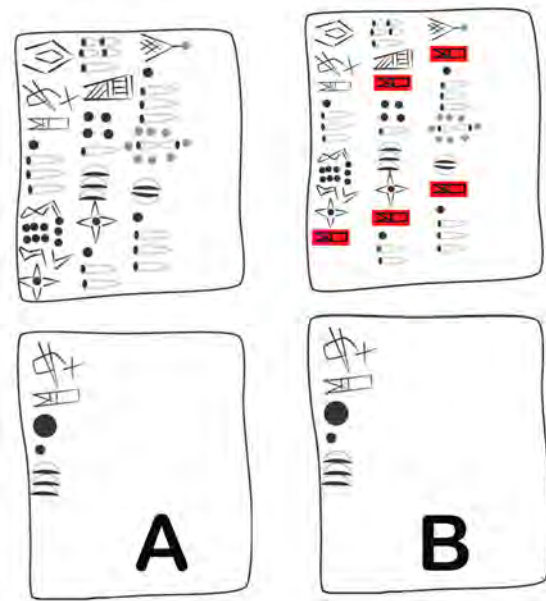


Fig. 7.: (A) Original tablet: M288 appears only in the first entry. (B) Reconstructed tablet: M288 added to all entries.

(sometimes specified as a wooden plow [GIŠ.APIN]) (Green & Nissen, 1987). The farmer or cultivator is known as ENGAR, working the fields (GÁN) and potentially utilizing elevated areas (NIM in an agricultural context) (Green & Nissen, 1987). KI often denotes “earth” or “land,” the foundation of their agrarian society (Green & Nissen, 1987). Beyond basic concepts, proto-cuneiform texts also document specific crops. Besides grains, we find mention of chickpeas (ŠĪKIR), likely onions or garlic (AŠ.GAB), and the vital date palm (ZÚ.LUM) (Green & Nissen, 1987). Tools like the metal plowshare (URUDU.KIN) and harvesting tools, potentially sickles (NĪG.GA), are also represented (Green & Nissen, 1987). The system also included terms for social organization within the agricultural sphere. UGULA might denote an overseer or supervisor managing agricultural laborers (GURUŠ) (Green & Nissen, 1987). Administrators or officials responsible for resource management could be represented by SANGAB (Green & Nissen, 1987). Proto-cuneiform employed complex numerical systems, including sexagesimal, to record quantities of grain, land area, and other agricultural products (Damerow, 2012). Understanding those related to agricultural records and potentially tribute payments.

these numerical notations is crucial for interpreting agricultural records (Englund, 1998).

Introduction to the M56 Ideogram

The M56 ideogram, known by the code M56, is one of the signs frequently used in the Proto-Elamite tablets, identified by Meriggi in 1974 (Meriggi, 1974). It is similar to the APIN sign in Proto-Cuneiform and *epinnu*⁴ in Babylonian, which means “to plow” (Green & Nissen, 1987). This sign is derived from a traditional agricultural tool called a “plow,” which is still used in some local communities today (Dahl, 2005). The plow, which has been used since ancient times, was a vital tool in agriculture (Sherratt, 2017)⁵. The continuity of the plow sign from Proto-Cuneiform to Babylonian Cuneiform demonstrates the enduring significance of this agricultural tool in Mesopotamian society (Green & Nissen, 1987).

Asghar Karimi (1986) writes the following about the Bakhtiari tribe plow in the Encyclopedia of Islam: All parts of the Bakhtiari plow are made of wood. The long beam of the plow is attached to a yoke located on the neck of two bulls or quadrupeds (horses and mules). This description shows that the plow, as a simple but effective tool, played an important role in the development of agriculture and ancient civilizations.


Numerous Proto-Elamite tablets housed in the National Museum of Iran contain the M56 sign. Among them, 35 tablets can be mentioned, which mainly fall into the category of Type I texts. These texts are simple and include only ideograms and numerical signs⁶. Some of these tablets are: MDP.26 : 11- 33- 67- 66- 69- 73-

76- 78- 103- 104- 105- 106- 107- 108- 109- 110- 111- 112- 113- 114- 115- 116- 117- 119- 120- 121- 122- 174- 247- 404. Another category of texts is classified in the standard Type II group, which, in addition to ideograms and numerical signs, also includes syllabic signs. These tablets are: MDP. 26: 102- 118- 123- 265- 267.

In addition to Susa, the M56 sign has also been found in some Proto-Elamite texts of Tepe Yahya, which are currently kept in the National Museum of Iran (Damerow & Englund, 1989). These signs are in the Type I tablets, and we can refer to the tablets yahya 1- 2- 3- 4- 5- 19. These texts usually begin with a sign of ownership or institution, followed by the M56 sign (plow) and a number of numbers with a volumetric system opposite it. This likely relates to measurements of land, agricultural produce, or perhaps even labor related to plowing.

Tablets 1 and 19 from Tepe Yahya are among the unique texts in the Proto-Elamite tablet collection. Despite their simple appearance, these two tablets have a fascinating feature: **“the repeated use of a single tablet.”** Both tablets fall into the category of simple Type I texts, which include a number of entries (likely payments) related to the M56 sign (representing a plow). However, the noteworthy point is the text on the back of these tablets, which has no connection to the text on the front.

It seems that both sides of the tablet were treated as the front, and both begin with a header and then the M56 sign. This raises interesting questions about how these tablets were used and the purposes for writing these texts. Perhaps these tablets were reused after the initial text was completed, and a new text was written on them or the two texts on the tablet were related in some way, but this connection is un-

form texts to calculate rations of barley, fish, or milk and cheese. A similar use in Proto-Elamite might be assumed. Specific categories of rations were probably calculated with the graphic variant of the sexagesimal system. In contrast to these various systems of accounting for discrete objects, only one system was used to count continuous, contiguous objects such as liquids or grains (the capacity system). It is usually used to calculate the sign M288 and its graphic variants () , thus indicating the likely ideographic value of this sign: grains in general (and perhaps barley in particular).

4. The *epinnu* sign in Babylonian Cuneiform, derived from the Proto-Cuneiform APIN, maintains the core meaning of “plow.” Lexical lists and dictionaries, such as the Assyrian Dictionary of the Oriental Institute of the University of Chicago (CAD), confirm this meaning and provide further details about the plow’s construction and use. Studies of Babylonian agriculture, drawing on textual evidence, including legal documents, agricultural manuals, and administrative records, highlight the *epinnu*’s importance in the Babylonian economy and its connection to land tenure, agricultural labor, and crop yields.

5. A handbook of economic history is a good place to find broad support for the significance of agricultural technology.

6. “The sexagesimal system was used in proto-cunei-

clear to us. For example, one side of the tablet could have been a list of goods, and the other side a list of people who received those goods or maybe these tablets were used as practice for writing or were mistakenly used twice.



Fig. 8. Examples of agriculture tablets from Tepe Yahya.

Agricultural Practices in Proto-Elamite Tablets;

Given the proximity and contemporaneous nature of the Proto-Elamite communities with Mesopotamia, it's likely that their agricultural practices shared some similarities. This might include cultivating crops like barley, wheat, and dates, as well as instrument applied for farming, represented by APIN in proto-cuneiform tablets and M56 in Proto-Elamite tablets.

MDP 26:69

This Proto-Elamite tablet, cataloged as MDP 26:69, is a small tablet classified as belonging to the textual format Ia. Its content is brief and raises more questions than it answers. The text opens with the sign M327, which is generally understood to denote ownership or household in charge. This suggests the tablet documents some kind of transaction or record related to a specific individual or entity. Immediately following the ownership sign is the M056-f, more commonly known as the APIN sign in proto-cuneiform tablets. APIN represents a plow

and, by extension, is associated with agriculture and farming. This sign strongly hints that the tablet's content is likely related to agricultural activities. The final element of the inscription consists of five repetitions of the N14 sign. Each N14 sign represents the number 10 in bi-sexagesimal system, so the five repetitions together signify the number 50. This numerical value is the crux of the interpretive challenge. While the presence of the M056-f sign suggests an agricultural context, the meaning of the number 50 remains elusive. Scholars are left to speculate. Does it refer to a quantity of grain? Perhaps 50 units of a specific crop were exchanged or recorded. Could it represent a measure of land area, perhaps the size of a field being plowed? Or might it indicate something else entirely, such as a number of workers represented by M056-f in decimal system? The tablet provides no further context to illuminate the meaning of this crucial number. Similarly, the parties involved in this transaction, or the specific nature of the recorded activity, are unknown. Without additional information, the precise purpose and significance of MDP 26:69 remain a mystery, a small but intriguing puzzle from the Proto Elamite administration system.

MDP 26:200;

Proto-Elamite tablet MDP 26:200 is a small but significant artifact, classified as a simple tablet in the textual format Ia. Its single entry, though brief, provides clues to agricultural practices in the Proto-Elamite period. The text begins with the M195, interpreted as a sign of ownership or household for which the entries were recorded. Following this sign is the combination of signs M056-f and M288. M056-f, while sharing a similar form with the cuneiform APIN sign (plow), may have a slightly different meaning or nuance in the Proto-Elamite context. However, its association with agriculture is generally accepted. M288, when used alongside M056-f, reinforces this agricultural connection, often related to cereal ration payments, distributions, or other transactions involving agricultural products. This combination strongly suggests the tablet concerns agricultural yields or trans-

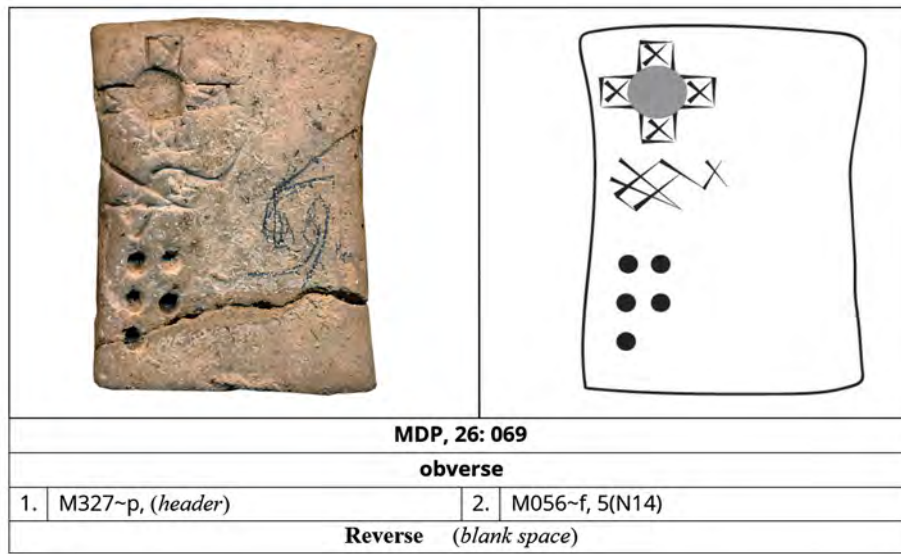


Fig. 9. Proto Elamite Tablet, MDP 26:69, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

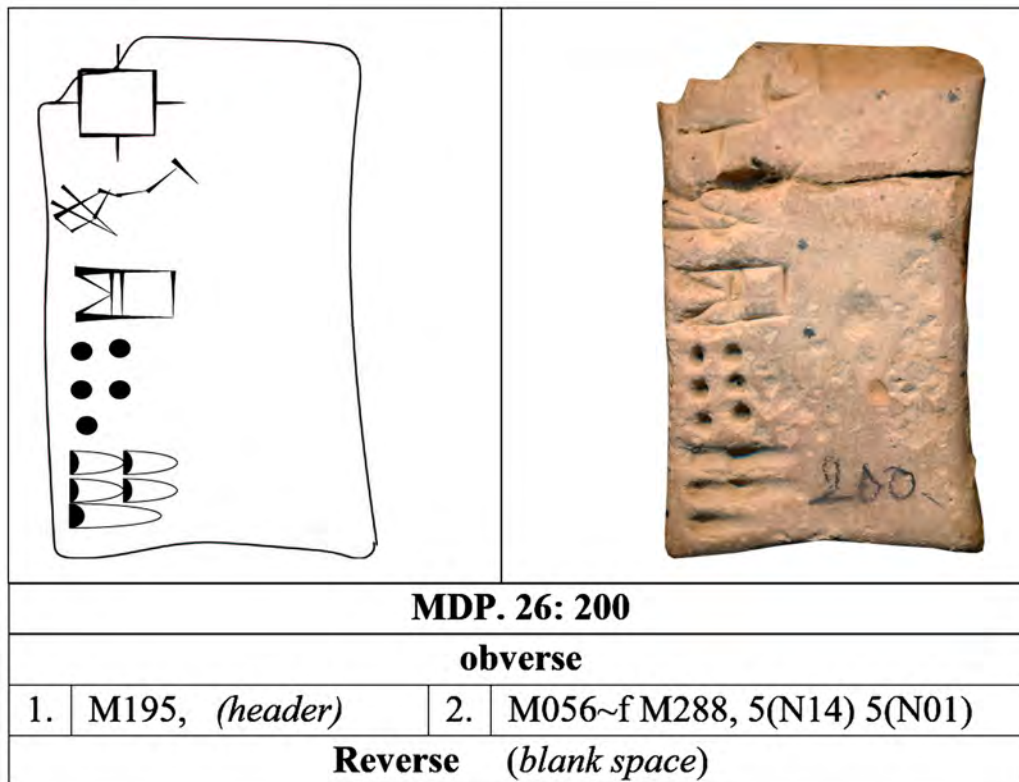


Fig. 10. Proto Elamite Tablet, MDP 26:200, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

actions. The tablet concludes with quantitative information: five N14 sign and five of the N01 sign in capacity or volumetric system. While the agricultural context is reasonably clear, the specific meaning of the number system remains open to interpretation. It could represent a quantity of grain, measured in a specific unit of volume or weight. Alternatively, it might signify a payment made with agricultural products basically barely.

The most probable scenario, given the presence of the signs related to grain payments and agricultural activity, is that the quantified M288 refers to the amount of produce harvested after processing. Perhaps it's the yield of a particular field, or the final output after threshing and winnowing. However, the tablet's conciseness leaves much to our imagination.

MDP 26: 067

Proto-Elamite tablet MDP 26:067 is a small but complex administrative document, categorized as a simple tablet belonging to the Ib textual group. This categorization suggests a specific format and structure common to tablets of this type. The tablet's content, while concise, reveals details about agricultural accounting practices. The first entry on the tablet begins with the M327, a well-established sign of ownership or household. This indicates the tablet's contents pertain to resources or transactions under the control of a specific individual or entity. The second entry features the sign M056-f. While visually similar to the Sumerian APIN sign (plow), its precise meaning in the Proto-Elamite context is debated, though it is generally accepted to relate to agriculture, plowing, or agricultural produce, particularly grains. This sign strongly suggests the tablet deals with agricultural matters. Following M056-f

is a numerical notation using a capacity system. One instance of the sign N34 is followed by three instances of N14. This yields a total of 5.5 N1 (1 N34 = 3 N45 = 3 * 10 N14 = 30 N14, 30 N14 + 3 N14 = 33 N14, 33 N14 = 33 / 6 N1). This number, in conjunction with the agricultural sign, likely refers to a quantity of grain or another agricultural product. The third entry contains the signs M010 and M305+365, the meanings of which are uncertain, but they are likely related to specific agricultural activities or processes. These signs are accompanied by numerical notations: one N34, one N14, and five N01 signs, totaling 11.1666 N1 (1 N34, 1 N14, 5 N01, 1 N34 = 30 N14, 30 N14 + 1 N14 = 31 N14, 31 N14 = 31 / 6 N1 = 5.1666 N1, 5 N01 = 5 N015.1666 N1 + 5 N01 = 11.1666 N1) within capacity system. The fourth entry features the sign M111-g, also of uncertain meaning but likely related to agricultural practices, along with one N34, two N14,

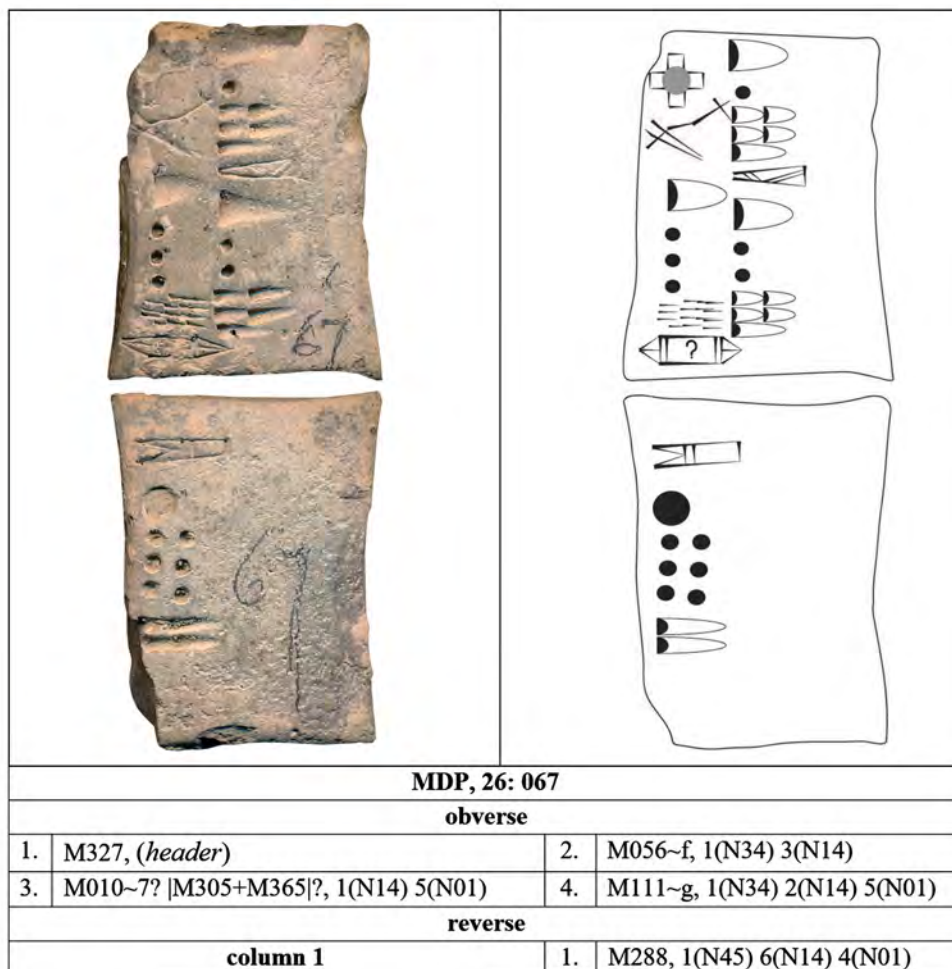


Fig. 11. Proto Elamite Tablet, MDP 26:067, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

and five N01 signs, totaling 10.333 N1 (1 N34, 2 N14, 5 N01, 1 N34 = 30 N14, 30 N14 + 2 N14 = 32 N14, 32 N14 / 6 = 5.333 N1, 5 N01 = 5 N01, 5.333 N1 + 5 N01 = 10.333 N1). The reverse of the tablet carries the sign M288, possibly signifying a disbursement or transaction, and a series of volumetric signs: one N45, six N14s, and four N01s. This volumetric notation strongly suggests that the quantities recorded on the obverse of the tablet represent measures of volume, likely of grain. The presence of this total on the reverse implies that the entries on the front are related and can be summed to arrive at the final volumetric total (1 N45, 6 N14, 4 N01, 1 N45 = 10 N14, 10 N14 + 6 N14 = 16 N14, 16 N14 / 6 = 2.666 N1, 4 N01 = 4 N01, 2.666 N1 + 4 N01 = 6.666 N1). The tablet, therefore, appears to be a record of agricultural activities, possibly related to the measurement and accounting of grain. The reverse total (6.666 N1) does not equal the sum of the obverse entries (27 N1). With the capacity system equivalencies, the discrepancy between the obverse and reverse is even more significant. The obverse entries, when summed, are

substantially larger than the total recorded on the reverse. This reinforces the idea that the tablet is not a simple summation. Here are a few possible interpretations, considering the capacity system as the reverse side (100 N1) could represent what was distributed or removed from a larger quantity (represented by the obverse). The obverse might record initial amounts, and the reverse a final balance after some transaction or the obverse could represent several separate transactions, while the reverse is a summary of only one of them. Moreover, the difference between the obverse and reverse could account for loss, waste, or spoilage of the grain. It's possible, though less likely, that the obverse and reverse use slightly different capacity measures, but this would be unusual.

MDP 26:112

Proto-Elamite tablet MDP 26:112, classified as a simple tablet of the Ib textual format, presents a brief but intriguing record. The tablet opens with a sequence of signs: M387, M305, M041-g, and M056-f, followed by two instances of the N01 sign. The meanings of M387,

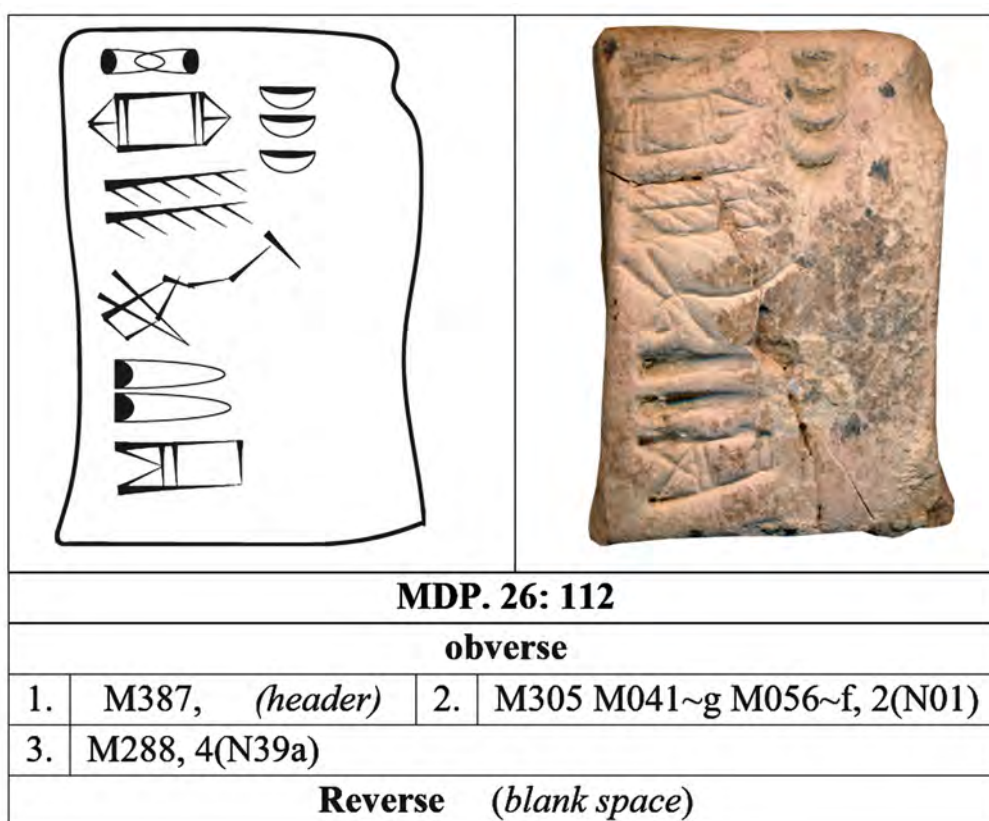


Fig. 12. Proto Elamite Tablet, MDP 26:112, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

M305, and M041-g are currently unknown due to the challenges in deciphering the Proto-Elamite texts. The presence of this sign strongly suggests the tablet pertains to agricultural activities. The two N01 signs, each representing the number one, likely modify or quantify the preceding signs, but their precise role is unclear without further context. The second entry on the tablet consists of the sign M288 and three instances of the N39A sign. M288 is often interpreted as signifying a disbursement, transaction, or payment. The most plausible interpretation of this second entry is that it records a transaction related to agricultural labor. The three N39A signs could represent the quantity of ration paid through M288 sign to the group of 2-member agricultural workers attested by M305, M041-g. However, the presence of M056-f and the numerical sign N39A strongly suggest that MDP 26:112 is an administrative record related to agricultural activities, possibly involving labor and payments.

MDP 26:078

MDP 26:078 is a small but complex administrative text from the Proto-Elamite period. It begins with the two-part string of signs as the

header (M136+M365), the first entry contains the sign M056-f. The presence of this sign suggests the tablet deals with agricultural activities. This is followed by a bisexagesimal numerical system. One N34 (representing 60), five N14s (representing 10 each), and six N01s (representing 1 each) are inscribed. This number, totaling 116 ($1 \text{ N34} = 60, 5 \text{ N14} = 5 * 10 = 50, 6 \text{ N01} = 6 * 1 = 6, \text{ Total} = 60 + 50 + 6$), likely refers to a quantity of grain or another agricultural product. The second entry begins with M288, which is often interpreted as signifying a disbursement or payment. This is followed by a volumetric counting system: seven N14s, four N01s, and three N39Bs ($7 \text{ N14} = 7 * 6 \text{ N1} = 42 \text{ N1}, 3 \text{ N39B} = 3/5 \text{ N1}, 4 \text{ N01} = 4/5 \text{ N1}, \text{ Total} = 42 \text{ N1} + 3/5 \text{ N1} + 4 \text{ N01} = 42 + 0.6 + 4 = 46.6 \text{ N1}$). These numbers together represent a specific volume of product. It appears that this tablet records two related pieces of information. In the first entry, after the ownership mark M136+M365, the sign M056-f signifies the amount of produce harvested from a plot of agricultural land. In the next entry, marked by M288, it shows the amount of net product obtained from the harvested grain. In other words, MDP 26:078 probably records the amount of

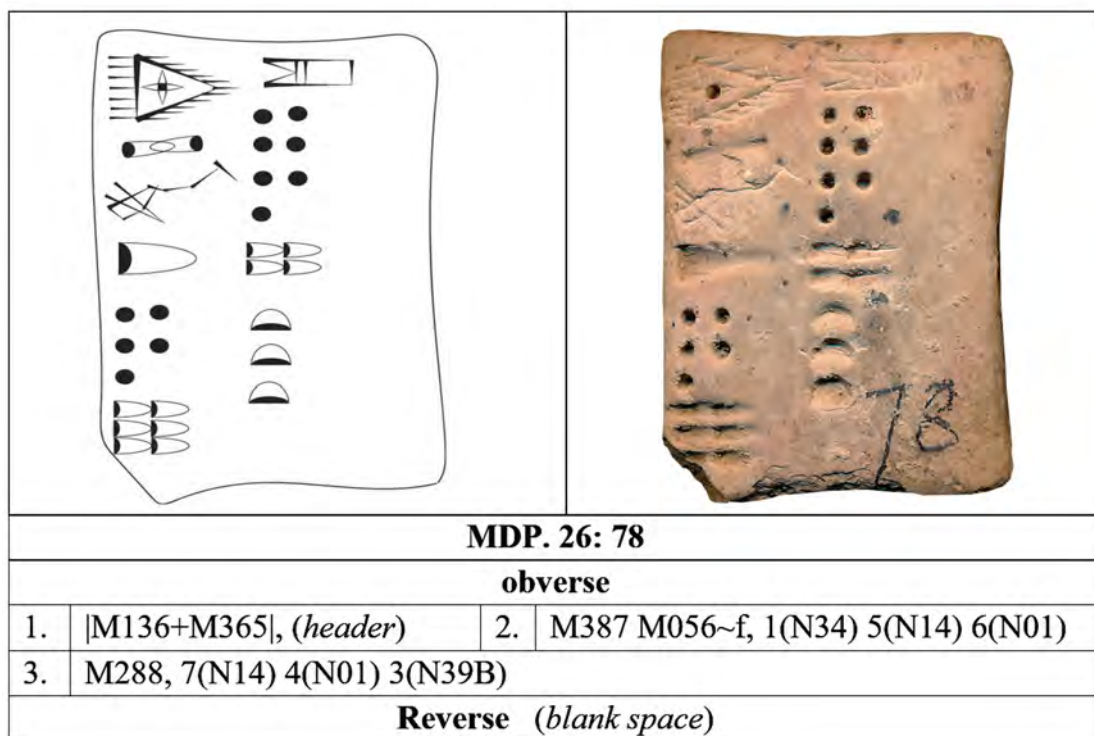


Fig. 13. Proto Elamite Tablet, MDP 26:78, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

product harvested from the field and then the amount of net product obtained after processing. A possible interpretation is that the relationship between the two numbers represents a yield. About 46.6 N1 of “net product” is obtained from a raw amount of 116. This suggests a loss of over half the initial volume during processing (e.g, threshing, cleaning).

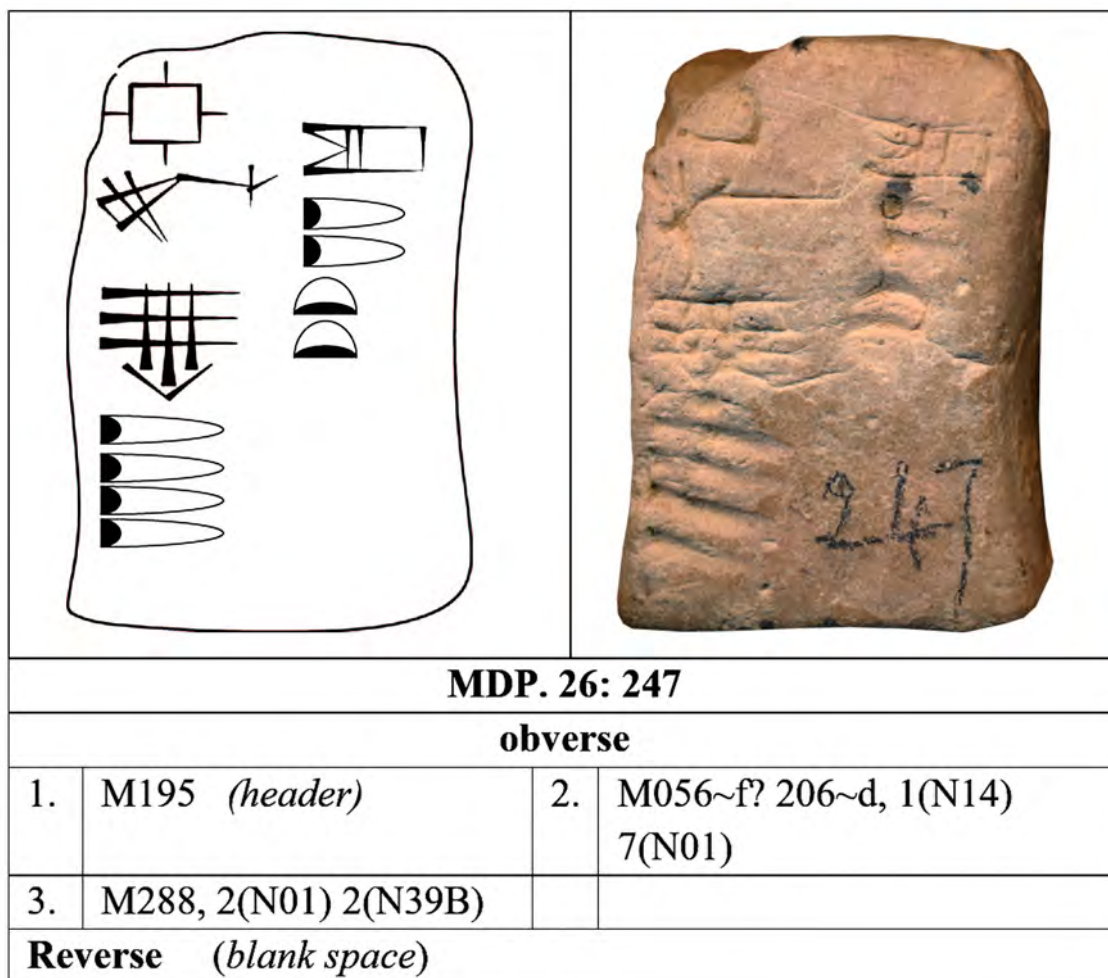
MDP 26:247

MDP 26:247 begins with an ownership sign M195. The second entry contains the sign M056-f, representing agricultural activity, combined with the ideogram M206-d and numerical signs from the decimal system: one N14 and seven N01s used for counting workers. This entry indeed uses the decimal system (1 N14 and 7 N01) to count the workers since if there were any other numerical system, 7N01 is improbable. Therefore, M206-d signifies “17 workers.” The

third entry includes the sign M288, along with the numerical signs two N01s and two N39Bs from the volumetric counting system (Total ration = 0.4 N1 + 2 N1 = 2.4 N1). We have 17 workers and 2.4 N1 of rations. The calculation reveals that each worker received approximately 0.141 N1 of rations. This figure represents the distribution of the total ration amount (2.4 N1) among the 17 workers, indicating a standardized allocation. In essence, the tablet suggests that the rations were divided relatively equally among the workforce, with each individual receiving this calculated portion. This tablet represents a gang of seventeen workers of unidentified gender worked in an agricultural land and received their rations through M288.

MDP 26:113

Proto-Elamite tablet MDP 26:113 has a simple Ib textual format. The tablet begins with



MDP. 26: 247

obverse

1.	M195 (<i>header</i>)	2.	M056~f? 206~d, 1(N14) 7(N01)
3.	M288, 2(N01) 2(N39B)		
Reverse (<i>blank space</i>)			

Fig. 14. Proto Elamite Tablet, MDP 26:247, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

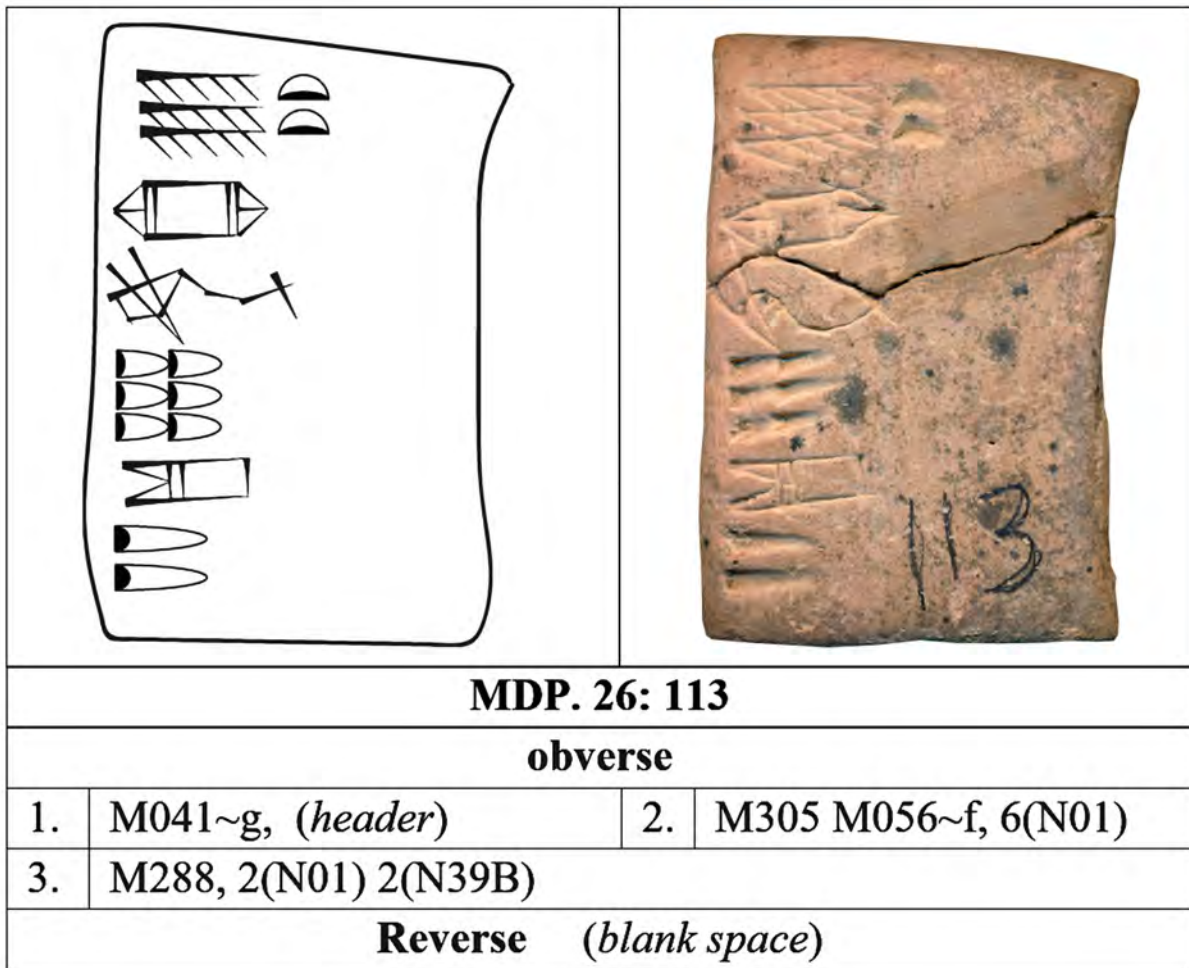


Fig. 15. Proto Elamite Tablet, MDP 26:113, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

several signs: M041-g, M305, and M056-f, followed by six N01 signs from the decimal system. The second entry contains the sign M288 along with the volumetric counting system: two N01 signs and two N39B signs (2 N01 + 0.4 N01 = 2.4 N01). This likely refers to the number of six workers of unattested gender and wage payments, or the amount of work performed and wage payments, or perhaps the volume of harvested product along with the volume of its processed form. Based on the tablet MDP 26:113, the sign M288 is associated with both a quantity, likely representing wage payments, and a number of workers. The text indicates that M288 is linked to “six workers” and an amount represented by “two N01 signs and two N39B signs,” which equals 2.4 N01. Therefore, if M288 indeed signifies the wage payment for these six workers, the calculated

ratio of wage payment to workers is 2.4 N01 to 6 workers, simplifying to 0.4 N01 per worker.

MDP 26:076

Tablet M1DP 26:076, a small but significant artifact, offers a glimpse into the administrative practices and economic record-keeping of the Proto-Elamite period. The tablet’s structure and the signs it bears suggest a focus on agricultural accounting, likely related to the management of grain resources. The tablet begins with a header composed of two “ownership signs.” These signs, though undeciphered, likely designate the individual or institution responsible for the recorded transactions, perhaps a land owner or an administrative body.

Following the header, the tablet is divided into distinct entries, each detailing specific aspects of the agricultural activity. The first entry fea-

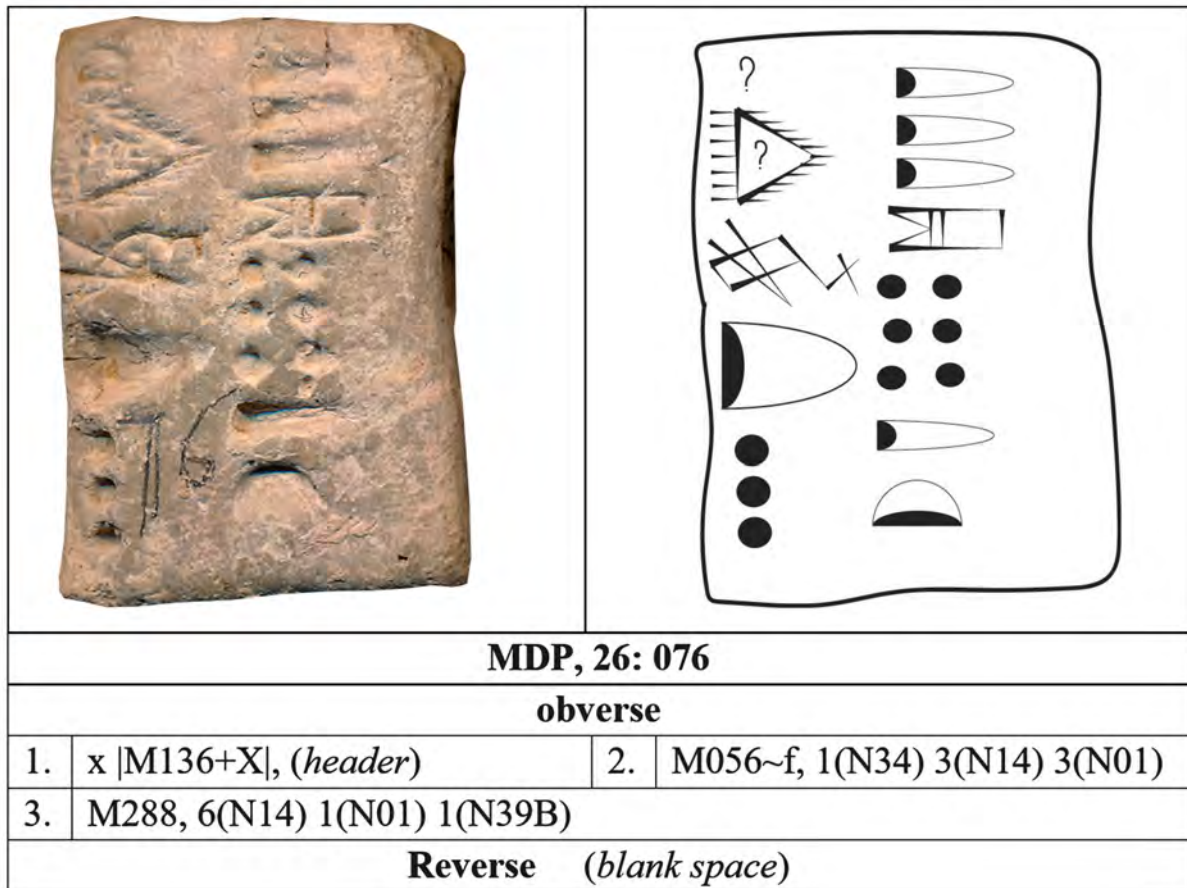


Fig. 16. Proto Elamite Tablet, MDP 26:076, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

tures the sign M056-f, a sign that appears in other Proto-Elamite texts related to agricultural activities, strongly suggesting a connection to farming or produce. This sign is followed by numerical notations from the bisexagesimal system, a counting system common in Proto-Elamite accounting for discrete objects. The notation consists of one N34, three N14, and three N01. Bisexagesimal system's structure suggests a possible focus on counting large quantities, perhaps of units of land, agricultural primary production, or measures of seed. The second entry on the tablet shifts to a different sign, M288, and employs the volumetric counting system. This system, distinct from the bisexagesimal system, was used for measuring capacities and volumes, particularly of grains and liquids. The numerical notation accompanying M288 includes six N14, one N01, and one N39B. This entry likely represents a specific quantity of grain (possibly barley), measured in volumetric units. The combination of M288 with volumetric notations points towards the re-

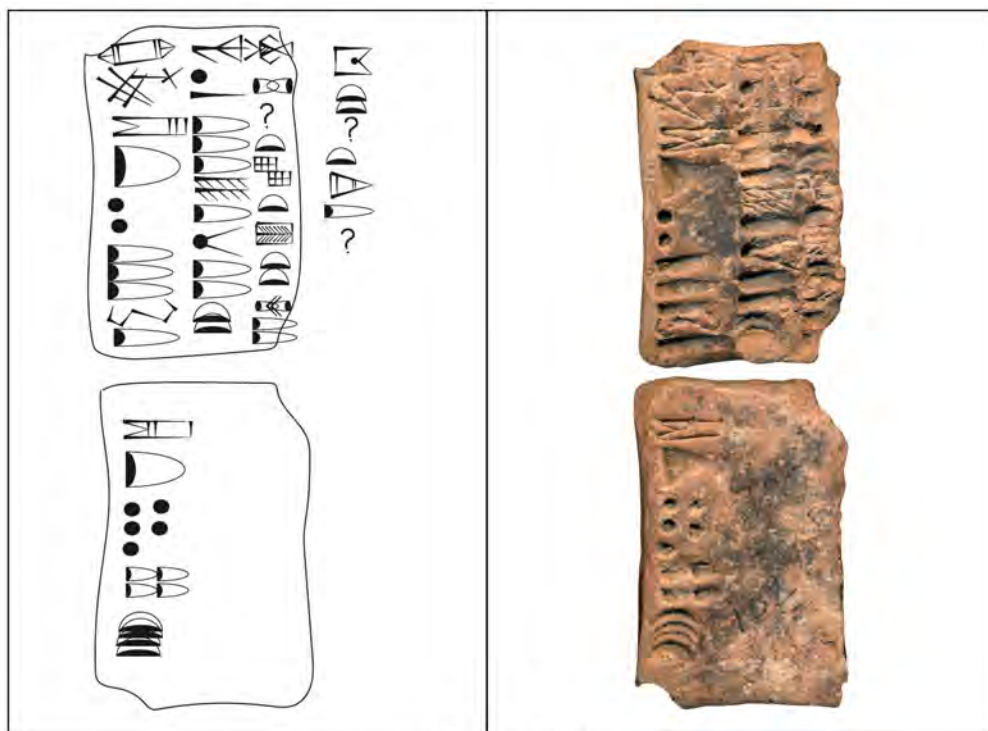
coding of harvested crops or processed grain products. The tablet's overall structure, with its distinct entries and numerical notations, suggests a detailed accounting of agricultural inputs (possibly represented by the first entry) and outputs (represented by the second entry). The tablet likely records agricultural activities. The first entry (M056-f), using the bisexagesimal system, might represent a count of inputs, such as seed quantities. A value of 93 could represent 93 units of seed grain. The second entry (M288), using the capacity system, likely represents the measurement of harvested crops, specifically grain. The value of 61.4 N01 could refer to the volume of the harvested grain.

MDP 26:102

Proto-Elamite tablet MDP 26:102 is a fascinating, albeit challenging, text that appears to be a detailed accounting document related to agricultural production. The tablet begins with the sequence of signs M305, M056-f, and M288. While the precise meanings of M305

and M056-f (often associated with plows and agriculture) remain somewhat uncertain due to the difficulties in deciphering Proto-Elamite, their combined presence strongly suggests a focus on farming and agricultural produce. M288 is frequently interpreted as representing a transaction, disbursement, or payment. This initial sequence sets the stage for what follows: a complex record of calculations pertaining to grain or other agricultural products. What makes MDP 26:102 particularly interesting is its structure. The tablet is divided into twelve distinct entries, each containing numerical data

written using the Proto-Elamite capacity system. This system, while not fully understood, clearly indicates that the quantities being recorded are measured in units of volume. The first entry stands out as the most numerically dense, containing a larger number of signs than the subsequent entries. This suggests that the first entry might represent a primary quantity, perhaps the initial harvest from a particular field or the total amount of grain received. The remaining eleven entries are more concise numerically, leading scholars to believe they represent subdivisions or portions of the initial



MDP. 26: 102			
obverse			
1.	M305, (<i>header</i>)	2.	M056~f M288, 1(N34) 2(N14) 3(N01)
3.	M051~a, 1(N01)	4.	M124, 1(N14)
5.	M001, 3(N01)	6.	M041~j, 1(N01)
7.	M367, 2(N01) 2(N39B)	8.	M320~m M387~c X, 1(N39B)
9.	M205~c, 1(N39B)	10	X, 2(N39B)
11	M387~c?, 2(N01)		
reverse			
column 1		1.	M289~d, 2(N39B)
2.	X, 1(N39B)	3.	M131~e? 1(N01)
column 2		1.	M288, 1(N34) 5(N14) 4(N01) 4(N39B)

Fig. 18. Proto Elamite Tablet, MDP 26:102, Image courtesy of the Cuneiform Digital Library Initiative (CDLI), Drawing and Transliteration by the Authors.

amount. Perhaps these smaller entries record distributions to different individuals, allocations for seed, amounts set aside for specific purposes, or even losses due to spoilage or other factors. The presence of the sign M367, often associated with livestock, hints that the calculations might even include the share allocated to animal husbandry. The real complexity comes into play on the reverse of the tablet. Here, a final calculation is recorded, again using the volumetric or capacity system. This grand total is represented by one N34, five N14s, four N01s, and four N39Bs. This final sum strongly suggests that the tablet is a comprehensive record of agricultural activity, encompassing multiple stages from harvest to distribution or processing. The tablet's significance goes beyond simply recording quantities. It likely provides insights into the socio-economic organization of the Proto-Elamite period. The total recorded on the reverse of the tablet, 214.8 N1, is greater than the sum of the individual entries calculated from the obverse, which is 211.2 N1. The reverse side's total exceeds the obverse total by 3.6 N1. This discrepancy suggests that the obverse side, as it currently exists, might not contain a complete record of all transactions or quantities, or that the reverse side includes totals from other tablets. It's also possible that there were errors in the original recording or that the reverse includes items not listed on the obverse.

This suggests a complex agricultural system where different aspects of production were carefully tracked and accounted for. The tablet could be a record of yields from a specific plot of land, including the portions allocated to workers as wages, seed for the next planting, feed for livestock, and perhaps even taxes or payments to authorities. It could also be a record of a communal harvest, where the total yield is divided amongst various stakeholders. While the exact interpretations are still subject to scholarly debate due to the challenges in deciphering Proto-Elamite, MDP 26:102 provides a tantalizing glimpse into the sophisticated accounting practices of the time.

MDP 26:115

This tablet, MDP 26:115, is a fascinating, though not fully deciphered, document that likely relates to agricultural administration. The presence of ownership signs at the beginning of each entry is significant. It suggests that the items or quantities being recorded belonged to different individuals or household represented by the sign frequently appear as the header. This points towards a system where various households or high-ranking individuals were contributing something. The combinations of signs like M157, M010, and M056-f in the second entry, and similarly in other entries, are likely related to specific agricultural products, activities, or locations. M056-f, as mentioned, is often associated with plows, agriculture, or grains. The appearance of M056-f again on the back of the tablet, along with a final number, strongly suggests that the tablet is a record of agricultural contributions, perhaps of grain. The number on the reverse likely represents the sum total of all the quantities recorded in the individual entries. The authors' suggestion that this tablet records "tribute or offerings" is a plausible one. Given the ownership signs and the agricultural context, it seems likely that different individuals or households were contributing agricultural products, perhaps as tribute, tithes, or offerings to a central authority or institution.

The obverse of the tablet contains entries of grain quantities using the Capacity system. These entries are: 3(N14), 1(N14) 5(N01), and 5(N01). Converting these all to N1 by using the factor $1 \text{ N14} = 6 \text{ N1}$, the total of the obverse is 34 N1. The reverse of the tablet contains one entry of grain using the Capacity system: 4(N14) 4(N01). Converting this to N1, the total of the reverse is 28 N1. Thus, the obverse total of 34 N1 is 6 N1 higher than the reverse total of 28 N1. This discrepancy suggests a potential imbalance in the recorded transactions or calculations. Several possibilities could explain this difference, including errors in the original recording, such as miscalculations or incorrect entries, or omissions. It's also possible that the tablet represents an incomplete record, where

some transactions are not fully documented, or that there are other factors at play that are not immediately apparent from the transliteration alone, such as the movement of goods. Further research, including a more detailed examination of the tablet's physical condition and any accompanying texts, may help to clarify the reasons for this discrepancy.

MDP 26:118

Tablet MDP 26:118 presents a fascinating puzzle, offering a glimpse into the administrative practices and economic organization of the Proto-Elamite period. The tablet's content begins with a unique, composite ownership sign, M387+387. The second entry features the sign M056-f, which, while its exact meaning remains debated, is generally associated with

agriculture, specifically plowing or agricultural produce, and most likely grains. This sign is accompanied by two N45 signs from the Proto-Elamite capacity or volumetric system. This indicates that the quantities being recorded are measured in units of volume, likely referring to a specific type of agricultural product, possibly grain. Interestingly, all the non-numerical signs on this tablet, except signs and M056-f, are commonly used as headers or introductory signs in Proto-Elamite texts. Their presence within the entries suggests a structured format, perhaps indicating different sections or categories within the tablet's record. The repeated use of ownership signs, however, is a particularly noteworthy characteristic of MDP 26:118. Following the initial entries, the tablet lists seven more entries, each consisting of a sign and an

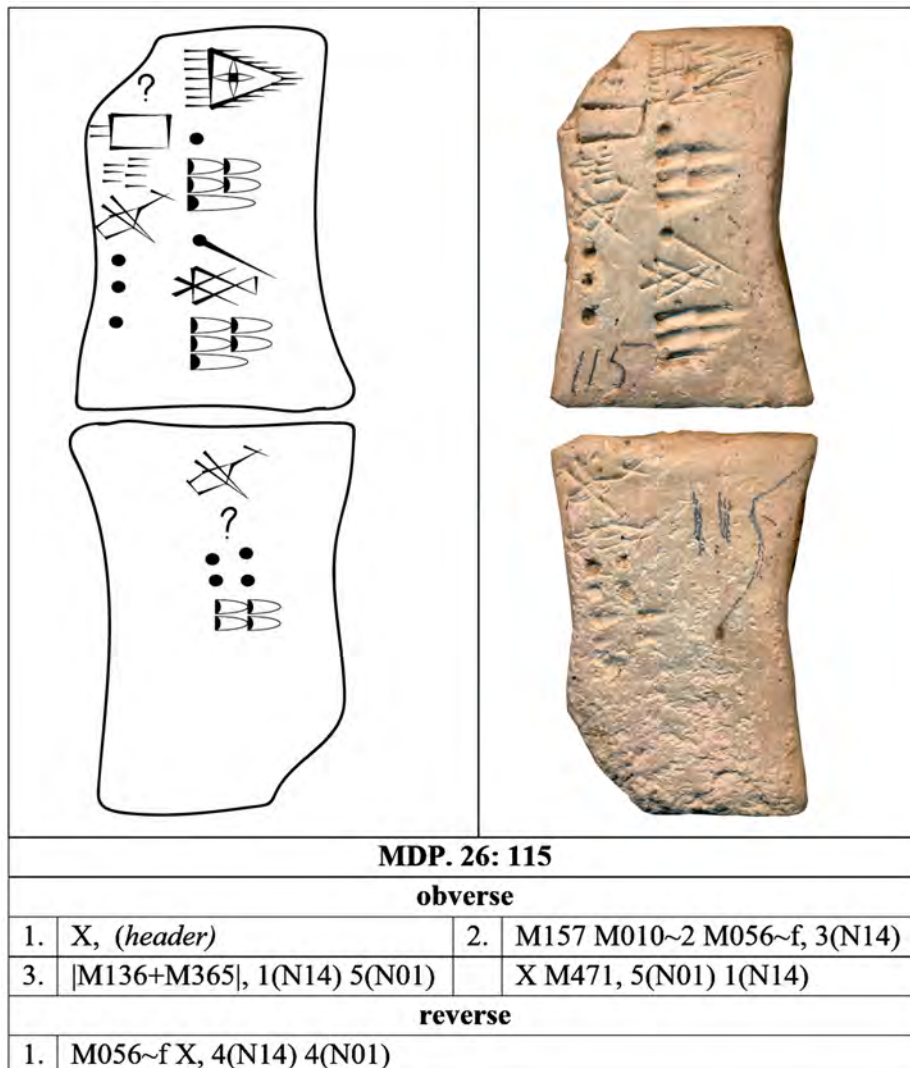



Fig. 19. Proto Elamite Tablet, MDP 26:115, Image courtesy of the Cuneiform Digital Library Initiative (CDLI)., Drawing and Transliteration by the Authors.



MDP. 26: 118

obverse			
1.	[M387+M387], <i>header</i>	2.	M056~f, 2(N45)
3.	M384, 3(N14)	4.	M195, 3(N14)
5.	X, 3(N14)	6.	M136~i, 6(N14)
7.	X, 1(N14)	8.	M286~a, 1(N14)
9.	M305, 3(N14)		
reverse			
column 1	1.	M056~f, 1(N34) 1(N45)	

Fig. 20. Proto Elamite Tablet, MDP 26:118, Image courtesy of the Cuneiform Digital Library Initiative (CDLI)., Drawing and Transliteration by the Authors.

associated number of N14 signs. These entries are as follows: M384 with three N14s, M195 with three N14s, an unidentified sign with three N14s, M136-i with six N14s, another unidentified sign with one N14, M286-a with one N14, and M305 with three N14s. The different signs likely represent different individuals of known households. The associated N14 signs quantify the amount of each item.

On the reverse of the tablet, a final entry summarizes the preceding nine. This summation includes one N34, one N45, and the sign M056-f, again likely signifying grain. This final calculation strongly suggests that the tablet is

a record of contributions or deliveries of agricultural products, possibly grain, from multiple households. The calculations for Tablet MDP 26:118, when converted to the N1 unit, reveal a balanced accounting of grain. The obverse total is derived from summing the individual entries: Entry 2's 2(N45) equals 120 N1, and the subsequent entries 3 through 9, with quantities of N14, sum to 18 N1 each for entries 3, 4, 5, and 9, 36 N1 for entry 6, and 6 N1 each for entries 7 and 8. This results in a total of 240 N1 for the obverse side. The reverse side, with its single entry of 1(N34) 1(N45), also equals 240 N1 (180 N1 + 60 N1). In conclusion, both the obverse and

reverse sides of the tablet record an equal total of 240 N1. The authors propose that MDP 26:118, like the closely related tablet MDP 26:115, served as a record of tribute or deliveries from multiple owners or entities to a central administrative body or individual. The various signs preceding the numerical notations likely represent the different contributors, while the numerical values indicate the amounts of grain or other agricultural products they provided. The final sum on the reverse represents the total amount received. The unique use of multiple ownership signs reinforces the idea of individual contributions being tracked within a larger administrative framework.

Conclusion

The evidence gleaned from Proto-Elamite tablets, despite the persistent challenges of decipherment, provides a compelling, if still incomplete, picture of the pivotal role agriculture played in Proto-Elamite society. The repeated appearance of signs linked to plows (M056-f), various grains, and diverse agricultural products, combined with the meticulous recording of quantities, transactions, and ownership, leaves little doubt about farming's fundamental importance for the community's sustenance and economic prosperity. These records, often painstakingly detailing deliveries, calculations, and the allocation of agricultural goods, point towards a sophisticated system of agricultural production and administration. The complexity evident in some tablets, particularly those featuring multiple entries, volumetric calculations, and diverse sign combinations, strongly suggests a structured agricultural economy. This structure likely encompassed specialized labor, perhaps with distinct roles for cultivators, harvesters, and administrators; carefully managed land allocation, possibly reflecting different levels of ownership or control; and organized distribution systems, ensuring that agricultural produce reached its intended recipients. The level of detail in these records hints at a centralized authority capable of organizing and overseeing agricultural activities on a scale that supported a growing population and, potentially, a degree of social stratification. Given Susa's strategic location at the intersection of the Mesopotamian lowlands and

the Iranian highlands, and its documented role as a hub for interregional exchange in later periods, it is highly plausible that Susa also functioned as a significant market center within the Proto-Elamite world. The concentration of agricultural production and administrative activity in Susa, as evidenced by the tablets, would have naturally fostered the development of a marketplace where surplus goods could be exchanged, further stimulating economic activity and contributing to Susa's growing importance.

While the precise nature of many agricultural practices and the exact semantic value of certain signs remain shrouded in the mysteries of the undeciphered text, the sheer abundance and character of these agricultural records offer powerful testimony to the fundamental importance of farming in Proto-Elamite life. Agriculture was not merely a means of survival; it formed the very bedrock of their economy, deeply influencing social organization, administrative practices. The surplus generated by a productive agricultural system likely fueled population growth, supported the development of specialized crafts and trades. It is conceivable that the management of agricultural resources, coupled with Susa's role as a market hub, played a key role in the emergence of social hierarchies and the concentration of power in the hands of an elite class. Furthermore, the development and use of the Proto-Elamite writing system itself can be seen as a direct outgrowth of the need to manage and account for agricultural production, its associated economic activities, and the exchanges taking place within the market. The tablets, therefore, are not just records of agricultural transactions; they are artifacts that reflect the complex interplay between economic activity, social organization, the development of writing, and the potential emergence of market economies in early complex societies. Continued efforts to decipher the Proto-Elamite script, including comparative analysis with other contemporary writing systems and meticulous contextual analysis of archaeological finds, hold immense promise for revealing further intricacies of their agricultural system, the role of Susa as a market hub, and their profound impact on the Proto-Elamite community.

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