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A "New" Proto-Elamite Tablet with Unattested Numerical System from Tappeh Sofalin

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Abstract

Late 4th millennium B.C is a period of human life in which he developed writing on clay tablets as a major means of economic transactions. This process is one of the greatest inventions in human history, and perhaps the most important of them, which did not happen all at once and had a gradual trend from the Neolithic period to the second half of the fourth millennium BC. The main feature of this period, along with seals and seal impressions, is clay tablet with ideographic signs plus counting notations and then evolved with syllabic conventional signs in the later stages, which is probably the initial shape of the standard writing. These clay tablets in Iran have been obtained from Susa and Chogha Mish in Khuzestan, Sialk in Kashan and Sofalin in Tehran province. The excavation seasons at Tappeh Sofalin unearthed a significant corpus of administrative material culture that provides evidence for the use of a complex administration systems during the Proto Elamite period at the second half of the fourth millennium B.C. These evidences are closely related to administration systems known from sites in southwestern Iran, most prominently at Susa III period. The types of administrative evidences from economic tablets to ideo-numerical ones were found at Tappeh Sofalin, suggesting that the settlement prolonged during the Proto Elamite period. One of the diagnostic administrative materials unearthed during the expedition is an almost intact Proto Elamite tablet with an unattested numerical system. Given the relative scarcity of texts from this time, the example offered in this article should add significantly to our knowledge and understanding of one of the world's oldest attested forms of writing. Here we discuss this Proto Elamite tablet and the meaning it conveys.

Keywords: Proto Elamite, Clay Tablet, Ancient Iran, Administration Technique. Unattested Numerical System, Tappeh Sofalin.

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Introduction

An important subject of study for archaeologists has been the study of the cause and nature of change from simple village communities to more complex societies (Nicholas, 1980: 5). A core tenet of complex society was a transition from agrarian and kinship societies to complex, industrial societies. The transition occurs as a result of specialization in the means of labor, with some people rising to power as rulers and administrators, while others remained as food producers. This kind of relationship, one between the producers and the rulers is a highly unequal and dependent one. A division of labor encourages a society to differentiate, and heighten the material and intellectual culture of that society (Crone, 2003). In Iran, recent research interest in this developmental problem has focused on a set of manifestations that can be loosely lumped together and referred to as the Proto-Elamite phenomenon (Abdi, 2003). Archaeologists have variously used the term Proto Elamite to mean a people, a script, a material culture and a time period; in addition, the term has been used to carry inherent geographic implications (Alden, 1982; Pittman, 1997; Potts, 1999; Carter, 1980; Dittmann, 1986).

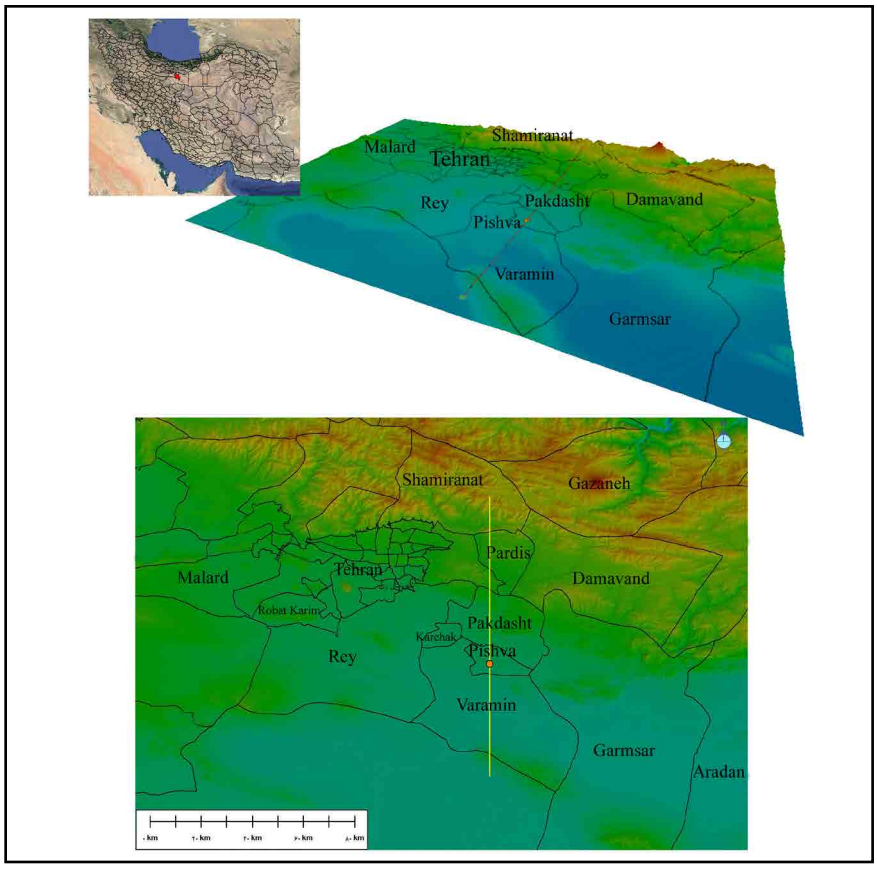
The label was first applied to a pictographic script at the site of Susa in the province of Khuzestan, Southwestern Iran (Scheil, 1905). Susa was known to be the historical capital of the Kingdom Elam, where numerous records written in Elamite had been recovered from the upper levels of that site. It is therefore inferred that the crude pictographic tablets coming from the lower levels at Susa represented early attempts at writing made by the ancestors of the later Elamites; accordingly, the script was designated as Proto Elamite (Nicholas, 1980: 7). However, it has been proven that the authors of the tablets were not the forerunners of the people known as Elamites and indeed, the Proto Elamite script has now been recovered over an area considerably more extensive than the known bounds of ancient Elam (Biscione et al., 1977). Labeling individual sites as Proto Elamite should thus as present only be done on the basis of the presence of tablets written in the Proto Elamite script or numerical notation (Whitcom, 1971). Archaeologists date the proto-Elamite period to sometime around 3300 BC, or contemporary with Uruk III or the Jemdet-Nasr period in Mesopotamia (Dahl et al., 2012).

The Proto-Elamite administrative system was used over a very large geographical area, stretching from Tappeh Sialk (Ghirshman,1938), Tappeh Ozbaki (Majidzadeh, 2001) and Tappeh Sofalin (Hessari, 2021; 2011) to the north, from Shahr-i-Sokhta (Tosi, 1984) to the east, from Tappeh Yahya

(Lamberg-Karlovsky, 1970; Potts et al., 2001) and Malyan (Sumner 1986) to the south and from Susa (Carter, 1980; Dittmann, 1986; Le Brun, 1971) to the west. This vast geographical range for the presence of Proto-Elamite administrative technology is variously explained as gradual cultural diffusion, colonial activity, traders' settlements, demographic developments and perhaps pastoral nomadism subsistence system (Lamberg-Karlovsky, 1972; Alden, 1982; Yousefi et al., 2022).

Tappeh Sofalin

The site of Sofalin lies in the eastern Ray (Varamin) Plain of north-central Iranian plateau, at a general elevation above sea level of about 966 meters. This location is some 35 kilometers southeast of the city of Tehran. The site itself is about 15 kilometers south of the Khorassan road, the major East-West trade route, between southern Mesopotamia, Southwestern Iran, Iranian plateau, Central Asia and Afghanistan (Map. 1). The extensive remains of Tappeh Sofalin, in an area about 500 meters long and 400 meters wide, consists of material cultures of late 4th millennium and the Iron Age III. (Hessari, 2011). The results of C14 dating and many of the tablets dates back from middle 4th to the early 3rd millennium B.C (Hessari et al., 2021).



Map. 1: Location of East of Rey Plain, Varamin plain and Tappeh Sofalin (Authors, 2020). ►

TSF13

The script style of TSF13 dates this text to late Proto Elamite period, indicating that it was written about 2900-2800 B.C., due to the existence of complex graphemes.

The tablet is a medium size measures 62×45×18 mm and was assembled from columns of ideograms and numerical notations, with one third of the whole portions having been lost. There is not any effacement of the obverse and the reverse side. The readability of the tablet was greatly improved after being cleaned at the restoration workshop at Department of Archaeology of Islamic Azad University of Varamin-Pishva. A proposed translation of each line follows the transliteration in Table 1.

This is a multi-entry text, with line-dividers. It groups together with late texts from Susa (Levels 15-14). It is inscribed on the obverse, reverse and top edge (right edge according to the original direction writing). The text has a total on the reverse, and the text of the obverse spills over on the reverse, resulting in writing in opposite directions on the reverse.1 The space between the main text and the total on the reverse is in many parallel Susa texts occupied by a sealing or a "Scribal Design". The top edge inscription is apparently flipped 180º compared to the direction of top-edge inscriptions on Susa texts. The text appears to be unsealed.

The text is more or less well preserved presumably an account of some group of workers (M376 interpreted by Damerow and Englund to be a variant of M388 or Mesopotamian KUR), and their rations. Strikingly, the rations are counted with an as of yet unattested numerical system, resembling the much later Neo Babylonian weights and measures "BAN2" of Mesopotamia (Powell, 1990). The total is separated in three parts, two for the total of the grain(?) rations and one for the total of workers. It may be that the last of these in fact is a grand total of the two first sub-totals, but more work on this and the other tablets from Sofalin is needed to establish this beyond doubt.

The 'workers' are identified by short strings of signs, none of which are identical with sign-strings in Susa. The same header (M375) found in this text is found in a number of other Sofalin texts and may represent either the ruler of Sofalin, or the 'designation' of the particular household discovered there. The two signs directly following the header are well known in the Susa corpus.

At least two numerical sign systems are used in this tablet. One is the unattested numerical System used for grain rations. The composition of the numerical signs for the grain rations is unique of its kind in rationing

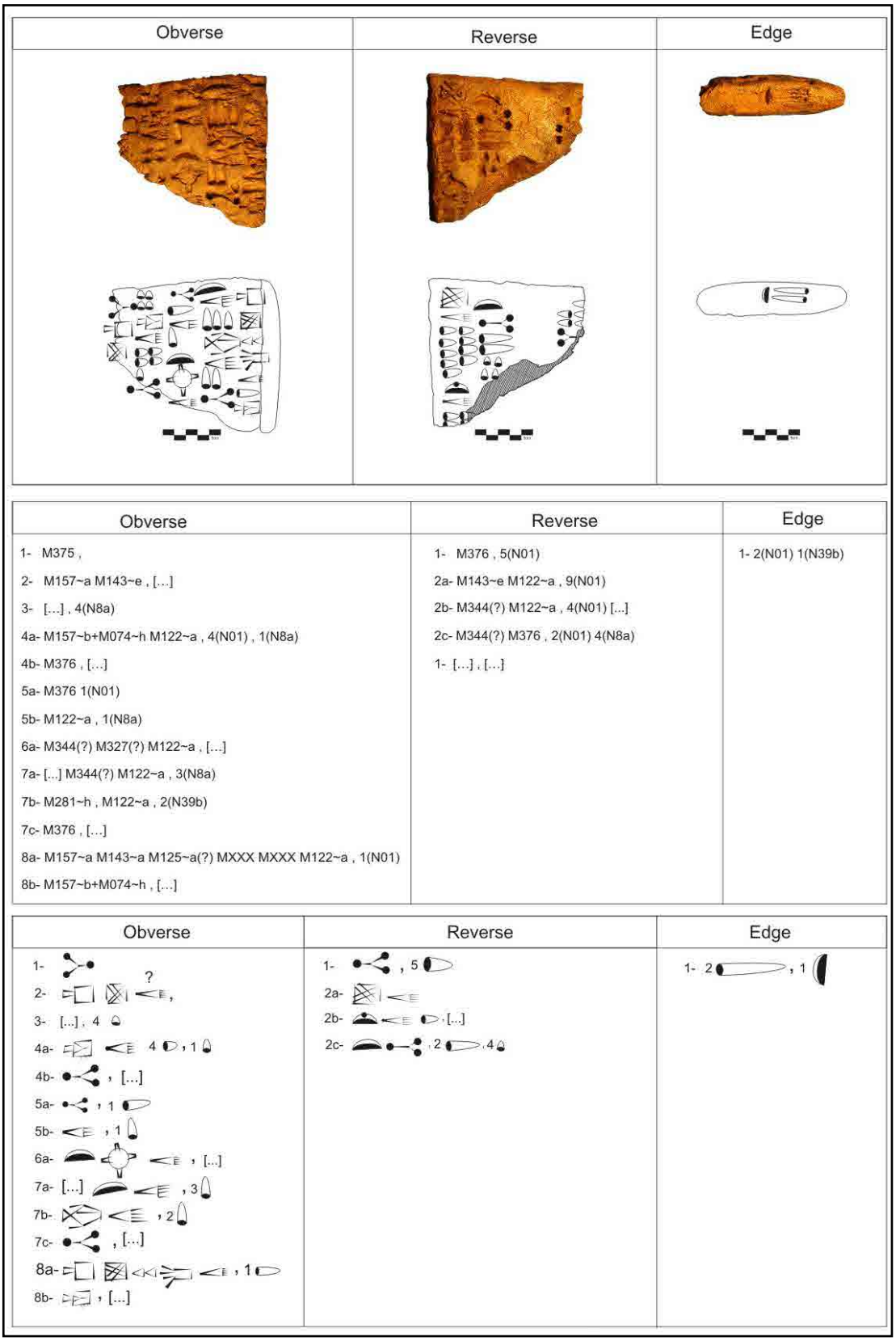


Fig. 1: Proto-Elamite Tablet with Unattested Numerical System from Tappeh Sofalin (Authors, 2020). ▲

system and the other is the Decimal numerical System used for the total of workers. Because of breaks in the tablet, total number of workers, for example M 375, is ambiguous regarding the numerical sign system used. We know that M375 uses the Decimal System, since the quantity 4(N8a) could not be valid in a Decimal system where N01 is worth 1.2

Conclusion

We think in the end, based on the incomplete decipherment of the Proto Elamite writing system, it is best to avoid trying to make distinctions the know-how of individuals or elites holding particular statuses are inside or outside the administration institute, but it seems that the Proto Elamite administration centers did "govern" their territories and perhaps the other minor power centers, local communities and persons residing or brought within their territories. What the foregoing discussion concerning the workers ration tablet has demonstrated is how all-encompassing the complexity of the Proto Elamite administration system was. But the nature of economic activity within the system and the terms upon labor projects were conceived, implemented and completed involved a broad range of agents and interests. The Proto Elamite administration centers, it would seem, were aware of boundaries of authority, interest, obligations and benefit and they seem to have done it with local big men, clans and elites. The Proto Elamite economic centers would have had long experience of taking advantage of workers including women and children and interactions with regional elites in its own immediate district, before it became the paramount site of a region.

The Proto Elamite Social divisions, or class structure, in the eve of urbanization in middle 4th millennium B.C reflects an amazing complexity in division of labor. The elite class essentially contributed to the organization of work, because they controls the wealth and land, basic to production in this society, the elites alone possessed the wealth to purchase the products, to buy goods brought from a distance as well as men power for the jobs needed to be done.

- Transliteration

Obverse

1. M375,
2. M157~a M143~e, […]
3. […], 4(N8a)

4a. M157~b+M074~h M122~a, 4(N01), 1(N8a)

4b. M376, […]
5a. M376 1(N01)
5b. M122~a, 1(N8a)
6a. M344(?) M327(?) M122~a, […]
7a. [...] M344(?) M122~a, 3(N8a)
7b. M281~h, M122~a, 2(N39b)
7c. M376, […]
8a. M157~a M143~a M125~a(?) MXXX MXXX M122~a, 1(N01)
8.b. M157~b+M074~h, […]

- Reverse

1. M376, 5(N01)
2a. M143~e M122~a, 9(N01)
2b. M344(?) M122~a, 4(N01) [...]
2c. M344(?) M376, 2(N01) 4(N8a)
1.[…], […]

- Edge

1. 2(N01) 1(N39b)

Endnote

1. From the comparison with proto-cuneiform signs, it has been proposed that the tablets were probably to be written and read vertically. Two rotation axes have been determined (Englund 1998; 2004a: 123), one horizontal to write on the reverse the total, one vertical to keep on adding entries on the reverse before turning the tablet 180° to record the total.

2. The Food ratio observed in the texts and cereal has been interpreted as a standard sowing rate relating a surface area to a specific cereals quantity to be used to sow it. If this assumption is correct, the exact volume and numbering remain to be determined.

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گل‌نوشتهٔ آغازایلامی با سیستم نگارشی تأیید نشده‌ای از تپه سفالین

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چکیده

دورهٔ آغازایلامی در نیمهٔ دوم هزارهٔ چهارم پیش‌ازمیلاد در بازهٔ زمانی ۳۳۰۰ تا ۲۸۰۰پ.م. شکل گرفت که می‌توان آن را به‌عنوان انقلابی در زندگی سیاسی و معیشتی بشر دانست. تپه سفالین در شمال مرکز فلات ایران، یکی از بارزترین محوطه‌های این دوره است که کلیهٔ شاخص‌های مهم دورهٔ آغازایلامی را داراست. بررسی و تحلیل معیشت، جامعه و طبقات اجتماعی مردمان دورهٔ آغاز ایلامی ساکن در سفالین براساس گل‌نوشته‌ای با سیستمی نگارشی پیشنهادی که هنوز تأیید نشده از این دوره است، یکی از مهم‌ترین اهداف این پژوهش است. این‌که چرا جامعهٔ آغازایلامی با سیستم نگارشی کهن خود، چنین سیستمی داراست و چگونه هم‌زمان با شکل‌گیری جوامع شهری و پیدایش خط در فلات ایران و خوزستان می‌توان این سیستم نگارشی را مورد ارزیابی قرار داد. یکی از وجوه شاخص را می‌توان، وجود داده‌های ویژه، بیانگر سیستم اداری و فن مدیریت خاص، تغییر معیشت و نوع زندگی به گونهٔ طبقاتی و به‌وجود آمدن تمایزات اجتماعی و سیاسی می‌باشند. در پژوهش حاضر نگارندگان با استفاده از روش تحلیلی-توصیفی این گل‌نوشتهٔ آغازایلامی، سعی‌بر معرفی و نهایتاً تحلیل ساختار نگارشی جدیدی پیشنهاد داده‌اند؛ براساس گل‌نوشته‌های تپه سفالین می‌دانیم که در برخی از الواح به‌دست آمده، مفاد متنی دستمزد پرداخت بیش از هزار کارگر برای انجام کاری ثبت شده است و برروی متون نگارشی مبنی‌بر شمارش، گله‌هایی با تعداد بسیار بالایی از دام به یادگار مانده است، که نشان از یک جامعهٔ بزرگ طبقاتی و یا شاید حکومتی می‌باشد و معرف یک جامعه با پیچیدگی‌های شهری است؛ همان‌گونه که ذکر شد با وجود مستندات حاضر، نیل به هدف که همانا تحلیل این موضوع ویژه امکان‌پذیر می‌شود. این گل‌نوشته می‌تواند با سیستم نگارشی خاص خود دریچه‌ای جدید در مطالعات گل‌نوشته‌های آغازایلامی، تحت‌عنوان آغازایلامی فلات نشان دهد.

کلیدواژگان: گل‌نوشتهٔ آغازایلامی، ایران باستان، فن مدیریت، سیستم نگارشی تأیید نشده (پیشنهادی)، تپه سفالین.

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