
(ELIZABETH CARTER)

iii. Proto-Elamite

"Proto-Elamite" is the term for a writing system in use in the Susiana plain and the Iranian highlands east of Mesopotamia between ca. 3050 and 2900 B.C.E., a period generally considered to correspond to the Jamdat Nasr/Uruk III through Early Dynastic I periods in Mesopotamia. This span is represented in Iran by levels 16-14B in the Acropole at Susa (Le Brun, 1971), as well as Tepe Yahya (Yahyā) IVC, Sialk (Sialk) IV2, and Late Middle Banesh (Banesh). Proto-Elamite tablets are the earliest complex written documents from the region; the script consists of both numerical and ideographic signs, the latter sometimes assumed to represent a genetically related precursor of the Old Elamite language (see iv, below). This supposed precursor language is, however, unknown, and the script itself has been only partially deciphered. Nevertheless, conclusions about the contents of the Proto-Elamite texts can be drawn from contextual analyses and formal similarities to proto-cuneiform tablets from Mesopotamia. In particular, the structure of published documents containing accounts and the use of numerical signs and of certain signs for objects in bookkeeping can be somewhat clarified.

History of decipherment. Since the first Proto-Elamite documents were discovered at the turn of the century (Scheil, 1900, pp. 130-31; Fribig, I, pp. 22-26) approximately 1,450 Proto-Elamite tablets from Susa have been published. Recent excavations at other sites have proved that the script and numerical systems known from Susa were in use at administrative centers ranging across Persia as far as the Afghan border, including the sites of Sialk, Malāyān (Malīnān), Yahya, and Shahr-i Sokhta (Sahr-i Sūkta; Damerow and Englund, 1989, pp. 1-2; Stolper, 1985, pp. 6-8; Sumner, 1976; Carter and Stolper, p. 253;
Nicholas, p. 45). The texts, written on clay tablets, seem without exception to be administrative documents: receipts and transfers of grain, livestock, and laborers; rationing texts; and so on. There are neither literary nor school texts of the sort known as "lexical lists" from contemporary Mesopotamia. The earlier "numerical tablets" from Godin (Gowdín) Tepe V and Chogha Mish (Coga Miš, q.v.), generally dated contemporary with Uruk IVb and level 17 in the Acropole at Susa, lack ideographic signs and are thus not classified as Proto-Elamite (Weiss and Young, pp. 9-10; Porada, p. 58).

Some scholars have attempted to demonstrate a link between the Proto-Elamite and Linear Elamite scripts (see v, below; Hinz, 1975; Meriggi, 1971-74, I, pp. 184-200; André and Salvini), but adducing syllabic values proposed for Linear Elamite has not led to successful deciphering of Proto-Elamite. A preliminary graphotactical analysis of the Proto-Elamite texts has also met with only modest success (Meriggi, 1975; idem, 1971-74, I, pp. 172-84; Brice, 1962-63, pp. 28-33; Gelb, 1975). Other scholars have attempted to establish a connection between Proto-Elamite and proto-cuneiform, which first appeared in Uruk IVa (ca. 3200-3100 B.C.E.) and thus seems to predate Proto-Elamite by about a century (Langdon, p. viii; de Meccquenem, p. 147; Gelb, 1952, pp. 217-20; Meriggi, 1969; Damerow and Englund, 1989, pp. 11-28).

Advances in the decipherment of Proto-Elamite have been hindered to a certain degree by the absence of necessary philological tools. A first step would be a sign list sufficiently dependable and cleansed of redundant variants to offer an approximate idea of the number and frequency of signs in the scribal repertoire, as well as providing a transcriptional instrument for analysis of sign combinations and simple contexts. Such textual work is a prerequisite for a complete edition of the Proto-Elamite texts.

Sign lists provided by early editors (Scheil, 1905; idem 1923; idem, 1935; de Meccquenem; Meriggi, 1971-74) have proved wanting (Damerow and Englund, 1989, pp. 4-7). The first serious attempt at a formal description and decipherment of Proto-Elamite script was undertaken in the 1960s and early 1970s (Brice, 1962-63; idem, 1963; Meriggi, 1971-74; Vaiman, 1989a). Most recent advances have resulted from a new understanding of the structure of the numerical sign systems, which has provided a powerful tool for semantic identification of a number of ideograms, including those for grain products, animals, and, it seems, human beings (Vaiman, 1989a; Friberg, I; Damerow and Englund, 1989).

**Format and semantic hierarchy.** Proto-Elamite texts are written on clay tablets similar in general shape and proportions to Mesopotamian clay tablets of the 3rd millennium B.C.E., including Uruk III proto-cuneiform tablets of the later phase. The tablets are thick oblongs, their height and width normally in a ratio of 2:3. Following the convention established in the earliest proto-cuneiform phase, Proto-Elamite scribes used both sides of the tablet. Regardless of the space remaining after two or more entries on the obverse, the scribe usually rotated the tablet around a vertical axis and recorded the totals along the upper edge of the reverse. Larger accounts could have a more complex format (Brice, 1962-63, pp. 20-21; Vaiman, 1989a, pp. 130-32; Damerow and Englund, 1989, pp. 11-13; Figure 1).

Three features distinguish Proto-Elamite tablets from proto-cuneiform documents, however. First, the Proto-Elamite documents were written in a linear script. Second, the first signs on a tablet, the heading, have approximately the same function as the proto-cuneiform "colophon," which is usually inscribed together with the final total on the reverse of the tablet; Proto-Elamite headings never contain numerical notations, however. Third, each entry normally includes an ideogram-followed by a numerical notation, a divergence from the strict sequence of numerical sign followed by ideogram in proto-cuneiform texts.

The heading of a Proto-Elamite tablet generally specifies the purpose and authorizing person or institution; the best known such ideographic designation is the so-called "hairy triangle," which seems to represent a leading institution or possibly kin group in Elam. Qualifying ideograms were inscribed within this sign, apparently to designate subordinate institutions or groups (Dittmann, 1986a, pp. 332-66; Lamberg-Karlovsky, p. 210; Damerow and Englund, 1989, p. 16). Following these introductory sign combinations are the individual entries, in horizontal registers without regard to formal arrangement into columns (Figures 2-3). The ideograms in Proto-Elamite text entries seem almost exclusively to denote persons, quantified objects, or both; sign combinations seeming to designate persons invariably precede those designating quantified objects when both appear in one notation. A sign or sign combination representing a person or title is often introduced by a sign representing his position. Objects are generally designated by ideograms in combination with qualifiers; as yet, however, there are no statistical means of testing the probability that certain signs functioned as qualifiers of presumed substantives.

In Proto-Elamite documents there can be multiple entries with different levels of internal organization. A text may consist simply of a sequence of entries of exactly the same type; an example would be a list of grain rations for a number of different recipients. A text may also embody a hierarchical order of transmitted information, as in the oft-encountered alternation of two different types of entry, perhaps a number of workers followed by the amount of grain allotted to them. In this instance the two entries may be considered to be combined in a more comprehensive text unit. A text may also, however, be highly
structured, with many identifiable levels, reflecting, for instance, the organizational structure of a labor unit (Figures 2-3; Nissen, Damerow, and Englund, pp. 116-21).

That all entries seem to contain numerical notations suggests that they represent a bookkeeping system, rather than the distinct sentences or other comparable semantic units of a spoken language. This semantic structure is evidence of a close relation between Proto-Elamite and proto-cuneiform texts. Proto-Elamite headings correspond to the “colophons” that often accompany totals on proto-cuneiform texts. Entries in Proto-Elamite documents correspond to the physically encased notations on proto-cuneiform texts; curiously, the hierarchical structure of individual Proto-Elamite entries is not reflected in a syntactical structure, whereas in Mesopotamian texts this hierarchy continues to be represented in some measure by the graphic arrangement of cases and subcases. Despite different graphic forms, Proto-Elamite texts thus exhibit the same general semantic structure as that of proto-cuneiform texts. This relationship must be considered a strong indication of their relative chronology: The more developed linear syntax apparent in Proto-Elamite texts, in which the graphical arrangement of

Figure 1. Proto-Elamite administrative account of four sheep herds. (Scheil, 1905, no. 212; scale 1:2).

Figure 2. A proto-Elamite account of cereal rations for labor gangs of two supervisors (Scheil, 1905 no. 4997; scale 1:2).

Figure 3. Complex rotation of the proto-Elamite account (Scheil, 1905, no. 4997).
semantic units has been dispensed with, implies that proto-cuneiform is earlier. This conclusion is in full accord with the established stratigraphic correspondences between Susa and Uruk (Dittmann, 1986a, pp. 296-97, 458 table 159e; Dittmann, 1986b, p. 171 n. 1).

Numerical sign systems. Early work on the numerical notations in Proto-Elamite texts was hampered by inadequate identification of individual signs and in particular of sign systems, which were applied in Mesopotamia and Elam to record different types of objects. Initially there was an attempt to combine a large number of what are now recognized as incompatible numerical notations into a single "decimal" system (Scheil, 1905, pp. 115-18; idem, 1923, p. 3). This attempt was abandoned in 1935, when it was recognized that different numerical systems had been in use in Mesopotamia, particularly for enumeration of discrete objects and for measuring grain by capacity (Scheil, 1935, pp. i-vi). It was, however, mistakenly assumed that the sign • had the same decimal value $10 \times \text{60}$ (instead of $6 \times \text{60}$) when representing grain measures as when representing numbers of discrete objects (Thureau-Dangin, p. 29; Langdon, pp. v, 63-68; Vaiman, 1989a), which prevented understanding of capacity notations until

Sexagesimal System S
System used to count discrete animate objects.

Decimal System D
System used to count discrete animate objects, in particular domesticated animals and human laborers.

Bisexagesimal System B
System used to count discrete grain products; objects noted with this system may, as in archeic Babylonia, belong to a rationing system.

Bisexagesimal System B°
System derived from the bisexagesimal system B, used to count rations (?) of an unclear nature.

Capacity System C
System used to note capacity measures of grain, in particular barley; the small units also designate bisexagesimal-counted cereal products.

Capacity System C°
System derived from the capacity system C, possibly related to the system B°.

Capacity System C°
System derived from the capacity system C, graphically related to the Babylonian system used to measure emmer.

Area System A
System used to note area measures.

Figure 4. Numerical sign systems attested in the proto-Elamite text corpus (Damerow and Englund, 1989, 18-30; the numbers located above the arrows indicate how many respective units were replaced by the next higher unit). In the capacity system, the basic sign $\bigcirc$ (= "1" in the systems qualifying discrete units) may have represented ca. 25 liters of grain.
the late 1970s (Friberg, 1978-79). Although detailed
documentation of the various numerical systems has
not yet been undertaken, the formal structure of
these systems and their dependence upon the older
proto-cuneiform systems are now clear (Damerow
and Englund, 1987, pp. 117-21, 148-49 n. 12; idem,
1989, pp. 18-30).

As the semantic analysis of Proto-Elamite is largely
dependent upon examination of the contexts in which
signs are used, the close connection with proto-
cuneiform sources in the numerical systems has been
helpful in establishing correspondences between
Proto-Elamite and proto-cuneiform ideograms. For
example, the sexagesimal system used in Mesopo-
tamia for most discrete objects, including domest-
ic and wild animals, human beings, tools, products
of wood and stone, and containers (sometimes in
standard measures), is also well attested in the Susa
administrative texts, though the field of application
seems limited to inanimate objects like jars of liquid
and arrows (Damerow and Englund, 1989, pp. 52-
53). A decimal system used in Proto-Elamite texts
for counting animals and human beings has no proto-
cuneiform counterpart. Bexagesimal notations
qualify barley products, as in contemporary
Mesopotamian documents. The numerical system
for indicating grain capacity involves signs from the
sexagesimal system but with entirely different arith-
metical values. This system is well attested in both
Proto-Elamite and proto-cuneiform sources and
seems to have had the same area of application. In
particular, the small units inscribed below Ψ are
qualifying ideograms for grain products, thus denot-
ing the quantity of grain in one unit of the product.
The Proto-Elamite system differs from the proto-
cuneiform system in that below the sign Ψ only units
that are multiples of one another appear (e.g. 1/2, 1/
4, 1/8), a simpler system than the somewhat cum-
bersome use of fractions in proto-cuneiform texts
(Damerow and Englund, 1987, pp. 136-41). As with
the proto-cuneiform texts, in the Proto-Elamite texts
there are numerical systems graphically derived from
the basic systems but perhaps applied to different
sorts of discrete objects or grain (Figure 4). All these
similarities together suggest that the Proto-Elamite
systems, with the exception of the decimal system,
were borrowed from Mesopotamia; even signs in the
decimal system were apparently borrowed from the
Mesopotamian bexagesimal system to represent the
higher values 1,000 and 10,000.

Ideograms. Semantic analysis of the objects
counted by the decimal system has led to the prob-
able identification of a number of ideograms. The
most important are the two signs Ψ and Ψ. The
graphic form, as well as the association, of the
ideogram Ψ with other signs strongly resembling
proto-cuneiform signs known to represent domestic
animals, in particular sheep and goats (㈯), suggests
the interpretation of this sign as "sheep" (Figure 1).
In texts from the essentially rural economy of an-
cient Persia the large numerical notations qualifying
this ideogram and related signs seem to confirm the
identification. The fact that the signs are on
the whole abstract forms may suggest either a set
of symbols for domestic animals common in
Mesopotamia and Susiana before the inception of
written documents or, more likely, signs borrowed in
altered form from Uruk (Damerow and Englund,
1989, pp. 53-55).

It appears that the very common sign Ψ was used to
qualify personal names. All signs or sign combina-
tions in a text may be interpreted by it, though more
commonly it introduces only the first entry (Damerow
and Englund, 1989, pp. 53-55). The same sign was
used as an ideogram for objects, together with deci-
mal notations commonly used for counting animals.
This double function suggests that the sign denotes a
category of workers or slaves. The use of the sign in
both ways is firmly established in the text illustrated
in Figures 2-3 (Damerow and Englund, 1989, pp. 56-
57; Nissen, Damerow, and Englund, pp. 116-21). In
the same text numbers of objects represented by this
ideogram correspond to a regular capacity measure
of barley of 1/2 iatrics, parallel to texts known from
contemporary Mesopotamia. Finally, the sign is
often used parallel to signs that may thus also be interpreted as referring to persons. One
of them is a clear graphic equivalent of the proto-
cuneiform sign SAL ( Vinci ), so that both the graphic
and semantic correspondences of proto-Elamite Ψ
to proto-cuneiform ܕ, meaning "male slave/
laborer" (Vaiman, 1989b), seem clear.

Bibliography: B. André and M. Salvini,
"Réflexions sur Puzur-Infusinak," Iranica Antiqua
System of the Proto-Elamite Account Tablets of
Susa," Bulletin of the John Rylands Library 45,
Account Tablets of Susa in the Proto-Elamite Script
with Those of Hafia Triada in Linear A," Kadmos
2, 1963, pp. 27-38. E. Carter and M. Stolper, Elam:
Surveys of Political History and Archaeology,
Berkeley and Los Angeles, 1984. P. Damerow and R.
K. Englund, "Die Zahlzeichen der Urzeit aus Urak," in M. Green and H.
Nissen, eds., Zeichenliste der Archaischen Texte
Proto-Elamite Texts from Tepe Yahya, American
School of Prehistoric Research Bulletin 39, Cam-
zur Frühezeit des Südwest-Iran, Berlin, 1986a. Idem,
"Susa in the Proto-Elamite Period and Annota-
tions on the Painted Pottery of Proto-Elamite
Khuzestan," in U. Finkbeiner and W. Röllig, eds.,
Gamdat Našr: Period or Regional Style? Wies-
Roots of Babylonian Mathematics, 2 vols.,
Göteborg, 1978-79. L. Gelb, A Study of Writing,
a king list found at Susa (Scheil; Gelb and Kienast, pp. 321 ff.; see i, above). He ruled ca. 2150 B.C.E. and was a contemporary of Ur-Nammu, the first ruler of the Ur III dynasty in Mesopotamia, and Gudea, ensi of Lagash (Wilcke, p. 110). Linear Elamite (Meriggi, pp. 184-220, tables I-IV; "script B") may have been derived from Proto-Elamite script ("script A"); see i(iii), above), with which it has some signs in common; it may not have survived Puzur-Inšušinak. It was written either from left to right or from right to left.

There are only twenty-two known documents in Linear Elamite; they are identified by letters A-V (Hinz, 1969, pp. 11-44; Hinz 1971; André and Salvini, 1989, pp. 58-61); nineteen of them are on stone and clay objects excavated in the Acropole at Susa and are now in the Louvre, Paris (cf. André-Salvini, 1992). There is also a fine silver vase with a line of perfectly executed text (Q) preserved in the Tehran Museum; its provenance is unknown (Hinz, 1969, pp. 11-28). Six linear signs, three of which are without parallel (hapax legomena) in known Linear Elamite writing, are engraved on the rim of a vase (S) from Shahdad (Šahdad) in Kermān (Hinz, 1971). Finally, on a marble stamp seal (V) of unknown origin there is a representation of a bull surmounted by three linear signs (two of them unattested variants), which probably hide a personal name (Glock, Auction Droout, no. 466). A tablet bearing the only Susa Linear Elamite text (O) that does not come from the Acropole includes signs analogous to but different from those on the other objects and must be considered to represent a different and probably older system of writing.

The most important longer texts, appear in monumental contexts, and are partly bilingual. They are engraved on large stone sculptures, including a statue of the goddess Narunte (I), the "table au lion" (A; Figure 1), and large votive boulders (B, D), as well as on a series of steps (not stelae! cf. Scheil, MDP X, pp. 9-11, pl. 3; F, G, H, U) from a monumental stone stairway, where they alternated with steps bearing texts with Puzur-Inšušinak Akkadian titles (cf. André

IV. LINEAR ELAMITE

Linear Elamite was a system of writing used at the end of the 3rd millennium B.C.E. by Puzur-Inšušinak, the last of the twelve "kings of Awan," according to

(ROBERT K. ENGLUND)

Figure 1. Linear Elamite text A, from the "table au lion" (Sb 17) in the Musée du Louvre, Paris. It is written from right to left and from top to bottom.