I. Introduction: the discovery of the tablets and my connection

Thirty years ago – in another era! – Cuyler Young circulated a memo to "all the principal authors for the Godin Project final publication."¹ My contribution was foreseen for Volume IV: "The Early Periods at Godin Tepe," more specifically for its Fascicle A: "Period V," and within that presumably for Part 3: "Small finds." Material for the fascicle, it was optimistically suggested, was to be turned in by June 1976.

As fate would have it, this deadline was not met, to say the least. In my own case, a ceaseless avalanche of other obligations competed for prior attention. The reasons that I am now at last able to move the project to the front burner are twofold. One is the luxury of retirement (as of July 1, 2002), the other is Cuyler's patience, rivalling that attributed to Job by James.

It may well be asked why I was assigned to deal with the tablets in the first place. The answer begins with a chance meeting between Cuyler and me – in a New York subway if memory
serves - early during my curatorship of the Yale Babylonian Collection, which I had taken over in 1963. It eventually led to my proposal, and his agreement, that the Collection make a modest financial contribution to his excavation at Godin Tepe, which had been going on since 1965. In return our faculty and students could participate, as indeed happened, with Richard Ellis and his wife Maria deJong Ellis, Harvey Weiss, Marie-Henriette Carr and her husband Charles (Charlie) Gates, and Curtiss Hoffman all involved at one time or another.

"The fifth and final season of excavations at Godin Tepe began on May 19 and ended on August 30, 1973" (Young and Weiss 1974:207). On June 6, Charlie excavated the first inscribed text at Godin, an event dramatically recounted by Cuyler in the magazine of the Royal Ontario Museum under the title "The Day We Found the Tablet" (Young 1974). My own visit to the site took place less than two months later. Cuyler assured me I'd have no trouble finding it, since I had told him I was bringing Edith with me. It was not, however, Edith Porada as he thought, but my late wife.

Our ride from Teheran via Hamadan to Kermanshah was an adventure. The road had been improved two years earlier in connection with the Shah's 2500-year jubilee, but not so the Mercedes limousine which we rented for the occasion. The driver held steadfastly to the middle of the road, but it was his tires that troubled us most. Their tread was 98% gone. When one of them
lost the remaining 2%, it was providentially in front of an auto
mechanic's shop. The "spare" was if anything more parlous than all
the others, but the young mechanic patched it well enough for it
to see us to our destination. And thus I earned the chance to edit
the Godin tablets! (See Weiss and Young 1975:88, n. 14; Hallo
1980:309 and n. *.)

In January, 1979, Cuyler Young provided me with
photographs of the inscribed sides of 27 of the tablets, i.e., all
those reasonably well preserved, and in May of the same year
followed that up, at my request, with "xerox copies of the
drawings on the registration cards of all thirty-six tablets and
tablet fragments which had marking of some sort (including finger
nail impressions)," to quote his covering letter of May 9, 1979.
The drawings were prepared by L. R. [Cuyler: PLEASE SUPPLY FULL
NAME], and included 25 of those I had in photograph form; 11
others I have only in drawings and 2 only in photographs (see
below, IV). From that day to this (2003), however, I have not
looked at either the drawings or the photographs. As for the
original tablets, I have not seen them since my visit to Godin in
1973. I have kept abreast of much of the literature on the
forerunners of writing in the ancient Near East, and have taken up
my long delayed assignment as soon as possible after my retirement
from active teaching.

Of course there can hardly be a question of a standard
text publication for these 38 tablets. (The number 43 quoted in
early publications includes fragments that had neither inscriptions nor seal impressions.) Instead, they will be presented here in terms of their wider context. Where do they fit into the pattern of other archaic Near Eastern writing, the evolution of literacy and "numeracy," and the cultural horizon of "Greater Mesopotamia"? As a philologist I am forced to ignore all strictly archaeological questions, but happily can refer the reader to a dissertation on the subject by one of Cuyler's students (Badler 19XX).

II. The parallels from elsewhere

The tablets from Godin all come from Level V, now dated by the excavator to ca. 3500-3200 BCE (Young 1997; previously Young 1986:222). That means they are as early as or even slightly earlier than the earliest texts from Uruk, which come from Level IVa, a level now dated, partly on the basis of Godin, to ca. 3200-3100 (Porada 1965:177; Porada et al. 1992:1 100, II 96). But the Uruk material is not yet suitable for comparative dating purposes. As van Driel put it, "no tablets have been published (or found) from a context earlier than Uruk IVa, but on the other hand, the suspicion remains that the tablets are used to date their archaeological context to Uruk IVa. There is, however, as yet no reason to assume that 'writing' was unknown before the buildings regarded as Uruk IVa was in use.... Uruk, though eponymous for the
culture, is unsuitable for serious comparative dating purposes" (1982:18).

In any case, the Godin tablets are not unique. Similar tablets have been found in a wide arc of sites around the Near East (see the map) and even beyond it. They will be surveyed briefly here.

MAP copied from Schmandt-Besserat 1992 I 131.

To begin with Uruk itself, there are a few Godin-type tablets, i.e. with numerals only to the exclusion of word-signs. To those listed by van Driel (1982:18, n. 6) and Schmandt-Besserat (1992:130, nn. 25-31), may now be added one which has been in the British Museum since 1851 (Reade 1992) and another that has just been published from the Heidelberg collection (Englund and Nissen 2001:W 20239; cf. also W 19410,11; W 19689,a, W 20044,11). As to the more fully developed script found in Level IVa, the forerunner of true cuneiform sometimes referred to as proto-cuneiform or Proto-Keilschrift (Vaiman 1976:15), it includes numerical signs very similar to those in use at Godin. The majority of the texts in this script may be described as accounts; numerals figure prominently in them and often help in their decipherment. Great strides have been made in their interpretation since the first systematic attempts by Falkenstein (1936), Vaiman (1976) and
others, especially by Nissen, Damerow and Englund (1990, 1993).

When we turn to Iran itself, the comparative material is more abundant. At Choga Mish in Khuzistan, some 20 miles from Susa, were found a few "sealed clay balls and crude clay tablets with numbers only, but no real writing" (Nissen 1977:19, citing Delougaz 1972, p. 27, 30 and pls. 9f.), exactly as at Godin. But Susa itself has yielded a rich harvest of bullae and Godin-type tablets. Here they represent the first stage in an evolution that led by the addition of the first pictograms in Level 16 (LeBrun and Vallat 1978; Vallat 1979) ultimately to the fully developed Proto-Elamite script (see e.g. Stolper 1978:94-96; below, VII A). Other Iranian sites that have yielded archaic tablets are Tepe Sialk, though these are more properly described as proto-Elamite (Ghirshman 1938:65-68 and pls. xciif.), and Tall-i-Ghazir (Weiss and Young 1975:91 and n. 20).

The situation in northern Mesopotamia is similar. From Nineveh in the East (Collon and Reade 1983:33f.), via Nagar/Nawar (= Tel Brak, Oates 1982:65; Matthews and Eidem 1993; Oates, Oates and McDonald 2001), to Habuba Kabira (Strommenger 1977, 1981) and Jebel Aruda (Van der Leeuw 1974:fac. p. 83; Van Driel 1982) in the West and back to Mari (Parrot 1965:12) and Khafaje (Tutub; Weiss and Young 1975:88 n. 16) there have been finds of archaic number tablets and in some cases such as Habuba Kabira (Heinrich et al., 1973:26; Strommenger 1973:170) also bullae or, at Brak, "dockets" (cf. Matthews 1997, Nos. 117, 164, 201).
Going even further afield, the analogies are less clear. Shahr-i Sokhta, which may (Hansman 1978) or may not (Majidzadeh 1976; Michalowski 1986:133) be ancient Aratta, has yielded one tablet with both number-sign and word-sign and is described as Proto-Elamite by Meriggi (apud Amiet and Tosi 1978:28 and fig. 16). But it is difficult to judge a newspaper account of Pakistani finds of the earliest writing from the Indian subcontinent, allegedly dating to 3300 BCE (Anon. 1977). And it is highly unlikely that there is any connection with the so-called Tartaria tablets from Romania (Vlassa 1963), let alone the pre-neolithic signs from Russia (Marshack 1979).

III. The implications for the origins of writing

In a 1980 survey of cuneiform writing, Edzard weighed the possibility of an antecedent system based on three-dimensional clay "tokens" while withholding outright assent to the theories of Schmandt-Besserat (Edzard 1980:548f.). My own endorsement was less qualified, though I recognized the objections raised against the thesis (Hallo apud Schmandt-Besserat 1992 I:ix-xi; 1996:26-30). Since then, the ground has been gone over again by Glassner, who took note of my position (2000:90) and even claimed to have found the Sumerian term for the tokens (or counters or calculi or stones) which form the basis of Schmandt-Besserat's thesis. According to him it is īmna (2000:103), although this is not
equated with abnu, the Akkadian term which designated the phenomenon in a later Nuzi text.

Summing up my own reading of the thesis, writing was preceded by counting, and counting was done with clay tokens such as occur as early as the ninth millennium BCE throughout the Near East, i.e., shortly after the neolithic revolution or "agricultural revolution" and probably as a consequence of it. After some millennia of simple token assemblages (1), it was found convenient, before the end of the fourth millennium, to string the tokens together and enclose the end of the string in a ball of clay ("bulla") or to deposit them inside round and hollow clay envelopes (2). These bullae and envelopes were impressed with stamp seals or cylinder seals and, in the case of some envelopes, with tokens like those enclosed in them to indicate what they contained. But their format was not ideal for record-keeping. To verify the contents and to reuse the tokens required breaking the envelope open. It was simpler to rely on the impression of the tokens on the outside of the envelope and simpler still to dispense with the making and enclosing of ever new tokens and to rely exclusively on their impressions on the outside, or even to imitate them with stylus or finger (so Nissen, Damerow and Englund 1990:171, fig. 18c, 173 = 1993:127, fig. 109) or fingernail (3). That given, it was only a short logical step to abandoning the envelope shape entirely in favor of a simple rectangular tablet whose shape was only slightly rounded on the writing surface (4).
In short order the rounding of the obverse writing surface was replaced by a flat obverse, presumably in order to prevent the signs of the obverse from being deleted by contact with the palm of the hand while inscribing the reverse (5). The final transformation occurred when a reed stylus was employed to impress the clay tablet with designs resembling in two-dimensional format the three-dimensional tokens that had preceded (6). With this step, full writing had been achieved (Hallo 1996:27f.). Much the same sequence of steps had already been outlined in 1978 by LeBrun and Vallat.

Where do the Godin tablets fit into this sequence? In my terms, they belong to step (4) above, when the envelope shape had been abandoned in favor of rectangular tablets slightly rounded on both obverse and reverse, but before the flattening of the obverse which had become standard. In Schmandt-Besserat's own terms, they are coeval with Uruk IVa and predate Uruk III; they thus anticipate or perhaps coexist with the earliest forms of pictographic writing at Uruk (1992:133).

IV. Physical Description of the Godin Tablets

A. Catalogue of texts

In the following catalogue, the tablets have been renumbered from 1-38, retaining the sequence of field numbers assigned to them in 1973. Tablets of which photographs were
available to me are indicated by \textit{P}, those for which drawings were available by \textit{D} followed by the number assigned to the drawing on the registration card. Dimensions are given, in centimeters, as on the registration cards (where available) as follows: \(a\) = height of the tablet measured from the top as "top" is interpreted below (\textit{VA}); \(b\) = width of tablet; \(c\) = maximum thickness of tablet. Plus (+) indicates that the relevant dimension of a fragmentary tablet was originally greater. Sealed tablets are indicated by \textit{S}, unsealed ones by \textit{U}. Some of the tablets have been previously published by Weiss and Young (1975) and/or by Schmandt-Besserat (1981, 1992); they are identified here by \textit{Y/W}, \textit{W/Y} and \textit{S-B} respectively.

<table>
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<tr>
<th>No.</th>
<th>Gd no.</th>
<th>P/D</th>
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<th>(b)</th>
<th>(c)</th>
<th>Seals</th>
<th>Previous publication</th>
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<td>1.3</td>
<td>?</td>
<td></td>
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<td>\textit{W/Y} 89 (5)</td>
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<td>\textit{W/Y} 90 (5)</td>
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**B. Dimensions**

It may be noted that the dimensions of the tablets are remarkably uniform. Apart from fragmentary ones, their height varies from 2.7 cm (No. 22) to 5.0 cm (No. 15), with the rest ranging between 3.4 and 4.9. Their width varies from 3.9 (again No. 22) to 5.95 (Nos. 26 and 27), with the rest ranging between 4.7 and 5.75. Their thickness varies from 1.3 (No. 1) to 2.7 (Nos. 15, 32 and 38) with the rest ranging from 1.5 to 2.6. According to Weiss and Young (1975:88), their arithmetic mean dimensions are 3.8x5.2x1.9 cm.

**C. Seal impressions**

Most of the tablets are unsealed. Of the seven (CHECK) that definitely are sealed, three (2, 20, and perhaps 24) are "duplicated" by three unsealed tablets (see VI B below).

To the perennial question of which came first, the seal
impression or the impressed signs, the answer seems to be that the seals were impressed first, since the number signs occasionally seem placed so as to avoid disturbing the seal design as much as possible. Occasionally the tendency to put the sign or signs in the middle of the (top) line seems dictated by the prior placement of the seal impression, as illustrated best by examples from Uruk such as W 10133 (UVB 3 pl. 19b = 5 pl. 23c) or W16184 (UVB 8 pl. 51c).
The same conclusion was reached for the single tablet from archaic Niniveh (Collon and Reade 1983:33) as well as for archaic tablets from Uruk and Shuruppak (Matthews XXXXX), while the opposite is more often true of later periods, e.g. Ur III (Fischer 1997:98-100; ref. courtesy R. Mayr).

D. Direction of script etc.

On the basis of No. 27, one may read all the Godin tablets as if they were to be held with the top of the vessel at the top of the tablet, in keeping with comparable tablets from other sites. Their signs thus begin at the top of the tablet and either begin at the right end or are placed in the middle. If a second line is needed, it either follows immediately after the first line or, more rarely, is placed at the bottom of the tablet. With all these conventions may be compared the earliest tablets from Susa (Scheil 1923; Amiet 1972:474f., 521, 534, 606, 621!, 629, 633, 652, 657, 666, 673; Vallat 1971:fig. 43:9, pl. xxiv 5; 1973:103:4) and a tablet from Habuba Kabira (Heinrich et al. 1973:25 fig. 4). But there are deviations from these patterns, perhaps for the seal impressions (e.g. Amiet 1972:491, 642).

There seems to be a strong sense of symmetry at work in the disposition of the signs (cf. Schmandt-Besserat 1992:135), leading not only to their placement in the middle of the tablet but to the alignment of signs on the lower lines beneath those on the higher one. This is noticeable in some tablets from Godin (e.g. Nos. 18 and 22) and others from Uruk (especially Reade
1992). Sometimes the effect is almost pictorial, as at Brak (Oates 1982:65 fig. 51), Habuba Kabira (Strommenger 1973:171), and Jebel Aruda (van Driel 1982, figs. 1a, b, 4,5) and one has to wonder whether that is not their primary motive! It certainly strengthens the case for reading the lines from top to bottom not from left to right.

If there is not enough room for all the signs of a given order of magnitude on one line, they are carried forward to a second line which is begun, unlike the first, at the left edge (Nos. 10, 24 and 26).

E. Obverse and reverse

The Mesopotamian convention of flattening the obverse to create what may be called the "plano-convex" tablet developed early; for a possible motive behind this development see above (III). But this convention had not yet been fully adopted in the time of the Godin tablets, most of which are still slightly convex on both sides; two are flat on both sides (Nos. XXX and XXX) and only four are plano-convex Nos. XXXXXXXXX CUYLER PLEASE SPECIFY!!; cf. Weiss and Young 1975:88). Except for the last, there are thus no easy criteria for distinguishing between obverse and reverse. The designations here employed are to that extent arbitrary, as indicated by the quotation marks; they follow those supplied with the photographs.

By way of comparison, it may be noted that at Jebel Aruda, the tablets are variously described as flat (2), flat
on one side and convex on the other (4, 10, 11), flat and round (5), both sides slightly curving (i.e., convex) (7), uninscribed side slightly flatter than the inscribed side (8, 9), both sides slightly concave (13). Sometimes the flat side is inscribed (2, 4, 10) and sometimes the convex side is sealed (4, 12?) but at other times the convex side bears the inscription (11??) and sometimes the flatter side has the seal impression (9). Since none of the tablets are inscribed on both sides, the motive for a flat "obverse" (above) is absent; if in fact the seal was impressed first, one would rather expect it to appear on the flat side. Clearly there is as yet no conventional usage in this respect at Jebel Aruda, and obverse and reverse are arbitrary designations.

A further question is whether the direction of writing is the same on obverse and reverse or, as in later Mesopotamian usage, the opposite. In "proto-cuneiform" and proto-Elamite, both conventions are attested (Vaiman 1976:16) and a similar variety prevails at Godin. Some of the Godin tablets inscribe both sides in the same direction (Nos. 3, 14, and 36); one of these tablets (No. 3) has margins in addition (see IVC above). In Nos. 4, 16(?) and 31, where the inscribed surfaces are not obverse and reverse but "obv." and edge, the evidence is less clear. But in Nos. 18, 20, 23, 24? and 26 the later Mesopotamian rule applies. (Cuyler: THIS NEEDS TO BE CHECKED AGAINST THE ORIGINALS!)

F. Edges.

While most of the tablets use obverse and/or reverse as
writing surface, a number of them employ one of the long edges either in addition to (Nos. 4 and 31) or instead of (No. 5) the other surface(s). In No. 16, it is not clear whether the deep impressions on the short edge are intended as signs.

G. "Margins" and "cases"

Two of the tablets, Nos. 3 and 18, have indentations running all around both obverse and reverse, as if to form a frame or margin for the signs. No. 14 has such a frame but only on the "obverse." No. 18 is said to also have a dividing line creating the effect of two cases (see below, V B 8).

V. Interpretation of the texts.

When it comes to the interpretation of the texts from Godin Tepe, it is hard to improve on the treatments of Weiss and Young (1975) and Schmandt-Besserat (1992:129-154). But while they were able to present the best preserved tablets in their sampling, the attempt here will be at an exhaustive presentation of all 38 inscribed tablets. The texts may be divided into three unequal groups, the first consisting of one tablet with an incised drawing of a pictographic sign as well impressed signs, the second of 25 tablets with impressed signs only, and the third of 11 fragments to poorly preserved to allow for even a tentative interpretation. The seal impressions of all three groups, are dealt with elsewhere in this volume. (CUYLER: YES?)
A. The tablet with the pictographic sign (No. 27).

The pictographic sign on No. 27 almost certainly represents a pitcher or other clay vessel, with pointed base and a neck secondarily attached to the body. The vessel pictured is of a type equally familiar from the excavations and from early sign-forms, both conveniently catalogued by Salonen (1966). For the former, one may compare especially his plate xli, described as a "crouching figure with vessel, of limestone, from Susa, archaic deposit of Stratum Cc of the high proto-Elamite period, third quarter of the fourth millennium" (Salonen 1966: 481; my translation); this accords well with both the period and the provenience of the tablet. For the latter, one may compare his sign no. 15.1, based on Labat 1948:88f., no. 108), the pictographic forerunner of the later DUR-sign, itself a ligature of a sign for a vessel with an inscribed sign for a carrying-cord, and based on evidence from Jemdet Nasr, i.e. the Uruk III period (Salonen 1966:37 and 41, based on Deimel 1928:281). To this one may add the evidence of the Uruk IV period at Uruk itself, where signs 156-158 in the older sign-list (Falkenstein 1936) and signs 88b and 296 in the newer one (Green and Nissen 1987) closely resemble ours.

The presence of the pictographic sign allows us to "orient" this tablet and presumably all the Godin tablets. Vessels with pointed bottoms clearly could not stand on their own; they were therefore placed on stands such as those pictured in archaic
(Uruk IV and III) signs 161-164, 170 and 178-179 (Falkenstein 1936:45-47) and in slightly later script by the pictographic ancestor of the sign GAN (Labat 1976:100f. No. 143). Alternatively they could be "hung" from a cover(?) like that pictured by archaic sign 181 (Falkenstein 1936:49) and its later equivalent SAKAN (= GAN+U). All these signs became logograms for various specialized kinds of vessels, while the standard logogram for vessel, DUG, derived from the pictogram of a jar, sometimes with the addition of a spout or handle.

The pictographic sign on our tablet is thus safely interpreted as a vessel standing on its pointed bottom, and allows us to "read" the tablet from top to bottom and to describe the three elongated signs to its left as "verticals." These verticals are topped by three circular signs above them, but in such a fashion that the first circular sign is to the right of the first vertical and the last vertical is to the left of the last circle. The direction of writing in Mesopotamia was from top to bottom within the case and from right to left between cases throughout the fourth and third millennia and did not change to the later convention of writing from left to right within the case and from top to bottom between cases until well into the second, especially for monumental texts (Edzard 1980:545f.; Hallo 1982:114f.). We can therefore safely deduce that the pictographic sign was written first, the circles next, and the verticals last. This sequence provides an important clue to the meaning of the
"numerical" signs, since it seems likely if not incontrovertible that the higher magnitude was written before the lower. On the analogy of later texts from Mesopotamia, we may tentatively assign to the circles the meaning "10" and to the verticals the meaning "1." We thus arrive at the sense "vessel containing 33 unities of ...." or "33 vessels containing ...."

A further observation is in order. The circles and verticals were impressed into the wet clay by means of tokens or, with Weiss and Young (1975:88), of a stylus, while the pictographic sign was definitely drawn on it with some kind of stylus or other writing instrument. This implies the absence of a suitable token to depict the vessel. Such tokens have been identified by Schmandt-Besserat from a large variety of sites, not including Godin (1992a xxxi and xxxvi sub 13). But since verticals and circles, or what she calls cones and spheres, were likewise lacking from the Godin assemblage, it seems more reasonable to attribute the resort to a drawing of the vessel to the fact that the tablet represents a step in the transition from impressed tokens to incised pictograms.

For the possibility of a second tablet with an incised sign see below, ad no. 23.

B. Whole tablets with impressed signs and no pictograms.

There are 37 tablets with impressed signs on them but no pictograms. 25 of these are in reasonably good state of
preservation and may be presented here in descending order of the amounts recorded on them or on their principal surface. For the relative and absolute values here assigned to the signs, see below (VII). Whether these amounts refer to the same commodity as the tablet with the incised pictogram is not clear, but that pictogram itself reveals little or nothing about the commodity involved, so would be of no great help in answering the question (but see below, VI A).

1. 2 large verticals over 4 circles over 6 verticals (= 246?)

No. 33: in every case, the tablets are inscribed beginning near the top of the writing surface. (For a similar large vertical see No. 37 (fragment 10) and Amiet 1972:545). Unless that rule is violated here, the two deep impressions over the circles must represent a line of writing. In later cuneiform, verticals most often stand for powers of 60. If the smaller vertical here too stands for sixty to the zero power = 1 (below, No. XXX), then the large verticals would likely be sixty to the power one = 60. But that can hardly be the case, given that two tablets (below, 2) appear to express 90 by 9 circles rather than by a sign for 60 and three circles. So it seems safer for now to suggest a ratio of 1:10 as we move from circles to large verticals, i.e., to interpret the latter as standing for 100. The same ratio appears to apply to as we move down from circles to (small) verticals, based (a) on the analogy of later Mesopotamian
cuneiform and (b) on archaic tablets from Susa with nine but never more than nine impressed verticals(?!) (Scheil 1923:82 = Amiet 1972:520; LeBrun and Vallat 1978:47 fig. 4:5 = 5 pl. iv 6; ib. 9); for 9 verticals divided over two lines cf. Englund and Nissen 2001:W19408,33.

2. 9 circles (= 90?)

a. No. 24 "reverse" (so called on the expedition photo): eight of the circles are disposed along the top of the surface, the ninth below them on the left side of the surface. This might suggest that the writing began on the left side but it may be preferable to regard it as an early case of poor planning - when space ran out after the eighth circle had been impressed, the writer simply impressed the ninth below the eighth. The "obverse" of the tablet features 2 circles over three verticals, all reasonably well centered at the top and in the middle of the surface respectively. It should be noted that the signs face in a direction opposite to that of the "obverse," as in No. 18 and in later Mesopotamian usage (cf. above, IV E). The tablet is very lightly sealed, if at all.

b. No 26: the tablet is only 4.35 cm wide compared to 6.5 cm for No. 24, so this time the scribe only managed to place the first seven circles into the top line, and had to "indent" the eighth and ninth. But the explanation offered for No. 24 holds, reinforced by the fact that the ninth circle is slightly
lower than the eighth.

3. 5 circles over 3 verticals (= 53?)

   No. 35: both lines start at the right side of the tablet, with a large space left between them, as in No. 25, though the tablet is slightly smaller.

4. 4 circles over 4 verticals (= 44?)
   a. No. 22: This is a clear example of its type. It is impressed on only one surface, and is unsealed. The verticals are well aligned under the circles, in distinction from the tablet with the pictogram. The tablet is one of the smallest in the corpus, the inscribed surface measuring just 2.7x3.9 cm.
   
   b. No. 25: Probably the same type, but this time the tablet surface is larger (4.25x4.9 cm) and the scribe has taken advantage of this fact to separate the verticals from the circles by a considerable blank space, as in No. 35. In the process, he has failed to align the verticals with the circles. The tablet is unsealed.

5. 3 circles (= 30?)
   a. No. 11: the circles are neatly centered at the top of the tablet. The rest of the surface and all the other surfaces are blank.
   
   b. No. 21: three circles, beginning at top right
edge, followed by a break and what may be a smaller circle at the left top edge.

6. 2 circles over 4 verticals (= 24?)
   a. No. 14 "reverse" is broken, but the traces suggest this restoration; alternatively, there may be only three verticals. At 3.6x5.4 cmm, the tablet is more rectangular than square, and there is relatively little space between circles and verticals. The alignment is such that the verticals are not directly below the circles but to their left (and right). The "obverse" is inscribed with what appear to be two verticals, neatly centered at the top of the tablet, as in No, 3. As in No. 18, the tablet has a margin, but only on the "obverse." It is unsealed.
   
   b. No. 2: the tablet is broken, but may be restored on the basis of No. 14 reverse, which it resembles in all respects except that it is sealed.

7. 2 circles over three verticals (= 23?)
   See No. 24 "obverse" (above, 1.)

8. 1 circle over 4 verticals (= 14?)
   No. 18 "obverse": a well preserved rectangular tablet, with a deep indentation on the right side and shallower ones on the left side and top and bottom which may be interpreted
as a "ruled margin." A fifth sign is impressed to the left of the four verticals. One would be inclined to regard this as a crescent (for the term see below ad No. 12) but for the fact that such signs otherwise appear on a separate line from the verticals, e.g. Nos. 4 and 23 rev. The reverse is also inscribed, with a circle over three verticals, and shows the same kind of margin. In addition, it has a "horizontal line dividing the field into two cases" (Schmandt-Besserat 1992:134 and fig. 81).

9. 1 circle over 3 verticals (= 13?)
   a. No. 18 "reverse" (see above, 8).
   b. No. 3 obverse: there is a slight indentation to the left of the circle which could be interpreted as a second circle. However, there seems to be a clear tendency either to begin the circles on the right hand side of the tablet or to center the verticals under the circles which seems to be the case here. There is a margin as in No. 18. The margin is repeated on the reverse, which features only two verticals, neatly centered at the top, as in No. 14. Note that they face in the same direction as the verticals on the obverse, in distinction to No. 18.

10. 1 circle over 2 verticals (= 12?)
   No. 9: this is a rather unusual tablet, almost square (5.3x4.9 cm), though rounded at the top. The circle is centered at the top of the tablet but the verticals are not
11. 1 circle over 1 vertical? (= 11?)

No. 16: this tablet almost gives the impression of being a practice tablet. Note the atypical placement of the vertical well to the right of the circle and especially the three deep circle-like impressions on the short edge.

12. 1 circle over 4 crescents and a pair of joined dots (= 10.9?)

No. 4 long edge: the tablet is well preserved but heavily sealed. That may be why the "obverse" is otherwise uninscribed and the inscription occupies the long edge (as in No. 5). The triangular wedges (so-called by Schmandt-Besserat 1992:135 fig. 84) are here referred to as "fingernail-impressed crescents" or simply "crescents" following Weiss and Young (1975:88). They must represent a smaller unit than the vertical wedges, since they follow these when they co-occur (e.g. No. 23, possibly No. 18). If (as in later cuneiform) the vertical wedges represent 60 to any power, including sixty to the power zero = one, then the triangular wedges may represent a fraction of one, here hypothetically regarded as 1/5 (see below, VI). They are followed by an "apex to apex" sign (so called by Schmandt-Besserat 1992:135 fig. 84) or what Weiss and Young call "paired, joined dots" (1975:88). By the same logic, these are clearly a smaller fraction...
yet, here assumed to represent 1/2 of a crescent, i.e. 1/10 of a vertical (see below, VI).

The reverse of the tablet has four verticals, neatly centered at its top.

13. 1 circle over 2 crescents (= 10.4?)

No. 30: the amount is just fractionally less than No. 4 (above, 12).

14. 9(?) verticals (= 9?)

No. 10: the tablet is damaged but space considerations suggest room for up to three verticals at the top right for a total of nine verticals.

15. 5 verticals over 2 crescents over 1 pair of dots (5.5?)

a. No. 23 "obverse": the verticals may be said to be centered, leaving a slight space on the right. In this space there are the merest traces of an incised sign, vaguely resembling a hand. The crescents are definitely centered, being placed to right and left of the middle vertical. The pair of dots is near the right edge. The "reverse" has three verticals over 2 crescents (= 3.4?). The tablet is unsealed.

b. No. 36: the upper right hand corner of the obverse is lost, so the restoration is speculative, based on the
assumption that the verticals began near the right edge. The reverse probably had four verticals, as in No. 4, which this text resembles, except that it is not sealed.

16. 4 verticals (= 4?)
   a. No. 5: the inscription is on the long edge; the tablet is sealed.
   b. see No. 4 reverse (above 12).
   c. see No. 36 reverse (above 15b).

17. 3 verticals and 2 crescents (= 3.4?)
   No. 23 "reverse": see above, 15a.

18. 3 verticals (= 3?)
   a. No. 20: the verticals are fairly well centered at the top of the tablet, which is sealed. On the drawing, the reverse shows four crescents; note that they face in the opposite direction from the verticals on the "obverse."
   b. No. 28: the inscribed side is damaged, but otherwise resembles No. 20, except that it is unsealed.

19. 2 verticals over 4 crescents and 1 pair of dots (= 2.9?)
   No. 31: Note that the pair of dots is on the same line as the crescents (so too in Nos. 4 and 29); the fact that it
is to the left of the crescents is another powerful argument for reading the lines from right to left. The long edge has two crescents.

20. 2 verticals over 2 crescents (= 2.4?)
   No. 34.

21. 1 vertical over 2 crescents and 1 pair of dots (= 1.5?)
   No. 29: Unsealed.

22. 4 crescents (0.8?)
   No. 20 "rev." (see above, 18a).

23. 2 crescents (0.4?)
   No. 31, edge (see above, 19)

C. Fragmentary tablets with impressed signs

1. No. 1: fragment with traces of a circle over a double axis.
   (No. 2: fragment from left side: 2 circles over three verticals; for suggested restoration see above, ....)

2. No. 6: fragment from right side: 2 verticals.

3. No. 7: fragment from bottom(?): 2 verticals.
4. No. 8: fragment from upper right corner: 2 verticals preserved.

5. No. 12: fragment from right side(?): traces of 2 signs


7. No. 15: fragment from left side: 2 circles.

8. No. 17: fragment from left side, remains of 1 circle at top.

9. No. 19: fragment from left bottom: 2 verticals.

10. No. 32: fragment from bottom (?), traces of 2 (?) signs.

11. No. 37: fragment from right side, to judge by the orientation of the large vertical impressed on the short edge (cf. No. 33, above 1).

12. No. 38: fragment from top: two circles and remains of a third.

VI. Discussion

A. The commodity or material being counted

The token system that preceded the number-tablets indicated not only the quantity but the nature of the commodities being counted, according to Schmandt-Besserat. The slightly later archaic tablets from Uruk IV perpetuate these distinctions, albeit on a more sophisticated level, using different systems of counting
for different commodities. Since the Godin system most nearly resembles that used for barley at Uruk, one may venture a guess that barley is also at issue here (see below, VII). The Godin V stratum where the tablets were found indeed contained storage rooms and pottery (Young 1997) and there were "legumes and grains stored in room 22" (Weiss and Young 1975:96). The tablets, though found in other rooms and in the courtyard, may refer to the grain stored in the storage in room 22.

B. The possibility of pairs. Note that there may be several pairs of duplicate or near duplicate texts, notably Nos. 22 and 25 and Nos. 5 and 21, all unsealed, and inscribed on one side only. In some cases, one duplicate is sealed and the other is not, namely Nos. 2 (sealed) and 14 (unsealed) and Nos. 20 (sealed) and 28 (unsealed); again, all four are inscribed on one side only. Nos. 24 (sealed ??) and 26 (unsealed) form a similar pair. Where more than one side is inscribed, only one duplicates one or even two other tablets, namely: Nos. 3 rev. and 18 rev., Nos. 23 and 36 obv. (all unsealed), and Nos. 4 and 5 (both sealed) and 36 obv. (unsealed). Whether any significance can be attached to these observations remains to be seen.

C. The possibility of joins. While it is difficult to propose or even to rule out joins on the basis of photographs and drawings alone, there are no likely prospects for joins among the fragments. CUYLER: TRY IT ON BASIS OF MY DESCRIPTIONS OF THE FRAGMENTS??
VII. The numbers

Since the inscribed Godin tablets consist almost entirely of numbers, an attempt to assess the relative and absolute size of these numbers is called for. "Number tablets" from other sites need to be considered, but it must be remembered that there is not as yet a conventional form of notation that bridges the geographical horizon of all the finds, each of which has its own divergences; but even when there are trans-regional similarities in the number signs, there may not be any easy way to compare them with the forms of numeral notation in historic periods (Nissen, Damerow and Englund 1990:172f. = 1993:128f.).

A. Given the local variations in notation, and the uncertainties attached to all of the local varieties, the best that can be done for now is to advance a working hypothesis as to both relative and absolute numerical values to be attached to the signs in the Godin tablets. In a limited corpus, it is impossible to differentiate among possibly multivalent signs; hence it is best to operate with the further hypothesis that whatever was being counted or measured was one and the same staple, or at least used one and the same numeration. On this basis the safest course is to regard each lower unit as related to the next higher unit in the ratio of $x+1:1$ where $x =$ the highest number of units attested for the lower unit.
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On this basis, and without reference for now to archaic tablets from other sites, it will here be posited that the "pair of dots" sign, which occurs five times, each time by itself, stands in the proportion of 1:2 to the crescent. The latter occurs 9 times, six times as two of the kind and three times as four of the kind. If four is in fact the highest number of crescents to occur in the texts, then it may tentatively be suggested that it stands in the proportion 1:5 to the vertical. The latter occurs no less than 25 times, in quantities ranging from 1 to 9. It would then be likely to relate to the circle as 1:10. The circle occurs 19 times, in quantities ranging - again - from 1 to 9. It should thus relate to the large vertical as 1:10. Therewith a basically decimal system has been reconstructed, although the lowest unit is subdivided in two.

When it comes to absolute size, one is forced - again ex hypothese - to fall back on the known value of Mesopotamian number signs in the sexagesimal system. There the vertical wedge is universally employed to represent 60 to any power, including 60 to the power zero = 1. Applying that value to the vertical at
Godin, we can hypothetically assign to the successive signs in descending order the values 100, 10, 1, 1/5 and 1/10. The values assigned to the numbers in the texts above are based on this understanding.

B. Base 10?

An apparent exception to the observation that no more than nine circles appear on any one tablet is found at various sites. At Jebel Aruda, one small tablet has two lines of five circles each, and a large tablet has two lines of eleven circles each (Nissen, Damerow and Englund 1990:174, fig 18h = 1993:130, fig. 114). At Sialk, one tablet has two lines of 10 circles each starting at the top right edge, followed by a third line with three circles. This tablet further diverges from the norm at Susa and Godin by starting the second and third lines before the preceding line is carried all the way to the left edge (Ghirshman 1938:67f. and pl. xcii S. 1631). Perhaps it represents some kind of an exercise tablet. Note that its "reverse" has an intricate drawing much like some of the school-texts from Ur and Shuruppak (Fara; Heinrich 1931:64). In and of itself it is not enough to negate the theory of a decimal base for counting. On the other hand there seems no doubt that a decimal base was early replaced by a sexagesimal base as illustrated by 'the oldest known schooltext from Babylonia' (Englund and Nissen 2001:17 ad W 19408,76+) in which 600 is expressed by a ligature of 60 and 10 (Nissen, Damerow and Englund 1990:98 = 1993:58). It is
dramatically illustrated in a Fara period text which is described as "the oldest document of its kind" and as one of "the oldest documents relating to a systematic study of the arithmetical techniques which originated in the archaic period" (Nissen, Damerow and Englund 1990:181-3 and fig. 18m = 1993:136-8 and fig. 119).

Another possible exception may be represented by the lone tablet from Mari (Parrot 1965:12), with 4 circles in the first line, 6 in the second, and one in the third, followed by three verticals. In its isolation, it can hardly be treated as normative.

There is also the question of markings which are neither as deep as the verticals nor as rounded as the crescents though, like the latter conceivably made with the fingernail. The presence of five of these on an Uruk tablet (UVB 25 pl. 27k,n) may have to be explained as representing something other than a number.

C. Large vertical or large circle?

For No..33 (and possibly No. 37) we have interpreted the large impressions as large verticals, assigning them a value of 100. But it must be admitted that there are clear examples of tablets where a large circle is written over one or more (small) circles, e.g. W 20239 in Englund and Nissen 2001. At Jebel Aruda, both phenomena occur (van Driel 1982:16).

D. Fractions
To interpret the vertical wedge as "1" is to be guided not only by later cuneiform usage but by the virtually universal meaning of this sign. In treating the units that follow this sign as fractional values of "1," the later analogies are more ambivalent. The archaic roster of numeral signs that precedes full cuneiform writing, or "proto-cuneiform," counts no less than 60 different forms according to the tabulation by Nissen, Damerow and Englund (1990:62, fig. 8a = 1993:26, fig. 27), but not one of them resembles a crescent scratched with the fingernail. The nearest analogue is their N 39 (= Falkenstein 1936, Sign No. 935) which, however, faces the other way: if the Godin sign may be compared to a growing crescent, the Uruk sign is a waning crescent. It is related to the vertical wedge, which is the next highest unit in this system, as 1:5, just as (on my reading) the crescent at Godin, and presumably on the same basis, i.e. that it never occurs more than four times at one time. It is used in the basic barley-system ("SE-system"), and recurs, with an additional stroke, in the special barley system apparently intended for malt.

While the value of the crescent as 1/5 had been recognized already by Langdon (1928) and Falkenstein (1936), the value of the next lower unit (Nissen et al. N 24 = Falkenstein 1936, Sign No. 919) was first established by Vaiman, who recognized the sign at Uruk resembling the "pair of dots" at Godin as 1/2 of 1/5, i.e. 1/10. Essentially the sign signifies a
reciprocal of 2. Similarly, three dots represent the reciprocal of 3, i.e. 1/3, more particularly 1/3 of 1/5 = 1/15; four dots represent 1/4 of 1/5 = 1/20, 5 dots 1/5 of 1/5 = 1/25, and 6 dots 1/6 of 1/5 = 1/30 (Vaiman 1976:18f.).

These smaller fractions occur in the barley-system at Uruk (Nissen et al. N 26, 28, 29, 30a). In the malt-system at Uruk the paired dot is said to be in the ratio of 1:5 to the crescent, hence of 1:25 to the vertical, and for good measure in the "EN-system" (perhaps used for measures of weight) in the ratio of 1:2 to the vertical (without any intervening crescent unit). The sign N 51 also bears some comparison, but is not explained at all (Nissen, Damerow and Englund 1990:64f., fig. 8b = 1993:28f., fig. 28). At Godin, by contrast, the paired dot occurs on five separate tablets but never more than once at a time, i.e. only in the basic meaning of 1/2 of 1/5 = 1/10.

The fact that the form, if not always the function, of the number-signs on the Godin tablets most nearly resembles the form of those reconstructed for the tablets from Uruk for the measurement of barley (both below and above "1") may provide a precious clue to the identity of the staple being accounted for at Godin (above, VI A).

Comparing Godin-type tablets from sites other than Uruk yields no comparable signs for fractions. It is interesting, however, that the paired dots occur in proto-Elamite, and likewise with the value 1/2 (Meriggi 1971:167, 169), while the (growing)
crescent occurs at Jemdet Nasr, apparently with the value 1/5, i.e. it "never occurs more than four times" (Langdon 1928:65, No. 451).

VII. Conclusion: regional and inter-regional implications

A. Implications for Proto-Elamite

The relations of the Godin tablets to proto-Elamite deserves closer scrutiny. True, "if the people who occupied the Oval Enclosure [at Godin] were merchants, they might just as well have been merchants from Sumer as from Susa" (Young 1986:218). But given the appearance of Godin-type number tablets not only at the type site but at four other sites to its south, all or most of them in the highland kingdom later known as Elam, it is worth seeing whether they have any relationship to the proto-Elamite tablets known from Sialk, Shahr-i Sokhta and particularly from Susa. Tablets inscribed with this script first appear at Susa in Level Cb, which is said to correspond to Uruk III. The conventional wisdom therefore has it that this script was derived from the first full script attested at Uruk in Level IV (e.g. Hinz 1973:28). But others argue that it goes back to the middle of the fourth millennium and that it originated and developed independently of Sumerian cuneiform and its forerunners (Gragg 1995:2162f.). So it may be worth noting certain resemblances between the Godin-type tablets and these earliest proto-Elamite
 tablets, resemblances that are not found in the archaic tablets from Uruk.

In the first place, the disposition of the number signs on the tablet are such that they begin at the top right corner of the tablet (interpreting "top" as in the Godin tablets); the earliest Uruk tablets tend to dispose the signs much more often symmetrically in the middle of the top of the tablet. If the nature of the commodity counted is identified, the pictogram or logogram in question appears before, i.e. to the right of the number signs, as in Godin No. 27. Both these features are illustrated on a tablet published by Walker, who also discusses the directions in which the signs were inscribed and read respectively (1980 75 and fig. 4). Other examples, also probably from Susa, were published by Stolper (1978 figs. 15, 17, 18).

Secondly, the proto-Elamite tablets favor the Godin type of "growing crescent" (sometimes followed by a single pair of dots) against the "waning crescent" in use at Uruk (e.g. Stolper 1978:96 fig 17).

Thirdly, the numbering system in proto-Elamite appears to be decimal rather than sexagesimal, in this regard, too, resembling Godin more than Uruk (Gelb 1952:89; Brice 1962; Meriggi 1971:159-172).

These are no more than hints, but they should suggest the need to reconsider the precise route which led to proto-Elamite writing. Again, it is necessary to put a limit on
speculation, however. Thus the suggestions of a proto-Elamite or Elamite connection to Dravidian, however beguiling, cannot be pursued here (McAlpin 1974, 1975).

B. Implications for "Greater Mesopotamia"

In spite of the near uniqueness of the Godin corpus in respect to fractions of "1," it is linked to archaic number tablets from elsewhere in all other characteristics. In fact, the similarities are striking, the divergences minor, when one considers such factors as the date of the assemblage, the size and shape of the tablets, the appearance of the units from "1" and up, the arrangement of the number signs on the tablets, the use of seal impressions, and of course the medium (clay) on which the seals and number tokens are impressed. Clearly, the Godin material is part and parcel of an inter-regional phenomenon that embraces, in modern terms, Iraq, northern Syria and western Iran or, in ancient terms, what has come to be regarded as "Greater Mesopotamia." The term was introduced by Flannery (1965:1247) and the concept was utilized by Young in his discussion of early population dynamics (1972:828, 1977:828; Smith and Young 1972:3), becoming the theme of his tribute to Robert Dyson (Levine and Young 1977; cf. also Weiss and Young 1975:94; Hallo 1980:309 and n. 8). It is a useful reminder of what others have called "the Uruk expansion" (e.g. Alagaze 1993:53-55, 98). At the same time it helps to define the limits of that expansion. Thus it was easy to exclude the material from Shahr-i Sokhta, Pakistan, Romania and
Russia from the discussion (above, II).

(8357 words)

40 pp.

1. His covering letter to me, dated June 7, 1974. The memo itself carried the date of April 16, 1974.

Godin-Bibliography


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After completing the draft of my chapter on the Godin Tepe tablets, sent copies to a number of colleagues who really knew the subject of archaic tablets. Two of them were kind enough to respond with very thoughtful comments. By rights I should have incorporated all of these into my draft, and did so where feasible. But most of them are based on premises so different from my own that it would have been impossible to integrate their explanations with mine. With their consent, I have instead opted to append their comments to my chapter under their own names and in their own words. I am deeply grateful to them, both for their permission and for their critiques.

The following are virtually verbatim transcripts of their remarks. My editorial comments are kept to a minimum, and identified by square brackets.
Robert K. Englund, letter (e-mail) of May 9, 2003:

Dear Bill,

Now then, I’ve gone through the Godin Tepe article and recommend that you review the comments on the numerical notations on the texts. Please note that there is no decimal system on any Late Uruk material, thus for instance your text 33 must be a simple exagesimal notation, whereas the texts 24 and 25 that you cite there should be grain notations that, assuming both columns are to be read together, represent 9 x 6 = 54 basic units. This might also be simple doodling of [on] the reverse surfaces of both texts, I should think that nearly all of your accounts consist of sucg grain nottions, but this could be contested in those cases thz contain “N1” and/or “N14” in numbers that could be interpreted as sexagesimal. All notations with “N39b”, “N24” must be from [the] grain capacity system. N39b (“waning crescent”) is common in the Uruk Iva texts, replaced in Uruk III by N39a. Falkenstein 1936 should not be cited instead of ATU 2 (there page 342). The value of N39 (1/5 NI) and lower members of the grain system was clearly demonstrated by Falkenstein “Archaische Texte des Iraq-Museums in Bagdad”, in OLZ 40, [(1937)] pp. 401-410, and is also clear from totals Peter [Damarov] and I discussed in ATU 2 ch.3.

I do not understand your comments about the malt system in VIIImD. It mirrors the basic system.

The proto-Elamite decimal system is not attested at this time; the Godin texts are all Late Uruk.

Some notes:

Text 10: if 6N1 then not grain notation.

Text 13: is that a large N14 on obverse? If so, then the notation could be sexagesimal or grain (or bisexagesimal).

Text 27: the famous one, this could be either sexagesimal “33” or a grain notation equal to 3 x 6 + 3 = 21 N1.

Text 40: (and perhaps one or several that I cannot recognize, nos. 34, 37 too?) looks to have a “60” sign on the edge; this is probably in ideographic use according to a number of proto-Elamite texts.

Text 34 ([10??]): as I mentiones, in all likelihood sexagesimal and therefore very interesting here. This cannot be grain since 6N1 would have been replaced by N14.

Other notes working from beginning of [chapter]:

Van Ess of DAI-Warka dates Uruk Iva now to 3350, and D. Suerenhagen in his Habilitationsschrift dates the Red Temple “Uruk IVa” tests to at least IVb, and probably V. Mathematicians take exception to the use of “numerals” to

You know my and others’ belief that there is no clear evidence for the complex token theory, and much that speaks against it. The Uruk “tablets” (unclear function) W 10133 (six tablets) and 16184 (and all other gypsum tablets) are published in ATU 5. Mathews wrote in MSVO 2 of the Jemdet Nasr practice of sealing first, and writing over the impression [of the seal(s)]. He considers this a “letter head”.

If you transliterated the texts using the Green-Nissen sign list [Margaret W. Green and Hans J. Nissen, Zeichenliste der archaischen Texte aus Uruk (Berlin, Mann, 1987)],

instead of describing the notation with circles and verticals, it would help to avoid confusion with the standard archaic publications that will describe N1 as “horizontal” and so on – the old orientation flap. A “vertical”, in our publications = ½ of the basic unit in the sexagesimal system.

II. Denise Schmandt-Besserat, letter of March 29, 2003

Dear Bill,

Thank you for sharing with me your ms. ...I hope the attached will be of some help.

Joran Friberg might be recognized as having done seminal work on the archaic tablets, namely interpreting the impressed signs as units of commodities – not numerals. According to him, wedges + circular signs are units of cereals. See Joram Friberg, The Third Millennium [Early] Roots of Babylonian Mathematics (Chalmers University of Technology and the University of Goteborg, 1978-79), pp. 10, 21 and 46. I have followed Feiberg’s interpretation (see my Before Writing, 1992, pp. 1-132) and so have Nissen, Englund and Damerow (see their Archaic Bookkeeping, 1993, pp. 28-29) previously idem, Frühe Schrift und Techniken der Wirtschaftsverwaltung im alten Vorderen Orient (1990, pp. XXX).

[Comments to selected passages :]

II. I think it is better to call the hollow objects holding tokens “envelopes” and reserve the term “bulla” for the solid
For the sake of forging a series of standard terms, I would suggest to [replace] the term “Godin-type tablet” by “impressed tablet”.


III. “Clay tokens such as occur as early as the ninth millennium”: the first tokens occur ca. 7500 BC (at Mureybat, Syria, and Tepe Asiab, Iran), therefore: “eighth millennium”.