N_{16} in the Archaic Texts

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§1. The sign N_{16} is scarcely attested in the archaic texts, limited to only the Uruk III/JN period. Until recently, only three attestations were available,[1] all in tablets coming from Uruk and in fragmentary contexts. A few more tablets in which the sign occurs are now available and in much better preserved condition, albeit of uncertain provenance. The scope of the following analysis is to deduce and assess the meaning of this sign.

§2.1. A text that has recently been made available,[2] an almost complete but damaged tablet with an account of barley destined as food (GU_7), includes the sign N_{16} in a partially broken context. The transliteration of the relevant section is provided in the following.[3]

O0105a	⌜$6N_{14}$⌝ $3N1$ $3N_{39a}$ ⌜$1N_{24}$ $1N_{28}$⌝ [...]
O0105b1	⌜$6N_{14}$⌝ $1N_{24}$ $1N_{28}$ ⌜ŠU⌝ UR_{5a}
O0105b2	⌜$3N_1$⌝ $1N_{16}$ TAR_a

§2.2. Case O0105a registers the total of the quantity of barley listed in case O0105b1, qualified as ŠU UR_{5a}, and the quantity reported in case O0105b2, qualified as "tribute" (TAR_a). Such "tribute" is usually equivalent to 10% of the value of the relevant transaction (case O0105b1). In terms of N_1 = "barig"[4], we have the following equivalence:

$$39.75 \text{ (total)} = 36.15 \text{ (⌜ŠU⌝ } UR_{5a}) + 3 + 1N_{16} (TAR_a)$$

which, by calculation, would provide for $1N_{16}$ the value 0.6 (= 39.75 - (36.15 + 3)). Since such a quantity is always written $3N_{39a}$, as in case O0105a, we have to assume a scribal error in case O0105b2, which should be corrected to:

$$⌜3N_1⌝ <3N_{39a}> 1N_{16} TAR_a,$$

i.e., in terms of barig, equivalent to $3.6+1N_{16}$.

§2.3. Considering that 10% of the quantity in case O0105b1 is

$$^1/_{10} \times (⌜6N_{14}⌝ 1N_{24} 1N_{28})$$
$$= {}^1/_{10} \times 36.15$$
$$= 3.615 \text{ (barig)},$$

it would follow that

$$1N_{16} = 0.015 \text{ (barig)}$$

§2.4. As a consequence, the total reported in case O0105a should be restored as

$$⌜6N_{14}⌝ 3N_1 3N_{39a} ⌜1N_{24} 1N_{28}⌝ [1N_{16}].$$

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[1] The three tablets are W 21385, a two-column fragment with a broken context (O0201: $3N_{14}$ [...] ⌜$1N_{16}$?⌝ EN_a X U_4x$2N_{57}$ [...]), where the traces of the sign rendered as $1N_{16}$ allow its reconstruction as NUMUN as well; W 21537, a fragmentary account of possibly grain groats, where the sign N_{16} occurs in a broken context (R0101: [...] ⌜$1N_{30c}$⌝ $1N_{16}$ ⌜$3N_{57}$?⌝ X ⌜HI*gunu*$_a$?⌝ [...]); and *ATU* 3, pl. 75, W 21208,8+, a fragmentary lexical list, where the signs $1N_{16}$ and $1N_{17}$ are listed in sequence (O0105-6: $1N_1$ $1N_{16}$ / $1N_{16}$ $1N_{17}$).

[2] MS 4499, to be published in R. K. Englund, *Proto-Cuneiform Texts from the Schøyen Collection* (=*PCTSC*); photographs and transliteration available in the CDLI under no. P006303.

[3] The transliteration provided [5 Dec. 2005] in CDLI has ⌜$SANGA_a$⌝ UR_{5a} in case O0105b1; the reading ⌜ŠU⌝ UR_{5a} is supported by the parallel sections of *MSVO* 3, 26 (O0101a / O0102a), CDLI no. P006396 (O0304a / R0101), MS 4496 (O0101), MS 4559 (O0201),

NES 51-02-001.1 (O0101a / O0102a / O0103a), NES 51-10-032 + NES 51-10-034 (R0101b1) and NES 51-10-007 (O0201) (the last three texts are to be published as *CUSA* 1 [S. Monaco, *The Cornell University Archaic Tablets* (=*Cornell University Studies in Assyriology* vol. 1, forthcoming)], nos. 74, 97 and 172).

[4] For the value of the barig cf. fn. 11 below.

Such calculations will be reviewed below by taking into account the correct value of N_{16}, as resulting from the following textual analysis.

§3.1. CUNES 50-06-203,[5] a well preserved tablet with an account of beer for five months, registers the results of calculations similar to those recorded in the tablet MS 4499. The transliteration of the obverse (the reverse is uninscribed) reads as follows:

O0101	$1N_{28}$ ŠE$_a$ U$_4$.$1N_{57}$ KAŠ
O0102a	$1N_1$ $3N_{39a}$ $1N_{29a}$ $1N_{16}$ U$_4$x$1N_1$ KAŠ
O0102b1	$1N_1$ $2N_{39a}$ $1N_{24}$ U$_4$x$1N_1$
O0102b2	$1N_{24}$ $1N_{29a}$ $1N_{16}$ TAR$_a$
O0103	$1N_{14}$ $2N1$ $1N_{39a}$ $1N_{24}$ U$_4$x$5N_1$ KAŠ
O0104	AB$_a$ KAŠ

§3.2. The quantity recorded in case O0101 is a daily ration of beer equivalent to $1/20$ (barig) of barley, which is calculated in case O0102b1 over a period of one month (U$_4$x$1N_1$)[6]:

$$1N_1\ 2N_{39a}\ 1N_{24} = 30\ \text{(days)} \times 1N_{28}$$
$$= 30 \times 0.05\ \text{(barig)}$$
$$= 1.5\ \text{(barig)}$$

§3.3. Case O0102b2 records the "tribute" (TAR$_a$), equivalent to 10% of the quantity registered in the preceding case O0102b1:

$$1/10 \times (1N_1\ 2N_{39a}\ 1N_{24})$$
$$= 1/10 \times 1.5$$
$$= 0.15\ \text{(barig)}$$
$$= 1N_{24}\ 1N_{29a}\ 1N_{16}$$
$$= 0.1 + 0.04 + 0.01$$
$$= 1/10 + 1/25 + 1/100$$

§3.4. It follows that $1N_{16}$ has the value $1/100$ "barig". Consequently, the quantity reported in case O0102a, being the sum of the quantities in cases O0102b1 and O0102b2, results, in terms of barig, in

$$1N_1\ 3N_{39a}\ 1N_{29a}\ 1N_{16} = 1.65\ \text{(barig)}$$

§3.5. Obviously, such a numerical value for the sign $1N_{16}$ is much more suitable than the value (0.015) calculated in the previous paragraph, and consequently it shall be assumed that in tablet MS 4499 the value of the "tribute" was rounded off to 3.61 (barig). It follows that the total quantity reported in case O0105a should

read

$$⌜6N_{14}⌝\ 3N_1\ 3N_{39a}\ ⌜1N_{24}\ 1N_{28}⌝\ [1N_{16}]$$
$$= 36 + 3 + 0.6 + 0.1 + 0.04 + [0.01]$$
$$= 39.75\ \text{(barig)}$$

§4.1. The sign N_{16} occurs in two other archaic tablets of the Cornell University Collection, one of which (CUNES 50-06-217) brings additional evidence for the value of N_{16} ($1/100$) obtained above. The other tablet, CUNES 51-10-007,[7] an account of grain groats, registers in case O0102 an amount of groats ($1N_1$ $1N_{24}$ ⌜$1N_{16}$?⌝ ḪI*gunû*$_a$ ⌝ ERIN E$_{2a}$ UR$_2$), with the possible occurrence of the sign N_{16}[8], the value of which, however, cannot be determined from the context.

§4.2. CUNES 50-06-217,[9] a damaged tablet with a mixed account of cereal producs (bread and beer), records a quantity (of bread?), measured in the numerical notation N_{51}, together with the corresponding amount of grain groats. The relevant section reads as follows:

R0302a	$2N_{51}$ [...] $1N_{16}$
R0302b	⌜$2N_1$ $2N_{39a}$⌝ ḪI*gunu*$_a$,

where $1N_{16}$ in case R0302a is to be regarded as the reference value for the accounted product.[10] The following equivalences confirm the value $1/100$ for the sign $1N_{16}$, which represents the equivalent amount of grain groats for a single unit of a small cereal product,

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5   To be published as *CUSA* 1, 143.

6   Tablets recording similar calculations are *CDLB* 2003/4 and NES 51-01-098 (=*CUSA* 1, 114).

7   *CUSA* 1, 172.

8   There is also an unlikely occurrence in NES 51-01-100 (=*CUSA* 1, 149), which is disregarded in the present analysis because the shape of this and other numerical signs, present in the same case (O0103), do not allow a reliable identification of the signs themselves.

9   *CUSA* 1, 112.

10 For similar case arrangements and numerical relationships in analogous accounting contexts of various kinds of breads and cereal products, cf. the following texts: *MSVO* 1, 90 (O0206a/O0206b: $1N_{51}$ GAR $1N_{24}$? / $4N_5$), *MSVO* 1, 111 (O0103a/O0103b: $1N_{51}$ GAR $1N_{28}$ / $1N_{20}$), *MSVO* 3, 3 (O0101a/O0101b; O0103a/O0103b: $2N_{51}$ $1N_{30c}$ DU$_{8c}$ AB$_b$ EZINU$_d$ / $4N_5$ $4N_{42a}$; $5N_{51}$ $1N_{30c}$ DU$_{8c}$ GIŠxŠU$_{2b}$ SAR$_a$ / $2N_{20}$); *MSVO* 4, 66 (O0102a/O0102b; O0103a/O0103b; O0104a/O0104b; O0105a/O0105b: $1N_{51}$ $1N_{24}$ / $2N_{20}$; ⌜$1N_{51}$⌝ $1N_{26}$ / $1N_{20}$ $2N_5$; ⌜$2N_{51}$⌝ $1N_{34}$ $1N_{28}$ / ⌜$2N_{20}$ $3N_5$⌝; $5N_{51}$ $1N_{29a}$ / $4N_{20}$), NES 50.08.073.1 (=*CUSA* 1, 113) (O0101a/O0101b; O0102a/O0102b: $2N_{51}$ $1N_{34}$ $3N_{57}$ ŠU / $2N_5$ ḪI*gunu*$_a$; $1N_{51}$ $1N_{30c}$ GAR / $2N_5$ $2N_{42}$ ḪI*gunu*$_a$), NES 51-06-009 (=*CUSA* 1, 118) (O0101a/O0101b; O0102a/O0102b: $2N_{51}$ ŠE$_a$+GAR $1N_{29c}$ / $1N_{20}$ $3N_5$; $2N_{51}$ $1N_{30c}$ ŠE$_a$+GAR / $4N_5$).

probably bread.[11] Thus

(R0302a) $2N_{51}$ [...] $1N_{16}$
  = 240 [breads ?] × $^1/_{100}$ (barig each)

which, in terms of barig, gives

(R0302b) ⌜$2N_1$ $2N_{39a}$⌝ $\underline{H}Igunu_a$
  = 2.4 (barig of) grain groats

§5. In conclusion, there is sufficient textual evidence available to demonstrate the numerical value of the sign N_{16}, representing the smallest fraction ($^1/_{100}$) of the unity of capacity barig currently known. With such considerations in mind, it is surely of interest to analyze in greater detail the text W 21208,8+. The tablet is a lexical list dealing with cereal products that registers in sequence several kinds of bread, following apparently two criteria. These are typology and size of the products. In the first column, only partially preserved, there are at least three numerical notations, which could denote the size of some standard type of bread, probably by measuring the relevant quantity of cereals needed for their production. It is noteworthy that $1N_{16}$ is followed by $1N_{17}$, for which a value of $^1/_{200}$ (barig), corresponding to $^1/_8$ of a liter, seems logically the most appropriate. Since there are presently no other occurrences of the sign N_{17} in the known archaic tablets, however, the proposed value must be considered hypothetical for the time being, awaiting future textual evidence for its confirmation.

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[11] Assuming for the barig (N_1) a value of approximately 24 liters (according to P. Damerow and R. K. Englund, "Die Zahlzeichensysteme der Archaischen Texte aus Uruk," in M. W. Green and H. J. Nissen, *Zeichenliste der Archaischen Texte aus Uruk* [=*ATU* 2; Berlin 1987] 153-154, fn. 60), $1N_{16}$ represents about $^1/_4$ of a liter. It is worth noting that in later periods the minimum value of the rations due to the lowest class of workers (dumu) amounted to 10 sila$_3$ per month (cf S. Monaco, "Parametri e Qualificatori nei testi economici della terza Dinastia di Ur," *OrAnt* 24, 21ff.). This value corresponds to a daily ration amounting to $^1/_3$ sila$_3$, equivalent to approximately $^1/_4$ liter (based on a sila$_3$ value of $^5/_6$ liter), i.e., the same value represented by $1N_{16}$. Whether such a coincidence implies a continuity in the Mesopotamian administrative ration system of the 3rd millennium shall be left to a study that is beyond the scope of the present analysis.