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Notes on *SET* 274

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§1. The Umma text *Sumerian Economic Texts from the Third Ur Dynasty* (*SET*) no. 274 represents a good example of what can go wrong in standard Assyriological transliterations of Ur III documents. This large account, a part of the collection of the Rosicrucian Egyptian Museum in San Jose, California, was published in 1961 by T. Jones and J. Snyder in their chosen form of transliteration and short commentaries. Doubtless most Ur III specialists have since tried to make sense of the labor day numbers in that text, which also following Assyriological standards were transliterated in decimally interpreted form (see W. Hallo, *Fs. Jones* [=*AOAT* 203; Neukirchen-Vluyn 1979] 4-13). The "headache" lines in the original publication were:

§2.

	the workdays:
col. I	
14-15) x + 4976 / gem]é u_4 1-šè	**4976+**
17-20) s]i-ì-tum mu ^{d}/AMAR-^{d}EN.ZU lugal-e / ur-bí-lum^{ki} / mu-ḫul	
col. II	
41) 170 $^{2}/_{3}$ gemé $^{3}/_{30}$	
42) 12 $^{2}/_{3}$ gemé á $^{1}/_{2}$	
43) 7 $^{1}/_{3}$ DUMU $^{2}/_{30}$	
44) iti 12-šè	
45-46) á-bi u_4 50,400 / 15,960	**66,360**
47) ^{itu}še-gur$_{10}$-ku$_5$-ta	
48) ^{itu} ^{d}Dumu-zi-šè	
53-54) 160 LAL-1 á u_4-du$_8$-/a gemé zi-ga didli	**159**
col. V	
162-163) šu-nigin 76,920 / 15 $^{1}/_{2}$ gemé u_4 1-šè	**76,935.5**
col. VI	
194) sag-gar-ga-ra-kam	
195) šà-bi-ta	
196) 8,335 $^{1}/_{2}$ gemé u_4 1-šè	**8,335.5**
197) á u_4-du$_8$-a	

§3. Of course, the total of the first section of the account, ll. 162-163, could be calculated by adding ll. 14-15, 45-46 and 53-54, that is, 4976[+n] + 66,360 + 159 = 71,495[+5440.5]. Now this 5440.5 would have to be found in the reconstruction of ll. 14-15, the record of the arrears from the preceding year (Amar-Suen 2) of the work crew that was the object of this account. To do this, it is first necessary to break up the decimal number 4976 into its constituent sexagesimal elements, that is, into 1(šar$_2$) 2(geš'u) 5(geš$_2$) 6(diš) and then add before and after that reconstructed notation further sexagesimal signs to complete the total of 10,416.5. However 5440.5 is bent and split, unfortunately, there was no way to fit the remains into this notation in a

credible fashion. The eager Sumerologist then moves on to the other postings, but neither seemed to offer much solace. 66,360 of ll. 45-46 was clearly the expected result of the calculation of ll. 41-44:

$(170\ ^{2}/_{3} + (12\ ^{2}/_{3} \times\ ^{1}/_{2}) + 7\ ^{1}/_{3}) \times 360 = 66{,}360,$

and ll. 53-54 seemed straightforward. The second high irregularity in the text derived from the calculated "off-days" of the female laborers in l. 196 of the account. This number from the second, the credit section of the text should, but unfortunately did not represent some whole fraction (usually $^{1}/_{6}$ in Umma) of the total in ll. 45-46, or possibly of one of this number's three constituents. For reasons that we are left to divine, the original editors left off after line 335 with a vague reference to totals "(lines 337-482) including notice of "shrinkage" for each item, and ending with the "balance remaining". "

§4. This was the state of affairs when in the mid-1980s M. Cooper restudied the *SET* publication, including copies of tablets from the northern California collection completed, but never published by J. Snyder, and made available in *ASJ* 8 (1986) 309-344 the results of his work (it appears from Cooper's remarks in *ASJ* 8, 309, that he never inspected the physical tablets in the Rosicrucian collection). The collation of *SET* 274 (RC 929) resulted in no substantive changes in the original edition (see R. Englund, *JNES* 50 [1991] 273 n. 27, 278 n. 37). My frustration was great when John Carnahan and Kent Hillard re-collated the Rosicrucian texts with results for *SET* 274 (*ASJ* 15, 246-251; *ASJ* 16, 310) that seemed to make matters worse. For Wolfgang Heimpel's Berkeley graduate students had noted for ll. 14-15 the number

$[7200 + 36]00 + 1376 + [^{1}/_{2}] = 12{,}176.5,$

and for ll. 45-46 the number

$36000 + 3600 \times 7 + 600 \times 5 + 60 \times 6 + 40 = 64{,}600.$

I sent a note of protest to Heimpel early in September of 1993, to which he replied on 21 September that the "query on the numbers in *SET* 274 made us scratch our heads." Hillard "disappeared, drove down to San Jose, and came back telling me that the collation is correct."

§5. Upon receiving this message from Heimpel, I spent an evening in Berlin working through these numbers again, to discover that the dilemma could be solved with elegant, and as so often, embarrassing simplicity. Lines 41-44 were to be corrected to:

$(170\ ^{2}/_{3} + ((12\ ^{2}/_{3}) \times\ ^{1}/_{2}) + ((7\ ^{1}/_{3}) \times\ ^{1}/_{3}))$
$\times\ 360 = 64{,}600.$

Once the production norm of the children, dumu, of l. 43 was reduced to $^{1}/_{3}$ that of the adult female laborers, everything fell into place, and the basic numerical structure of the text can now be described with the following transliteration excerpts (including several from the full treatment of the final sections by Carnahan and Hillard, all with sexagesimally oriented notations):

§6.

col.1 the workdays:

10') ⌜3.22.56 $^{1}/_{2}$ geme$_2$⌝ u$_4$ 1-še$_3$ **12,176.5**
13') ⌜si⌝-i$_3$-tum mu ^{d}amar-^{d}suen lugal-e ur-bi$_2$-lum^{ki} mu-ḫul
col. 2
13) 2.50 $^{2}/_{3}$ geme$_2$ 0;0,3
14) 12 $^{2}/_{3}$ geme$_2$ a$_2$ $^{1}/_{2}$
15) 7 $^{1}/_{3}$ dumu 0;0,2
16) iti 12-še$_3$
17) a$_2$-bi u$_4$ 17.56.40 **(170 $^{2}/_{3}$ + ((12 $^{2}/_{3}$) x $^{1}/_{2}$) + ((7 $^{1}/_{3}$) x $^{1}/_{3}$)) x 360 = 64,600**
18) iti še-gur$_{10}$-ku$_5$-ta
19) iti ^{d}dumu-zi-še$_3$
24) 2.40 la$_2$ 1 a$_2$ u$_4$-du$_8$-a geme$_2$ zi-ga didli **159**
col. 5
7) ŠU+NIGIN$_2$ 21.22.15 $^{1}/_{2}$ geme$_2$ u$_4$ 1-še$_3$ **(12,176.5 + 64,600 + 159 =) 76,935.5**
col. 6
5) sag-ni$_3$-gur$_{11}$-ra-kam
6) ša$_3$-bi-ta
7) 2.18.55 $^{1}/_{2}$ geme$_2$ u$_4$ 1-še$_3$ 8,335.5
8) a$_2$ u$_4$-du$_8$-a

col. 11
26) ŠU+NIGIN$_2$ 20.19.40 $^1/_2$ geme$_2$ u$_4$ 1-še$_3$ **73,180.5**
col.12
28) ⌜1.02.35⌝ geme$_2$ u$_4$ 1-še$_3$ **3755**
29) ⌜la$_2$-ia$_3$⌝-am$_3$

N.B.: 76,935.5 – 73,180.5 = 3,755

§7.
Translation:
col.1
10') *12,176 $^1/_2$ workdays of female laborers:*
13') *arrears of the year: "Amar-Suen, the king, destroyed Urbilum".*
col. 2
13) *170 $^2/_3$ female laborers at 3 (ban [ca. 30 liters] of barley per month),*
14) *12 $^2/_3$ female laborers, one-half work (norm),*
15) *7 $^1/_3$ children at 2 (ban [ca. 20 liters] of barley per month),*
16) *for 12 months,*
17) *the work involved: 64,600 days,*
18) *from the month "Harvest" (first month, Umma calender)*
19) *through the month "Dumuzi" (twelfth month, Umma calender).*
24) *159 free days of female laborers, variously booked.*
col. 5
7) *Total: 76,935 $^1/_2$ workdays of female laborers*
col. 6
5) *are the debits.*
6) *Therefrom:*
7) *8,335 $^1/_2$ workdays of female laborers,*
8) *work performance, free days.*
col. 11
26) *Total: 73,180 $^1/_2$ workdays of female laborers.*
col.12
28) *3755 workdays of female laborers*
29) *are the deficit.*

§8. An interesting consequence of the meticulousness of the Carnahan/Hillard collations is that, although its ultimate meaning remains cloudy, 7.75:1 should be added to the usual ratio of 6:1 between accounting period and free days among female laborers in the province of Umma (*JNES* 50, 275-277). *SET* 274 gives us 64,600 ÷ 8335.5 = 7.749985.

§9. The original mistake of Jones and Snyder can be explained in one of two ways. The benign explanation is that the original editors misread the numbers but did not understand the implicit workforce calculations behind their ll. 45-46, with the interesting coincidence that the total made sense assuming the 7 $^1/_3$ DUMU of their l. 43 were full laborers. The non-benign explanation is that they interpreted the DUMU to be full laborers and wrote the total to correspond to the resulting calculation. This latter, as I think likely explanation can well have been the result of post-tablet-inspection calculations and transliteration manipulations facilitated by *decimal interpretations imposed on the text at a too early stage of its edition*.

This note is dedicated to my Berkeley advisor and Ur III mentor, Wolfgang Heimpel, currently resident of Etna, CA.