

SIMO PARPOLA

Transliteration of Sumerian: problems and prospects.^x

Transliteration can be broadly defined as the process, or the result of the process, of representing the graphic signs of a writing system with the graphic signs of another script. This definition presumes that the conversion is carried out according to standardized codes, or transliteration rules, so that the graphemic distinctions of the original text remain unaltered, but it of course does not mean that the code used in transliterating texts written in a given script and a given language could mechanically be applied to other texts written in the same script but in a different language. This is so because the phonological distinctions of the languages they record, and consequently the phonetic values of their graphic signs are bound to vary in direct proportion to the number of languages they are used to record, and to the extent to which the phonological systems of these languages differ from each other. Everybody would object to applying to Phoenician texts the system of transliteration used in transliterating Greek texts, not only because the Greek alphabet lacked certain letters used by the Phoenicians and because the function of the Greek letters occasionally differed from their graphetically more or less identical Phoenician counterparts, but above all because the procedure would convey a very poor idea of the Phoenician

phonology, the phonemic inventory or Greek overlapping only partially with the Phoenician one. From this point of view our present system of transliterating Sumerian must be considered entirely unsatisfactory. It is based on the phonetic values assigned to cuneiform signs in Akkadian syllabaries and lexical lists, and consequently the phonetic aspect of our transliterations is exclusively Akkadian. In other words, only Akkadian phonemes (or phones) appear in our transliteration and, since it is impossible to express all phonemic distinctions of a language in terms of the phonemic system of another language, the number of "phonemes" thus attributed to Sumerian is conceivably much smaller than in Akkadian. As a result, phonological oppositions of Sumerian are grossly annulled, and the diacritic signs and subindexes introduced to differentiate between the large number of homophonic signs (and words) thus obtained allow no distinction between true and false homophones. Not enough with that, our transliteration seriously distorts the phonetic approximations supplied to us by the ancient lexicographers. It renders the pronunciation column of the ancient lists according to the phonetic values the cuneiform signs had in the late periods, ignoring the fact that these lists were for the most part composed in the Old Babylonian period and should hence be read, at least as far as Sumerian is concerned, with the phonetic values the signs had in the early periods, i.e. before the "Akkadization" of the cuneiform syllabary effected during the Cassite period. Copies of lexical lists standing outside the Old Babylonian scribal tradition, Sumerian texts in "unorthographic" spelling and Greek transcriptions clearly show that we should, in order to utilize correctly the pronunciation indications of the Akkadians, use emphatic stops instead of voiced, <š> instead

of <s> , <š> instead of <z>, etc. Thus our present transliteration system does justice neither to the Sumerian phonological system nor to the Akkadian approximation of it, and hence fails to fulfil the minimum requirement set to all systems of transliteration, namely that they should reflect the phonological systems of their object languages as truly as the scripts in which they are recorded do.

The situation is particularly annoying in that it gives rise to all kinds of misunderstandings and confusion. By all means, the present system would be tolerable if it were commonly regarded as only a set of conventions used for lack of a better alternative and if the phonetic distortions it causes were commonly traced back to their proper origins. But the sad truth is that too many take our transliterations at face value, believing that it reflects the phonemic system of Sumerian as adequately as transliterations usually do, and are thus lead seriously astray whenever they have to do with matters of Sumerian phonology. Others, noticing that the system does not render correctly certain lexical items occurring in Sumerian texts (mainly foreign proper names and Akkadian loan words), try to "improve" it by utilizing in these cases phonetic values they consider more appropriate, thus unfortunately only causing additional confusion. Nevertheless, such a procedure can be viewed as an indication that the inadequacies of the system referred to above are on the way of becoming more widely recognized. There are other similar symptoms, too: just consider the innumerable footnotes in recent publications pointing out specific Sumerian sounds allegedly concealed behind our transliterations. However, what is really needed is not a haphazard adjustment of the orthographies of certain isolated (mostly peripheral) words, nor disorganized remarks on isolated (mostly illu-

sory) aspects of Sumerian phonology, but a revision of the whole transliteration system designed to give maximum expression to the phonological system of Sumerian as reflected in the Sumerian script. Given the situation and the symptoms just mentioned, it is, as a matter of fact, quite surprising that the possibility of such a reform has hardly ever been touched in public. Is it that this is simply not considered worth while, or is it generally thought that it is a priori impossible to do anything concrete for the matter because we are not in a position to acquire sufficiently accurate knowledge about the Sumerian phonological system anyway? Personally, I do not think it is necessary to take such a pessimistic attitude. The difficulties to be overcome in the recovery of the Sumerian phonological system cannot and must not be overlooked, but on the other hand they should not be overemphasized either. We have, after all, a good collection of various kinds of sources providing information on various aspects of Sumerian phonemics, and this information can be effectively exploited with the help of the methods and comparative data furnished by general and historical phonologies. The fact that our sources can be utilized only through an Akkadian frame of reference does of course form an obstacle, but not an unsurmountable one. Historical phonology in general is confronted with similar difficulties, e.g. the obscuring effects of traditional orthographies, but hardly anybody would claim that it is impossible to gain objective knowledge about extinct forms of language because of that. A more serious drawback is that Sumerian continues to be linguistically isolated, which means that there is no chance to check the correctness of phonological reconstructions in the light of comparative evidence provided by related languages. Still, the results can be controlled, to a large extent, e.g. by paying attention to the linguistic

correlations between Sumerian and Akkadian on the one hand, and Emesita and Emesal on the other, as well as observing how well the reconstructions account for the phonetic variations noticed within the Sumerian system proper.

However, it is not my purpose to go on assessing the theoretical premises and methods of Sumerian graphemics and phonemics, doing what I would soon have used up the time I have at my disposal. Instead I shall - so to say - lay my head on the scaffold and submit for consideration an outline of a transliteration reform which seems to me warranted by the data at our disposal and could be carried into effect within reasonable time. Naturally, what I have to offer is, for the time being, only a sketch. Elaboration of an entire transliteration system is so time-consuming a task that it could conceivably be undertaken only if the idea itself meets sufficient approval. Even then, it would be advantageous if the elaboration of the final thing could be carried out as a joint project, proceeding on a basis that is acceptable to all parties involved.

My sketch is based on the results of two interrelated analyses: a phonological analysis, designed to reconstruct the phonemic inventory and phonotactic system of Sumerian, to the extent these are represented in the script, and a graphemic analysis, designed to reconstruct the basic principles of the Sumerian script, to map out the inventory of phonetic values actually attested in genuinely Sumerian texts - that is, in texts written by scribes speaking Sumerian as their first mother tongue -, and to check the phonetic shapes of these values from the environments in which they occur. In general, I would say, the results of these analyses pretty well agree with the published views of other scholars, notably Gelb and Civil, which would seem to indicate that a common agreement on

most of the issues concerned could be achieved in a not too distant future. In particular, the reconstruction of the Sumerian phonemic inventory as given in Table I seems more or less established, with the exception of the posited labiovelar stop, the exact definitions of the dental-alveolar fricatives as well as certain insufficiently documented phones not entered in the table. The grounds suggesting the individual reconstructions are briefly stated in the appendix to the table and consequently I shall not touch upon that point of the matter here. Similarly, I shall refrain from discussing the general feasibility of the reconstructions, which should be judged in the light of the linguistic correlations exemplified in Table II.

The results of the graphemic analysis can be summarized as follows:

Each Sumerian grapheme had two basic functions: a semantic one, often but not always corresponding to the semantic content of the lexemes associated with the early pictograms, and a phonetic one corresponding to the phonemic shapes of the lexemes in question, including their allomorphs. Depending on the number of phonemes constituting the underlying lexemes, and thus the phonetic values of the graphemes, certain graphemes were used primarily in semantic function only, whereas others were primarily used only in phonetic function. In principle, each grapheme was identified by one or more unique phonetic values, each distinct from every other phonetic value of the inventory. In practice, however, the script possessed a large number of homophonic values resulting from the morphophonemic variations of the lexemes supplying the phonetic values, and from the fact that vowel length was ignored in setting up the phonetic values of the script.

The selection and background of the homophonic values thus brought about is illustrated by the examples given in Table III. The script also possessed homophonic values of an entirely different kind. While the homophones of the former type are the result of phonetic merger of phonemically distinct lexemes, those of the latter type represent graphic differentiation of phonemically identical but semantically different lexemes. Such primary homophones are recognizable from the fact that the underlying graphemes have certain graphic features in common, in contrast to the utterly distinct graphemic shapes of secondary homophones. Examples of primary homophones are gi "reed" v. gi₄ "return" (written "reed" + diacritic strokes); bad "open" v. bād "city wall" (written "city wall" + inserted bad): and uš "die" v. uš₁₁ "spittle" (written "mouth" + inserted uš). Besides differentiating homophonic lexemes, diacritic strokes also served for the reverse purpose, namely to differentiate phonemically distinct but semantically identical lexemes, e.g. eš v. unu (wr. eš with strokes), both meaning temple. Depending on scribal conventions, the phonetic correspondencies could be also the other way round: the sign with strokes could be read eš and the simple sign unu. Both primary and secondary homophones, as well as graphemes of the eš-unu type, could be used in the script as optional graphemic variants. A third type of homophones occurring in Akkadian syllabaries and lexical lists, however, is never used in this capacity in genuinely Sumerian texts, and can hence be identified as "falsely homophonic", the phonetic values in question actually representing phonetically distinct lexemes under-differentiated in terms of the Akkadian phonological system.

The foregoing summary, which by necessity is a gross

oversimplification, implies that the vast majority of the diacritics and subindexes by which our present system of transliteration differentiates between homophonic sign-values can be dispensed with, since the phonetic values in question can be differentiated and were in fact differentiated with reference to the distinct phonemic shapes of the underlying lexical morphemes. It is mainly because of this plain fact that I feel entitled to suggest the following modifications to our present transliteration system:

1. The transliteration of Sumerian is separated from the system used in transliterating Akkadian texts.

2. Only phonetic values attested in syllabic use in Sumerian texts are included in the syllabary. The phonetic shapes of the graphemes used exclusively in semantic function should be defined in the dictionary and could, for that matter, well be rendered in transliteration with their semantic counterparts in the transliterator's language, as done in the transliteration of hieroglyphic Hittite and Linear B.

3. The phonetic values of the graphemes entered in the syllabary are identified with reference to the fullest forms of the underlying lexemes. Morphophonemic variants can be indicated e.g. by enclosing the omitted phonemes in parentheses. Diacritics should, in principle, be used only in the case of primary homophones and gunû-signs.

4. The Akkadian approximations of the phonetic values used in the present system are replaced by a corresponding phonemic notation based on Table I. The procedures involved are illustrated in Table IV.

5. The graphemes entered in the syllabary are ordered according to their graphic shapes current in the 3rd millennium.

These are of course only some of the points that must be

taken into consideration in setting up a revised system, but they are certainly the most crucial ones. I am naturally well aware that the program just outlined must sound pretty radical to many, especially as regards the point made about the separation of the Sumerian and Akkadian systems from one another. However, the Sumerian writing system was after all, by all objective criteria, as distinct from the Akkadian as Phoenician is from Greek and Etruscan, so why should we not use different codes in their transliteration if obvious advantages are gained by such an arrangement. There is nothing sacred in the present system, on the contrary, and the practical gains which the creation of an independent transliteration system would entail are so obvious that it seems almost superfluous to touch that aspect of the matter at all. Just consider how much routine labour would be avoided and how much printing costs be reduced by the mere removal of most of the cumbersome diacritics and subindexes; how much easier it would be for a beginner to learn the script with the help of a syllabary listing only the Sumerian sign-forms and sign-values in a sign-order natural to the Sumerian script, without having to assimilate at the same time all kinds of redundant information bearing only on the study of Akkadian; and how much confusion would be avoided if we for once had a system that is really as Sumerian as we can make it. It is often contended that any alterations in the present system would only make it confusing. This is certainly true, if Sumerian continues to be transliterated in the present way, but it is certainly not true if the adjustments necessary were made within the limits of a completely new system. The independence of the two systems would be immediately apparent from the typographical appearances of the transliterations, the Sumerians one

being written in roman and the Akkadian one in cursive type as before.

It seems worth while to repeat that much detail work is required before a revised system like this can be made a reality. For instance, though it can be fairly easily deduced that the vowel <u> appearing in our transliterations should be split into two autonomous Sumerian phonemes, /u/ and /o/, it is by far not easy to decide in individual cases which vowel has to be reconstructed. Relevant information can be obtained e.g. from concatenations of graphemes in syllabic spellings and from Emesisa-Emesal correlations, but such information is not always available. Similarly, assuming that Sumerian possessed the aspirate /h/, which seems assured, in which cases should be posit a phonetic value beginning with a vowel and in which cases one beginning with /h/? Again, all kinds of hints are available, but especially the many phonetic values with an initial <u> present serious difficulties. Nevertheless, it is my conviction that many of the difficulties encountered so far can be overcome if more material is submitted to analysis, and we can always refrain from positing odd phonemes like /o/ and /h/ if the relevant evidence is not strong enough.

I realize that an issue as complex as the present one cannot be properly presented in a 25 minute paper, and consequently I will not be surprised if I have not been able to convince anybody here of the necessity and feasibility of the individual reconstructions and suggestions made above. However, I do hope that I have succeeded in drawing attention to the fact that there is something basically wrong with our present transliteration system and that a systematic evaluation of the possibilities to amend it points to a system quite radically diffe-

rent from the one now in use. As the case of the English orthography so clearly demonstrates, it is of course quite possible to continue using a system of graphic notation even if it is burdened by several inadequacies, provided that the phonetic correlations between the written and spoken language are specified exactly enough in the grammar and the dictionary. However, such an arrangement complicates things unnecessarily, since everybody reading a text written in the said way should have to reinterpret it in the light of phonetic information given elsewhere, and everybody not aware of the arrangement would be as misled as ever. All such complications could be avoided if the phonetic information everybody is supposed to acquire were clearly indicated in the script itself. If my paper can provoke criticism that will help clarify some of the problems I have touched and thus prepare way for a transliteration system showing a better fit between the Sumerian script and language than the present system, it will have more than fulfilled its purpose.

* Unaltered version of the paper read by me at the XXIème Rencontre Assyriologique Internationale, Rome, en June 27, 1974. I hope that this paper, which the hero of the day was prevented from listening to, will be a suitable birthday present to Professor Armas Salonen, who is well noted for his lively interest in Sumerian phonology.

Table I. Reconstruction of the Sumerian phonemic inventory

CONSONANTS ⁶	lab.	dent.	alv.	post-alv.	vel.	uv.	glott.
stops unaspirated	p ¹		t		k ¹		(ʔ) ²
aspirated	ph ¹		th ¹		kh ¹		h ³
labialized					kw ⁴		
nasals	m		n		ŋ		
fricatives		θ ⁵	s	ʃ ⁵	x		
liquids			l				R
SEMI-VOWELS				(j) ²			
VOWELS ⁷	front		central		back		
close	i				u		
half-open			e		o		
open			a				

(Phonetic notation according to the system of IPA.)

- NOTES (1) Basically voiceless, with respectively voiced and weakly aspirated optional variants ([b, d, g] and [p', t', k'] in voiced environments (e.g. V__V). The opposition between the two series is neutralized in (word- and syllable-)final position.
- (2) Defective phonemes. [ʔ] (phonemically zero) occurs only as an attack of initial vowels, [j] only as a glide after homorganic falling diphthongs. Not marked in the script.
- (3) Articulatorily, part of the fricative series; perceptually, aspirated counterpart of the glottal stop.
- (4) Uncertain. Indications mainly restricted to the environment $\left\{ \begin{smallmatrix} u \\ \# \end{smallmatrix} \right\} u(r)$.
- (5) Opposition between these two phonemes unmarked in script in final position.
- (6) A sequence of two consonants is only permitted

between vowels. Sequences of three consonants do not occur.

- (7) Diphthongs must be posited for the language (cf. <a-a> = aja "father", the glide implying that the syllabic constitution of the word be reconstructed as /ai-a/) but not for the script (note <a> = /ai/ /a/ in the example just quoted).

APPENDIX: Evidence for individual reconstructions

- | | |
|----------|---|
| p, t, k | 1. Oakk orthography, implying that the phonological distinction of the two Sum series was not perceived by the Akkadians in life-situation (note the existence of stops followed by slight aspiration as allophones of voiceless stops in Sem languages). This excludes oppositions voice <u>v</u> . voiceless and emphatic <u>v</u> . nonemphatic, as well as a good number of phones alien to Akkadian. |
| ph,th,kh | 2. Sumerian loanwords from Akk (same implications). |
| | 3. Oakk loans from Sum, showing that both series were basically voiceless. |
| | 4. Late Greek renderings (Sum <p, t, k> = Greek aspirates, <b, d, g> = Gr. tenues or mediae). |
| | 5. Unorthographic spellings and Akk phonetic approximations of the lexical lists corresponding to the rendering of Greek aspirates and tenues in Akk texts. |
| | 6. See in general Gelb, MAD 2 ² 28ff; Krecher, AOAT 1 157 ff; Renger, ZA 61 31ff, and cf. e.g. Civil, Or 42 34 and Cooper, ib. 244 ⁴⁹ . Notice further that aspiration is well attested as a feature distinguishing plosive series in many languages and that allophonic variation in voice |

such as evidenced by our sources is paralleled by many languages also.

kw

See Civil, JNES 32 57ff. The Emesal substitution of (etc.) for <g> can be accounted for on stylistic level.

ø

1. OAkk orthography (Sem. *t/d = <š> , *š/ś = <s> , *s/s/z = <z>). NB: These correlations apply only to the pre-Sargonic and Sargonic periods, which implies that t and š merged in later OAkk. Isolated (probably dialectally conditioned) indications of the merger occur already in Sar. period.
2. Sum loanwords from Akk (dam-ŠI/ŠE-lum [mtl]).
3. Akk loans from Sum (š/tupšikku, š/tapsūtu).
4. Akk approximations of Sum phonetic values (cf. š/tibir, Biggs, ZA 61 206).
5. Coexistence of syllabic values like <zíd, zì, šè> , explainable only by assuming a case of morphophonemic alternation reflecting an archimorpheme *tit. In <zíd> (= sit), the dental fricative would have been dissimilated to an alveolar fricative. No such explanation is possible if <š> is assigned e.g. the phonetic values [ʃ] or [tʃ].

h

1. Existence implied by minimal pairs such as a : á/é, i : i, e : è, ù : u, ab : áb, eš : èš, ib : íb, úr : ur, never used as graphic variants in script.
2. <é-gal> = Ug./He. hkl; <idigna> = He. ḥdql.
3. OAkk spellings with <e> = Sem. *ḥa (é-ru-uš, é-ra-sum, la-é/á-ra-ab, ^dé-a).
4. Existence favoured by consideration of the

over-all structure of the phonetic pattern.

5. The non-marking of /h/ in Akk phonetic approximations is due to the fact that a /h/ did not exist in the phonological system of Akk (Wsem h = Oakk š). The Akk "rendering" of Sum /h/ with zero is thus parallel to the cuneiform renderings of WSem and Gr names with /h/, e.g. NA ^Iú-si-'a = Hôšē^ca.

- R A distinction from Sem rolled [r] is implied by Akk /šuruš/ → Sum <suḥuš> .
- o 1. Existence implied by the large number of <u>-values in comparison with <a> , <e> and <i>-values.
2. See h 4.
3. See h 5, mutatis mutandis.
4. Note MD <u> → ES <e> with concomitant assibilation of preceding <d> , suggesting that <e> stands for [y] or [i]. If MD <u> is not changed to <e> , an /e/ can be assumed. Cf. Cf. MD <dumu> = ES <ṭu-mu> = Gr. *δομ* .

Reconstructions considered but not found sufficiently well documented to be entered in Table I: l₂ (Falkenstein), dr (J. Bauer), ř (Poebel et al.), ü (Jestin et al.). Much of the pertinent indications can be accounted for without further additions to the phonemic inventory.

Table II. Phonetic and graphemic correlations

1. Sumerian loan words from Akkadian
 dam-ḥa-ra (= tamḥara) < tamḥārum
 dam-gār < tamkārum
 mur-ni-iz-ku (= murnisk^hu) < mūr-nisqu; cf. q → k^(h)
 in Turkish LW's from Arabic
2. Comparison of Sum and Akk isoglosses

- in synchronic spelling

Sum		Akk
Ag-gi-dè ^{KI}	←	A-ga-dè ^{KI}
dam-ši-lum-bi	←	dam-ši-il-su
kar	→	ga-ri-im
sa-tu	←	sa-tu-i

- in diachronic spelling

apin	↔	epinnu
áb-zà-mí	→	apsammiku
dub-sar	→	ṭupšarru
éš-gār	→	iškāru
gu-za	→	kussû
ḥur-saġ	→	ḥuršānu

3. Greek transcriptions of Sumerian

e-si-ga	[es]ek
pa ₅ šitā	pha seith
an-ta ki-ta	[anath] kheith
pa ₅ mu-un-bal	pha m[o]nebal
nu-mu-un-ge ₄ -e-da	na[m]ongeda
nam-mu-un-kur ₄ -ù-dè	[na]monkhoret

4. Main Dialect - Emesal correlations

udu [utu]	e-ši [esi]
dùg [tuk]	ši-ib [sip]
gim [kim]	di-īm [tim]
dingir [tiġir]	dīm-me-er [timir]
sum [šum]	si-im [sim]
zi [si]	ši [θi]

N.B. eme-sal means literally "fine/thin language". Most of the phonetic differences between MD and ES noted here can be explained as autonomous sound changes occasioned by a forward shift of the basis of articulation (u > i = high back > high front; k > p, t = velar > labial/dental stop; ŋ > m, n = velar > labial/dental nasal; š > s = post-alv. >

alv. fricative; $s > \theta = \text{alv.} > \text{dental fric.}$), which seems to indicate that "backward-flanged" phonemes (i.e. narrow vowels, and labial or dental, including alveolar consonants) were considered "finer" than their "forward-flanged" counterparts (wide vowels, velar and palatal, including post-alveolar, consonants). Assibilation $t > s$ conditioned by the environment.

5. Examples of "unorthographic" spellings found in syllabic ES texts

ù-nu-ka	for	unu ^{ki} -ga
bu-lu-ka-ki	"	bulug-an-ki
ka-ša-an	"	ga-ša-an
ki	"	gin ₇
a-pa-ar	"	abbar
ku-ru-ša-ri-ba	for	guruš-a rib-ba
pa-ra	"	barag
ni-ip-pi-ig-ru	"	ní bí-in-gùr-ru
šu	"	sum
ú-tu-uk	"	udug

6. Excerpt from Oakk inscription tentatively transliterated according to the system proposed (PBS V - XV 41 iv 13 ff)

iš-tum-ma (14) ti-a-am-tim (15) ša-pil-tim (16) TUMU. TUMU (17) A-ka-de (18) ENŠIK-ku-a-tim (19) (h)u-ka-lu₂ (20) ma-(e)ri KÍ (21) u NIM.KÍ (22) maḥ-ri-iš (23) šarru-KI (24) LUKAL (25) (h)i-za-zu-ni (26) šarru-KI (27) LUKAL (28) KÁLAM.MA.KÍ (29) kíš KÍ (30) a-ṭa-(e)ri-šu (31) (h)i-ni

Table III. Aspects of Sumerian writing system

1. Examples of morphophonemic variation within basic phonemic values

1.1 Affecting segments larger than a phoneme

bappir - bir_x barag - bár emen - en
 gibil - bíl pirig - bir_x temen - ten
 munus - mín gilim - gil šumur - šúr

1.2 Affecting single phonemes

1.2.1 Vowel apocope

ama - ma_x idim_x - dím usur - sur_x
 ara_x - rá išib - šib aba₄ - ab₄
 aka(n)_x - ká itu - tu_x ága - ág
 eri - rí ugu₄ - ku íla - íl
 erím - rím uru - ru₉ gemé - gím
 erin - rin_x uru₅ - ru_x uru - ur_x(URUxGU = gur₅)
 erín - rín uru_x(URUxA) - ru_x utu - ud

1.2.2 Consonant apocope

bam - ba₁₁ sim_x - sí mal - mà sig - si₁₉ duḥ - du₈
 bum - bù mim - mí lul - lu₅ sig₄ - si_x zíd - zí
 dim₆ - dé dun - tu níg - ní eg_x - e sud - sù
 túm - du bil - bí saġ - sa_x ud - u₄ pàd - pà
 gum - qu gil - gi₁₆ zag - zà kid - ke₄
 zum - su la₁ - lá dug₄ - du₁₁ bab - ba_x

1.2.3 Vowel alternation

eš - uš_x si₄ - su₄ ḥar - ḥur áġ - íġ - úġ bi - bé
 eri - uru nim - num bam - bum aḥ - iḥ - uḥ bí - be₇
 šir - šur iti - itu làḥ - luḥ usar - usur ri - re

1.2.4 Consonant alternation

sim - sín am₆ - an zig - zíb ni - lí mu - gu_x
 gim - gin₇ erim - erín kin - kiġ ne - li₉ mi - ġi₆
 mim - mín sig - sib_x dúr - dul₅ mà - ġá èš - iri₁₀

2. Examples of optional variation of simple and gunû-signs

simple gunû	simple gunû	simple gunû
ḥa - peš/gir	utu - iti	ġi ₆ - dugud
peš _x /gir _x - (ha _x ?)	iti _x - (utu _x ?)	(dugud _x ?) - ġi ₂₅
lam - iš _x	ab/iri ₁₀ - unu	aga - du ₅
(iš _y ?) - lam _x	unu _x - ab ₄ /iri ₁₁	(du _x ?) - aga _x

Table IV. Replacement of conventional phonetic notation by notation based on Table I

- a, e, ġ, ḫ, i, l, m, n, r remain unchanged.
- b, d, g → p, t, k; old notation retained for optional use in intervocalic position.
- p, t, k → p̣, ṭ, ḳ
- s → š
- š → ṭ; → š in final position.
- z → s, old notation retained for use in intervocalic pos.
- u → u and o; the cases where /o/ has to be posited remain to be specified
- zero → h in those V- and VC values which have contrastive homophonic pairs and do not occur in environments pointing to an initial vowel.

