PROBLEMS OF WRITING AND PHONOLOGY IN CUNEIFORM HITTITE

By GILLIAN R. HART

INTRODUCTION

The attempt to extract information about the phonology of a language no longer spoken from its written records is always fraught with problems. A writing system may have been originally designed to represent a language with quite different phonological characteristics, and be poorly adapted to its new purpose; one may think here of the sketchy representations of Greek afforded by Linear B or the classical Cypriot syllabary. There may be inadequacies inherent in the writing system itself, like the impossibility of writing certain groups of consonants without 'empty' vowels in a syllabic script. Changes in the language may take a long time to show themselves where there is a conservative orthographic tradition, and the state of a language apparently indicated by the written records may in fact be one which existed several centuries earlier. In such cases departures from standard orthographic practices may be more informative about the current state of the language than adherence to the norms.

This is not to say that in such a situation abnormal spellings can be uncritically accepted as based on what the writer actually hears; what he produces may be a curious hybrid resulting in part from his aural perceptions and in part from his scribal training, and may reflect accurately neither the contemporary form nor its historical predecessor. It is not necessary to conclude from the presence of such 'improbable' forms in a corpus that the writers had an imperfect command of the language, or that the language was dead; indeed it is more likely that such aberrations from traditional norms are signs of continuing life.

Cuneiform Hittite abounds in problems of this kind; it has a long tradition, a borrowed script containing many inherent ambi-

guities, of which the precise circumstances of acquisition are still unknown, and the attribution of values to its syllabic signs depends ultimately on the values deduced by Assyriologists from the study of other varieties of cuneiform syllabary, which is in itself a matter of great complexity. Indo-Europeanists who wish to use its evidence have to contend with numerous continuing uncertainties about its phonology, where Hittitologists either find themselves unable to agree, or else adopt positions of extreme scepticism. The history of this sad state of affairs had been related at some length by Eichner (1980). Difficulties arise both on the purely descriptive and the historical level; sometimes it is easier to correlate a particular feature of Hittite with its presumed Indo-European antecedent than to be sure what it actually was in Hittite.

The difficulty of interpreting the cuneiform syllabary has not been the only problem; work done in the last two decades has established that the documents were not all written, as had previously been thought, in the last two centuries of the Hittite Empire, the fourteenth and thirteenth centuries B.C., but that there also exist some texts which were written in the previous two centuries, distinguishable from later ones by the forms of signs ('ductus') as well as by certain linguistic and orthographical peculiarities. Apart from these there are texts written in the later period which are copies of more ancient ones and have been to some extent modernized, whether deliberately or not it is hard to say. At all events it appears that efforts to preserve the ancient features of the texts being copied operated somewhat unevenly. The identification of some (unfortunately rather few) texts as belonging to these earlier periods has made it possible to regard some kinds of variations in spelling as having a chronological basis. This being so, it is no longer possible to treat them as synchronically alternative solutions to the problem of representing the same sequences of sounds. Even variations within a single text need not (although they sometimes may) be indicative of hesitation about the most appropriate way to render faithfully the sounds in question. Such inconsistencies may also stem from a conflict between the spelling of the exemplar and the writing habits of the scribe's own time.

This does not imply that a great deal has yet emerged about possible phonological changes which may have taken place during

the four hundred or so years covered by the documents. There are, to be sure, changes in spelling habits, some of which, such as the increasing tendency to make use of Sumerograms and Akkadograms in place of syllabically written Hittite words, have nothing to do with phonology except insofar as they remove some of the evidence for it. Others, such as the apparently arbitrary changes in preference for certain syllabic signs, or the abandonment of the so-called plene-writing of vowels in some (but by no means all) words are still of doubtful significance. Nor has it proved feasible to produce any definitive account of Hittite phonology in purely descriptive terms; doubt still attaches to such fundamental matters as how many vowel qualities were distinguished, whether vowel length was autonomous or not, what was the nature of the consonantal oppositions represented by double versus single writing of consonants between vowels and also in certain complex consonant groups, and what were the accentual characteristics of the language. These matters depend on the interpretation of the writing system: hence their obscurity.

The first part of this paper is therefore concerned with the question of the origins of Hittite cuneiform and the contributions which may have been made to its formation by Akkadian and Hurrian traditions respectively. This is followed by a more detailed investigation of one area which is relevant to the question of the part played by Akkadian influence, the choice between pairs of signs which in Old Babylonian were used to distinguish between voiced and voiceless stops. The third section is devoted to the use of the vowel signs transliterated as *u* and *ú* and the possibility that they represent different phonemes. The last section summarizes the conclusions reached.

1. The Script: Questions of Origin

1.1 Like most writing systems the one used by the Hittites was not invented for the representation of their language but borrowed from elsewhere and adapted for the purpose. It is not known how and where they first acquired it. It must have been derived either directly or indirectly from some kind of Akkadian cuneiform, and it is quite clear, if historically surprising, that it is not based on the Old Assyrian syllabary used by Assyrian merchant colonies in Cap-

padocia. Its affinities are rather with the regional varieties of cuneiform described as 'Akkado-Hittite' or 'Hurro-Hittite', which are found at Nuzi, Ugarit, El Amarna in Egypt and Alalaḫ in Syria, where both the forms of the signs and the system of the syllabary are very similar to those used in Hittite, without being identical to them.[1]

These western syllabaries share certain features which are archaic from the point of view of Old Babylonian, and it has been recognized that these have their origin in an earlier, Old Akkadian stage of development. They include the lack of special signs to represent the emphatic consonants of Semitic languages, lack of a properly established distinction between signs for voiced and voiceless stops, and a more archaic arrangement for the representation of Semitic sibilants than that used in Old Babylonian.

1.2 What these sites have in common is the fact of Hurrian influence, shown in some cases by the presence of Hurrian personal names and in others by the existence of actual Hurrian texts.[2] The intermediacy of the Hurrians in transmitting the syllabary to the Hittites used to be almost automatically assumed, but seems now to be less favourably regarded, perhaps because of the arguments advanced against it by Gamkrelidze (1961). The most obvious point in favour of a belief in Hurrian involvement is the Hittite practice of writing stops double when they are etymologically voiceless (the so-called Sturtevant's rule) between vowels and sometimes also in groups of three consonants. This is inexplicable on the assumption of borrowing from a purely Semitic source, unless one believes, with Gamkrelidze, that the innovation was motivated directly by a characteristic of the Hittite language. It is easy to understand in terms of Hurrian intermediacy, since in Hurrian consonantal length was distinctive, stops (and probably sibilants as well) being automatically voiceless between vowels when long, and also in initial position, but automatically voiced between vowels when the consonant was short.[3]

Hurrian scribes were insensitive to the voicing distinction of Akkadian[4] and tended to ignore it except in intervocalic position where it could be correlated with their own distinction of consonantal length: Akkadian scribes writing Hurrian, on the other hand,

were liable to hear its single intervocalic stops as voiced and the double ones as voiceless and spell accordingly. The Hittites, introduced to a system in which the use of different signs to distinguish voiced and voiceless stops was not yet developed, yet needing such a distinction for their language, resorted to the practice of writing stops double between vowels when they were voiceless, single when they were voiced. This method was not available in initial position: whether the Hittites found this a problem, and if so, how they went about solving it, are matters of current concern to which we must return later.

Gamkrelidze's argument for the different uses of the signs for sibilants in Hittite and Hurrian is at first sight more convincing. There are two such signs in use in Hittite. One, conventionally transcribed as *š*, continues IE **s*, though it can also have other origins; the other, transcribed *z*, has usually an affricate value [ts] of various origins. Here again it is not quite certain that this is the only value.[5]

In the system of transliteration used by Assyriologists, established by Thureau-Dangin (1926), the signs are given the primary values *š* and *z*. These are not, however, the earliest values. The history of the signs used to represent the various Semitic sibilants in cuneiform syllabaries is complex, showing a redistribution of values to signs as a result of phonological change. In the Old Akkadian period the signs of what was later to become the *z*-series had three values, corresponding to the phonemes *s*, *z* and the emphatic *ṣ*. This left another three sibilants to be represented by other signs. The first of these, derived from the Proto-Semitic dental spirant **θ*,[6] was represented by what later came to be the *š*-series. Two further Proto-Semitic sibilants, **ś* and **š*, merged in Old Akkadian to give *š*, which was at that stage represented by signs of what was later to become the *s*-series. But because of a later merger between the phonemes *θ* and *š* only one set of signs was ultimately needed to represent their joint outcome, and for this the signs of the eventual *š*-series were used.

This freed the signs which had previously been used to represent the outcomes of Proto-Semitic **ś* and **š* for a new use, and they came to be used with the value *s*, thus relieving the overloaded *z*-series of one of its values. The introduction of *s*-values for the

eventual *s*-signs happened gradually, and the peripheral areas lagged behind Babylon in adopting them. Even in Old Babylonian their establishment was far from complete (Von Soden, 1952:30) and in the Akkadian of Alalaḫ there are very few examples of signs of the *s*-series being used for etymological *s*, which is still usually represented according to the old system by signs of the *z*-series. It is particularly interesting that in the Akkadian of the fourteenth-century letters of Tušratta of Mittanni to Egypt (Adler, 1976:5) the signs SA, SI and SU are very rare and are used mainly in words of Sumerian or unknown origin, while Akkadian *s* is normally represented by signs of the *z*-series.

Gamkrelidze's argument turns on the fact that in some Hurrian sources signs of what eventually became the *s*-series are found, namely in the Mittanni Letter, in texts from Mari, and in personal names at Nippur, where *s*-signs with *s*-values were also in use for the writing of Akkadian. Signs to which the value *s* has been attributed also occur in Ugaritic alphabetic texts in Hurrian. If the Hittites had acquired their syllabary from Hurrians who already used the signs of the *s*-series with the value *s* + vowel, there would have been no need for them to use the *š*-series to represent their etymological **s*. If on the other hand they used a model which still kept the older method of representing sibilants, assuming that they had first decided to use the *z*-series to represent their affricate *ts*, it would have been reasonable for them to have used a different set of signs to represent their *s*-series, rather than using the *z*-series to stand for both *s* and *ts* while leaving the *š*-series unused. The Hittite treatment of signs for sibilants can therefore be adequately explained on the basis of derivation from a Semitic syllabary which kept the Old Akkadian arrangement for sibilants: it cannot be explained as derived from a Hurrian system which already used signs of the *s*-series with *s*-values.

Hurrian cuneiform writing can be traced back at least as far as the Old Akkadian period.[7] There must therefore have existed varieties of Hurrian cuneiform syllabary which antedated the innovation regarding the representation of sibilants, which was, as we have seen, late to take effect especially in the more peripheral cuneiform-using areas. Since it is now clear that the Hittites had been using cuneiform writing as early as the period of the Old

Kingdom, it becomes much less likely that its source, whether Hurrian or Akkadian, would have incorporated the new arrangement regarding sibilants.

It is also not enough to have shown that some Hurrian sources use signs of the *s*-series. The values of such signs have not yet been certainly demonstrated,[8] they are infrequent and it is hard to find satisfactory correspondences between forms from different sites written in different types of Hurrian orthography. It is not at all certain that the value was *s*, and the usage of Tušratta's Akkadian letters suggests otherwise.

There seems to be no serious objection to deriving Hittite cuneiform, as far as the treatment of sibilants is concerned, from an early version of Hurrian cuneiform. It is considered possible that the sound represented by signs of the š-series in Hurrian was a dental spirant, or rather two dental spirant phonemes opposed in medial position by a distinction of length, like the Hurrian stops. This would have been no more or less appropriate a sound for the Hittites to have equated with their *s*-phoneme than Akkadian š. As to the derivation of the value of Hittite *z*, it does not appear that Hurrian intermediacy can be either asserted or excluded, since the value of the *z*-series in Hurrian is a further problem (for further discussion cf. note 8).

1.3 There seem on the other hand to be some grounds for suspecting a more direct Akkadian influence on the Hittite system, possibly at a somewhat later stage than that of the first adaptation of the syllabary for writing Hittite. The presence of Sumerograms and Akkadograms is not a feature of the Hurrian tradition, and the addition of the Akkadogram to the Sumerogram as an alternative to the syllabic writing of Hittite words certainly looks like a learned innovation inspired by training in Akkadian, which the Hittite scribes knew and used. The question is whether this knowledge of Akkadian also influenced the spelling in syllabically-written Hittite words, and in particular whether it encouraged a more principled choice between signs for voiced and voiceless stops than had existed in the first place. It is also possible that the influence worked in the other direction, with Hittite writing habits affecting scribes when they wrote Akkadian.

1.4 It has recently been suggested that when in the writing of Hittite words constant and etymologically justifiable spellings occur with signs which in Old Babylonian (though not yet in Old Akkadian) were used to represent voiced or voiceless stops, the agreements should not be regarded as coincidental. Eichner (1980:139) and Oettinger (1979:551–556) have drawn attention to consistent spellings of certain common words with 'appropriate' signs in initial position, where the contrast of single versus double writing of the stop could not be applied. No claims are made about appropriate spellings in intervocalic or other internal positions, nor is it claimed that even in initial position the choices made were always appropriate (which is clearly not the case), but only that there are words in which the spellings remain constant at all periods. Eichner's insistence that more notice should be taken of consistent spellings is to be welcomed in that it may help to correct a false impression which can be gained from reading handbooks rather than texts, namely, that the spelling habits of the Hittites were chaotic. The truth is that within a single text the degree of consistency is rather high, though never entirely free of variation. Between different texts, especially if they come from different epochs, rather more variation can be found.

It may be useful at this point to attempt to classify some of the possible causes of such variations:

(a) Scribal errors.
(b) Variation between fuller and shorter spellings of the same word in the same text, probably under the voluntary control of the scribe in that he would regard the shorter version as permissible abbreviation rather than an error requiring correction. This type is not always easy to distinguish from involuntary omission of signs.
(c) Variations reflecting different spelling habits in different periods.
(d) Variation between contemporary individuals.
(e) Variation in a copied text resulting from conflict between the exemplar and the scribe's own spelling habits.
(f) Variation arising from hesitation about the treatment of an unfamiliar word or form.

(g) Variation arising from indifference, or purely from a liking for variation.

So far only type (c), chronological variation, has attracted much attention in the form of detailed study. This means that it is rather easier to identify consistent spellings of particular words than to observe the extent of variation within or between texts, from which equally significant information may be extracted.

There are some disturbing features about the finding that certain common words have consistent and appropriate spellings. No indications are given explicitly about whether there are also common words with consistent but etymologically inappropriate spellings; if there are, the importance of the first finding is considerably diminished, while if there are not, it is greatly increased.

It is also puzzling that consistency should operate so unevenly in the vocabulary, and that it appears especially in very common words. There is nothing surprising in the fact that common words have consistent spellings; the more often a word is written the more automatic the habit of spelling it in a particular way is bound to become. Common words are also likely to be among the first acquired by the learner, and their spellings will therefore be remembered as they have been learned; it is in the less familiar words where the writer may be relying more on the application of general spelling rules than on his memory of the visual image of particular words that variation is more likely to occur: traditional spellings will therefore be more readily preserved in common words, and consistency over a long period of time may result.

The concentration of consistent spellings in the commonest words is therefore a suspicious phenomenon: it suggests that where traditional forces were weak, i.e. in the relatively uncommon words, there was no reliable spelling rule based on the phonemic oppositions present in the language to which the writer could resort when deciding which of a pair of signs to use. Consistency in choice was the product of early training reinforced by frequent use rather than of the application of a clearly apprehended general rule.

1.5 There is some evidence to suggest that the choice of one sign rather than another was a matter of fashion. Before investigating

how this showed itself in Hittite texts it may be enlightening to look at other neighbouring types of cuneiform syllabary to see how the pairs of signs used to distinguish voiced and voiceless stops in Old Babylonian were treated.

Akkadian texts from Boghazköi also show confusion between the signs for voiced and voiceless stops. The facts were discussed in some detail by Labat (1932:21–31). He found that there were preferences in the choices of signs which applied both to the representation of the emphatic ṭ and to the voiced and voiceless stops. For the labials choice was possible only between PA and BA, and here PA was greatly preferred. For the dentals the differences were less marked, but DA was slightly preferred to TA, TI was preferred to DI and DU to TU. Among the velars GA was preferred to KA and KI to GI and KU to GU. There was thus no uniform preference for signs with voiced or voiceless values as a class, but there were preferences at the level of individual syllabic signs. Labat was impressed by the apparent influence of the following vowel on the sign chosen to represent the consonant, and thought that phonetic facts must be involved, but did not say how. Similar preferences can be observed for Hittite, and some of them change through time: this evidence will be discussed below in section 2.

The Hurrian system of the Mittanni Letter addressed to Amenophis III of Egypt by Tušratta is remarkable in that it has eliminated redundant signs, a fact noted by Bush (1964:19). Here it is not a question of preference but of exclusive selection. Only one set of signs is used for each series of stops: five vowels are distinguished, and the arrangement is as follows:

Labials:	PA	BE	BI	BU-U	BU-Ú
Dentals:	TA	TE	TI	DU-U	DU-Ú
Velars:	KA	GI	KI	KU	GU-Ú

It should be noted that in the first row the sign here transcribed as BI is the one which is generally rendered as PÍ in transliterations of Hittite: BU is the sign generally rendered as PU, and in the third row the sign labelled GI has the value *ke*, as can be seen from its place in the grid. This sign was also used by Hurrian scribes at Nuzi with the vowel value *e*, and a value *ge* is indicated for Hittite.[9] A further instance of the use of different consonantal signs

as a method for distinguishing vowel quality is manifested in the use of KU versus GU, but this method could not be applied everywhere, and is supplemented in the case of the labials, where only the one sign BU was available, by the writing of an extra vowel sign U or Ú: this method was also used for the dentals, and the sign TU was discarded.

This system has all the signs of being the result of a deliberate reform. Other Hurrian cuneiform systems are not so rational. There is no question of the Mittanni system being ancestral to the Hittite: that is excluded both by chronology and by the obvious systematic differences, but in view of a possible if remote connection between the two systems it is interesting to compare the selections of the Mittanni Letter with the preferences of Boghazköi Akkadian. There is agreement with regard to PA, TI and DU and disagreement in the case of KA/GA: for KI/GI and KU/GU comparison fails because the members of these pairs have been specialized in the Mittanni Letter to represent different vowel values, and for the remaining signs no choice was possible.

Preferences in the Hittite syllabary are apparently rather similar: in the labial series only one set of signs is in regular use, as BA is extremely rare in Hittite words. In the dental series all signs are paired except TE (there is no DE). TI is a great deal more common than DI, which never occurs initially[10] and seems also to be relatively rare internally. The pairs TA/DA and TU/DU continue in use throughout the period of the documents but with changing fortunes: after the Old Hittite period TA loses ground to DA and TU to DU. GU is almost entirely confined to Akkadian words or Sumerograms, and GI is specialized in the value GE. GA and KA are both in use throughout the period, with some competition from QA, but their relative frequencies are more difficult to assess than in the case of TA/DA or TU/DU because of the large number of CVC-signs having initial K, which reduce the occasions for using KA/GA/QA.

Consultation of Laroche's *Glossaire de la langue hourrite* (1980) shows that similar patterns of choice can be observed in Boghazköi Hurrian texts. PA is a good deal commoner than BA, TI than DI and KU than GU, while in the case of TA/DA, TU/DU and KA/GA both members of the pairs are in quite frequent use and may be exchanged in spellings of the same words.

It may help to tabulate these results. Where both members of a pair are in use the less frequent one is enclosed in brackets, or, if extremely rare, in double brackets.

Mittanni Letter	Boghazköi Hurrian	Boghazköi Akkadian	Hittite
PA	PA (BA)	PA (BA)	PA ((BA))
TA	TA DA	DA (TA)	TA DA
TI	TI ((DI))	TI (DI)	TI (DI)
DU	TU DU	DU (TU)	TU DU
KA	KA GA	GA (KA)	KA GA
KU GU	KU ((GU))	KU (GU)	KU ((GU))

What emerges from the comparison of these systems is that there existed, independently of any possible correlation with a voiced-voiceless distinction, a tendency to reduce the number of signs in common use by choosing one member of the pair in preference to the other. Only the Mittanni letter carries this tendency through to completion by dropping redundant signs. This has not happened in the Hurrian material from Boghazköi, which shows preferences similar to those found in Hittite material from the same site. Since the Hurrian material is apparently associated with the influx of Hurrian cults which took place in the fourteenth and thirteenth centuries B.C. (Laroche, 1980:13) it is antedated by the earlier Hittite material. One should therefore think in terms of an existing set of writing habits being imposed on the Hurrian texts written in the Hittite capital rather than regarding Boghazköi Hurrian as any kind of model for Hittite orthography. This of course has nothing to do with the question of the possibility of Hurrian influence at the time of the creation of the Hittite syllabary, which must have happened considerably earlier. There is nevertheless some general similarity between the preferences established in the Hittite of Boghazköi and the Hurrian system of the Mittanni Letter, which is not, as Boghazköi Hurrian must be, under any suspicion of Hittite influence. This suggests that the process of selection between paired signs may have been going on for some time.

1.6 There were, as has been said, some changes in the preferences for particular signs during the historical period in Hittite. It is of

interest to consider whether or not these changes resulted in a better adaptation of the writing system to the language.

Oettinger (1979:551–556) gives a list of words with etymologies which are for the most part generally agreed, in order to test the appropriateness or otherwise of spellings with signs with voiced or voiceless values, according to the Old Babylonian system, at the beginning of the word, where the option of single versus double writing was not available. He claims that words with initial stops which are etymologically voiceless are usually spelled with the appropriate signs, but notes that where the initial stop is etymologically voiced there is less consistency. In some cases there is apparently a chronologically linked variation in spelling between signs for voiced and voiceless stops, but this does not seem to have any relationship with etymology.

These observations do not suggest that Hittite scribes were applying a spelling rule based on the phonological facts of the language in their choice of one sign rather than another, at least not in the material presented by Oettinger, which concerns the choice of signs in initial position. If this had been the case, it would be impossible to account for the fact that they had greater success in choosing the appropriate sign when the initial consonant was voiceless than when it was voiced, or that changes in preference for particular signs over a period of time had no correlation, either positive or negative, with etymology. Clearly some alternative hypothesis is needed to account for these facts.

1.7 A possible reason for the greater success of the scribes in choosing the appropriate sign for a voiceless stop might be that there was a fashion at the time of writing which favoured the signs in question. At a time when, for example, TU was popular and DU unpopular an etymologically voiceless dental stop before *u* would have a good chance of being appropriately rendered, whereas an etymologically voiced stop would have a correspondingly worse one; later, when DU became the more popular sign, the reverse would be the case.

Such changes in fashion could also account for the fact that differences in spelling between earlier and later texts have no correlation with etymological appropriateness; they represent neither

an improvement in the use of the syllabary nor a decline from some previous state of excellence, and it would probably be fruitless to look for their causes. Nevertheless, it may be interesting to look at them in more detail.

2. Changing Fashions in the Use of Signs for Voiced and Voiceless Stops

2.1 In the survey which follows I have taken a small sample of texts from different periods in order to test the hypothesis proposed above. The detailed results of the experiment may be found in the Appendix; here I shall give a brief summary of what they appear to show. I have considered the pairs TA/DA, TU/DU and KA/GA in all positions in the word. PA/BA and KU/GU are not worth considering in view of the extreme rarity of BA and GU, and KI/GI have been excluded because of their different vowel values.

TU/DU. The sample shows TU strongly predominant in the early texts, and DU strongly predominant in later ones. The change in favour of DU is already seen to be beginning in the Middle Hittite examples. When a text has a very heavy bias in favour of DU this can be seen to be due to the large number of active imperative endings it contains. Two of the Middle Hittite texts, KUB XVII 10 and KBo XV 10 still retain TU in *e-eš-tu*; KUB XVII 10 also has TU in another two verbs ending with the same sequence of signs, otherwise these texts use DU in active imperative endings, and this becomes the later norm. There are, however, some words which characteristically retain TU against the trend: *tu-uk/tu-e-el*, *tu-e-ik-ka-*, *uk-tu-u-ri*, *pít-tu-li-*, *ḫa-tu-ga-*, *Ḫa-at-tu-ša-aš*. Words in which earlier TU is replaced by later DU are *tu-me-e-ni*, *pí-e-tu-me-ni*, *a-tu-e-ni*, *wa-aš-tu-ul*, *tu-wa-ar-ni-iz-zi*: (for this last see Oettinger 1979:308–310).

TA/DA. Here too there is a change in fashion, but it is neither as early nor as marked as in the case of TU/DU. Once more, the material may be divided into words or morphemes with early and constant TA, those with early and constant DA, and those which show a change, or synchronic variations, in the choice of DA and TA.

In the first category come the particles *ta* and *-ašta*, the enclitic pronoun *-ta* of the second person singular, *katta(n)*, *natta*, and most verbal endings in *-ta*, *-tari*, *-taru*, *-tat(i)*, although some *d*-spellings are also found among these.

In the second category are the verbs *da-* 'take', *dai-* 'put', pronominal stems containing *-d-* such as *ku-e-da-ni*, the verb *ḫandaizzi*, *anda(n)*, *idalu-* and (usually, though not without exception) *pí-e-da-i*, *ú-da-i* and *menaḫḫanda*.

The third class contains many words with initial TA/DA, such as *ta-ma-i-/da-ma-i-*, *ta-lu-ga-/da-lu-ga-*, *ta-a-an/da-a-an*, *ta-šu-wa-aḫ-/da-šu-wa-aḫ-*, *tagan/dagan*, *ta-a-i-iz-zi/da-a-i-iz-zi*, *ta-ru-up-/da-ru-up-*, *ta-ra-an-zi/da-ra-an-zi*. There is also variation after nasals, for example *ši-pa-an-ta-an-zi/ši-pa-an-da-an-zi* (with etymological *-d-*) and in various suffixes with etymological *-t-*, such as those of the participle in *-ant-*, adjectives in *-ant-* and *-want-*, and the nominal suffix *-ant-* exemplified by *ut-ni-an-da-an*; in these suffixes *-d-* spellings are not infrequent from the earliest texts onwards.

KA/GA. Because of the abundance of CVC-signs in use the evidence from any one text for KA and GA is restricted; the sample does not reveal any marked change in fashion between the two signs over the period; their occurrences remain rather evenly balanced. The sample does support Götze's finding[11] that KA is more frequent initially and GA internally: it also appears that the tendency to distribute the signs in this way increased as time went on. It is notable that the early text StBoT 25.4 has several examples of initial GA, of which two (*ga-a-an-ga-aḫ-ḫé* and *ga-ra-ú-ni-ši*) certainly had etymologically voiceless initial stops. Single intervocalic GA in the sample is usually etymologically justified, and single KA in this position is rare, but doubled writings of KA, GA and QA are interchangeable with each other. After a consonant GA is favoured after *-n-* and *-r-*, but it also appears after *-s-* in *iš-ga-a-ri*, where it seems unlikely that the stop would actually have been voiced. DA and DU may also occur after *-s-* as well as after nasals.

2.2 It looks as if a distinction may have to be drawn between initial position and other positions in the word. In the initial posi-

tion the choice of signs does not correspond in any principled way with the etymologically expected character of the stop, and appears to be dominated by the fashion of the time. In intervocalic position there was in theory no need for two sets of signs, since the distinction between double and single writing of consonants was available to express the voicing distinction. Yet one of the most typical situations in which 'voiced' signs occur is to represent an intervocalic consonant which was etymologically voiced, and as such written single. Other positions favoured for these signs (and this applies to the relatively rare DI as well as to DA, DU and GA) is after nasal or *-r-*. On the other hand in early texts TA, TI and TU can be written singly to represent etymologically voiced stops in intervocalic position, and DA, DU and GA can occur at the ends of double-consonant groups. In the case of GA there are examples from early as well as late texts (note *lu-ug-ga-at-ta-ma* in the early StBoT 25.4, where a voiced consonant would certainly be unetymological). Personal pronouns followed by the particle *-a* which does not cause doubling of the preceding consonant normally have GA, the usual choice in medial position: if followed by the particle *-a/ya*, which does cause consonant doubling, they may have either *-k-ka* or *-g-ga* (*-q-qa* being a further possibility): so for example with single consonant *ú-ga*, *zi-ga*, but with double *ú-uk-ka*, *zi-ik-ka*, *zi-ig-ga*. In the case of the dentals there are examples of *-d-du* from the Middle Hittite texts in the sample onwards, in accordance with the preference for DU over TU which begins to emerge at that time. For *-d-da* there are a few examples even in Old Hittite texts.

2.3 Cases where alternative spellings with both signs of a pair are found in the same word in the same manuscript will be found underlined in the Appendix. It may be useful to summarize the results here by giving the total number of lexical items in each text for which such variation is found.

KBo VI 2		StBoT 17A		StBoT 17B	
TU/DU	0	TU/DU	0	TU/DU	0
TA/DA	2	TA/DA	0	TA/DA	1
KA/GA	0	KA/GA	0	KA/GA	0

StBoT 18		StBoT 25.3		StBoT 25.4	
TU/DU	0	TU/DU	0	TU/DU	1
TA/DA	0	TA/DA	2	TA/DA	1
KA/GA	0	KA/GA	1	KA/GA	1

KBo XV 10		KUB XXX 10		KUB XVII 10	
TU/DU	0	TU/DU	1/2	TU/DU	2
TA/DA	3	TA/DA	0	TA/DA	2
KA/GA	0	KA/GA	1	KA/GA	0

KUB XIV 1		KUB XXIX 1		KUB VI 34+	
TU/DU	1	TU/DU	0	TU/DU	1
TA/DA	2	TA/DA	3	TA/DA	2
KA/GA	0	KA/GA	0	KA/GA	0

KUB VII 53+	
TU/DU	0
TA/DA	2
KA/GA	0

Analysis of the environments in which variation occurs in individual manuscripts produces the following results:

Initial position	5 examples
Intervocalic double consonant	7 examples
Intervocalic single consonant	3 examples
After *n*	9 examples
After *s*	1 example
After *r*	1 example

It can be seen that the extent of variation in individual texts is very slight, and also remarkably constant. There is no noticeable difference between originals and copies, or between texts of different periods, though hesitation between TU and DU is more in evidence in the Middle Hittite texts than elsewhere. TA/DA show the greatest amount of variation, but this is the most frequent pair; KA/GA, the least frequent pair, show the least variation.

2.4 The pairs TU/DU, TA/DA and KA/GA are not treated in a parallel way. In the case of TU/DU there is a definite and early shift to preference for DU over TU. In the case of KA/GA there is a marked tendency for KA to be used initially and GA internally, which seems to increase with time. For TA/DA the results are less clear. The shift

in preference from TA towards DA is more gradual and not so extreme as the shift from TU to DU. It seems therefore worth while to give a more detailed analysis of the environments in which these signs are used in the texts in question. ('Medial' refers to the position of the consonant, not the sign.)

KBo VI 2

TA Initial 13 Medial 15		DA Initial 4 Medial 8
Medial TA		Medial DA
Intervocalic double	7	0
Intervocalic single	3	1
After *n*	0	7
After *s*	2	0
After stop	3	0

StBoT 17A

TA Initial 6 Medial 10		DA Initial 2 Medial 7
Medial TA		Medial DA
Intervocalic double	3	0
Intervocalic single	1	1
After *n*	1	4
After *s*	3	0
After stop	2	0

StBoT 17B

TA Initial 5 Medial 9		DA Initial 1 Medial 3
Medial TA		Medial DA
Intervocalic double	1	1
Intervocalic single	1	0
After *n*	1	2
After *s*	5	0
After stop	1	0

StBoT 18

TA Initial 2 Medial 10		DA Initial 1 Medial 7
Medial TA		Medial DA
Intervocalic double	5	1
Intervocalic single	0	2
After *n*	1	4
After *s*	4	0

StBoT 25.3

TA Initial 3 Medial 19		DA Initial 2 Medial 10
Medial TA		Medial DA
Intervocalic double	8	1
Intervocalic single	7	2
After *n*	2	7
After *s*	3	0

StBoT 25.4

TA Initial 3 Medial 20		DA Initial 3 Medial 12
Medial TA		Medial DA
Intervocalic double	9	1
Intervocalic single	5	4
After *n*	3	7
After *s*	2	0
After *r*	1	0

KBo XV 10

TA Initial 2 Medial 20		DA Initial 5 Medial 14
Medial TA		Medial DA
Intervocalic double	4	1
Intervocalic single	2	6
After *n*	8	4
After *s*	3	1
After *r*	2	1

KUB XXX 10

TA Initial 2 Medial 21		DA Initial 1 Medial 6
Medial TA		Medial DA
Intervocalic double	8	1
Intervocalic single	1	3
After *n*	2	2
After *s*	9	0
After *r*	2	0
After *h*	1	0
After stop	1	0

KUB XVII 10

TA Initial 1 Medial 29	DA Initial 3 Medial 7
Medial TA	Medial DA
Intervocalic double 7	1
Intervocalic single 4	3
After *n* 7	4
After *s* 8	0
After *z* 2	0
After *r* 1	0

KUB XIV 1

TA Initial 3 Medial 46	DA Initial 6 Medial 18
Medial TA	Medial DA
Intervocalic double 13	3
Intervocalic single 8	10
After *n* 10	5
After *s* 10	0
After *r* 1	0
After *h* 3	0

KUB XXIX 1

TA Initial 2 Medial 28	DA Initial 3 Medial 14
Medial TA	Medial DA
Intervocalic double 10	3
Intervocalic single 2	6
After *n* 7	5
After *s* 4	0
After *r* 3	0
After *h* 1	0

KBo VI 34+

TA Initial 0 Medial 20	DA Initial 4 Medial 11
Medial TA	Medial DA
Intervocalic double 12	3
Intervocalic single 1	6
After *n* 0	2
After *s* 5	0
After *r* 1	0
After stop 1	0

	KUB VII 53+	
TA Initial 1 Medial 16		DA Initial 6 Medial 21
Medial TA		Medial DA
Intervocalic double	3	3
Intervocalic single	1	9
After *n*	6	9
After *s*	3	0
After *r*	2	0
After *h*	1	0

From this table it can be seen that TA occurs in all the environments represented in the sample, but DA (with a few exceptions in KBo XV 10) is restricted to four environments: initial position, intervocalic double consonant, intervocalic single consonant and after nasal, the last being the most favoured. The least favoured environment for DA is when double intervocalic consonant is required; this is also the environment in which TA occurs most often. The examples of DA in this position are concentrated very clearly in the later texts of the sample, though not absent from earlier texts.

In initial position the figures for TA and DA show that TA is somewhat in the lead. It is the earlier texts which contribute most to this result. Intervocalic single TA is actually more frequent than DA in several of the early texts, but this situation is reversed in the later ones. After a nasal DA predominates clearly in the early texts of the sample, but competition from TA in the Middle Hittite period often reverses this situation. Later texts again show greater preference for DA.

The few early examples of DU are either single intervocalic or after nasal, but by the time of the Middle Hittite texts DU, mainly by virtue of its use in imperative endings, was being used in a very wide range of contexts, showing none of the restrictions which affected DA. Any possible phonological considerations which might have prompted choice of TU rather than DU were likely to have been overridden in the imperative endings by the desirability of having a constant spelling for the same morpheme. It seems possible that other verbal endings are similarly rendered more recognizable by the use of TA rather than DA in contexts where a single

consonant is required. In fact such cases are few in the sample. TA is quite often used in early texts, however, when the particle *-a* which does not cause doubling is added to a word which ends in a dental stop; it is also found when other enclitic elements beginning with *a-* are so added. Many of the instances of nasal followed by TA do occur in verbal endings, however, and it seems possible that some morphological influence is at work here.

2.5 It is now time to consider arguments for and against the proposal that the usage of Hittite scribes points to an acquaintance with the Old Babylonian system of distinguishing between voiced and voiceless stops by using specific signs, and that their choices in this respect may provide evidence of significance for etymology.

Arguments in favour of the proposal:

Common words have stable and appropriate spellings (cf. Eichner, 1980; Oettinger, 1979; and section 1.4 above).

TA is used most often as second member of a double-consonant group: this suggests a voiceless value. DA is very rare in this environment.

DA is often used in representations of a single intervocalic stop: this suggests a voiced value.

DA is most often found after a nasal; it is hardly ever found after other consonants. This too suggests a voiced value.

TA is also found after a nasal, but many of the examples could be motivated morphologically.

DU in early texts behaves similarly to DA (although examples are few).

KA prefers initial position, GA medial position. (For the possible significance of this see 2.6.)

Arguments against the proposal:

In the initial position there is a good deal of variation (see above, section 2.1) as well as the stability in common words noticed by Eichner and Oettinger.

Chronological change neither increases nor decreases etymological appropriateness of spellings, but is related to changing fashions in the popularity of signs. Such changes cannot be reconciled with phonologically motivated choices. Single TA and TA after nasal are quite well represented.

The treatment of the pairs TA/DA, TU/DU and KA/GA is not the same, as might be expected to be the case if they were systematically opposed signs for voiceless and voiced stops.

2.6 The solution which suggests itself in the face of the strength of the arguments on both sides is that the Hittites did at some point become acquainted with Old Babylonian values for the signs concerned, but never fully integrated them into their own writing system. They already had a method of distinguishing between voiced and voiceless stops in intervocalic position by the use of single and double spellings, so that the use of different signs was in this case redundant: nevertheless in the case of TA/DA there seems to have been a tendency to choose the appropriate sign in medial position as well, though cases of single TA and double DA show that the method was not applied with total consistency. In the case of TU/DU the habit never established itself, or account of the shift in favour of DU, which could have originated in its selection as a morphological identifier of active imperative endings, which brought about its occurrence in a much wider variety of environments than DA.

The position in which the existence of signs for distinguishing voiced and voiceless stops should have been most useful was at the beginning of the word, where consonants could not be written double; they should also have been useful medially after another consonant. The evidence for these two positions is rather different. DA is restricted in medial position with very few exceptions to the case where a nasal precedes; TA occurs freely in this position after all consonants. This at least suggests some kind of systematic difference. But in initial position there is a substantial amount of variation, some synchronic and even occurring within the same text, more between different texts and different periods.

There are some pointers which suggest that the distinction of voice might actually have been lost in initial position. In addition to those already mentioned, it has been noted that KA tends to be specialized as the initial and GA as the internal variant, although this is not noticeable in the early texts of the sample, where initial GA is relatively common. The lack of initial DI mentioned by Eichner could be another indicator of the same thing, and is indeed

taken by him to reveal a change of *di* to *ti* in this position. A further assumption he makes is that *gi* became *ki*, and that the sign GI consequently became specialized with the value *ge*, but the sign was already used with the vowel value *e* in some Hurrian areas, and it seems far more likely that its *e*-value in Hittite was part of the tradition taken over from the source of the Hittite syllabary than that it acquired it as a result of an inner-Hittite sound-change. A further possible piece of evidence for initial devoicing comes from double writing at the beginning of the root in reduplicated verbs like *kikkištari*, where it has been suggested that devoicing in the initial consonant was followed by harmonization of the root-initial consonant with that of the reduplicating syllable. It seems easier to believe in a general initial devoicing of stops than in a partial one.

If such a change had taken place it would help to account for the failure of the Hittite syllabary to adopt the Old Babylonian system of distinguishing between voiced and voiceless consonants by the use of different syllabic signs in any complete way, while at the same time making it easier to understand why some spelling habits in medial position suggest that such a distinction was not unknown to the Hittites. It seems probable that the change had taken place some time before the writing of the earliest surviving documents, since in early texts initial TA is apparently preferred even when there is no etymological justification for it, and the same may be true of initial TU. On the other hand the early and constant spellings with initial DA, which are accounted for chiefly by the very common verbs *da-* 'take', *dai-* 'put' and derivatives, may go back to a time before the devoicing of initial consonants, and have been maintained because of their great familiarity against the later trend, manifested in the Old Hittite period, of preference for initial TA.

If this account is right, the consequence for the etymologist is that spellings in initial position are not to be trusted even if they are early and constant, because it is not possible to be sure whether the spelling became established early enough to reflect the etymological value accurately. It is rather because of the existence of words with reasonably certain etymologies with stable and appropriate initial spellings which resist the pressure of current fashions that it is possible to posit a stage at which appropriate choices in

this position could be made. This stage would have to have existed at some time between the original adaptation of the syllabary and the writing of the earliest surviving documents, and presupposes a period during which the Hittite writing system was in use before the foundation of the Old Kingdom at Hattusas.

3. The Vowel System: The Signs U and Ú

3.1 One of the advances of recent years has been the demise of the notion that Hittite had no distinction between the vowels *e* and *i*. This now appears to have been an illusion caused by the fact that the syllabary is deficient in signs with *e*-values, and that *e* had actually fallen together with *i* in some environments: this does not, however, amount to a total merger of the two vowels. The reality of the distinction has emerged from a more intensive study of the early texts, in which greater use of plene-writing is made, with the result that vowel qualities are more easily distinguishable. It has recently been claimed by Eichner (1980:141) that the *e*/*i* distinction was still fully alive in the later period as well, and I see no reason to doubt this. The question I wish to consider here is whether the signs U and Ú were used to represent vowels of different quality or not. The question whether a word is spelled with one sign or the other seems often to be ignored in etymological discussions, but perhaps this neglect is unjustifiable.

The question was enthusiastically debated in the early years of Hittite scholarship, but no consensus emerged. Weidner (1917) and Marstrander (1919) brought forward detailed arguments in favour of the distinction, but it was rejected by Hrozný (1917) and argued against in greater detail by Sturtevant (1942). Of more modern writers on the subject Kronasser (1966:19) and Rosenkranz (1978:36) reject any distinction, while Friedrich (1960) does not commit himself to either view.

There are several reasons for this failure to reach any satisfactory conclusion. It is well known that there are a great many words which are spelled consistently with one or other of the signs, but there are also some cases of interchange within the same word, as when, for example, the scribe of KBo VI 2 writes *ḫu-ú-ni-ik-zi*

(once) for *hu-u-ni-ik-zi* and *a-pu-ú-un* (once) for *a-pu-u-un*. Etymology is another problem. There are abundant good correspondences of *ú* with IE **u*, but the origins of *u* are far more problematical.

Apart from the vowel signs themselves the possibility was considered that Hittite might have exploited different CV-signs like TU/DU in order to indicate distinct rounded vowels, as happens with KU/GU in the Mittanni Letter. There is nothing in the way in which Hittite uses TU/DU to encourage such a belief, nor does the Mittanni Letter exploit this pair of signs in this way. This is the only pair of signs in which the question can arise in Hittite, since GU is extremely rare and only one sign exists for PU/BU.

If Hittite did possess two different vowels, therefore, the only means it had for expressing the difference was the pair of vowel signs, and syllabic writings of the form CV-VC without extra vowel sign were in fact ambiguous. Investigation must therefore start from the vowel signs.

3.2 Apart from being used as vowels both signs could be used before vowels, between vowels and after vowels. The combinations *ú-e-* and *ú-i-* functioned like simple syllabic signs *we* and *wi*, parallel to *wa*, and occur frequently in initial position. Initial *u-*, on the other hand, seems to be uncommon initially before a different vowel. Both signs can occur in word-final position, where *-ú* is normal in active imperative endings such as *da-a-ú* 'let him take' or in the adverb *ka-ru-ú* 'formerly', but *-u* is found in the neuter plural of the adjective *a-aš-šu-u* with the meaning 'goods'; with this neuter plural ending of a *u*-stem adjective may be contrasted the nominative-accusative singular neuter *su-u-ú* 'full'.[12]

Between vowels there is some variation between the two signs, and this has been noted especially in the ending of the 1 pl. active in *-wen(i)*, a fact which has been used in support of the argument for identical values. Here a closer look at the evidence suggests that there may have been a difference. This is a point on which individual scribes differ; some use only one sign for the ending, while others make use of both, but in different environments. It is the latter group which is particularly interesting. Some examples are:

(a) StBoT 25.4 has *pí-en-ni-ú-e-ni* 'we drive' but *ú-wa-u-e-ni* 'we come'.

(b) KBo XV 10 has *ḫu-it*]*-ti-ya-an-ni-ú-e-ni* 'we draw' but *da-a-u-en* 'we took' and *da-a-i-ú-en* 'we put'.

(c) The various manuscripts of the Prayer of Arnuwandas and Asmunikkal yield:

with *ú*	with *u*
is-su-ú-e-ni	*pí-eš-ga-u-e-ni/pí-is-ga-u-e-ni*
pí-ú-e-ni	*zi-ik-ki-u-wa-ni*
up-pí-ú-e-ni	*me-mi-iš-ki-u-wa-ni*
	ar-nu-uš-ki-u-wa-ni
	m]*u-*[*k*]*i-iš-ga-u-e-ni*

(d) The Old Hittite text StBoT 25.129 has *ha-aš-šu-ú-e-n* but *pi-eš-ši-ya-u-e-ni.*

In these examples the preceding and following vowels appear to influence the choice; after *-a-*, and also as a glide before *-wa-*, *u* is found, while after *i* and *u* the choice is *ú*. Where these rules conflict, as when *i* precedes and *wa* follows, the first one prevails and *u* is written. The use of *u* as a glide before *wa* is very widespread in other categories: many of the facts were already noted by Weidner (1917), but I will add here some cases of paradigmatic alternation between the two signs which seem particularly interesting.

In the forms of the verb *šuwe-* 'push' listed by Oettinger (1979:294), *ú* is used before a front vowel, as for example in 3 sg. present *šu-ú-iz-zi*; in persons which have *-a-* as the thematic vowel the sign *wa* is used, and the vowel sign *u* may be added before it as in *šu-u-wa-at-ten.* The word *pár-ta-u-war* 'wing' has *-u-* before *-wa-* in the nominative-accusative singular, but in the oblique cases the *-wa-* of the suffix becomes *-ú-*, as in *pár-ta-ú-ni-tu-uš* StBoT 25.3 i 6' (instrumental singular with suffixed pronoun *-uš*). Further examples of spellings with *-ú-* in oblique cases of nouns with the *-war* suffix are *ga-ra-ú-ni-š*[*i*] (StBoT 25.4 iii 24) and *a-ša-ú-ni* (KBo VI 2 iii 49). In the oblique cases the *-ú-* represents the reduced form of the element *wa-* of the suffix in preconsonantal position, but the *u* in the nominative-accusative singular has the rather different function of a glide preceding the suffix *-war* in its full form. Similar added

-u-vowels are found in the infinitives in *-wanzi* as well as in verbal nouns in *-war*, and, as we have seen, before *-wani* endings in the first person plural.

A further case of paradigmatic alternation is found in the ritual of Tunnawi, KUB VII 53, where locative *wa-ap-pu-ú-i* in i 24 and iii 56 varies with genitive singular *wa-ap-pu-u-wa-aš*; once again, *u* regularly precedes *-wa-*, but between *u* and *i* the choice is *-ú-*. Both the additional vowels are optional, and elsewhere in this long text the scribe writes *wa-ap-pu-i* and *wa-ap-pu-wa-aš* and even *wa-ap-pu-aš*.

This is a small sample, but illustrates the usefulness of looking at the practice of scribes in individual texts; this can sometimes reveal features which are obscured if one considers large amounts of material from different periods of the language as if everything belonged to a homogeneous corpus. This is especially true in the present case, where scribes differ on some points in their treatment of intervocalic *w*; some choose to use the different *u*-signs in different environments, while others make no such distinction. An example of the latter class is the writer of the Old Hittite manuscript of the story of Zalpa (= StBoT 17A, KBo XXII 2). He uses only *u* in endings of the 1. pl. active; *sa-an-ḫi-iš-ki-u-e-ni* and *da-aš-ki-e-u-e-ni* appear beside the expected *ú-e-mi-ya-u-en*. The scribe's other uses of *ú* are perfectly normal: initial before vowel in *ú-e-ša, ú-e-mi-ya-u-en, ú-it, ú-e-te-it, ú-ik-ta*, before consonant in *ú-wa-at-te-en, ú-wa-te-it*, and initial plene in *ú-uk-wa*. These are all regular and expected spellings for these words. But in some cases in intervocalic position scribes could apparently exercise the option of writing *-u-* or *-ú-*.

The fact that some scribes (though by no means all) chose to use both signs but selected different ones in different environments suggests that the signs stood for sound which did not appear to them to be exactly equivalent, although both could be used with semivocalic function. The distribution of semivocalic *u* and *ú*-signs suggests that *u* was the more open and *ú* the closer of the two.

3.3 I have drawn attention to the intervocalic uses of the signs U and Ú in particular because this is the position where they seem most often to coincide, and I would emphasize again that the 'rules'

for distribution which have emerged are not to be taken as holding for the entire corpus, or for the work of all scribes, and that for any given form it is possible that variants will occur in this position. The difference between the sounds represented by U and Ú between vowels was presumably not phonemic but merely allophonic, but the usage of those scribes who employ both signs may be able to cast some light on the character of the vowels *u* and *ú*, discrimination between which seems to have been highly consistent. It is true that there are some cases of aberrant spellings like the two from KBo VI 2 mentioned above, but occasional anomalies of this kind should not be given an exaggerated importance; the other 43 examples of Ú in the text are all normal. Yet even anomalies may be able to tell us something; both the examples from the Laws occur before a nasal, and this also applies to some of Sturtevant's other examples of variation between vocalic *u* and *ú*.

What is needed in such cases is a statement of the extent of the variation, not simply the fact that there is at least one case of it. It is important to know when a particular spelling is typical (like *a-pu-u-un* or *ku-u-uš*) and where it is rare and exceptional (like *a-pu-ú-un* or *ku-ú-uš*) and such information is all too seldom provided. Until such work has been done it is premature to try to explain how anomalous spellings arose, though one might conjecture that the difference between the vowels was not wide, and that there were certain environments in which it might be suppressed. It is also premature to conclude that because of variations of this kind the signs U and Ú were simply allographs for the same vowel, and that it is safe to ignore the different spellings when using Hittite for comparative purposes.

3.4 Words in which Hittite *ú* corresponds to PIE **u* are not difficult to find. Among these may be mentioned *i-ú-kán* 'yoke' from **yugóm*; *ú-uk* 'I' with vowel from *tu-uk* 'thee' (cf. Palaic *tu-ú*); *ta-a-i-ú-ga-aš* 'two-year-old' (cf. Sanskrit *yuga-* 'age'); the 3 sg. imperative active ending of vowel stem verbs like *na-a-ú* 'let him lead' (for the ending compare Skt. *astu* 'let him be'), and *-ú-* as the reduced form of the suffix-element *-wa-* in *a-ša-ú-ni* etc. The word *šius/šiunaš* 'god' also has spellings with *-ú-* both in the nominative singular and in oblique cases.[13]

For *u* it is more difficult to find enlightening correspondences. One of the clearer examples is the verb *au*(š) 'see', in which *u-* in the 1 sg. forms *u-uḫ-ḫi, u-uḫ-ḫu-un* alternates with *ú-* in 1 pl. present *ú-me-ni*, 3 pl. *ú-wa-an-zi*. Since the 1 sg. should have a full grade of the root in contrast with the zero grade of the plural, *u* here could represent the outcome of monophthongization of the diphthong *a-u-* seen in 2 sg. present *a-ut-ti*, 3 sg. *a-uš-zi* before *-ḫḫ-* of the 1 sg. ending.

There are some other words in which a diphthongal origin for *u* is merely a possibility:

(a) The verb *tu-u-ri-iz-zi* 'harnesses'. This has been connected with Vedic *dhūḥ*, accusative singular *dhúram* 'chariot pole' etc.[14] The Hittite verb, according to Kammenhuber (1968:189–190), is a denominative from a noun not preserved in Hittite. This need not necessarily have been a root-noun, as in Vedic: the verb could for example have been based on an *i*-stem neuter noun **dheuri*. Hittite does in fact possess a noun ^{GIŠ}*tu-u-ri* 'spear' which might be connected via the meaning 'shaft', but this is all quite uncertain.

(b) The verbal prefix *u* 'hither' is usually written with *ú* in Hittite: an exception is the verb *u-un-na-i* 'drives'. But in Cuneiform Luwian the verb which corresponds to Hittite *ú-iz-zi* 'comes' is *a-ú-i-ti*, which seems to point to an originally diphthongal form of the prefix. This would appear to suggest that Hittite *ú* as well as *u* could reflect the outcome of a diphthong, but there is another possible explanation, which is that two forms of the prefix, full-grade with *u*-diphthong and zero-grade *u*, existed in Anatolian, of which the first was preserved in Hittite *u-un-na-i*, Luwian *a-ú-i-ti*, and the second in Luwian *ú-wa-ta-a*[*n-du* (KUB XXXV 102 rev. 2 and 103 ii 14) and possibly also in the verb *ú-pa-* 'bring'.

(c) The demonstrative pronouns *ka-a-aš* and *a-pa-a-aš* have spellings with *u* in the accusative singular common forms *ku-u-un* and *a-pu-u-un* and accusative plural *ku-u-uš* and *a-pu-u-uš*. The morphology of the accusative singular is problematical but not isolated in Hittite: it recurs in the pronoun *u-ni* (also with *u*) which functions as accusative singular common to *a-ši*. These pronouns have recently been the subject of a study by Laroche (1979), who suggests, convincingly to my mind, that the pronouns have been constituted by combining deictic particles *k(e)* and *ab(a)* with old

anaphoric pronouns *a/u/e*, still preserved in Hittite in the forms *a-ši, u-ni, e-ni*, which are members of a single paradigm (Laroche, 1979:151). As to the etymology of the anaphoric elements, Laroche does not discuss it, describing it as a 'problème sans objet', nor is the question of spelling with *u* as against *ú* mentioned. The Sanskrit suppletive pronouns *ayám* and *asáu* are mentioned by way of parallel rather than with any intention of etymological comparison, though Benveniste (1962:72) compared the *u* of *amúm* (accusative singular masculine to *asau*) with the *u* found in the accusative forms of the Hittite pronouns. This would point to etymological **u*, but there is an alternative possibility, which would be to link Hittite *u* with the second element of the nominative singular masculine *asau*. The initial *a* here is secondary, as shown by the cognate Avestan *hau*; Burrow (1973:277) analyses the form **sau* as consisting of the pronoun *sa* (<**so*) and a particle *au* indicating distance; the *u* of *amúm* is explained as a variant grade of the same particle. It is then conceivable that the Hittite pronouns could have contained a diphthong rather than simply **u*, but once again this remains merely a possibility.

(d) The adverbs *tu-u-wa, tu-u-wa-az* 'at a distance, from a distance', were connected by Benveniste (1932:142–3) with Sanskrit *dūrá-* 'far' and various words in other languages meaning 'for a long time' or 'long since', such as Greek δήν, δᾶν or the adjective δηρός to which he regarded Hittite *tu-u-wa-la* 'distant' as a close morphological parallel, deriving it from **dwālo-*. But the spelling of the Hittite words with plene *u* in the first syllable makes any direct equation with forms beginning with **dw-* very unlikely. Also the Hittite words show no sign of the suffixes which appear in many of the cognates; they do, however, present a parallel with local adverbs like *appa(n)* or *katta(n)*, and the endings *-a* and *-az* are no doubt nominal case-forms.[15] The underlying noun must have been either a root-noun or (less probably) thematic. At all events it has generalized radical accentuation, and possibly also the root vocalism of the strong cases. Again the evidence is unfortunately ambiguous, since a shift of accent to the root in the weak cases might possibly have produced a similar effect. If, however, the root vocalism does continue the full grade, *u* could here be the product of a diphthong.

(e) The nouns *a-ni-u-ur* 'ritual' and *par-šu-u-ur* 'fragment' inflect throughout with the *r*-suffix, which can have plene *u*. (*aniur* also has some spellings with *ú*, though these are less common; cf. Friedrich-Kammenhuber *HW*^{2} for examples.) *aniur* has a by-form *a-ni-ya-u-wa-ar*, and may therefore contain the result of a contraction, perhaps originating in the oblique cases, if a similar reduction of the suffix occurred there as in the heteroclitic nouns of the type *par-ta-u-wa-ar*. On the analogy of *partaunit* this should have yielded an oblique stem **aniaur*- rather than *aniur*-, however, and it may be that the solution lies in a different direction, though it does not seem that deriving *a-ni-u-ur* directly from a nominative singular *a-ni-ya-u-war* would help matters. *a-ni-ya-u-war*, an isolated and morphologically transparent form beside the common but opaque *a-ni-u-ur*, looks suspiciously like a learned reconstruction rather than a genuine form, but this need not mean that is an incorrect reconstruction. The problem is that we still do not know in what circumstances monophthongization of *u*-diphthongs took place in Hittite, or failed to take place.

(f) The adjective *šu-u-uš* 'full' is derived, according to Oettinger (1979:159) from a form **seuh*$_2$ or **seuh*$_2$*-u* with full grade of the root in contrast with the nasal infix verb *šunna*- 'fill' $<$**suneh*$_2$-. The Palaic verb which corresponds with this has 3 sg. preterite *su-ú-na-at*, 2 sg. imperative *šu-ú-na*, both with *ú* reflecting original **u* rather than a diphthong, which would be out of place in such a formation. The plene-writing of *ú* may indicate a retraction of the accent to the first syllable.

A case where plene *u* does not seem to indicate diphthongal origin is in the neuter plural of the adjective *aššuš*, *a-aš-šu-u* 'goods', where the ending should go back to **-ū* or **-uH*.

3.5 There is no doubt more to be said on this subject, but I hope that this has been enough to show that the internal evidence of Hittite spellings points to a largely consistent discrimination between the two vowel-signs, and that cases of interchange are to be found either in intervocalic position, where a phonemic contrast in unlikely, or are rare exceptions to the general rules. I think that if the two vowel signs were merely graphic variants, as is sometimes asserted, we should find far more random variations in their use

(the choices between paired signs for stops offer an instructive contrast here).

The difficulty of producing an etymological justification for the use of two *u*-signs has impeded progress in this area; as can be seen from the examples discussed above, there are many cases where more than one interpretation is possible. Nevertheless, it appears possible that the sound which the Hittites habitually wrote with *u* rather than *ú* was the outcome not of PIE **u* (for which they used *ú*), nor of PIE **o*, which was represented by *a*, but of diphthongs with *u* as second element which had been monophthongized, and possibly also from an original **uH*, though this is less well supported.

In the past it has been assumed almost by default that the two *u*-signs both represented inherited **u*, and etymological discussions have proceeded without mention of which of them was involved in the spelling of a particular Hittite word. Since **eu/u* are ablaut variants, this has not been as disastrous as it might have been for the discovery of etymological connections, but it has perhaps hindered a better understanding of morphological details, as the case of Hittite *tu-u-wa* illustrates.

4. Conclusions

After nearly seventy years of work Hittite phonology is full of unsolved problems. They are not all necessarily insoluble, but it is unlikely that solutions will emerge rapidly. The renewal of interest in the field shown especially in the work of Eichner (1980) and Oettinger (1979) is greatly to be welcomed; nothing is more likely to prevent progress than the belief that none is possible. I cannot here discuss the very interesting proposals which these scholars have made about the development of consonants in the Anatolian languages, since detailed arguments in support of the hypotheses advanced have not yet been presented, but it does seem that the hypothesis relating to the lenition of stops in certain environments is well founded, and may explain the 'exceptions to Sturtevant's Law' which have in the past caused etymologists to regard it as not entirely reliable.[16] The related question of the origin or doubling in consonants other than stops seems to be more problematical.

In this paper I have looked at some of the old problems of Hittite phonology and some of the new suggestions made for solving them. From this certain general conclusions have emerged. The first is that the Hittite writing system cannot be considered in isolation from other cuneiform systems which are most likely to be related to it. Otherwise there is a risk that traditional features inherited from the source may be misinterpreted as having particular significance for facts of the Hittite language.

The second point is that the Hittite convention for the rendering of consonantal oppositions can have been neither purely Hurrian nor purely Akkadian. The double writing of etymologically voiceless consonants cannot have come from a Semitic source in which the features of voice and consonantal length were independent of each other, nor can the principled choices between paired signs for expressing the voicing contrast have come from a Hurrian source. Yet this last feature of the Hittite system, although there is some reason to believe that it exists, is less important than has been suggested in some recent work, and the best evidence for it is not in initial position but internally; the evidence adduced in support of appropriate choice of signs in initial position seems when considered more closely to point in the opposite direction, suggesting that here there was in fact no opposition.

It has been no part of my purpose to discuss orthographic criteria for the dating of texts, which I regard as a minefield. Even the limited sample presented above makes it clear that isolated spellings of what is supposedly the more 'archaic' of two options can occur in late texts, and vice versa. A better clue to the date of a text is provided by the overall frequency of signs which are subject to changing fashion; the sample here gives an approximate idea of the way in which this can change, but it must be emphasized that it is a small sample, and that very few features have been looked at.

Although influenced by the fashion of time, it appears that each scribe has his own preferences. One surprising fact to emerge is the small but remarkably stable degree of variation with respect to the features being considered within single manuscripts; this happens in originals and copies alike. It would no doubt be useful to look at other features in which similar options exist to see if the same pattern emerges for them as well. The chief problem about the

study of Hittite orthography is that of size and complexity, especially if one wants to study the incidence of variation with a view to assessing its significance. It therefore seemed a useful strategy to begin by looking at the amount of variation which can occur in single manuscripts, to provide a yardstick for measuring degrees of variation between different scribes and different historical periods. Attention to individual manuscripts can also reveal some finer distinctions in usage like the choice of *u* and *ú* between different vowels which only some scribes practise; this would not be noticed if the material was looked at in bulk; indeed such variations were taken to show that the choice of *u* or *ú* was a matter of indifference.

H. Eichner (1980:150) looks forward to the time when complete information about the use of every sign in the syllabary will be made available, and remarks: 'Dabei könnte ein Computer sinnvoll eingesetzt werden'. That may be still a distant goal, but much can be learned from the analysis of even a small sample of texts with the aid of a computer, which will sometimes suggest answers to questions which one had not thought of asking in the first place. It is in this direction that there seems to be at last some real hope of progress in establishing the facts about Hittite writing, without which the question of phonology cannot adequately be approached.[17]

Department of Classics,
University of Durham

Appendix

A small sample of texts from different periods has been used to illustrate the choices made between paired signs and the chronological changes in preference for one sign as against the other, as well as the degree of variation found in individual manuscripts with regard to such choices. Only the pairs DU/TU, DA/TA and KA/GA have been looked at. TI/DI, in view of the comparative rarity of DI, would have required a large sample in order to produce significant results, and the material obtained from a sample of this size for KA/GA is also somewhat meagre, but for TU/DU and TA/DA some reasonably consistent patterns emerge.

The texts used were:

I. In Old Hittite ductus
   KBo VI 2 (= ms. A of the Laws)
   StBoT 17 (the story of Zalpa): only 17A is in Old Hittite ductus, 17B being a later duplicate.
   StBoT 18 (Anittas)
   StBoT 25.3 and 25.4 (the two main mss. of the Old Hittite ritual for the royal couple)
II. In Middle Hittite ductus
   KBo XV 10 (ritual for Tudhaliyas and Nikalmati)
   KUB XXX 10 (prayer of Kantuzili)
   KUB XVII 10 (Version A of the Telipinus Myth)
   KUB XIV 1 (Madduwattas)
III. In Empire ductus
   KUB XXIX 1 (ritual for the foundation of a temple)
   KBo VI 34+ (First Military Oath)
   KUB VII 53+ (ritual of Tunnawi)

Some of these are copies of earlier texts. KUB XXIX 1 is a copy of the Old Hittite text preserved as a small fragment in KUB XXIX 3. KBo VI 34+ is a copy of a middle Hittite text. KUB XVII 10 may go back to an Old Hittite original, and H. Craig Melchert (1977: 75, 78) has suggested that this may also be the case with KBo XV 10 and KUB XXX 10 on the grounds of their archaic language, though it seems possible that this may have been a stylistic feature characteristic of prayers and rituals. In the spellings studied here, as well as in ductus, they belong with each other rather than with group I.

In the tables I have eliminated multiple occurrences of the same word, and have not as a rule listed different inflectional forms of the same word unless they are morphologically diverse or have interesting variant spellings. The same goes for enclitic elements like the pronoun *-ta* '*te, tibi*', but in the case of common morphemes like verbal endings I have recorded their separate occurrences as there are sometimes variations of a potentially interesting kind.

(a) TU and DU

Texts in Old Hittite ductus

KBo VI 2

Words with TU	*Words with* DU
tu-wa-ar[-ni-iz-zi	None
ḫa-at-tu-ši	
tu-ik-kán-za-aš-ši-iš-	
tu-u-ri-iz-zi	
Total 4	

StBoT 17A

Words with TU	*Words with* DU
tu-un-na-ak-ki-iš	None
ša-li-ik-tu-ma-ri	
ḫa-at-tu-ša	
Total 3	

StBoT 17B

Words with TU	*Words with* DU
ḫa-at-tu-ši	[p]a-id-du
tu-pa-la-a-an	kar-aš-du
Total 2	*Total* 2

StBoT 18

Words with TU	*Words with* DU
at-tu-uš	ḫu-u-ma-an-du-uš-
e-eš-tu	
ḫa-at-tu-ša-	
tu-un-na-ki-iš-na-	
^{GIŠ}tu-u-[	
Total 5	*Total* 1

StBoT 25.3

Words with TU	*Words with* DU
par-ta-ú-ni-tu-us	an-du-uḫ-ša-aš
iš-ḫar-wa-an-tu-uš	
pí-e-tu-mi-ni/pí-e-tu-me-ni	
tu-wa-at-tu	
uk-tu-u-ri	
a-ša-an-tu	
tu-uš	
ḫa-at-tu-ši	
ḫa-tu-ka-aš-/ḫa-]tu-ú-ga-[a]n	
a]tu-e-ni	
pít-tu-li-uš-	
pár-tu-u-ni-us	
iš-pa-an-tu-uz-zi-ya	
Total 13	*Total* 1

StBoT 25.4

Words with TU	*Words with* DU
tu-wa-at-tu	an-du-uḫ-ša-aš
ḫa-at-tu-ša-aš	pí-du-me-ni
ḫa-tu-ga-uš	a-du-e-ni
is-ḫa-aš-kán-tu-uš	
pí-e-tu-me-e-ni	
uk-tu-u-ri	
iš-pa-an-tu-uz-zi-ya	
a-ša-an-tu	
tu-uš	
tu-me-e-ni	
pít-tu-li-uš-	
pár-tu-u-ni-uš	
tu-ut-tu-mi-li	
Total 13	*Total* 3

Texts in Middle Hittite ductus

KBo XV 10

Words with TU	*Words with* DU
tu-u-ru-up-pa-aš	du-ut-ḫa-li-y[a
uk-tu-u-ri	wa-ḫ]a-an-du
e-eš-tu	pí-iš-kan-du
pí-tu-u-la-aš	pí-an-du
	kar-ap-du
	ḫa-aš-ši-ik-du
	ma-ya-an-du-uš
	p]í-e-du-me-en
	a-ša-an-du
	du-me-e-ni
	ḫar-du/ḫar-kán-du
	mi-iš-ri-wa-an-du-uš
	tar-na-an-du
	ḫar-ak-du
Total 4	*Total* 14

KUB XXX 10

Words with TU	*Words with* DU
ḫa-tu-	du-ud-du-mar (cf. tu-wa-ad-du?)
kán-tu-zi-li	e-du-un
an-tu-uḫ-ša-aš	da-an-du-ki-iš-na-ša
tu-ug-ga-aš-ta-aš/tu-ik-ka-ma-an	ki-nu-ud-du
tu-el/tu-uk	wa-aš-du-ul
uk-tu-u-ri	ki-e-id-du
pít-tu-li-ya-aš	te-id-du
tu-u-ri-ya	ḫu-uš-nu-ud-du
tu-wa-ad-du	tu-wa-ad-du

	iš-da-ma-as-du
	iš-du-wa-ri
	an-du-uḫ-ša-an
Total 9	*Total* 12

KUB XVII 10

Words with TU	*Words with* DU
e-eš-tu	pár-aš-du-uš
pár-ku-e-eš-tu	du-wa-ar-ni-it
mi-i-e-eš-tu	mi-li-id-du
tu-wa-an-na	iš-ki-id-du
tu-ug-ga-az-še-e-it	ma-li-id-du
wa-aš-tu-ul	mi-li-ti-iš-du
tu-li[ya-aš	du-wa-a-an
tu-u-ma-an-ti-ya-aš	wa-aš-du-ul
	a-ra-an-du
	pa-id-du
	e-ip-du
Total 8	*Total* 11

Texts in Empire ductus

KUB XXIX 1

Words with TU	*Words with* DU
tu-e-el	e-du-wa-a-ni
an-tu-uḫ-ša-aš	ú-li-li-iš-ki-id-du-ma-at
uk-tu-u-ri-ya-aš	iš-du-uš-ta-ya-aš
	šu-u-wa-du-uš
	du-uq-qa-a-ri
	Du-ud-ḫa-li-ya-aš
	-]du-e-ni
	da-an-du
	ú-id-du
	du-uš-ki-eš-kán-zi
	pi-eš-še-ya-an-du
	pa-ak-ku-uš-kán-du
	a-ša-an-du
	du-uš-kán-ta-ri
	ma-ak-ki-eš-ša-an-du
	ši-i-ya-an-du
	e-eš-du
	ar-ši-ya-an-du
Total 3	*Total* 18

KBo VI 34+ : it seems needless to give more than a summary for this text. The only word with TU is *tu-uz-zi-*: DU occurs very frequently, but almost exclusively in the imperative active endings. There are two words with initial DU: *du-ud-du-mi-ya-aḫ-ḫa-*[*a*]*n-du* and *du-wa-ar-na-an-zi*.

KUB VII 53+

Words with TU	*Words with* DU
an-tu-uḫ-ša-aš	ši-pa-an-du-wa-an-zi
tu-uk/tu-e-el	a-a-an-du-uš
tu-e-iq-qa-aš	du-wa-ar-ni-iz-zi
ḫa-tu-ga-tar	e-eš-du
ḫar-tu-u-wa-ḫar-tu-wa-ti	šu-un-ni-id-du
ḫa-at-tu-la-tar	az-zi-ki-du
Total 6	*Total* 6

(b) TA and DA

Texts in Old Hittite ductus

KBo VI 2

Words with TA	*Words with* DA
a-aš-šu-še-it-ta	da-a-i
ú-na-at-ta-al-la-an-pát	da-šu-wa-aḫ-ḫi
ta-ki-i-ya	da-aš-ki-e-ir
ta-an etc.	i-da-lu-uš
ša-a-ak-ta-a-iz-zi	ḫu-u-ma-an-da-an
la-a-az-zi-at-ta	ma-an-da
ta-a-i-iz-zi	ma-a-aḫ-ḫa-an-da
na-at-ta	da-a-i-iz-zi
ta-ma-i-ša-an	e-na-an-da-an
ku-up-ta-ar-ra	an-da
ḫa-ap-pa-ra-a-it-ta-az	ar-nu-an-da-an
ta-ya-az-zi-il	ḫa-me-eš-ḫa-an-da
ki-i-ša-an-ta-ti	
ta-ru-uḫ-zi	
ta-ma-al-ki-ya	
ta-aš-ḫi-ni-ya	
ši-it-ta-ri-it	
ta-a-i-ú-ga-aš	
ap-pa-ta-ri-iz-zi	
ku-uš-ša-aš-še-it-ta	
ta-šu-wa-aḫ-ḫi	
ta-ru-uḫ-za	
ma-a-na-aš-ta	
ta-pi-eš-ni	
iš-ta-[(a-ma-nu-uš)]	
ta-iš-zi-in	
ḫar-ap-ta	
tak-ku-wa-ta-an	
Total 28	*Total* 12

StBoT 17A

Words with TA	*Words with* DA
ḫa-a-aš-ta	ša-kán-da
ta-ma-ar[-	an-da-an
ar-kat-ta	pi-e-da-a[š]
ta-ma-i-in	da-a-ir
ka-ra-a-ta-an	da-aš-ki-e-u-e-n[i
na-at-ta	me-na-aḫ-ḫa-an-da
is-pár-za-aš-ta	a-ra-aḫ-za-an-da
ta-am-na-aš-šu-na	
ḫu-šu-wa-an-ta-an	
kat-ta-an	
e-eš-ta	
ta-ba-ar-na-an	
ú-ik-ta	
ta-me-eš-šir	
ta-a-li-is	
ḫar-ni-ik-ta	
Total 16	*Total* 7

StBoT 17B

Words with TA	*Words with* DA
iš-taḫ-ta	ud-da-na-aš-ša-aš
e-eš-ta	me-na-aḫ-ḫa-an-da
ta-ba-ar-na-aš-ša	ḫu-u-i-iš-wa-an-da-an
ta-ú-i-ni-ya	da-a-li-iš
a-ša-aš-ta	
kat-ta	
ta-it-ti	
me-mi-iš-ta	
ta-pa-az-zi-li	
ki-i-ta[-	
ta-li-it	
in-ta-lu-uz-zi-it	
is-pár-za-aš-´a	
ú-e-ik-ta	
Total 14	*Total* 4

StBoT 18

Words with TA	*Words with* DA
a-ni-it-ta	da-a-aḫ-ḫu-un
ne-pi-ša-za-aš-ta	ku-e-da-ni-ik-ki
e-eš-ta	ut-ni-an-da-an
kat-ta	ḫu-u-ma-an-da
tak-ki-iš-ta	me-e-na-aḫ-ḫa-an-da
at-ta-aš-ma-aš	ud-d[a-a-ar]
ḫa-an-ta-i-ši	pi-e-d[a-aš]

ta-a-an
ta-a-la-aḫ-ḫu-un
ki-iš-ta-an-zi-at-ta-at
ḫal-ma-šu-it-ta-aš
ú-e-it-ta[(-an-da-an-ni-es-si-ma)]
Total 12

StBoT 25.3
Words with TA
pár-ta-ú-ni-tu-uš
ki-it-ta
ta
[(ka-)]a-ša-ta-aš-ma-aš-kán
ka-lu-ú-lu-pi-iš-mi-ta-aš-ta
iš-g[(a-ra)]-an-ta
ḫa-an-ta-še-pu-uš
iš-ḫa-aš-kán-ta
pu-ta-li-ya-[(a)]n-te-eš-šá
ta-ru-e-ni
še-ir-še-me-ta
a-pa-at-ta-[an]
pí-e-ta-i
ša-a-wa-ta-ra-ša
ḫal-ma-šu-it-ta-az
lu-uk-kat-ta-ma
na-at-ta-an
ta-ak-na-a
pát]-ta-ar-ra
kat-ta-an
al-ki-iš-ta-aš-si-iš
ku-wa-a-pí-it-ta
iš-ta-a-ap-ḫe
[(wa-r)]i-ta-an-zi
Total 24

StBoT 25.4
Words with TA
ka-a-ša-ta-aš-ma-aš-kán
ta-at
ka-lu-lu-pí-iz-mi-da-aš-ta
ḫ]a-an-ta-še-pu-uš
pu-ru-uš-ḫa-an-da
Total 8

(B) only)
a-pí-e-da-an-da
ú-da-aḫ-ḫu-un/ú-da-aš (A: ú-taḫ-ḫ[u-un])
da-a-li-iš
ma-al-da-aḫ-ḫu-un (A: ma-a-al-taḫ-ḫu-un)
ú-i-da-an-da-an-ni-eš-ši-ma

Words with DA
an-da-an
ut-ni-ya-an-da-an
da-a-aḫ-ḫu-un
da-a-i
ú-e-eš-ša-[(a)]n-da-ma
ú-da-an-zi
me]-e-na-aḫ-ḫa-an-da
[ma-a-a]ḫ-ḫa-an-da
i-da-a-lu-uš
iš-ga-ra-an-da-an
iš-ḫi-ya-an-da
p]ád-da-ni-i

Total 12

Words with DA
da-a-aḫ-ḫu-un
ka-lu-lu-pí-iz-mi-da-aš-ta
iš-ga-ra-an-da
da-a-i

pu-ta-li-ya-an-te-eš-ša
k[a]-a-ta-pí
na-at-ta-an
ta-ak-na-a
pát-ta-ar-r[a/pá]t-ta-ni-i
ki-it-ta
ki-e-it-ta
ar-ta-ri
ḫa-an-ta-la-as
ta-a-ru
kat-ta-an
lu-ug-ga-at-ta-ma
I-an-ta
ku-i-ta
a-pa-at-ta
iš-tap-pu-ul-li-še-it-ta
wa-ri-ta-an-zi
ku-wa-pi-it-ta
al-ki-iš-ta-aš-ši-iš
Total 23

ú-e-eš-ša-an-da-ma
pí-]e-da-i
ḫu-šu-wa-an-da-an
ú-da-an-zi
me-e-na-aḫ-ḫa-an-da
i-da-a-lu-uš
ḫu-u-ma-an-da
pád-da-a-ni
iš-ḫa-an-da
da-aš-ki-e-mi
iš-ḫi-ya-an-da
Total 15

Texts in Middle Hittite ductus

KBo XV 10

Words with TA
ku-it-ta
iš-ši-iš-ta-ma-aš
zi-ip-la-an-ta-wi[-aš]
pa-ra-a-an-ta
ku-úr-ta-li-ma-aš-ša-an
ni-e-an-ta-an
da-me-ta-ni
kat-ta-an
mi-iš-ri-wa-an-ta-an
wa-al-ḫa-an-ta-an
na-ta-pa
ta-ga-a-an
kar-di-mi-ya-at-ta-aš
ta-ma-i
[me-na-aḫ-ḫ]a-an-ta
qa-a-ša-aš-ma-aš-ta
me-e-mi-iš-ta
ku-wa-a-pi-it-ta
a-ra-an-ta
kat-ta
ga-pár-ta-an
ši-pa-an-ta-aš
Total 22

Words with DA
da-an-zi
ku-úr-da-a-li
ki-e-da-ni
da-a-i-ú-en
ḫa-an-da-a-iz-zi
an-da
pí-da-an-zi
i-da-a-la-u-e-eš
ku-e-da-ni
ḫa-te-iš-da-a-an-te-eš
ma-ya-an-da-tar
da-me-ta-ni
ud-da-a-ar-še-it
a-pí-da-ni
da-a-li-i[r]
pád-da-ni
da-lu-ga-uš
pí-e-da-an
ši-pa-an-da-aš
Total 19

KUB XXX 10

Words with TA	*Words with* DA
ḫa-a-aš-ta	an-da
iš-ḫi-eš-ša-mi-it-ta	a-pí-da-ni
ḫar-ap-ta	ud-da-a-ar-še-it/ud-da-an-ta
ma-ni-ya-aḫ-ta	a-da-an-na
tu-ug-ga-aš-ta-aš	da-an-du-ki-iš-na-ša
iš-ta-an-za-na-aš-ta-aš	i-da-a-lu-un
na-at-ta	aš-ša-nu-wa-an-da-an
ku-it-ta	
ḫa-at-ta-ta	
ḫu-u-ma-an-ta	
li-in-ga-in-na-aš-ta	
ud-da-an-ta	
e-eš-ta	
ar-ta	
nu-ut-ta	
ta-ri-iḫ-ḫu-un	
a-ri-ir-ri-iš-ta	
kat-ta	
iš-ta-ma-aš-du	
ki-nu-na-at-ta	
ta-ma-at-ta	
ma-ak-ki-e-eš-ta	
kar-ta-az	
Total 23	*Total* 7

KUB XVII 10

Words with TA	*Words with* DA
lu-ut-ta-a-uš	an-da
ú-i-šu-u-ri-ya-an-ta-t[i]	pi-e-da-aš
iš-ta-na-na-aš	da-i-ir
ú-li-iš-ta	li-e-li-wa-an-da-an
ha-a-az-ta	i-da-a-lu-ma
na-aš-ta	ud-da-na-a-as
ki-iš-ta-an-ti-it	ḫa-an-da-a-an-za
pí-e-ta-aš	da-an-ku-i
me-mi]-iš-ta	da-a-aḫ-ḫu-un
pár]-ta-u-wa-aš-še-it-wa	an-da-da-an
a-mi-ya-an-ta	
nu-za-ta	
kar-aš-ta	
ki-it-ta	
tak-ša-an-t[a	
pa-ap-par-aš-ša-an-ta	
ú-wa-an-ti-wa-an-ta-az	
ti-it-ḫi-iš-ki-it-ta	

kat-ta
a-uš-ta-ta-an
ḫa-pa-an-ta-li
kar-di-mi-ya-at-ta-aš-ša-an
ú-i-šu-u-ri-ya-ta-ti
ta-lu-ga-y[a
ḫu-e-iz-ta
ut-ta-na-a-an-te-eš
ḫa-at-ta-lu
ar-ta
ḫa-an-da-an-ta-ti
pí-en-ni-iš-ta

Total 30

Total 10

KUB XIV 1

Words with TA

ma-ad-du-wa-at-ta-an
at-ta-ri-iš-ši-ya-as
par-aḫ-ta
ki-it-ta-at
nu-ut-ta
ku-en-ta
da-li-eš-ta
ka-a-aš-ti-ta-ma-an
kat-ta-an
me-mi-iš-ta
ta-ma-a-in
e-eš-ta-ri
pa-it-ta
iš-ta[-ma-aš]-mi
nu-wa-ra-aš-ta
li-ik-ta
me-na-aḫ-ḫa-an-ta
šar-ra-at-ta
ku-pa-an-ta^{D}KAL
u[n-ni]-e-eš-ta
ḫu-u-ma-an-ta
a-pa-a-at-ta
ḫa-an-da-a-it-ta-at
iš-par-za-ašta
ta-a-an
kat-ta-an-ta
]ta-ra
ma-az-za-aš-ta
par-ta-ḫu-ul-la-aš
e-eš-ta

Words with DA

an-da
pi]d-da-is
da-li-eš-ta
ud-da-a-ar
da-iš
ḫu-u-da-a-ak
me-na-aḫ-ḫa-an-da
ku-e-da-ni-ki
ta-me-e-da-ni
i-da-a-lu-un
da-a-aš
ḫa-an-da-a-it-ta-at
pí-e-da-aš-ša-aḫ-ḫi-ir
zi-da-a-an-za-an
da-la-u-wa-aš
a-pí-e-da-ni
píd-da-a-ni-wa-an
da-aš-ki-it
ki-e-da-aš
a-da-a-an-na
da[-ar-]aš-ki-it
pít-te-ya-a]n-da-an
kat-ta-]an-da
ú-da-aš

ḫar-ta
ši-ya-an-ta
e-ip-ta-
EGIR-an-ta
wa-al-aḫ-ta
an-ta-ḫi-it-ta-a-aš-
a-ša[-a-a]n-ta
mu-ú-ta-mu-ú-ta-aš-ša
a-ta-ri-im-ma
šú-ru-ú-ta
ši-e-ta-ni
pí-i-ta-aš-ša
ta-pa-ri-ya-al-l[i-e-eš
ka-ra-a-ta
za-aḫ-ḫi-ya-at-ta-ri
par-ra-an-ta
[píd-da-]i-iš-ki-it-ta-ri
ši-pa-an-ta-an-za
wa-a-tar-na-aḫ-ta
Total 49

Total 24

Texts in Empire ductus

KUB XXIX 1

Words with TA

na-]aḫ-ša-ra-at-ta-an
ki-iš-ta
nu-ut-ta
É-ir-mi-it-ta
ú-it-ta-an-na
ta-aš-nu-uš-ki-ir
kat-ta-an
ar-ki-iš-ki-it-ta
ú-e-ši-it-ta-at/ú-eš-ši-ya-at-ta
ma-ni-aḫ-ta
ḫur-ta-as
e-ḫu-ta
iš-du-uš-ta-ya-aš
ḫar-na-pi-iš-ta-aš-
kat-ta-wa-a-tar
pí-en-ta-ya-aš
mi-ḫu-un-ta-tar-
ma-ya-ta-tar
me-ir-ta
ta-ru-up
ša-ap-ta-mi-en-zu

Words with DA

ú-e-da-a-ši
ad-da-aš-ma-an
i-da-a-lu
ú-da-aš
an-da
a-pí-e-da-aš
da-a-i
da-a-at-ten
pí-e-da
da-a-an
ma-ya-an-da-aḫ-ḫi-ir
ku-e-da-ni
ši-pa-an-da-an-zi
ud-da-a-ar
ḫa-li-iḫ-li-ya-an-da-a-ri
na-aḫ-ša-ra-ad-da-an
ḫa-an-da-it-ta-ri

pal-ku-i-ya-an-ta
ši-pa-an-ta-an-zi
e-ša-an-ta-ri
ku-un-ki-iš-kán-ta-ri
ki-it-ta-ri
du-uš-kán-ta-ri
ḫa-an-da-it-ta-ri
ar-ta-ri
ḫur-pa-aš-ta-nu-uš
Total 30

Total 17

KBo VI 34+

Words with TA
e-ik-ta-an
[e-eš]-ta
na-aš-ta
pu-ut-ki-e-it-ta
kat-ta-an
šal-li-ya-it-ta/šal-li-it-ta-ru
mar-ri-it-ta/mar-ri-e-it-ta
ḫu-ur-ša-ak-ni-e-it-ta
pár-ši-it-ta-ri/-ru
ḫa-aš-ta-i
ḫar-ra-uš-ki-it-ta
[li-in-k]at-ta
šu-ut-ta-ti/šu-ut-ta-ru
da]n-na-at-ta
[tar]-na-at-ta-ri
ša-an-na-pi-li-eš-ta
i-ya-ta-ru
ki-iš-ta-ti/ki-iš-ta-ru
ḫur-ta-an-du
lu-lu-wa-it-ta
Total 20

Words with DA
da-a-i/da-an-zi
da-šu-wa-aḫ-ḫi-ir
da-a-i-e-ir
par-ši-ya-ad-da-ru
pí-e-da-u
da-ra-an-zi
an-da
ša-ra-ad-da
ḫu-ur-ša-ak-ni-ya-ad-da-ru
a-pi-e-da-ni-
ki-e-da-ni
ú-da-an-zi
ú-i-da-an
šar-ḫu-wa-an-da-an
pí-e-ḫu-da-an-zi
Total 15

KUB VII 53+

Words with TA
ta-ma-a-iš
i-ya-an-ta
ḫa-aš-ta-i
kat-ta
u-ša-an-ta-ri-iš
lu-uk-kat-ta
pár-ta-a-iz-zi
šal-la-an-ta-ru
a-ni-ya-an-ta
pa-ap-ra-aḫ-ta

Words with DA
an-da
ku-e-da-ni-ik-ki
šar-ḫu-u-wa-an-da-
ud-da-na-an-za
da-an-na-ri-iš
e-ḫu-ra-da-a-iz-zi
ḫa-an-da-iz-zi
e-da-ni
i-da-lu
da-aš-ki-iz-zi

a-aš-ta-ya-ra-tar	pí-e-da-i
ag-ga-an-ta-aš-	-ḫar-na-an-da-as
ḫu-i-pa-ya-ta-an	pád-da-ni-i
ki-nu-na-at-ta	a-ri-ad-da-li-iš
e-eš-ta	da-an-ku-ni-eš-kir
ar-ta	ag-ga-an-da-aš
ze-e-an-ta	ḫa-aḫ-la-u-wa-an-da
	da-an-ku-wa
	1-e-da-ni
	še-e-da-an (error for še-e-na-an)
	ḫu-u-ma-an-da
	ú-da-an-zi
	ki-e-da-ni-
	ma-ni-in-ku-wa-an-da-an
	u-ša-an-da-ri-iš
	da-a-i
	da-an-zi
Total 17	*Total* 27

(c) KA and GA

Texts in Old Hittite Ductus

KBo VI 2

Words with KA	*Words with* GA
ka-ru-ú	ga-ni-eš-zi
ku-e-el-ka	ta-a-i-ú-ga-aš
ka-a-aš	
ka-ru-ḫa-li-eš-me-eš-ša	
ka-ra-a-pí	
Total 5	*Total* 2

StBoT 17 A

Words with KA	*Words with* GA
ka-ni-iš	ga-ni-eš-zi
ka-a-ni-wa	ḫé-en-ga-ni
ka-ra-a-ta-an	
Total 3	*Total* 2

StBot 17 B

Words with KA	*Words with* GA
$^{HUR.SAG}$Ka-pa-	ú-ga
	ḫi-in-ga-ni
Total 1	*Total* 2

StBoT 18

Words with KA	*Words with* GA
ka-ru-ú	[pa]-an-ga-ri-it
Total 1	*Total* 1

StBoT 25.4

Words with KA	*Words with* GA
ka-a-ša	iš-ga-ra-an-da
ka-lu-lu-pi-	ḫa-tu-ga-uš
ka-ru-ú	ga-ra-ú-ni-š[i]
ma-a-ar-ka-aḫ-ḫi	ga-a-an-ga-aḫ-ḫé
	ú-ga
	lu-ug-ga-at-ta-ma
	ga-a-pí-na-an
Total 4	*Total* 7

Additional words from StBoT 25.3

With KA	*With* GA
ḫa-tu-ka-aš-me-it	ša-ga-i-[i]š
	pa-iš-ga-ḫa-at
	ḫa]tu-ú-ga-[a]n
Total 1	*Total* 3

Texts in Middle Hittite Ductus

KBo XV 10

(This text does not use KA at all, but substitutes QA for it)

Words with QA	*Words with* GA
qa-lu-lu-pu-uš	ga-la-an-kán-te-eš
qa-a-ša	ga-ga-a-aš
iš-qa-a-ri	ta-ga-a-an
	ga-an-ki-ir
	da-lu-ga-uš
	ga-pár-ta-an
Total 3	*Total* 6

KUB XXX 10

Words with KA	*Words with* GA
tu-ik-ka-ma-an	zi-ga
ku-uš-ša-an-ka	tu-ug-ga-aš-ta-aš
ka-a-ša-	li-in-ga-in-
ú-uk-ka	ḫi-in-ga-ni
	ga-ni-eš-mi
	ḫa-lu-ga-aš-ti
	ú-ga-
Total 4	*Total* 7

KUB XVII 10

Words with KA	*Words with* GA
ka-a-aš	pár-ga-mu-us
ka-ri-i-e-it	ga-la-ak-tar, ga-la-an-kan-za
a-aš-ka	tu-ug-ga-az-še-e-it
ka-ra-a-az	ta-lu-ga-as

zi-ik-ka	su-[uk-šu]-ga-an
Total 5	*Total* 5
KUB XIV 1	
Words with KA	*Words with* GA
ka-a-aš-ti	tu-ug-ga
ka-ri-e-pí-ir	li-in-ga-nu-ut
ka-a-ša	ú-ga-wa-za
ka-ra-a-ta	zi-ig-ga-wa-ra-an
ka-ru-ú	ar-ga-mu-uš-ša
ka-ra-ki-ša	pí-ig-ga-ya-ya
Total 6	*Total* 6
Texts in Empire ductus	
KUB XXIX 1	
Words with KA	*Words with* GA
ka-ru-ú-e-li-e-eš	ga-a-i-na-aš-mi-is
ka-a-aš	ú-ga
	ḫu-lu-ga-an-ni-in
	ḫar-tag-ga-as-
	[i]š-tar-ni-in-ga-is
	ḫa-aš-ši-ga-ya
	ḫar-ga-aš
Total 2	*Total* 7
KBo VI 34+	
Words with KA	*Words with* GA
ka-a-as	li-in-ga-us
ka-ri-pa-an-du	ag-ga-li-it
Total 2	*Total* 2
KUB VII 53	
Words with KA	*Words with* GA
ka-ri-ul-li	mu-ga-a-i
ka-a-aš	ag-ga-an-da-aš
zi-ik-ka-an	ḫa-tu-ga-tar
ka-ši-i	iš-ga-a-ri
ka-ru-ú	pa-an-ga-u-wa-aš
Total 5	*Total* 5

NOTES

1. For general accounts of the development of the local and chronological varieties of cuneiform see the introductions to Labat, 1976 and Von Soden and Röllig, 1976; for the old Akkadian system and the reasons for its initial lack of a distinction between signs for voiced and voiceless stops, see Gelb, 1961. For the absolute chronology of the Old Babylonian period a recent re-examination of the astronomi-

cal evidence by Huber (1982) suggests that the 'high' chronology (giving dates for Hammurabi of Babylon as 1848–1806) is the most likely to be correct; if so, the chronology of the Hittite Old Kingdom will have to be adjusted upwards accordingly.

2. Recent surveys of the Hurrian material can be found in Bush, 1964 and Laroche, 1980, with references to the earlier literature. Evidence for the Hurrian presence at Alalaḫ is discussed by Dafflkorn (1959).

3. The account of the Hurrian phonemic system given here depends on that of Bush (1964), which seems to me to make the most sense in linguistic terms. The fact that the Ugaritic alphabet used for writing Hurrian uses signs for voiced and voiceless stops, like its Semitic source, rather than the opposition of single and double consonants found in the cuneiform Hurrian sources, does not convince me that voice rather than consonantal length was the pertinent feature, because it fails to explain why the cuneiform systems adopted a single/double opposition in the first place. This is not to deny that single intervocalic consonants were phonetically voiced, and heard as such by speakers of languages which possessed a voiced/voiceless opposition. It is significant that even in the alphabetic orthography voiced stops do not occur initially.

4. Purves (1940) has some most useful comparisons of the practices of different ethnic groups of scribes from Nuzi in this and other respects.

5. An affricate value for *z* is assumed because it results from **t* before *i* as in the verbal endings of the third persons singular and plural active present in *-zi, -nzi* from **ti, *nti*; from **ts* in *nekuz* 'night' from **neqʷt-s*; from dental stop before dental stop in *ḫa-a-az-ta* 'dried' and *ḫu-e-iz-ta* 'drew'. *z* can also result from **s* after *n*, as in *anzas* 'us' (IE **ns-*), and *s* after *r* as in *ḫa-aš-te-ir-za* 'star' (cf. J. Friedrich, 'Zu den hethitischen Wörtern für "Stern" und "Hand"', *Athenaeum* NS 47 (1969), 116–118). In Luwian *z* can result from *s* after *n* or *l*: Laroche (1959:133) remains neutral about whether this indicates that *s* had become voiced or that an epenthetic *-t-* had developed before it. There are some puzzling cases of *s/z* alternation in initial position in Hittite: *šakkar/zakkar* 'dung' and *zamankur* 'beard' *šamankurwant-* 'bearded'. It is difficult to imagine a common explanation for developments of **sk-* and **sm-*; reinforcement of **s* to *ts* seems possible in the first case, but voicing more likely in the second; if *z* does represent the affricate here as well, it might perhaps be explained as reinforcement resulting from a resistance to voicing before *m*. A voiced value for *z* remains doubtful, especially as the regular way of expressing such a value in Hittite was more probably *-s-* as opposed to *-ss-*. On this see further Benveniste, 1962:8–9.

6. For Proto-Semitic sibilants cf. Moscati, 1980. For Old Babylonian cf. Goetze, 1958, and for Akkadian Aro, 1959.

7. Laroche, 1980:15. For discussion of the dates of the earliest Hurrian inscriptions see also Bush, 1964:29–30.

8. The existence of phonemes *s* and *z* in Hurrian is regarded as uncertain by Laroche (1980:24), and they do not figure in his table of correspondences between the different Hurrian orthographies. Bush (1964) is also cautious; he provisionally takes the *s*-signs to represent a sibilant and the *z*-signs an affricate, but does not rule out the possibility that the values may have been the reverse of this.

In view of the absence of voiced initial stops and other sibilants in Hurrian it may also be significant that in the cuneiform systems *z*-signs often occur initially (words beginning with *z-* occupy pages 300–310 in Laroche's *Glossaire*). Intervocalically both *-z-* and *-zz-* are found. Their distribution thus parallels that of the *š*-signs, and it is tempting to suppose that what lies behind these spellings is a pair of phonemes

with an opposition in intervocalic position between long (and voiceless) *-ss-*, written *-zz-* and short (and voiced) *-s-*, written *-z-*. The signs of the *z*-series in these syllabaries would then continue to have two of their original values, *s* and *z*. Such a system was still in use at Nuzi, where Hurrian names spelled with *Z-* corresponded with similar names spelled with *S-* at Nippur, where the more modern practice of using signs of the *s*-series with *s*-values had come into use (cf. Speiser, 1941:30; Bush, 1964:59).

Laroche (1980:315–16) gives a list of lexical equivalences between Hurrian and Akkadian words. Some of these are loan-words from Akkadian. These present some interesting correspondences:

(a) Hurrian initial *z-* and Akkadian *s-*:
zugulluhi: *sugullu* (Nuzi)
zilumpa: *suluppu* (Ras Shamra)

(b) Hurrian initial *azz-* and Akkadian *z-*:
azzamira: *zamaru* (Ras Shamra).

This curious example may be the result of Hurrian difficulty with initial voiced *z-* of Akkadian, but it also seems to reflect a compromise between the two possible solutions to the problems of dealing with this outlandish sound, devoicing the consonant or adding a prothetic vowel.

(c) Hurrian medial *-zz-*, Akkadian *-s-*:
ḫazziz(z)i: *ḫasīsu* (various sites)
Izzummi: *Usumu* (Boghazköi)

(d) Hurrian *-rz-*, Akkadian *-rs-*:
parziki: *parsigu* (Boghazköi)

(e) Akkadian *-z-* and Hurrian *-z-*:
maḫazi: *maḫḫazu* (Ras Shamra)

To these may be added:

Na-ra-am-zu-un = Akkadian Naram-Sin (Boghazköi: cf. Speiser, 1941:30) $^{\text{URJU}}$*Zi-ip-pi-ir-ri* = Sippar (Boghazköi) Laroche, 1980:305.

In the pair *ambašši*: *ambassu* there is an abnormal correspondence of Hurrian *-šš-* and Akkadian *-ss-*, but in this case the borrowing language was Akkadian (cf. *CAD* s.v. *ambassu*), and *-šš-* was no doubt the nearest equivalent from an Akkadian point of view to Hurrian *-θθ-* (written with *-šš-* in Hurrian).

Akkadian emphatic *ṣ* may also be rendered by Hurrian *z*, as in the following pairs: *ezaduḫlu*: *eṣedu* (Nuzi); *ḫalzi*: *ḫalṣu* (Boghazköi, with derivatives elsewhere); *zalmi*: *ṣalmu* (various sites). Akkadian *š* is regularly represented by Hurrian *š* in Akkadian loanwords into Hurrian.

These correspondences seem to indicate that signs of the *z*-series in many Hurrian sources could still have three values corresponding to those of Akkadian *s*, *z* and emphatic *ṣ*, though it is impossible to know how this last sound was identified by the Hurrians, or whether it was similar to any sound in their own language. The attribution of *s*-values to the *s*-signs in the Mittanni letter is still very doubtful on account of the lack of correspondences with other systems, but the use of these signs in Tušratta's Akkadian is grounds for caution.

9. The value *ge* for the sign was established by Riemschneider (1973), who showed that when a vowel sign was written after it this was always *e* rather than *i*; it also occurred in a number of words with etymological **ge*.

On these grounds Eichner (1973:78; cf. Oettinger, 1979:552) inferred that initial *g* before *i* had been devoiced in Hittite, so that only the value *ge* was left for the sign to represent. But it is unlikely that the specialization can be the result of a purely Hittite sound-change, since it is also found in the Mittanni Letter, and in the

documents written by Hurrian scribes at Nuzi (cf. Berkooz, 1937:10–11 and Purves, 1941:171). The Hurrian texts from Boghazköi use both *ki-e-* and *gi-e-* spellings for initial /*ke*/ (Laroche, 1980:140 ff.) but as in Hittite there do not seem to be examples of *gi-i-*. This suggests that here too the sign has only *e*-vocalism, but that the sign KI was still capable of being used with both *i* and *e*-values. The same seems to have been the case in Hittite, where spellings with *ki-e-* are common enough. The spelling with KI is regular in *ki-eš-šar* 'hand'; according to the devoicing theory this has to be explained as due to the influence of the dative-locative, where a change of **ghe* > **ghi* > *ki* is assumed to have taken place under the influence of the *-i* of the termination. On the other hand, the rare spellings with GI in *gi-ir* 'heart' mentioned by Oettinger (1979:552) may result from a desire to specify the quality of the vowel.

10. For the absence of DI in initial position cf. Eichner, 1980:149. For its comparative rarity in internal position cf. Götze, *AM* 273.

11. Götze, *AM* 267–274.

12. Cf. Otten-Souček, StBoT 8 (1969), 100 with note 2. This ending favours the analysis of *šu-u-uš* as a *u*-stem adjective.

13. For a thorough discussion of this word cf. Neu, StBoT 8 (1974), 116 ff. Plene-writing of the *-i* in some spellings suggests that the long diphthong of the nominative singular **dyēus* had not been monophthongized but that its first element *e* had become *i*. The *ú* would then represent only the second element of the diphthong.

14. Sommer (1949) discusses the various meanings of the word in Vedic, and also the question of the form of the root. On the basis of the equation with Hittite *tu-u-ri-iz-zi* he rejects the possibility that the *ū*/*ŭ* alternation goes back to *r̥* (which seems unlikely in any case as the previous consonant is not a labial). It is therefore possible that the strong cases of the noun once contained a diphthong **eu* or **ou* as against the *u* of weak cases like locative singular *dhuri*, and that the introduction of *ū* into the nominative singular is a secondary development.

15. For these endings in local adverbs cf. Starke, StBoT 23 (1977), 132. It is possible that the adverb *du-wa-a-an . . . du-wa-a-an* 'this way and that, on this side and that' is related to *tu-u-wa* etc. and represents the case ending in *-n*, like *appan, peran, kattan, andan*, but the different position of the plene-vowel, which is written, when it occurs in this form, in the final syllable, deserves notice. A morphological connection between this adverb and Greek δήν < **dwān* seems a distinct possibility. Latin forms like *dūdum* are ambiguous: the long *-ū-* could go back either to **ū* or to **eu/ou*.

16. The evidence of the three languages of the Luwian branch of Anatolian for verbal endings has recently been studied by Anna Morpurgo Davies, who has kindly allowed me to read a draft of her forthcoming paper on the subject. The evidence of these verbal endings does provide support for the existence of consonantal lenition, but it seems unlikely that Hittite verbal endings will shed any further light on the question, as they appear to have undergone drastic levelling.

17. I have been fortunate enough to have been allowed to use a VAX 11/780 computer at the Oxford University Computing Service to carry out some of the research required for this paper, and I should like especially to thank Susan Hockey of the O.U.C.S. for her interest and encouragement as well as instruction in the necessary programming techniques.

References

ADLER, H.-P., *Das Akkadische des Königs Tušratta von Mitanni*, Neukirchen-Vluyn 1976.

ARO, J., 'Die semitischen Zischlaute (t), š, ś und s und ihre Vertretung im Akkadischen', *Orientalia* 28 (1959), 321–335.

BENVENISTE, E., 'Sur le consonantisme hittite', *BSL* 33 (1932), 136–142.

BENVENISTE, E., *Hittite et indoeuropéen*, Paris 1962.

BERKOOZ, M., *The Nuzi Dialect of Akkadian, Orthography and Phonology, Language* Dissertation 23 (1937).

BURROW, T., *The Sanskrit Language*, Third edition, London 1973.

BUSH, F. W., *A Grammar of the Hurrian Language*, Brandeis University Ph.D. dissertation, 1964. University Microfilms Inc., Ann Arbor, Michigan No. 64–12, 852.

CAD = *The Assyrian Dictionary of the University of Chicago*, Chicago 1956–.

DRAFFKORN, ANNE E., *Hurrians and Hurrian at Alalaḫ: An Ethno-Linguistic Analysis*, University of Pennsylvania Ph.D. dissertation, 1959.

EICHNER, H., 'Die Etymologie von heth. *mehur*', *MSS* 31 (1973), 53–107.

EICHNER, H., 'Phonetik und Lautgesetze des Hethitischen – Ein Weg zur ihrer Entschlüsselung', in *Lautgeschichte und Etymologie*, Akten der VI Fachtagung der Indogermanischen Gesellschaft, Wien 24–29 Sept. 1978; hrsg. von M. Mayrhofer, M. Peters, O. E. Pfeiffer, Wiesbaden 1980, 120–165.

FRIEDRICH, J., *Hethitisches Elementarbuch* I (2), Heidelberg 1960.

FRIEDRICH–KAMMENHUBER *HW*^{2} = Johannes Friedrich – Annelies Kammenhuber, *Hethitisches Wörterbuch*, Zweite, völlig neuarbeitete Auflage auf der Grundlage der edierten hethitischen Texte, Heidelberg 1975–.

GAMKRELIDZE, TH. V., 'The Akkado-Hittite syllabary and the problem of the Origin of the Hittite Script', *Arch. Or.* 29 (1961), 406–418.

GELB, I. J., *Old Akkadian Writing and Grammar*, Second edition = M.A.D.2, Chicago 1961.

GIACUMAKIS, G., *The Akkadian of Alalaḫ*, Janua Linguarum Series Practica 59, The Hague – Paris 1970.

GÖTZE, *AM* = A. Götze (later Goetze), *Die Annalen des Muršiliš*, (*MVAeG* 38), Leipzig 1933.

GOETZE, A., 'The Sibilants of Old Babylonian', *RA* 52 (1958), 137–149.

HART, G. R., 'Some observations on plene-writing in Hittite', *BSOAS* 43 (1980), 1–17.

HEINHOLD-KRAMER, S., HOFFMANN, I., KAMMENHUBER, A., MAUER, G., *Probleme der Textdatierung in der Hethitologie*, Heidelberg 1979.

HROZNÝ, F., *Die Sprache der Hethiter: ihr Bau und ihre Zugehörigkeit zum indogermanischen Sprachen, Boghazköi-Studien* I, Leipzig 1917.

HUBER, P., with the collaboration of A. Sachs, R. M. Whiting, E. Leichty, C. B. F. Walker, G. Van Driel, *Astronomical Dating of Babylon I and Ur III*, Occasional Papers on the Near East, editor Giorgio Buccellati, I 4, Malibu (California) 1982.

KBo = *Keilschrifttexte aus Boghazköi*, Leipzig 1916–1923; Berlin 1954 ff.

KRONASSER, H., *Etymologie der hethitischen Sprache*, Wiesbaden 1966.

KUB = *Keilschrifturkunden aus Boghazköi*, Berlin 1921 ff.

LABAT, R., *L'Akkadien de Boghaz-köi*, Bordeaux 1932.

LABAT, R., *Manuel d'épigraphie akkadienne. (Signes, syllabaire, idéogrammes)*, Nouvelle édition, revue et corrigée par Florence Malbran-Labat, 5^e éd., Paris 1976.

LAROCHE, E., *Dictionnaire de la langue louvite*, Paris 1959.

LAROCHE, E., 'Anaphore et deixis en anatolien', in *Hethitisch und Indogermanisch*, herausgegeben von Erich Neu und Wolfgang Meid, Innsbruck 1979, 147–152.

LAROCHE, E., *Glossaire de la langue hourrite*, Paris 1980.

LAROCHE, E., 'Problèmes de l'écriture cunéiforme hittite', *Annali della Scuola Normale Superiore di Pisa, Classe di Lettere e Filosofia*, VIII 3, Pisa 1978, 739–753.

MARSTRANDER, C. J. S., *Caractère indo-européen de la langue hittite*, Christiania 1919.

MAYRHOFER, M., *Kurzgefasstes etymologisches Wörterbuch des Altindischen/A Concise Etymological Sanskrit Dictionary*, Heidelberg 1956–1976.

MELCHERT, H. C., *Ablative and Instrumental in Hittite*, Harvard Ph.D. dissertation, Cambridge, Massachusetts, 1977.

MERIGGI, P., *Schizzo grammaticale dell'Anatolico*, Roma 1980.

MORPURGO DAVIES, A., 'Dentals, Rhotacism and Verbal endings in the Luwian Languages', forthcoming in Proceedings of the First East Coast Conference, Yale University, 1982.

MOSCATI, S., SPITALER, A., ULLENDORF, E., VON SODEN, W., *An Introduction to the Comparative Grammar of the Semitic Languages: Phonology and Morphology*, Wiesbaden 1980.

NEU, E., *Der Anitta-Text*, StBoT 18, Wiesbaden 1974.

OETTINGER, N., *Die Militärischen Eide der Hethiter*, StBoT 22, Wiesbaden 1976.

OETTINGER, N., *Die Stammbildung des hethitischen Verbums*, Wiesbaden 1979.

OTTEN, H. and SOUČEK, V., *Ein althethitisches Ritual für das Königspaar*, StBoT 8, Wiesbaden 1969.

OTTEN, H., *Ein althethitische Erzählung um die Stadt Zalpa*, StBoT 17, Wiesbaden 1973.

PORKORNY *IEW* = J. Pokorny, *Indogermanisches etymologisches Wörterbuch*, Bern – München 1959–69.

PURVES, P., 'The Early Scribes of Nuzi', *AJSL* 57 (1940), 162–187.

PURVES, P., 'Hurrian Consonantal Pattern', *AJSL* 58 (1941), 378–404.

RIEMSCHNEIDER, K., 'Zur Entscheidung der Vokale *e* und *i* in der hethitischen Orthographie', in *Festschrift Heinrich Otten*, ed. E. Neu & C. Ruster, Wiesbaden 1973, 273–281.

ROSENKRANZ, B., *Vergleichende Untersuchungen der altanatolischen Sprachen, Trends in Linguistics, State-of-the-Art Reports* 8, The Hague 1978.

SOMMER, F., 'Altindische *dhur-*', *Die Sprache* 1 (1949) 150–163.

SPEISER, E. A., 'Phonetic method in Hurrian orthography', *Language* 16 (1940), 319–340.

SPEISER, E. A., *Introduction to Hurrian, The Annual of the American Schools of Oriental Research* 20, New Haven, 1941.

STURTEVANT, E. H., 'The development of the stops in Hittite', *JAOS* 52 (1932) 1–12.

STURTEVANT, E. H., 'Did Hittite have phonemes *e* and *o*?', *Language* 18 (1942) 181–192.

STURTEVANT, E. H. and HAHN, E. A., *A Comparative Grammar of the Hittite Language*, revised edition, Vol. I. New Haven 1951.

StBoT = *Studien zu den Boğazköi-Texten*, Wiesbaden.

TISCHLER, J., *Hethitisches etymologisches Glossar*, Mit Beiträgen von Gunter Neumann, Innsbruck 1977–.

THUREAU-DANGIN, F., *Le syllabaire accadien*, Paris 1926.

VON SODEN, W., *Grundriss der Akkadischen Grammatik*, Roma 1952.

VON SODEN, W., and RÖLLIG, W., *Das Akkadische Syllabar*, 3. Auflage, Roma 1976.

WEIDNER, E. F., *Studien zur hethitischen Sprachwissenschaft* I, Leipzig 1917.