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Vocalisation in Group Writing: A New Proposal

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A New Proposal

by

Marwan Kilani

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Foreword

It is easier to understand the interpretative model presented in this book if one knows how the whole system looks like and works since the beginning.

In this foreword, therefore, I provide a brief but exhaustive description of the functioning of group writing according to my new proposal. The reader who is simply interested in knowing how to interpret group writing words can just read this foreword, and ignore the rest of this study.

As for those who want to understand why my system looks like this, what its theoretical bases are, how the evidence supports it, and how it can be used to confirm the current reconstructions of the Egyptian vocalisation, they will find all this information discussed in detail in the following chapters.

I divide this forward into 10 points, each illustrating a specific feature of my system.

1 • In general, words written in group writing are transcribed according to their contemporary vocalisation. This means that the specific phase of the language must be taken into account when extrapolating the vocalisation, and it also means that a same word can be spelled differently in different periods, if some relevant phonological change took place between such periods.

2 • The group writing orthography indicates only **two** vowels, or better two *vocalic classes*, namely a *back vowel class*, transcribed in the present book as *U*, and a *non-back vowel class*, transcribed here as *A*.

3 • The stressed vowels /u/, /u:/, /o/, /o:/ were treated as belonging to the *back vowel class*, and are transcribed as *U*. The stressed vowels /a/, /a:/, /i/, /i:/, /e/, /e:/ were treated as belonging to the *non-back vowel class*, and are transcribed as *A*.

Words like **y ˈom* (“sea” - vocalisation of the 22nd Dynasty) and **ḫ ˈu:r(v)* (“street”, vocalisation of the 19th Dynasty) were thus perceived (and are transcribed here) as *yUm* and *ḫUr(v)*. By contrast, words like **y ˈam* (“sea” - vocalisation of the 19th Dynasty) and **h ˈey* (“husband” - vocalisation of the 22nd Dynasty) were perceived (and are transcribed here) as *yAm* and *hAy*.

The unstressed vowels are often difficult to reconstruct, and therefore difficult to analyse. For this reason this book will focus exclusively on stressed vowels. As a preliminary observation, however, it is worth mentioning that the available evidence suggests that in earlier texts the Egyptians did perceive a distinction between *non-back* and *back* vowels also in unstressed syllables. Moreover, it seems that the unstressed vowel /ə/ was perceived as belonging to the *non-back* class. Both these observations, however, would need further study to be confirmed.

4.a • Vowels belonging to the *back* vowel class are always indicated by the presence of a *w*, which is usually written either with the sign  = *w* or with a biliteral sign/group whose second consonant is *w*, such as . When the *back* vowel is associated with the consonant /t/,

the spelling  is also possible (see Kilani 2017a, 200–1). When the *back* vowel is associated with a consonant /k/, the group  could also be used (see below Point 10 and §4.5.1).

4.b • In group writing, vowels belonging to the *non-back* vowel class are indicated by the presence of a *ꜣ*, which is usually written either with the sign  = *ꜣ* or with a biliteral sign/group whose second consonant is *ꜣ*, such as  . In addition, the absence of any marker (either *ꜣ* or *w*) and the use of single consonantal signs can also indicate a consonant associated with a *non-back* vowel. So for instance, the sequences ***sa*** or ***si*** would both be interpreted as *sA* and in principle could be written as , or .

When the *non-back* vowel is associated with the consonant /t/, the group is usually used.

4.c • The marker *ꜣ* is also used in cases characterised by the *absence* of any vowel.[1] In these cases, I transcribe the *ꜣ* as *0* (= zero), rather than as *A*.

5 • In contrast with what usually assumed in previous scholarship, the sign does not indicate any vowel. Rather, it is a sort of diacritic sign used to modify the pronunciation of the consonant or group to which it is associated. In order to highlight this function as diacritic I transliterate it as *ʸ*. The nature of such modifications seems to depend on the sign or group to which is associated (see below §4.2). For instance, when associated with = *ḥ* in the form = *ḥʸ*, it indicates a pronunciation $ḥ_2$ > Sahidic ϫ (exclusively), in opposition to the standard pronunciation $ḥ_1$ > Sahidic ϩ and ϫ. When associated with in the form = *tʸ*, instead, it indicates the actual presence of the phoneme /t/, i.e. it indicates that the sign has a full consonantal value and it is not just an unpronounced orthographic element. When associated with the group in the form = *ʸr0*, it indicates a pre-consonantal /r/, i.e. it indicates that no vowel follows the /r/, as already noticed by previous scholars. A few other cases, however, are still unclear, and would need further specific investigation (see below).

6 • Groups marked with *c*+*w* (where *c* = any consonant), namely groups characterised by a consonant + a *back* vowel, can be read both as *cU* and as *Uc*. A group like can thus correspond to both *rU* and *Ur*.

Therefore, for instance, the word , “lotus”, can be analysed as *sA.ʸr0.pU.t(A)* = *sArpUt(A)*, with = *pU*, corresponding to the contemporary (post-20th dyn.) pronunciation ***svrpˈot*** > Coptic ϲⲁⲣⲡⲟⲧ.

By contrast, the word , “chariot”, can be analysed as *mA.ʸr0.k0.Ub.t(A)* = *mArkUbt(A)*, with = *Ub*, corresponding to the contemporary (post-20th dyn.) pronunciation ***mvrkˈobt(v)*** > Coptic ⲙⲣⲃⲟⲟⲩⲧ (with ⲟⲩ = /w/ < /b/).

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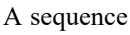
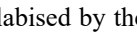
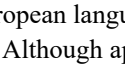
1 This, in fact, suggests that the *non-back vowel class* indicated by the marker *ꜣ* would perhaps be better understood as an *absence-of-back-vowel class*, which thus corresponds to all *non-back* vowels and to *absence* of any vowel – as in principle, the absence of a vowel is neither a *back* nor a *non-back* vowel. This distinction, however, is conceptual rather than practical, and therefore will not be discussed further in this study. It may be, however, an interesting topic for further research, as it provides a clue about how the Ancient Egyptians perceived their own vocalic system, and their language as a whole.

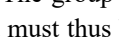
This is clearly the most innovative aspect of my proposal. The idea that a same syllabic group may encode both a sequence *cU* and *Uc* may at first appear surprising and even counterintuitive, but as I explain in detail here below, similar pronunciation pairs for the same sign(s) are sporadically attested in other writing systems and in Egyptian itself. The Egyptian evidence provides also clues about the possible origins of such phenomenon.

7 • A sequence with a *back* vowel located between two identical consonants is usually transcribed with the reduplication of the same group, which has then to be read as *cU.Uc*. For instance, the word  , "oven", can be analysed as *tA.rU.Ur = tArUr*, with = *rU.Ur = rUr*. Such a spelling corresponds to a contemporary pronunciation **tvrˈu:r(v)*, deriving from Sem. **tv(n)nu:r(v)*[2] and developing into Coptic ⲧⲣⲓⲣ (with regular /u:/ > /i:/ = ⲓ in proximity of /r/).

8 • As already observed by previous scholars, the groups  and  transcribe exclusively word-final or pre-consonantal /n/ and /r/, i.e. /n/ and /r/ not followed by any vowel. In addition, the group can be combined with a following /r/ to transcribe /l/. However, as I discuss below (§4.3) and in contrast with what assumed by previous scholars, I believe that such groups should not be understood as codas of the previous syllable. Rather, from the point of view of the graphic (not linguistic) syllabification, it looks like the Egyptians perceived them as connected with the following group, clustered with its initial consonant. Therefore, for instance, the above-mentioned word  was likely perceived and syllabised by the Egyptians as *sA-rpU-tA*, rather than as *sAr-pU-tA*, as most speakers of European languages would tend to do.

Although apparently trivial, this distinction becomes crucial in light of point 6 above: since groups characterised by a *back* vowel can be read both as *cU* and as *Uc* (where again *c* = any consonant), and since these preconsontal *n* and *r* clustered with the initial consonant of the following group, then it can be inferred that groups characterised by a *back* vowel and preceded by or could be read as *ncU* / *rcU* or as *Unc* / *Urc* , but not as **nUc* / **rUc*, as one would expect if and were perceived as codas of the previous syllable.

Therefore, a word like  , "spear", can be analysed as *m0 + ʸr.ḥ-U = m0.Urḥ = mUrḥ*, with  = *Urḥ*, which perfectly corresponds to the contemporary pronunciation **murḥ(v)*, deriving from Sem. **rumḥ(v)*[3] and developing into Coptic ⲙⲉⲣ(ⲉ)ϩ (with regular /u/ > /e/ = ⲉ).

9 • The group  = *dʸ* is exceptional as it appears to be characterised by a *back* vowel, and must thus be read as *dU* or *Ud* (see below §4.5.2). For instance, the word  , "comb", can be analysed as *mA.š0.dU.Ud = mAšdUd*, with  = *dU.Ud = dUd*, corresponding to the contemporary (post-Ramses II) pronunciation **mvšdˈo:dv* > Coptic ⲙⲱⲧⲱⲧⲉ.

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2 E.g. Akk. *tinūru*; Arb. *tannūr*; with assimilation /n/ > /r/ due to the following /r/)

3 E.g. Arb. *rumḥ*; Hbr. *rōmaḥ*; with metathesis *r-m* > *m-r* like in Ugaritic *mrḥ* < *rmḥ*.

10 • Egyptian vowels /a/ and /a:/ after /k/ appear to have shifted to /o/ and /o:/, or at least to have been realised and perceived as back vowels, already during the 18th Dynasty, if not before (see below §4.5.1). This means that after a /k/, a *back* vowel must be expected even in periods before the general /a:/ > /o:/ and /a/ > /o/ shifts took places. Note that instances of such early shift had already been occasionally noticed by various scholars. An example that is often mentioned is the word  , which is transcribed as *ku* in Cuneiform texts even in periods when we would expect a pronunciation, and a Cuneiform transcription, ***ka*.

As I will discuss in this book, the points just described are all derived from observations based on the Egyptian or Coptic evidence, and the resulting system is fully coherent and can be applied throughout the whole of the New Kingdom. At the same time, this system allows to analyse the Egyptian vocalisation through native Egyptian sources for the first time, and the fact that the readings obtained through it are overall in agreement with the reconstructions advanced so far confirms its general validity.

§1 Introduction

The nature and function of the so-called group writing/syllabic orthography has been an important topic of debate for more than a century. Many hypotheses have been suggested and different, often opposite interpretations have been advanced, without any consensus being reached (see Ward 1996 and Peust 1999 for general reviews of previous scholarship; no major addition to the discussion has been made since then).

Early forms of group writing are well attested in both Old and Middle Kingdom, especially in transcriptions of names and toponyms (Albright 1934, 6–11; Hoch 1994, 487–500), but it is with the New Kingdom and the emergence of Late Egyptian that its most common form becomes widespread.

The rationale for the use of group writing is still not completely clear. Foreign words were usually written with this orthography, which, however, could also be used to transcribe Egyptian words, including terms well attested in Middle Egyptian and thus having a proper Middle Egyptian orthography.[4] It is possible that in these cases group writing was used to transcribe new pronunciations or previously uncommon variants (Albright 1934; Hoch 1994; Ward 1996; Junge 2005, 43–4). At the same time, however, the presence of both loanwords and new Late Egyptian words transcribed with an orthography that is analogous to the classical Middle Egyptian one[5] suggests that there was no socio-cultural interdiction to write new words with the ordinary orthography. These observations show that the whole picture was clearly more complex than what it may appear at a first glance.

As for its functioning, it has been suggested that this orthography worked like a syllabary –hence the name "syllabic orthography"–, where each group transcribed sequences of both consonants and vowels, rather than just single consonantal phonemes. However, in which form and to what extent vowels were represented has been rather unclear, until now. In particular, the models and interpretations presented so far appear to be all somehow unconvincing, either because they do not manage to explain all the attested forms, or because they require multiple contradictory vocalic values to be assigned to the same groups, thus resulting in systems of transcriptions that are just too wide and therefore too ambiguous to be really meaningful.[6]

This book aims to present a fresh reassessment of the evidence, first by highlighting the methodological problems affecting the most popular approaches suggested in the past and by discussing what can actually be inferred from the sources, and then by introducing a new model to interpret the group writing orthography based on such observations.

It has to be stressed that this book does not have the ambition of solving all the issues affecting our understanding of group writing. Rather, its primary aim is to offer a methodo-

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4 E.g.  , *ṯrp* = "goose", attested since the Old Kingdom, but spelled in group writing as  in the New Kingdom (Erman and Grapow 1926–1963, V, 387.6-9).

5 Such as  = *jsbt* = "seat", "throne", attested only from the New Kingdom onward and which, in fact, is a loanword from a Semitic language.

6 See Ward (1996, 33–40) for a discussion of this issue based on a review of previous scholarship.

logical framework and a sketch of a new model that can be the starting point for further future research.

§2 Methodological problems in previous models

Usually, the main issues affecting the solutions suggested so far are related with their methodological frames and with the *a priori* assumptions on which they are based.

A first problem affecting all previous interpretations is the assumption that a system recognising and encoding three vowels /a(:)/, /i(:)/, and /u(:)/ underlies the group writing orthography, as it is the case for various Semitic scripts. Such assumption, however, is not based on any concrete evidence from the contemporary Egyptian texts. Although it is true that the original Middle Egyptian vocalic system was probably phonologically based on a three-vowel opposition, there is no real evidence indicating that this system was still preserved, phonologically and/or phonetically, during the New Kingdom. In fact, the evidence that we have seems to indicated that during the New Kingdom the vocalic system of Egyptian was already moving toward the Coptic one (e.g. Loprieno 1995, 38–9). In addition, and more important, the Egyptian perception of their vocalic system could have actually been very different from both its phonological and phonetic realities, and even if the vocalic system of the New Kingdom were indeed still a tri-vocalic system, there is no reason to assume that the Ancient Egyptians themselves perceived and conceptualised it as such. As consequence, there is no reason to assume *a priori* that the Egyptians felt the need to indicate in writing exactly these three vowels. In fact, they could have also developed a system in which more vowels were indicated[7] or one in which less than three vowels were graphically distinguished.[8] Such a discrepancy between the perception of the vocalisation and its phonological reality is not only relatively common in many written languages and writing systems around the world,[9] but it is also attested in Coptic.[10] Therefore, there is no reason to assume, *a priori*, that the Egyptians perceived as distinct vowels only and exactly the three vowels /a/, /i/ and /u/, and therefore there is no reason to assume, *a priori*, that the vocalic values of group writing must reflect this tri-vocalic division.

Another problematic and somehow related assumption affecting previous interpretations of group writing is the idea that *ꜣ*, *w* and *y*, either as independent signs  ,  and  or as second consonant in biliteral groups (in the case of *ꜣ*, *w*), are all vocalic markers, or more in general that they all have to be interpreted as graphemes representing distinct phonemes or phones. Other possibilities should also be considered. For instance, one or more

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7 For instance distinguishing and transcribing additional vowels that, from a phonetic point of view, were mere allophones.

8 For instance merging two of the three phonological vowels into a single graphic representation.

9 A good example is provided by some varieties of Levantine Arabic, where 5 long + 5 short distinctive vowels can be recognised (see e.g. the following minimal pairs: long vowels: *dār* "house", *dēr* "monastery", *dīr* "manage (imperative)", *dōr* "floor", "level", "turn", *dūr* "houses"; short vowels: *fihma* "her understanding", *fihme* "a single instance of understanding" (marginal form), *fihmi* "my understanding", *fihmo* "his understanding", *fihmu* "they understood") but which distinguish only the traditional *a*, *i*, *u* vowels when written in Arabic script, or distinguish a non-standardised and variable number of vowels (depending on the writer) when spelled in Latin script.

10 Where ʜ seems to represent two different vocalic phonemes (see below), and ᴏγ and ɪ seem to represent both /u:/ and /w/, and /i:/ and /j/ respectively (Loprieno 1995, 40, 46).

of these signs may have been diacritics, and they could have been used for indicating some modification of the phonetic –consonantal or vocalic– value of an associated grapheme, or they could even have represented the *absence* of a feature or phoneme.[11] Again, there is no reason to assume *a priori* that these three elements must necessarily be vocalic markers.

Besides these two theoretical problems, two additional methodological issues often flaw past interpretations of group writing. The first is the fact of focusing mainly (Albright 1934) or exclusively (Hoch 1994) on words of Semitic origin. Although it is true that Semitic loanwords do represent by far the majority of words written in this orthography, they also present a series of specific problems that makes them generally unsuitable to identify any meaningful patterns that may underlie the system.

First of all, the vowels and vocalic structures of Semitic words are usually not fixed, and can be changed to express different grammatical forms or derived meanings. In addition, we generally do not know the exact Semitic language(s) or dialect(s) at the origin of the Semitic borrowings in Egyptian. Are these words from southern Canaanite, northern Canaanite/proto-Phoenician, Akkadian, Ugaritic, Amorrite? Or do they come from some other Semitic language or dialect poorly or not attested at all? Egypt had direct contacts with various North-West-Semitic dialects of the Levantine coast and Syria, and Egyptian scribes used Akkadian as lingua franca: Semitic borrowings could thus virtually come from any of these languages. Moreover, even if we knew the exact language or dialect from which the Egyptians took these forms, the attestations of these languages (except Akkadian and Ugaritic) and of their vocalisation during the Late Bronze age are so scanty that any meaningful comparison would be extremely difficult. We could obviously work with theoretical reconstructions, but in this case we have to consider that if on the one hand reconstructions can be very precise on the phonological level, on the other they do not tell us anything about the phonetic realisations of phonemes involved, i.e. about the actual pronunciation that the Egyptians would have heard or perceived.

In most cases it is also impossible to determine when the word was borrowed, as such words may have entered Egyptian decades or even centuries before their earliest attestation in the texts. This is a crucial issue, because during that span of time phonetic changes leading to divergent vocalisations may have occurred both in Egyptian and in the donor language.

Many of the solutions advanced so far have paid little or no attention to such synchronic or diachronic considerations. Nevertheless, these are crucial methodological issues, because any approach that does not take them into account can only produce a huge corpus of words that, however, is not internally coherent and from which, therefore, no coherent result can be expected.

Some of these considerations are at the origin of Zeidler's proposal (1991) for a new approach, mentioned also by Peust in his review of previous scholarship on the topic (1999, 221). In particular, Zeidler recognises the problem of using Semitic forms, and decides to focus instead on those words written in group writing which are attested also

11 Such as the *sukun* ◌ْ, i.e. ◌̊, in Arabic, which indicates the *absence* of a vowel.

in Coptic. In other words, he proposes a change of perspective and he suggests to analyse the words written in group writing starting from their Coptic descendants, rather than from their supposed Semitic prototypes (see also Peust 1999, 221). As he says, using Coptic allows analysing the group writing from an "inner-Egyptian" perspective, bypassing all the incertitude deriving from the borrowing process highlighted above.

I think this is an excellent solution, from a methodological point of view. Zeidler application of this idea, however, presents problems that need to be addressed. First, on the basis of his article, it seems he did not distinguish the Egyptian words on the basis of the periods in which they are attested. This is a serious issue, which essentially flaws the whole study: group writing is attested over a long period of time, during which various phonological developments took place in Egyptian, especially at the vocalic level. To ignore these phonological changes and to compare all the words only with their Coptic descendants is therefore methodologically problematic: on the one hand it is clear that many of the Egyptian forms may reflect vocalisations that are different from those attested in Coptic, while on the other hand, since these Egyptian forms may come from different periods, that is from different "phonological phases", the way their vocalisation relates with the corresponding Coptic forms may change from one word to the other, if their attestations are not synchronic. For instance, we know that the phonological change /a:/ > /o:/ likely took place just after the reign of Ramses II (Loprieno 1995, 38). It is therefore to be expected that in words from before Ramses II, Coptic /o:/ will be transcribed as a *non-back* vowel, while in those after his reign it will correspond to a *back vowel*. However, if words from both periods are compared together, without chronological distinction, as Zeidler seems to do, then an inconsistency has to be expected, as it will seem that the same vowel could be transcribed in two different ways without apparent reason.

In addition, Zeidler, follows the previous scholars in assuming a vocalic system based on the three vowels /a/, /i/, /u/, without considering that, as said, the Egyptians' perception and conceptualisation of their vowels could have been different. Similarly, he also assumes that *ꜣ*, *w* and *y* act as vocalic markers, without considering any other possible functions.

Another problem in Zeidler's work is the inclusion of both nouns and verbs in his corpus. The inclusion of nouns is not an issue: their morphological variability is relatively limited and the evolution of their vocalic patterns is relatively well understood. Verbs, however, are problematic from many points of view. First, Egyptian verbal morphology is complex and includes various forms that were likely vocalised in different ways. Therefore, to be meaningful, any comparison between Egyptian verbs and their Coptic descendants should be strictly limited to corresponding morphological forms. This, however, is often impossible, because various verbal forms attested in Late Egyptian did not survive into Coptic. For this reason I think that verbs should be excluded from any preliminary work on group writing: it is clear, in fact, that the incertitude about both the vocalisation of their Late Egyptian forms and their relation with the Coptic attestations is likely to flaw any model built on them.

Finally, Zeidler did not publish the corpus on which his analysis is based, and he only provided a few selected examples for some of the groups he studied. This is a serious

shortcoming, because it makes it impossible to verify his data, and therefore the validity of his comparisons and results.

It thus appears that various problems affect the models presented so far, either because of the theoretical assumptions they are built on, or because of the composition of the corpora they used, or because of both. Since these issues are essentially methodological, they should be taken into consideration in any new attempt to analyse the group writing.

The interpretation I am presenting in this book does that, as I discuss here below.

§3 Group writing – A new approach

§3.1 Definition of the corpus

As already suggested by Zeidler, working with words attested both in group writing and in Coptic is probably one of the best possible solutions, from a methodological point of view. Such words, therefore, are at the basis of my corpus as well.[12] A few important differences, however, distinguish my dataset from his.

First, only forms for which the vocalisation can be reconstructed with reasonable certainty have been considered. Verbs have therefore been excluded, for the reasons discussed above. As for nouns, only those with a reasonably likely direct descendant in Coptic have been considered. For instance, Egyptian forms which are related with Coptic words, but do not seem to be their direct ancestors, have been excluded.[13] Similarly, words attested only in differing morphological forms (especially singular versus plural) have also been excluded, except when the corresponding forms can be reconstructed with some certainty. Moreover, and this is the most important difference with Zeidler's approach, the words of my corpus have been distributed into three chronological groups, corresponding to three phonological phases divided by major phonological developments of the vocalisation. Therefore, my model is built on the comparison of the attested Egyptian words with the corresponding contemporary vocalised forms as they can be reconstructed from Coptic, rather than with the Coptic forms themselves.

26 words of my corpus belong to the first period. 49 instead are attested in the second, while 23 in the third. 17 words are attested in more than one period. Of these, 5 are attested in all the three periods.

The first group consists of words attested before or during the reign of Ramses II, and presents a vocalic landscape which is essentially that of Middle Egyptian, except for a possible shift /i/ > /e/ (Loprieno 1995, 38). The second groups, instead, consists of words attested in the period going from the reign of Merenptah to the end of the 20th Dynasty, and it is characterised by the phonological shift /a:/ > /o:/, which likely took place at the end of the previous period, from around 1200 BCE (Loprieno 1995, 38). Finally, Period 3 is characterised by two additional phonological changes, namely the merging of /e/ and /u/ into /e/, and the shift of /a/ into /o/. It is usually assumed that the merging /u/~/e/ > /e/ took place at some point around 1000-800 BCE (Loprieno 1995, 39). As for the change /a/ > /o/, it is assumed to have taken place around or after 1000 BCE (Loprieno 1995, 39,

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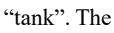
12 I based my corpus on the words identified by Černý (1976), Vycichl (1984) and Westendorf (1965) in their etymological dictionaries, as well as on those suggested by Ward in his review (1996) of Hoch's (1994) and Schneider's (1992) works.

13 Such as, for instance,  = *mrynt* = "a vessel", which Černý suggests may be related with Boharic ⲙⲉⲣⲁⲛ = "tank". The connection is very doubtful, as pointed out by Hoch (1994, 137, n44), but even if the two words were really related, then the Coptic form would clearly derive from a variant that was different from the form attested in group writing, because the Coptic form does not bear any trace of the *y* and *t* consonants implied by the  and groups of the group writing spelling.

46). In particular, this shift is already attested in the transcription of some Egyptian words in the Assyrian sources of the time of Sargon II, around 720 BCE,[14] while my study of the *w*-extended orthography (Kilani 2017a – see below) shows it was already in place at the time of the redaction of the tale of Wenamun, and thus possibly as early as the beginning of the 21st Dynasty.

The resulting chronological framework, and the corresponding vocalic landscape for each period, can be summarised as in tables 1–2.

Other important phonological changes affected the Egyptian vowel /u:/. However, both the nature of such changes and their chronological frame are rather unclear. As summarised by Peust (1999, 228–30), Coptic ⲏ seems to have transcribed two different phonemes, possibly an unrounded /e:/ and a rounded /ø:/. At the same time, Coptic ⲏ appears to also derive from two different phonemes, namely from an earlier /i:/ and an earlier /u:/. The relation between these two Coptic pronunciations and the two earlier vowels is not clear. It has been suggested that the first are the direct reflexes of the latter, but the evidence is far from being convincing and conclusive (Peust 1999, 228–30). In addition, in many cases earlier /i:/ remains /i:/ = ⲓ until Coptic. This, actually, seems to be the regular development, while /i:/ tends to turn into /e:/ = ⲏ mainly in specific phonological contexts, like after /n/ = ⲛ and /m/ = ⲙ, and before /j/ = ⲓ (Peust 1999, 231–2). However, there are clear attestations of the development /i:/ > /e:/ = ⲏ also in other unexpected phononological contexts, which suggests that the picture was either less regular, or more complex (Osing 1976, I, 19-26; Peust 1999, 231–2).

Similarly, /u:/ does seem to shift regularly to Coptic ⲏ, except in proximity of /r/ and possibly after etymological pharyngeal, where it turns into /i:/(~/y:/?) = ⲓ (Loprieno 1995, 48; Peust 1999, 231). However, as said above, such Coptic ⲏ seems to have had two different pronunciations, whose relation with earlier /u:/ is not clear.

It is therefore clear that these changes cannot be used to define any chronological frame. The evidence emerging from the present study, however, may shed some new light on these issues of historical phonology (see below §10).

14 See for instance the word "Pharaoh", transcribed in the Annals as *ᵐpi-ir-ʾu-u* or *ᵐpi-ir-ʾu* (Vycichl 1984, 177), corresponding to Egyptian **pər-ʕˈoʔ* , from earlier **pir-ʕˈaʔ*.

Table 1 – Short vowels

Late/Coptic	ⲟ = /o/	ⲁ = /a/	ⲁ = /a/	ⲉ = /e/	ⲁ/0/e/ⲓ = a/0/e/i	0 (+ –2× sonor.)
			/e/ > /a/	/e/ + –/ʔ/*~?	/e/ + sibil.	/e/ + –sonor.
Period 3	/o/ = U	/a/ = A	/e/ = A			
	/a/ > /o/	/a/ + –/ʕ~X/ > a	/e/~/u/ > /e/			
Period 2	/a/ = A		/e/ = A		/u/ = U	
Period 1	/a/ = A		/e/ = A		/u/ = U	
			i > e			
Middle Egyptian	/a/ = A		/i/ = A		/u/ = U	

Table 2 – Long vowels

Late/Coptic	ⲓ = /i:$_1$/	ⲏ = /e:$_2$/	ⲓ = /y:/ (> /i:$_2$/ ?)	ⲏ = /ø:/ (> /e:$_1$/?)	(ⲉ) = (/e/)	ⲱ = /o:/	ⲟⲩ = /u:/
							+ –/ʔ/~/N/–
Period 3	/i:$_1$/ = A	/i:/ +/ʕ/~/j/~others? > /e:/ = A ; /u:/(?) > /e:/~/ø:/? = A; /u:/ + /r/~X– > /y:/ (> /i:$_2$/ ?) = A				/o:/ = U	
Period 2	/i:$_1$/ = A					/o:/ = U	
						a: > o:	
Period 1	/i:/ = A		/u:/ = U			/a:/ = A	
Middle Egyptian	/i:/ = A		/u:/ = U			/a:/ = A	

Notes:

* /ʔ/< /ʔ/~/t/~/r/~/j/~/w/

Period 1: 18th – early 19th (Ramses II); i.e. from 1550 BCE and before 1200 BCE
Period 2: Late 19th (after Ramses II) – 20th; i.e. after 1200 BCE and before 1000 BCE
Period 3: 21st – 22nd; i.e. after 1000 BCE and before 700 BCE

U = *back* vowel : /o/, /o:/, /u/, /u:/
A = *non-back* vowel : /a/, /a:/, /e/, /e:/, /i/, /i:/
X = etymological pharyngeals
~ = "or"
–C = "followed by". E.g. /e/ + –/ʔ/ = /e/ followed by /ʔ/.
C– = "preceded by". E.g. /o:/ + /N/– = /o:/ preceded by /N/.
C without any – = "in proximity of". E.g. /i:/ + /ʕ/~/j/ = /i:/ in proximity of /ʕ/~/j/

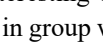
§3.2 The nature of the system

As mentioned above, the orthographic system discussed in this book is usually defined by scholars as "syllabic orthography" or "group writing" (e.g. Albright 1934; Zeidler 1991; Hoch 1994; Ward 1996; Peust 1999). Both these definitions are descriptive, and somehow legitimate: this orthography is indeed based on a set of "groups" of signs, and it does seem[15] that each of such groups transcribed short sequences of consonants and vowels, i.e. "syllables". If however one wants to describe such orthographic system from a functional, rather than descriptive, perspective, then I think that "rebus writing" would be a more suited name. As already noticed (e.g. by Hoch 1994, 501), various "groups" are in fact nothing but short mono- or biconsonantal words (either originally native or loanword) or morphological elements and particles that happen to be used to transcribe likely homophonic syllables or segments.[16] This is evident from the fact that classifiers may be retained when such words are used in group writing, even though they have no semantic

15 Some scholars have expressed doubts against it. Various clues, however, suggest that the system is somehow "syllabic".

16 Conceptually, such a "rebus writing" is not unique to Egyptian. A very similar principle underlies, for instance, the transcription of foreign words in Modern Chinese: "Italy", for instance, is transcribed as 意大利 = *yìdàlì*, which is essentially a sequence of three independent words, namely意 = *yì* = "meaning", "idea"; "to wish", "to desire", 大 = *dà* = "big", "great" and 利 = *lì* = "sharp", "convenient"; "profit", which however are used purely for their phonetic value, rather than for their semantic meaning. The use of such "rebus writing" to transcribe foreign words, or even full sentences, is not a modern invention in Chinese, but is well attested also in the past. For instance, hundreds of similar transcriptions of Sanskrit terms are attested in Middle Chinese (Chen 2000), such as for instance Sanskrit *maṇḍala* was transcribed using the three characters/monosyllabic words 曼拏羅 , which in Middle Chinese were pronounced *manH-nrae-la*, and originally meant "distant", "to handle", "kind of net" respectively (Chen 2000, 395, Middle Chinese pronunciation based on and transcribed according to Baxter 2014). The most advanced development of these system, however, is probably represented by the spelling of the so-called Secret History of the Mongols, an historical chronicle about the deeds of Genghis Khan, composed in Mongolian language

relation at all with the new word being spelled out. Let us consider, for instance, the word  , "hill(s)", < Semitic √*t-l-l* = *til(lu)*,[17] whose spelling can be analysed as a rebus combination of the Egyptian word *t* = "bread", written with its full set of classifiers, and the Egyptian word *rꜣ* = "mouth". Clearly, the classifiers of have no semantic connection whatsoever with the word "hill".

Another interesting example is the transcription of the Hurrian divine name Teshub, which appears in group writing as  (Hoch 1994, 258, no. 364). This spelling can be interpreted as a rebus composed of two elements. The first, *t(j)*, possibly originates from the second person stative suffix *-t(j)*. The second, , is not attested as an independent word but is present in other loans from Semitic languages. Leaving aside for a moment the position of in the sequence, which will be discussed here below (§3.3, §4.1), this can be identified with a Semitic verb meaning "to return" and attested in Biblical Hebrew as *šūb* and in Amorite as *šwb*, from √*š-w-b* (so Hoch 1994, 258, no. 364). Once again, the is the classifier of such verb, and it is not semantically related in any way with the name of the Hurrian god. Moreover, the presence of such classifier shows that the sequence as to be interpreted as a single group, as in fact scholars did, rather than as a combination of two distinct groups and : does make sense as classifier of , but it does not as classifier of alone.

Words with a C_1-C_2 structure,[18] like , are rather rare in New Kingdom group writing.[19] At the time, the general tendency was to prefer words that in the traditional Middle Egyptian orthography would be analysed as C_1-*ꜣ* (and rarely C_1-*j*) or C_1-*w*, such as *sꜣ*, *rw*, *tꜣ*.[20] The presence of the single stroke or of classifiers such as in confirms that, conceptually, the Egyptians perceived these groups as *words*, and not just as mere *phonograms*.

In Egyptian, however, the number of words with C_1-*ꜣ* or C_1-*w* structures is limited, and they do not cover all the consonants of the language. In those cases where no suitable *C-ꜣ/w* word exists, plain biliteral signs, sometimes combined with or / , or alternatively

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but written by using Chinese characters as purely phonetic, syllabic signs. For instance, the title of the first chapter reads as follows (see Rachewiltz 2004):

Chinese text :	成吉思合罕訥忽札兀兒
Pronunciation:	*chéng-jí-sī há-hǎn-nè hū-zhā-wù-ér*
Reconstructed Middle Mongolian text:	*čingɣis qaɣanu hujaɣur*
Meaning :	"(On) the origins of Gengis Khan"

Conceptually, this system is very similar, if not even identical, to the Egyptian use of the group writing to transcribe sentences in foreign languages, such as in Pap. Anastasi I 23,5.

17 Akkadian *tillu*, Hebrew *tell*, Aramaic *till*, Syriac *tell*, Arabic *tall* – see Hoch 1994, 356–7, no. 527.

18 Where *C* = any consonant except *ꜣ* or *w*.

19 While they are more frequent in earlier forms of group writing.

20 It has often been suggested that the sign was used to transcribe a third group of syllables, usually interpreted as C_1-*y*. I however disagree with this idea, as I think the evidence show that the had other functions. I discuss this aspect more in detail later, in §4.2.
Therefore, for now, I focus only on C_1-*ꜣ* (C_1-*j*) and C_1-*w* groups, which constitute the basic framework of the group orthography, as I think it will appear from this study.

combination of unilateral signs if no corresponding biliteral sign was available either, could be used instead.

Single consonantal signs could also be used in the spelling of biconsonantal words (such as  just mentioned), as phonetic complements for specific groups (such as  = *b-pꜣ-ꜣ* = *bꜣ*) or individually. When full words or bilitteral signs are available, they are clearly preferred to combinations of uniliteral signs, as it appears from Hoch index of groups (Hoch 1994, 506–12). For instance,  and  are by far the most common spellings of the groups *ʕꜣ* or *rw*, although in theory  = *ʕ* + *ꜣ* or  *r* + *w* would have been equally valid alterntives.

Naturally, these have to be understood as overall trends, not as absolute rules. The system was clearly not fully standardised, exceptions do exist, and a certain degree of voluntary or involuntary freedom was present. Therefore, it has to be expected that at times the same consonantal sequence could be written either with a full word, with a biliteral sign, or with a combination of uniliteral signs.

Nevertheless, these theoretical considerations are crucial, because understanding how the Egyptians themselves conceived and perceived the group writing can help understand how it functioned.

§3.3 The number of vowels

In a previous article (Kilani 2017a) I have argued that the so-called space filler  = *w* present in Late Egyptian texts was a sort of vowel marker used to give a general indication on the nature of the tonic vowel of the word. The system underlying such *w*-extended orthography[21] was rather rudimentary, and was characterised by two basic principles. First, the quality of only the stressed vowel was represented, and only two basic qualities, *non-back* and *back*,[22] could be indicated by the presence or absence of the respectively. Second, this vowel marker worked somehow as a classifier, in the sense that it was written at the end of the word, after any consonant and independently from the actual position of the stressed vowel within the word. Therefore, a form like  must be interpreted as *consonants + vowel marker*, that is as *ḫpr* + *w* => *ḫwpr*, corresponding to Coptic ϧωπε (see Kilani 2017a, 189). The reasons for such a system, and especially for the latter feature, which may appear rather counterintuitive or at least unpractical, may have to be searched in the specificities of the vocalisation of Late Egyptian, and in the nature of the Egyptian writing. In particular, it is likely that Late Egyptian, like Coptic, had only one distinctive vowel, namely the tonic one, while all the other unstressed vowel were reduced and realised either as [ə] or, in some specific phonetic environments, as [a]. This means that only one vowel was worth being indicated, and therefore only one vocalic marker was needed for the whole word. At the same time, the fact that many hieroglyphic signs simultaneously encoded for more than one consonant, made it often practically impossible to indi-

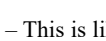
21 I do not call it like this in the article, in fact, I do not provide any specific definition, but it can be useful here.

22 In the article I refer to them as *front* and *back* vowels. However, now I think that it is more accurate to refer tot them as *back* and *non-back*. See below note 26.

cate the presence of a vowel there where it was supposed to be pronounced. For instance, as explained in Kilani 2017a, in the case of a verb like  = *ḫpr*, "to exist", Coptic ϣⲱⲡⲉ, it would be impossible to introduce a vocalic marker *w* between the "*ḫ*" and the "*p*" to indicate the vowel "*o*" at its actual position, because the two consonants are written together with the single, indivisible triliteral sign .

If one considers that in hieratic writing some ligatures may also have been perceived as indivisible groups or "schematograms",[23] then one may understand why writing the vowel marker *w* after all the consonants often was not a choice, but rather the only possible option.[24]

This *w*-extended orthography is relevant here, because it can be argued that the same principles governing it were also at the basis of group writing. In fact, if one considers that the groups of group writing were likely perceived as *words* within a rebus-based system, rather than just as elements of a phonetic syllabary, then one can expect them to abide to the same principles governing the spelling of ordinary words, including those underlying the *w*-extended orthography. These considerations constitute the basis for the interpretative model presented here.

23 Junge 2005, 38–9 – This is likely the case for words like  , where the sequence of signs may have been perceived as an indivisible schematogram, thus prompting a spelling = *ḫtm* + *w* => *ḫtwm*, corresponding to Coptic ϣⲧⲟⲙ (see Kilani 2017a).

24 One has to remember that this system was used by people who knew the language natively. Therefore, its main aim was probably to avoid ambiguities or as an aid-memoir to facilitate the recognition of words otherwise written only consonantally, rather than to allow readers unacquainted with the language to properly vocalise new, unknown words.

§4 Group writing – A new model

The following sections are structured as follow: first I introduce the general principles on which the proposal is based and I discuss a few special cases.

The proposal will then be systematically verified against the evidence from the corpus.

After that, the evidence is analysed diachronically. Some words are attested in different periods, and therefore it is possible to have a closer look at the evolution of their vocalisation. The identification of expected patterns of vocalic evolution can be used as a confirmation of the validity of the model here presented.

A statistical assessment of the results is then presented, while some special cases are further discussed after that.

A general conclusion follows.

§4.1 Definition of the interpretative model

The interpretation of group writing[25] I present here is based on the two following principles, which directly derive from the *w*-extended orthography:

- Groups encode only 2 vowels, or better 2 vocalic classes: *back* and *non-back*.[26] The presence of -*w* corresponds to the presence of a *back* vowel. In order to mark

25 In spite "rebus writing" would be conceptually more appropriate, in this study I will stick to the traditional definitions of syllabic orthography and group writing, just to avoid another superfluous label to this writing system.

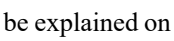
26 As suggested by a reviewer, since one of these vocalic classes seems to correspond to the stressed vowels /a/, /e/, /i/, while the other to the vowels /o/, /u/, in theory one may also interpret the underlying opposition as a question of roundedness/labialisation, that is as unrounded vs rounded. I think this may indeed be a valid alternative. However, I still prefer to interpret it as an opposition back vs non-back for two reasons. First, it is usually assumed that the articulatory position of a vowel is more distinctive than its roundedness (this is evident, for instance, from the fact that vocalic inventories of languages are usually described according to the position of the vowels, rather than according to their roundedness – this is also the case of descriptions of Egyptian, see for instance Loprieno 1995, passim). Moreover, there may be evidence from Coptic suggesting that the Egyptian themselves did not consider roundedness as a main distinctive feature of their vowels. In particular, as mentioned above (§3.1), it has been suggested that Coptic ⲏ was actually used to transcribe two distinct phonemes, possibly corresponding to an unrounded /e:/ and a rounded /ø:/ (Peust 1999, 228–30). If this is the case – and I do not see any concrete reason to question it –, then the fact that the same letter ⲏ was used for both would suggest that, at least in the Coptic period, Egyptians were not distinguishing their vowels on the basis of roundedness, because roundness is actually the only main feature distinguishing the vowels /e:/ and /ø:/. Naturally, it is clear that an orthographic feature of Coptic does not tell us anything, directly, about the Late Egyptian orthography. However, I think one may expect at least some degree of continuity in the underlying perception of the speakers of the language. In particular, if Late-Egyptian/pre-Coptic speakers did perceive roundedness as a main distinctive feature of their vowels, it might be expected that, when the Greek alphabet was adopted to write Egyptian, an attempt would have been made to try to mark such a distinction, also (and perhaps especially) in the vowels /e:/ and /ø:/. This, however, is clearly not the case, which suggests that in the underlying pre-Coptic perception, roundedness was not a main distinctive feature.

such *back* vowel, I use the transliteration *U*. The absence of *-w*, or the presence of *-ꜣ* indicate either the presence of a *non-back* vowel or the *absence* of any vowel. I mark it with *A* or *0*.

- The *-w* is written after the consonant of its group, but it can be read both before or after it. This is because the *-w* works like a classifier, like in the *w*-extended orthography. Therefore a group *c-w*[27] can be read either as *cU* or as *Uc*.

The possibility that only two vowels, rather than three, were encoded had already been implicitly suggested for the group writing of the Middle Kingdom (see Hoch 1994, 496–7 with refs). No one, however, seems to have considered that this principle may apply to later periods as well, possibly because of the common assumption that the sign  must have also been a vocalic marker.

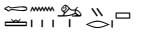
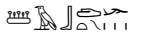
An interpretation based on only 2 vowels, however, is strongly supported by the evidence. As it is discussed more in detail below (§5), it can be shown that all the forms of the corpus can be explained on the basis of a two vowels system, with each group having only one vocalic value. None of the systems with three vowels suggested so far is comparably coherent.

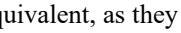
As for the *-w* in group writing working like the *-w* in *w*-extended orthography, a first confirmation comes from the transcription of the name of the god Tešub mentioned above. As said, the spelling  can be analysed as composed of two groups, and . The first can be read as *t+A = tA*, where *A = non-back* vowel, which is the expected transcription of the first syllable of the name, *te-*.

The second group,  , instead, transcribes the syllable *-šub*. It is clear that if we read it as it is written, namely *sbw*, then the spelling cannot be reconciled with the pronunciation of the syllable it is supposed to transcribe. If instead we assume it was spelled according to the *w*-extended orthography, then it can be read as *sb + w = sb + U*, where *U = back vowel*, and it can be normalised as *sUb*, the expected transcription for the syllable *-šub*. A reading *sUb* would also fit as a transcription of a verb /sub/ < Semitic *šūb* = "to return", which as mentioned above has been suggested by Hoch, on the basis of the classifier, as the source of the group .

 is a C_1C_2*+w* group, but the same principle may be applied to *C+w* groups, which can thus be analysed either as *C+w = C + U = CU* or *C+w = C + U = UC*.

This suggestion is supported by two words, attested in the corpus in two variants. They are the following:

	Variant 1	*Variant 2*
ʕnrr, "pebbles" (II.4)		
šbd, "rod" (II.34b)		

The spellings  and  can be assumed to be equivalent, as they are both attested in the same period and they are both singular, and therefore morphologically

27 Where *c* = any consonant.

identical (see Appendix A below for details). We can therefore assume that they aim at transcribing the same phonological sequence. This means that the groups  and  must be equivalent as well, and they also must transcribe the same phonological sequence.[28] This is possible only if we assume that the group  = *r*+*w* can be read both as *r*+*U* = *rU* and as *r*+*U* = *Ur*, so that:

 = (*r*+*ꜣ*) + (*r*+*w*) = (*r*+*0*) + (*r*+*U*) = *r0* + *Ur* = *rUr*

and:

 = (*r*+*w*) + (*ʸr*+*ꜣ*) = (*r*+*U*) + (*r* + *0*) = *rU* + *r0* = *rUr*[29]

The same considerations apply also to the second case: since and  are morphologically the same, and come from the same period, they can be assumed to transcribe the same phonological sequence. Therefore, the groups  and  must be equivalent. This is possible only assuming that  = *d(t)*+*U* = *Ud*,[30] so that:

 = (*b*+*w*) + (*d*) = (*b*+*U*) + (*d*+*0*) = *bU* + *d0* = *bUd*

and:

 = (*b*) + (*d(t)*+*w*) = (*b*+*0*) + (*d*+*U*) = *b0* + *Ud* = *bUd*

These variants are relatively rare, possibly because some orthographic rules or conventions may have existed within the system (see below §7).

It may appear counterintuitive that a same sign encodes for both *CV* and *VC* sequences,[31] as this is certainly not a common behaviour in attested scripts around the world. Nevertheless, a few parallels do exist. The first can be found in cuneiform Hurrian, where the sign *WA* can be used to write both the syllables /wa/~/we/ and the syllable /aw/~/ew/.[32] In addition, a few examples may suggest a similar behaviour also for the *alif*+*i* sign in the Ugaritic alphabet,[33] but this case is more controversial (Bordreuil and Pardee 2010, 37 with refs). More important, the same phenomenon, where the reading order of the sign is inverted in respect to their writing order, is attested also in Late Egyptian, for instance in BM EA 10474 (*Teachings of Amenemope*), where the sequence  corresponds to both *wt* and *tw* (Laisney 2007, 10).

On these theoretical bases, the system can be analysed in more details. I will do so in §5–6. First, however, a few special cases need to be introduced.

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28 I.e. the same sequence of consonants and vowels, in the same order and with the stress in the same position. Obviously, it cannot be excluded that such consonants and vowels may have been phonetically realised in slightly different ways, if different dialects were involved, but this is not relevant here, as such variations would not affect the order of the phonemes themselves.

29 For the reading = *ʸ*r+*ꜣ* = r + 0 = r0 see below.

30 For 𓏲 = *w* and therefore = *d(t)*+*U* = *dU*/*Ud* see Kilani 2017a, 200–1.

31 Where *V* = vowel.

32 E.g. the spelling *WA*-*ri* stands for *ew*-*ri* /evri/ Wegner 2007, 45.

33 Which seems to encode for both /ʔ/ + /i/ and /i/~/a/~/u/ + /ʔ/.

§4.2 The sign 𓏭

It has often been assumed that in group writing the sign 𓏭 had the function of marking a /i/ vowel. This suggestion, however, has never been demonstrated on the basis of any evidence. In fact, it has already been shown that, at least in some contexts, the 𓏭 sign clearly had other functions and was not used as a vowel marker. Moreover, in a system with two vowels as that implied by my model, a sign marking a third vowel /i/ would be superfluous.

This considered, I think that the 𓏭 should be interpreted as a diacritic sign, which modifies in some way the signs or groups with which it is associated. Various specific functions can be identified from the evidence.

First, it has long been recognised by various scholars (e.g. Albright 1934, 47, 50; Helck 1971, 552–3; Schneider 1992, passim; Hoch 1994, passim) that the combination 𓏭 + = *rꜣ*, usually written in the form , is used to transcribe a word-final or pre-consonantal /r/. In other instances, it appears instead that the function of 𓏭 is to modify the pronunciation of the consonant to which it is associated. This is the case, in particular, with *ẖ* = /, which corresponds to *ẖ* > Sahidic ϩ and ϣ, while the combination , i.e. *ẖ* + 𓏭 = *ẖ*$_2$, corresponds exclusively to *ẖ*$_2$ > Sahidic ϣ. The fact that should be interpreted as a spelling indicating a secondary pronunciation of *ẖ* is supported by demotic, where the sign < is specifically used to transcribe only *ẖ*$_2$ = Saihidic ϣ, in opposition with the sign < , which is used to transcribe a more general *ẖ* = Sahidic ϩ and ϣ.

The evidence from my corpus strongly supports this suggestion. In particular, Sahidic ϩ always corresponds to *ẖ* and never to *ẖ*$_2$ = :

mẖmẖwt$_1$ – *ⲙⲉϩⲙⲟϩⲩⲉ = "flowers (purslane)" (I.8)

ẖr – ϩⲁⲗ = "Syrian" (I.15; II.30)

ẖt – ϩⲁⲉⲓⲧ = "forecourt" (II.31)

ẖr – ϩⲓⲣ = "road", "street", "quarter" (I.14; II.29; III.14)

ẖbs – ϩⲏⲃⲥ = "lamp" (II.27)

While *ẖ*$_2$ = always corresponds to Sahidic ϣ and never to Sahidic ϩ:

ẖ$_2$*r* – ϣⲟⲗ = "tooth", "fang" (II.28)

mẖ$_2$*r* – ⲙϣⲓⲣ = "basket", "box" (II.16)

ẖ$_2$*ṯn* – ϣϫⲏⲛ = "lettuce", "garlic" (II.32)

ẖ$_2$*rd* – ϣⲟⲣⲧ = "veils", "thin cloth", "purse" (III.15)

In addition, there are two attestations where ẖ corresponds to Sahidic ϣ:

[*mẖr* – ⲙϣⲓⲣ = "6th month" (II.17)

/ *ẖbr* – ϣⲃⲏⲣ = "commerce", "associate", "companion" (III.13)

Various reasons could be suggested to explain these last two cases. First, simply, they could represent defective or less precise spelling, where a generic *ḫ* has been used instead of a more precise and accurate *ḫ₂* =  . In the case of  *mḫr* – ⲙⲉⲩⲣ, attested in Period 1, it could also be that the phonetic and/or phonological shift behind the development *ḫ* > *ḫ₂* =  – ⲩ had not taken place yet. It appears in fact that *ḫ₂* = is attested in the corpus only in words from Period 2 or 3, which may suggested that the phoneme this digram aimed at representing emerged, or started to be considered relevant, only after Period 1. Finally, it could also be worth considering the possibility that not two, but three distinct phonemes or allophones corresponding respectively to *ḫ* ~ ʔ , *ḫ* ~ ⲩ, *ḫ₂* ~ ⲩ may lie under these different transcriptions. Further studies, and additional evidence from a larger corpus, are needed to clarify this aspect. What is crucial, however, is that these last two cases do not contradict the previous evidence, as they just show that *ḫ* without  may correspond to both Sahidic ʔ and ⲩ, but do not disprove the fact that *ḫ₂* = corresponds exclusively to Sahidic ⲩ.

The sign seems to have had also other functions. In some cases it seems it was used to indicate that the previous consonant had to be fully pronounced. This happens mainly with  = *r*, = *t*, and = *w*, namely with consonants that at least in some phonetic or phonological environments either were not pronounced any longer, or were turned into /ʔ/. Examples from Late Egyptian can be = *rʸrʸ* = Cpt. ⲣⲓⲣ, or = *ntʸ* (= earlier *nḏ(j)*) = ⲛⲟⲉⲓⲧ and possibly also = *btʸ* (= earlier *bdt*) = ⲃⲱⲧⲉ (see Kilani 2017a, 194), or = *gw* and = *jswt*, where the variants = *gw* and = *jswt*, spelled with , show that the of represents a fully consonantal *w* (Hoch 1994, 346 nos. 507, 32 27 respectively).

In the case of  = *dʸ*, instead, the presence of seems to exceptionally indicate a group *dU*. This case is unique, and it is discussed more in detail here below (§4.5.2).

The uses just described cover most of the attestations of in the corpus of this book. The role of in the remaining cases is less evident. There the function of is perhaps to provide information about the syllabic structure of the word, in order to resolve some ambiguities inherent in the system (see also §7).

To sum up, the evidence shows not only that there is no reason to assume that  was a vowel marker, but also that there is no need for it to be so, as most of its occurrences can be easily explained in other ways. This indirectly supports one of the principles of the current proposal, namely that the group writing was based on a system recognising only two, rather than three, vowels.

§4.3  = *rC / r#* and = *nC / n#*

Many scholars (Albright 1934, 47, 50; Helck 1971, 552–3; Schneider 1992, passim; Hoch 1994, passim) have already noticed that at least two groups differ from the others in the fact that they are functionally specialised in encoding only final or pre-consonantal

consonants. These groups are  , encoding for *-r.(C-)* or *-r#* and  , which I transcribe as n_1, encoding for *-n.(C-)* or *-n#*.[34]

These groups appear to be different from standard = *r-ꜣ* and *n-ꜣ* groups, in that they explicitly always correspond to *r+0(+C/#)* and *n+0(+C/#)* and never to *r+A* and *n+A*.

To mark the peculiarity of these groups, in the following paragraphs I transliterate them as $^{y}rꜣ$ and n_1 and I parse them as ^{r} and ^{n} respectively.

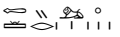
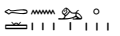
The fact that these two consonants enjoy such a special status and treatment has parallels in other syllabic scripts.[35] This exceptionality is probably due to their phonological nature, which seems to have induced various scribal cultures to perceive them as somehow different from other consonants.[36]

Usually, modern scholars have assumed an implicit identity between phonological syllables and written syllables in Egyptian group writing, and therefore have interpreted the groups and as transcribing consonants in coda of (phonological) syllables, as it appears from the conventions adopted in transliterating them (Albright 1934, 47, 50; Helck 1971, 552–3; Schneider 1992, passim; Hoch 1994, passim).

These assumptions, however, have never been demonstrated on the basis of any evidence. In fact, another scenario seems to emerge from the data, which suggested that, rather than codas of previous syllables, such groups should be interpreted, from the perspective of the functioning of the script, as clustered with the following consonant.

In other words, I think the evidence shows that a sequence *CV* + $^{y}rꜣ/n_1$ + *CV* was not interpreted by the Egyptian as *CVr/n.CV*, as usually modern scholars do, but was rather conceptually perceived as *CV.rCV* and *CV.nCV*. By analogy, it is likely that also when they are the last groups of a word, and must be interpreted as *CV.r#* and *CV.n#*, rather than as *CVr#* and *CVn#*.

This can be inferred from the following spelling variants attested in the corpus (II.3):

Variant 1		*Variant 2*
	*a)*	
	b)	

All these forms can be interpreted as transcriptions of /ʕul/, from which Coptic ⲁⲗ /(ʔ)al/ derives. The spelling of Variant 1 is transparent:

 = *ʕ*  = *w* = *back* vowel *U*  = n_1+ *rꜣ* = *l*

34 Where *C* = *consonant of the following group*, and # = *end of word*.

35 For instance, Japanese kana syllabaries have exclusively *CV* signs for all consonants but /n/, while in most cases Indian devanagari treats /r/ as a modifier of other *CV* signs, rather than just as an independent consonant.

36 I do not know if such a phenomenon has ever been investigated from a wider ethno-anthropological perspective. Whether it has or not, I think it would be interesting to look at it integrating the Egyptian data. It is clear, however, that such a study is far beyond the scope of the present study.

which gives *ʕU.ⁿr0* = *ʕU.l* = *ʕUl*, the expected transcription for /ʕul/.

The spelling of Variant 2), needs more attention. If we assume that the signs  and  have to be read as codas of the previous syllables, as it has been suggested so far, then we obtain:

Variant 2a):

	Syllable 1	Syllable 2
Attested form		
Transliteration	*ʕʒ* + *ʸ-rʒ*	*rw*
Normalisation	*ʕAr*	*rU = lU*

Variant 2b):

	Syllable 1	Syllable 2
Attested form		
Transliteration	*ʕʒ* + *n₁*	*rw*
Normalisation	*ʕAn*	*rU = lU*

Note that in both cases = *rw* cannot be read as *Ur*, because = *-r* and = *-n* imply a consonant just after them.

These transcriptions would thus yield, respectively:

 = *ʕAr* + *rU* = *ʕAr.rU* = *ʕAlU*

 = *ʕAn₁* + *rU* = *ʕAn₁.rU* = *ʕAlU*

Both those readings would be problematic, both because they do not correspond in any way to the reading implied by Variant 1 and because they do not correspond to neither SBA ⲁⲗ nor F ⲉⲗ (Crum 1939, 3).

If however we assume that the signs and should be read as clustered with the following consonants, then the following interpretations become possible:

Variant 2a)

	Syllable 1	Syllable 2
Attested form		
Transliteration	*ʕʒ*	*ʸrʒ* + *rw*
Normalisation	*ʕ0*	*ʳr-U = ʳrU* / *Uʳr = lU* / *Ul*

Variant 2b):

	Syllable 1	Syllable 2
Attested form		
Transliteration	*ʕɜ*	*n₁ + rw*
Normalisation	*ʕ0*	*ⁿr-U = ⁿrU / Uⁿr = lU / Ul*

Which in both cases can be read as, respectively:

 +  = *ʕ0 + Uʳr = ʕ0.Uʳr = ʕ0.Ul = ʕUl* = /ʕul/

 +  = *ʕ0 + Un₁r = ʕ0.Uⁿr = ʕ0.Ul = ʕUl* = /ʕul/

Which corresponds to Variant 1 and which is the expected transcription of /ʕul/.

The validity of such analysis is supported by two other words of the corpus, namely  = *mrḥ* and  = *ḫ₂rd*, which correspond to Coptic ⲙⲉⲣ(ⲉ)ϩ (and variants) = *mˈer(ə)h* and ϣⲟⲣⲧ = *šˈort* respectively.

 = *mrḥ* is attested in Period 1 and 2. The words is related with Semitic *rumḥ* (see below §6) and its pronunciation in Egyptian can be reconstructed as **murḥv* in both periods. Its spelling, therefore, can be interpreted as follow:

 = *m0 + ʸrḥ-U = m0 + Uʳḥ = mUʳḥ*

 = *ḫ₂rd* is instead attested in Period 3, and therefore its pronunciation at the time can be reconstructed as **ḫ₂ ˈord(v)*. Its spelling can be parsed as:

 +  = *ḫ₂0 + ʸrd-U = ḫ₂0 + Uʳd = ḫ₂Uʳd*[37]

Again, taking = *ʸrʒ* as the coda of the previous syllable would not work, as it would lead to a reading  = *mA + ʸr + ḥ-U = mAʳ + ḥU = mAʳḥU* and = *ḫ₂A- ʸr + d-U = ḫ₂Ar + dU = *ḫ₂ArdU*, which cannot be reconciled in any way with the attested Coptic forms.

These written consonantal clusters can be phonemic, i.e. they can represent a real combination of two distinct phonemes, or can be merely orthographic, i.e. they can be a conventional combination of two graphemes used to write a different phoneme, which is not independently represented within the range of available signs. This seems to be especially the case with the sign which can be combined with a following *r* to form a digram corresponding to Coptic ⲗ and thus probably representing /l/.

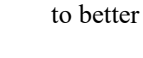
It has to be noted that the syllabification dictated by these signs is a phenomenon that takes place at the writing level, and it is therefore independent from the actual syllabic and prosodic patterns characterising these words at a purely linguistic level. Similar discrepancies between the intrinsic linguistic syllabification of words and the functional syllabification rules commanding their written representation are attested in various writing systems around the world. English orthography, for instance, implements syllabification rules that are unrelated with the actual linguistic syllabic structure of the words they

37 For  = dU/Ud see below §4.5.2.

represent,[38] while Indian devanagari (and essentially all South East Asian scripts derived from them) clusters up together all adjacent consonants irrespectively of any linguistic syllabic boundary.[39] In the latter, the resulting orthographic conventions appear to be, in this respect, conceptually and functionally very similar to what can be observed in the Egyptian group writing.

§4.4 ⌓ in final position

By the end of the Middle Kingdom the *-t* ending of feminine, usually written ⌓ was not pronounced any longer. The use of ⌓ in final position, however, survives in later periods, often but not exclusively in feminine words, and it is occasionally attested also in words written in group writing. In many cases this vestigial ⌓ may have been just a graphic phenomenon, possibly reinterpreted as a semantic marker of feminine grammatical gender. The evidence from the corpus used in the present study, however, seems to suggest that in other cases it may have retained some phonetic significance, and may have developed into a marker for /ə/ at the end of words. Such a development would not be surprising, as the disappearance of the feminine ending *-t* caused the previous usually unstressed vowel to appear in final position as a /ə/.

This considered, in the present study I transliterate this final ⌓ as t_1 and I parse it as *ə*, thus for instance:  = *šnft*$_1$ = *šA.n0.f0.ə* = **šʿi/unfv* = ϣ(ϵ)ɴqϵ.

This, however, has to be considered as a somehow conventional solution, and it has to be kept in mind that the presence of the ⌓ may be a purely graphic phenomenon, with no phonetic meaning at all. Further studies, on a larger and more specific corpus, are needed to better determine the uses and functions of this final ⌓ in Late Egyptian.

§4.5 Special readings for two groups

Two groups need special attention, as they appear to have a phonetic value that is in contrast with that which could be inferred from the sheer reading of their consonants.

§4.5.1 *kȝ* and the development of /a/ in proximity of /k/

It has long been suggested (see e.g. Allen 2013, 25) that in spite of its aliph, the sign 𓎛 = *kȝ* was pronounced with a *back* vowel already in Period 1 and 2, that is before the supposed date of the general /ˈa/ > /ˈo/ vocalic shift, which is usually dated between Period 2 and Period 3 (see above §3.1). The most compelling evidence is provided by the cuneiform transcription *kuʔiḫku* for Egyptian *kȝ-ḥr-kȝ* = ⲕⲟⲓⲁϩⲕ (S). Allen (2013, 25) has suggested that this pronunciation could be an early attestation of the /a/ > /o/ shift, limited to some specific phonetic environments. The present study confirms these observations, and shed some possible light on the phonetic conditions where such early shift took place.

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38 For instance, the English word “learning” is syllabised as *learn-ing* in writing, although phonological its syllabic structure is rather /ˈlɜː/ + /nɪŋ/.

39 For instance in Sanskrit a word like *śikṣak* = “teacher”, whose phonological syllabic structure is obviously *śik* + *ṣak*, is actually written शिक्षक, i.e. शि *śi* + क्ष *kśa* + क k(a), where क्ष = *kśa* is graphic ligature of the sign क *ka* + ष *śa*.

item	Period I id	Period I expected vocalisation at the time	Period I attested form	Period II id	Period II expected vocalisation at the time	Period II attested form	Period III id	Period III expected vocalisation at the time	Period III attested form
chariot mrkbt	I.7	*mvrk' abtv	 mArkUbt(A)	II.15	*mvrk' abtv	 mArkUbt(A)	III.7	*mvrk' obtv	 mArkUbt(A)
palm kp	–	–	– –	II.40	*k' ap	 kUp	III.20	*k' op	 kUp
a jar jkn	I.1	*ʔvk' a:nv	 j(A)kUnA	–	–	– –	–	–	– –

Various words whose Coptic descendants display a vowel /o/ are attested in the corpus during Period 1 and Period 2. The group writing form of many of them[40] implies a *non-back* vowel, thus showing that, as expected, the /ˈa/ > /ˈo/ shift did not take place yet. An example could be *ym* = "sea", which is spelled as / = **y ˈam* > ϵιωм (I.2, II.2) in Period 1 and 2 and therefore does not display any *back* vowel, but which does present a spelling with *w* = *U* in Period 3, after the shift had taken place, as it appears from the form = **y ˈom* > ϵιωм (Period 3, III.2).

The spelling of three other words, however, indicate the presence of a *back* vowel also in periods when an /ˈa/ or /ˈa:/ would be expected.

To which we can add the abovementioned Cuneiform *kuʔiḫku* for Egyptian *kȝ-ḥr-kȝ* = ϰοιϧϫ (S).

The use of in the spelling of in Period 1 suggests that such phenomenon was not limited to /a/ > /o/, but affected also the shift /a:/ > /o:/, a shift that in normal condition took place only after Period 1.

Even though the evidence is rather scanty, one feature seems to emerge: all the forms characterised by such unexpected *back* vowel present a velar consonant /k/ just before it.[41]

It can therefore be suggested that in general /ˈa:/ > /ˈo:/ after Period 1 and /ˈa/ > /ˈo/ after Period 2 except after /k/, where such shifts may occur earlier, already or even before Period 1, at least in some words.[42]

To investigate the reasons for such an early shift in such a phonetic environment is beyond the scope of this study. Some preliminary ob-

40 Their full list is given below (§5.1–2) and in Appendix A.

41 Which often evolves into ϭ = /kʲ/ in Coptic.

42 The conditional here is due, because three attestations are hardly enough to generalise the phenomenon.

servations, however, can be put forward. First, a plain voiceless velar /k/ is not an obvious phonetic trigger for the backing of a following vowel. However, a partial parallel for such a phonetic development can be found in Proto-Khanti, where [ɑ:] > [ɔ:] before velars (Zhivlov 2014, 124, n5). Alternatively, and perhaps more likely, one could assume that such shift was triggered by some additional feature that characterised the consonant *k*, but which was not recorded in the Egyptian writing. In particular, if the *k* was realised as a labialised **k^{w}* or as "emphatic" **k'* (possibly pharyngealised [k^{ʕ}]?), then such a development would look less surprising.[43] Moreover, a secondary articulation of some sort could also help explaining why some of these instances of *k* evolved into ϭ = /kʲ/ in Coptic, rather than into plain ⲕ = /k/.

Further research, however, is needed to clarify these points.

In any case, it seems that the presence of a consonant *k* may trigger the backing of a following /a/ or /a:/ already in Period 1, and this has to be considered when analysing the vocalic values of group writing.

§4.5.2 = *d^{y}*

The group = *d^{y}* is attested in three words in the corpus, and in all of them it appears to transcribe a *back* vowel.

	ⲙⲯⲧⲱⲧⲉ					m.šʒ.d^{y}.d^{y}.t$_{1}$		
II.19	mšt'o:tə	<	*mvšd'o:dv	 mšddt$_{1}$	=	⬇	=	mAšd'Udə
	comb					mA.š0.dU.Ud.ə		
	ⲯⲟⲣⲧ					ḫ^{y}.^{y}rʒ-d^{y}		
III.15	š'ort	<	*ḫ$_{2}$'ord(v)	 ḫ$_{2}$rd	=	⬇	=	ḫ$_{2}$Urd
	veils, purse					ḫ$_{2}$0.U^{r}d		
	ⲙⲉⲥⲧⲟ/ⲱⲗ					mk.d^{y}.rw(.ə)		
III.9	məkʲt'o/o:l	<	*mvkt'ol	 mktr(t$_{1}$)	=	⬇	=	mAkdUr
	stronghold					mAk.dU.Ur(.ə)		

In the case of , such a reading is confirmed by a later variant from Kawa (Hoch 1994, 252, no.353), where the word ⲯⲟⲣⲧ - *ḫ$_{2}$rd* is spelled  = *ḫ$_{2}$0.Ur.d* = *ḫ$_{2}$Urd*, which confirms the presence of a *back* vowel in this word and suggest a reading *dU*/*Ud* for the group = *d^{y}*, and therefore *U^{r}d* for .

43 Backing of vowels after labialised consonants is attested in various languages, while a good examples of that phenomenon in association with "emphatic" consonants is provided by Arabic, where the vowel /a/ is usually realised as /ɑ/ after emphatic consonants. Moreover, emphatic consonants are common in various Afro-Asiatic languages (e.g. Bisang 2006, 80 with refs) and labialised consonants are and probably were present in at least some subfamilies (possibly including Proto-Semitic – Diakonoff 1975, 141) if not even in Proto-Afro-Asiatic itself (Bomhard 1984, 185), and therefore it would not be so surprising if they existed also in Egyptian, at least in some specific phonetic contexts.

As said above, the 𓏏 sign is used here to mark a somehow non-standard pronunciation of the sign 𓂝 = *d*. The use of this alternative group 𓂝𓏏 = d^{y} to transcribe the syllable *d/tU*, instead of 𓏲 = *tw*, which would have been the obvious candidate, could have emerged from the need of preventing ambiguity, as the group 𓏲 = *tw* fulfils already other linguistically distinct functions in the Late Egyptian orthography.[44] The reasons for choosing specifically the group 𓂝𓏏 = d^{y}, and the origins of its apparent value with *back* vowel, however, escape me.

For further discussion on this group 𓂝𓏏, see below §11.

44 Such as e.g. stative ending (Junge 2005, 82), basis for the pronoun set of the adverbial sentence (Junge 2005, 101–12) connector for suffix pronouns after syllable-final -*t* (Junge 2005, 52).

§5 Group writing – Data and analyses

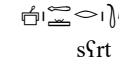
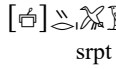
All the forms attested in the corpus are discussed in the following paragraphs according to a division by period and by the nature of the stressed vowel in the contemporary pronunciation. Cases involving a /k/ + /a/~/o/ are discussed separately for each period.

§5.1 Period 1

• NON-BACK VOWELS

In Period 1, 15 words with a stressed *non-back* vowel are attested. All of them are written without *w*. In 5 of them, the stressed vowel could be reconstructed both as a *non-back* /i/ or a *back* /u/. The spelling of the Egyptian forms, however, clearly points to a *non-back* vowel. Related Semitic forms are identifiable for one of them, and they support this interpretation (see below §6 for a throughout discussion of Semitic forms related the words of the corpus):

Egyptian /a/ = A > Coptic ⲟ; Egyptian /a:/ = A > Coptic ⲱ

I.2	sea	 ym	yA.m(A) ⬇ yAm(A)	*yˈam	ⲉⲓⲟⲙ jˈom
I.4	a fish	bry	bA.ʸr0.yA ⬇ bAr(yA)	*bˈar(yv)	ϥ/ⲫ/ⲃⲟⲣⲓ (B/B/S) ⲃⲱⲣⲉ (S) bˈorə bˈoːrə
I.8	flowers (purslane)	 mḫmḫwt$_1$	mA.ḫ0.mA.ḫ.w$_1$0.ə ⬇ mAḫmAḫw$_1$ə	*mvḫmˈaḫwv	*ⲙⲉⲥⲙⲟⲥⲩⲉ *məhmˈohwə
I.9	stronghold	 mktr	mA.k0.tA.r(A) ⬇ mAktAr(A)	*mvktˈa(:)l(v)	ⲙⲉⲃⲧⲟ/ⲱⲗ (B/S) məkˈtˈo/oːl
I.16	wool, hair	 sʕrt	sA.ʕA.r0.tA ⬇ sAʕArtA	*svʕˈartv	ⲥⲟⲣⲧ sˈort
I.17	lotus	 srpt	sA.ʸr0.pA.t ⬇ sArpAt	*svrpˈat	ⲥⲁⲣⲡ/ⲫⲟ/ⲁⲧ (O/B) sărpˈot

I.18	staffs, rods (pl.)	 šbd(t_1)	šA.bA.d0.ə ⬇ šAbAdə	*švbˈadyv *švbˈa:dv	ⲯⲃⲟϯ (B) ⲯⲃⲱⲧ (S) šəbˈotə šəbˈo:t
I.19	father/mother in law	 šm	šA.m0 ⬇ šAm	*šˈam	ⲯⲟⲙ šˈom
I.23	vessel for unguent	 krr	kA.rA.rA ⬇ kArArA	*kvlˈa:lv	ⲕⲉⲗⲱⲗ kəlˈo:l
I.24	couch, bed	 krkr	kU.rA.kU.rA ⬇ kArAkUrA	*kvlˈak(kvrv)	ⲥⲗⲟⲥ kʲəlˈokʲ

Egyptian /i/,/u/ = A > Coptic ⲁ, ⲉ, 0; Egyptian /i:/,/u:/ = A > Coptic ⲏ

I.3	branch of date-palm	 bʕyt$_1$	bA.ʕA.y0.ə ⬇ bAʕAyə	*bvʕˈi:/u:y(wv) > *bvyˈi:/u:ʕ(wv)	ⲃⲁⲉⲓⲏ (pl.) bəjˈe:
I.5	pail, bucket	 bs	bA.sA ⬇ bAsA	*bˈi:/u:sv	ⲃⲏⲥⲉ bˈe:sə
I.10	husband	 hy	hA.y0 ⬇ hAy	*hˈi/uy	ʔⲁⲓ hˈaj
I.20	scale of fish	 šnft$_1$	šA.n0.f0.ə ⬇ šAnfə	*šˈi/unfv	ⲯ(ⲉ)ⲛⲫⲉ šˈenfə
I.22	shield	 qrʕ	qA.r0.ʕA ⬇ qArʕA	*qˈi/ulʕv < Sem. *qilʕv	ⲑ(ⲁ)ⲗ kʲˈal

• <u>Back Vowels</u>

9 words are spelled with *w* = *U* in correspondence of their stressed vowel. In all of them, the stressed vowel could be reconstructed both as *non-back* or *back*, but the Egyptian spelling clearly point to a *back* vowel. The Semitic evidence, available for 3 of them, supports such interpretation (§6).

3 of these words are written with a *w* = *U* in the actual position of the vowel, in the form *c-w* + *c* = *cU* + *c* = *cU.c*.

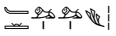
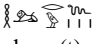
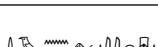
In 4 cases the *w* = *U* is written after the consonant following the vowel, that is as *c* + *c-w* = *c* +*Uc* = *c.Uc*.

In 1 case, *w* = *U* follows a cluster *r*+*c*, in the form c + ʸ*r* + *c-w* = *Urc* = *c.Urc*.

Finally, 1 case is written according to the form *c-w* + *c-w* = *cU* + *Uc* = *cUc*.

The attestations are summarised in the following table:

Egyptian /i/,/u/ = U > Coptic ⲁ, ⲉ; Egyptian /i:/,/u:/ = U > Coptic ⲏ, ⲓ

I.6	spear, javelin	 mrḥ	m0.Uʸrḥ ⬇ mUrḥ	*mˈi/urḥv < Sem. *murḥv	ⲙⲉⲣ(ⲉ)ϩ ⲙⲉⲣⲉ/ⲙϩ mˈerəh mərˈe:h
I.11	law(s)	 hp	h0.Up ⬇ hUp	*hˈi/up	ϩⲁⲡ hˈap
I.12	flower	 ḥrr(t)	ḥU.rU.Ur ⬇ ḥUrUr	*ḥvrˈi:/u:rv	ϩⲣⲏⲣⲉ hrˈe:rə
I.13	beetle, worm	 ḥrrw(t)	ḥA.rU.r0.w₁A ⬇ ḥArUrw₁A	*ḥvlˈi:/u:lwv	*ϩⲁⲗⲉⲗⲩⲉ (A) hălˈelwə
I.14	road, street, quarter	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈi:/u:rv < Sem. *ḫur(r)v	ϩⲓⲣ hˈi:r
I.15	Syrian	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈu/ir(rv) < Sem. *ḫur(rv)	ϩⲁⲗ hˈal
I.21	dust	šḥq	šA.ḥU.qA ⬇ šAḥUqA	*švḥˈi:/u:qv	ⲱⲓ(ϩ)ⲓⲕ šəhˈi:kʲ
I.25	scorpion	 ḏⁿryt₁	ḏA.n₁rU.y0.ə ⬇ ḏAⁿrUyə	*ḏvⁿrˈi:/u:yv	ⲥⲗϩ kʲlˈe:
I.26	arm (of oar)	 ḏnḥ	ḏA.n0.Uḥ ⬇ ḏAnAḥ	*ḏvnˈa/i/uḥ	ϫⲛⲁϩ jənˈah

In addition, 2 words display a stressed vowel preceded by a /k/. One is written with *w* = *U* in the form *c-ꜣ* + *c-w* = *c0* +*Uc* = *c.Uc*. The other is written with *w* = *U* in the form *c-w* + *c-ꜣ* = *cU* +*c0* = *cU.c*. They are:

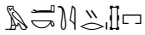
I.1	a jar	 jkn	jA.kU.nA ⬇ jAkUnA	*ʔvkʲa:/o:nv	ⲁⲕⲱⲛⲉ ăkʲo:nə
I.7	chariot	 mrkbt	mA.ʸr0.k0.Ub.tA ⬇ mArkUbt(A)	*mvrkʲa/obtv	ⲃⲣⲥⲟⲟⲩⲧ bərkʲʲowt

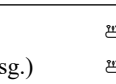
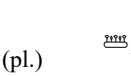
§5.2 Period 2

• Non-Back Vowels

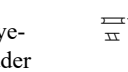
As for Period 2, 24 words with a stressed *non-back* vowel are attested. All of them are written without *w*. For 14 of them, the stressed vowel could be reconstructed either as a *non-back* /i/ or /i:/, or as a *back* /u/ or /u:/. The Egyptian spellings, however, point to a *non-back* vowel. Reliable related Semitic forms can be identified for 3 of these words, and for 2 of them they clearly support the presence of a *non-back* vowel. The Semitic evidence for the third one is problematic and not conclusive.

Egyptian /a/ = A > Coptic o

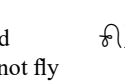
II.2	sea	 ym	yA.m(A) ⬇ yAm(A)	*yʲam	ⲉⲓⲟⲙ jʲom
II.6	wagon, chart	 ʕgrt	ʕA.gA.r0.tA ⬇ ʕAgArtA	*ʕvgʲaltv	ⲁⲥⲟⲗⲧⲉ ăkʲʲoltə
II.9	a fish	 bry	bA.ʸr0.yA ⬇ bAryA	*bʲaryv	ⲫ/ϥ/ⲃⲟⲣⲓ (B/B/S) ⲃⲱⲣⲉ (S) bʲorə bʲo:rə
II.20	stronghold	 mktr	mA.k0.tA.ʸr0 ⬇ mAktAr	*mvktʲar	ⲙⲉⲥⲧⲟⲗ (ⲃ) məkʲtʲol

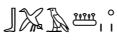
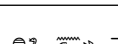
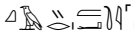
II.28	tooth, fang	 ḫⁿr ḫ₂r	ḫA.n₁r0 ⬇ ḫAⁿr	*ḫˈaⁿr *ḫ₂ˈar	⳩ⲟⲗ šˈol
II.34a	staff, rod (sg.)	 šbd	šA.bA.dA/d0.ə ⬇ šAbAdA/də	*švbˈad	⳩ⳙⲃⲟⲧ (S) šəbˈot
II.34d	staff, rod (pl.)	 šbd	šA.bA.d0.ə ⬇ šAbAdə	*švbˈadyv	⳩ⳙⲃⲟϯ (B) šəbˈotə
II.41	couch, bed	 krk	kA.rA.k(A) ⬇ kArAk(A)	*kvlˈak	ⲥⲗⲟⲥ kʲəlˈokʲ
II.42	hair-cloth, sacking, sack	 gwn	gA.w0.nA ⬇ gAwnA	*kˈawnv	ⲍⲟⲟⲩⲛⲉ kʲˈownə

Egyptian /i:/ = A > Coptic (ⲉ)ⲓ

II.1	a purple dye-plant, madder	 jp	jA.pA ⬇ jApA	*ʔvpˈi:(cv)	ⲁⲣⲉⲓ ăpˈi:
II.5	lentil	 ʕršn	ʕA.ʸr0.šA.nA ⬇ ʕAršAnA	*ʕvršˈi:/u:nv	ⲁⲣⲩⲓⲛ ăršˈi:n

Egyptian /i/,/u/ = A > Coptic ⲁ, ⲉ, 0; Egyptian /i:/,/u:/ = A > Coptic ⲏ, (ⲉ)ⲓ

II.7	young bird which cannot fly	 wr	wA.ʸr0 ⬇ wAr	*wˈi/ur	{ⲙⲁⲍ}ⲟⲩⲁⲗ wˈal
II.10	God Bes	 bs	bA.sA ⬇ bAsA	*bˈi:/u:sv	ⲃⲏⲥ bˈe:s
II.11	pail, bucket	 bs	bA.sA ⬇ bAsA	*bˈi:/u:sv	ⲃⲏⲥⲉ bˈe:sə

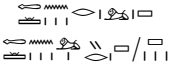
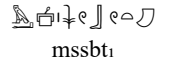
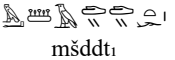
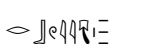
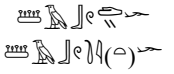
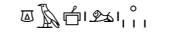
II.12	some fruit, malt	 bš	bA.šA ⬇ bAšA	*bʿi/uʔšv > *bʿi/ušʔv	ʙɛ(є)ɯ ʙн(н)ɯ bʿe(:)ʔš
II.22	husband	 hy	hA.y0 ⬇ hAy	*hʿi/uy	ʔʌı hʿaj
II.31	forecourt	 ḫt	ḫA.tA ⬇ ḫAtA	*ḫʿi/utvj > *ḫʿi/ujtv	ʔʌєıт hʿajt
II.32	lettuce, garlic	 ḫtn	ḫʸA.ṯA.nA ⬇ ḫ₂AṯAnA	*ḫ₂vtʿi:/u:nv < Sem. *ḫasi:nv	ɯ/ʔɤʜɴ (S/O) šəʤʿe:n
II.36	basket	 škrʕ	šA.kA.rA.ʕA ⬇ šAkArAʕA	*švkʿi:/u:rvʕv	ɯкıʌ šəkʿi:l
II.37	ashes, cinders, embers	 qrmt	qA.ʸr0.mA.tA ⬇ qArmAtA	*kʿi/urmv(t) < Sem. —	к(є)ꝑнє kʿermə
II.38	burnt-offering	 qrr	qA.rA.rA ⬇ qArArA	*qvrʿi:/u:rv	ɞʌıʌ kʲəlʿi:l
II.39	precious stone	 qrt	qA.r0.tA ⬇ qArtA	*qʿi/ultv	ɞʌтє kʲʿeltə
II.44	heap, hillock	 tⁿr	tA.n₁r(.ə) ⬇ tAⁿr(ə)	*tʿi/uⁿr(rv) < Sem. *til(lv)	тʌʌ tʿal
II.47	self-bent rods	 ḏⁿr	ḏA.n₁r0 ⬇ ḏAⁿr	*ḏʿi/uⁿr	ɤʌʌ (B) ʤʿal

• Back Vowels

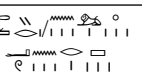
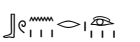
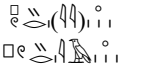
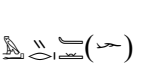
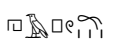
There are 26 words that display or may display a *back* vowel. In 19 of them, the stressed vowel could be reconstructed both as *non-back* or *back*, but the Egyptian spelling clearly point to a *back* vowel. Related Semitic forms are attested for 7 of them, and they all support the presence of a *back* vowel (§6). All of these 26 words are written with *w* = *U*.

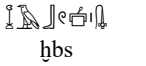
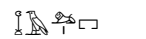
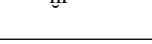
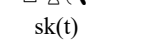
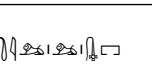
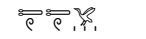
7 of them according to the form *c-w + c = cU + c = cU.c*.
9 according to the form *c + c-w = c +Uc = c.Uc*.
4 according to the form *c-w + c-w = cU + Uc = cUc*.
3 both according to the form *c-w + c = cU + c = cU.c* and *c + c-w = c +Uc = c.Uc* or with a cluster *r+c*, in the form *c + ʸr + c-w = Urc = c.Urc*.
2 in both the forms *c-w + c = cU + c = cU.c* and *c-w + c-w = cU + Uc = cUc*.
In 1 case, *w = U* follows a cluster *r+c*, in the form *c + ʸr + c-w = Urc = c.Urc.*

Egyptian /a:/ > /o:/ = U > Coptic ⲱ, ⲟⲩ

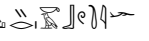
II.4	stones, rocks, pebbles	 ʕⁿrr	ʕA.n$_{i}$r0.Ur ʕA.n$_{i}$rU.ʸr0 ⬇ ʕAⁿrUr	*ʕvⁿrˈo:rv	ⲁⲗⲱⲗⲉ ălˈo:lə
II.18	metal tool	 mssbt$_{i}$	mA.sA.sU.Ub.ə ⬇ mAsAsUbə	*mvsvsˈo:bv	(ⲉ)ⲙⲥⲱⲃⲉ məsˈo:bə
II.19	comb	 mšddt$_{i}$	mA.š0.dU.Ud.ə ⬇ mAšdUdə	*mvšdˈo:dv	ⲙⲯⲧⲱⲧⲉ məštˈo:tə
II.21	lioness, she-bear	 rb(y)	rA.bU.yA ⬇ rAbUyA	*rvbˈo:y(v)	*ⲗⲁⲃⲱⲓ *lăbˈo:j
II.34b	staffs, rods (pl.)	 šbd	šA.bU.d(A) šA.b0.Ud(.ə) ⬇ šAbUd(ə)	*švbˈo:dv	ⲯⲃⲱⲧ (S) šəbˈo:t
II.34c	staff, rod (sg.)	 šbd	šA.bU.Ud šA.bU.t0(.ə) ⬇ šAbUd(ə)	*švbˈo:dv	ⲯⲃⲱⲧ (B, S?) šəbˈo:t
II.43	finger-ring	 gsr	gA.s0.Ur ⬇ gAsUr	*gvsˈo:rv	ⲕⲥⲟⲩⲣ kəsˈu:r

Egyptian /i/,/u/ = U > Coptic ⲁ, ⲉ; Egyptian /i:/,/u:/ = U > Coptic ⲏ, (ⲉ)ⲓ

II.3	pebble	 ʕⁿ/ʸ(r)r	ʕ0.Un$_1$/ʸ(r)r ʕU.n$_1$ʸr0 ⬇ ʕUⁿr	*ʕˈi/ur	ⲁⲗ ˈal
II.8	ball of eyes	 bⁿr	bU.n$_1$r0 ⬇ bUⁿr	*bˈi/uⁿr	ⲃⲁⲗ bˈal
II.13	bean	 pr(y) pr(j)	pU.rA(.yA) ⬇ pUr(yA)	*pˈi/ur(yv) < Sem. *pu:l	ⲫⲉⲗ (B) pʰˈel
II.14	spear, javelin	 mrḥ	m0.Uʸrḥ ⬇ mUrḥ	*mˈi/urḥv < Sem. *murḥv	ⲙⲉⲣ(ⲉ)ʔ ⲙⲉⲣⲉ/ⲏʔ mˈerəh mərˈeːh
II.16	basket, box	 mḫr	mA.ḫʸ0.Ur ⬇ mAḫ$_2$Ur	*mvḫ$_2$ˈiː/uːrv	ⲙⲯⲓⲣ məšˈiːr
II.17	6th month	 mḫr	mA.ḫ0.Ur ⬇ mAḫUr	*mvḫˈiː/uːrv	ⲙⲯⲓⲣ məšˈiːr
II.23	law(s)	 hp	h0.Up ⬇ hUp	*hˈi/up	ϩⲁⲡ hˈap
II.24	fare	 hm	h0.Um ⬇ hUm(A)	*hˈiː/uːmv	ϩⲏⲙⲉ hˈeːmə
II.25	vinegar	 ḥmḏ	ḥU.m(A).ḏ(A) ⬇ ḥUm(A)ḏ(A)	*ḥˈiː/ uːmvḏ(v) *ḥˈiv/umḏv < Sem. *ḥumṣv	ϩⲏⲙϫ ϩⲙϫ hˈe(ː)mʤ
II.26	flower	 ḥrr(t)	ḥU.rU.Ur ⬇ ḥUrUr	*ḥvrˈiː/uːrv	ϩⲣⲏⲣⲉ hrˈeːrə

II.27	lamp	 ḫbs	ḫ0.Ub.sA ⬇ ḫUb(A)sA	*ḫˈi:/u:bvsv	ƨ/ƨʜʁc (S/B) hˈe:bs
II.29	road, street, quarter	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈi:/u:rv < Sem. *ḫur(r)v	ƨıᵽ hˈi:r
II.30	Syrian	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈu/ir(rv) < Sem. *ḫur(rv)	ʔᗅλ hˈal
II.33	ass's foal	 sk(t)	s0.Uk(.ə) ⬇ sUk(ə)	*sˈi:/u:kv	cʜơ sˈe:kʲ
II.35	dust	 šḥq	šA.ḥU.qA ⬇ šAḥUqA	*švḥˈi:/u:qv	ꟽ(ƨ)ıϭ šəhˈi:kʲ
II.45	oven	 trr	tA.rU.Ur ⬇ tArUr	*tvrˈi:/u:r(v) < Sem. *tv(n) nu:r(v)	ᴛᵽıᵽ tərˈi:r
II.46	sparrow	 tt	t̲U.t̲0 t̲U.Ut̲ ⬇ t̲Ut̲	*t̲ˈi/ut̲	ɤʌɤ ʤˈadʒ
II.48	scorpion	 d̲ry(t)	d̲A.n$_1$r0.rU.yA ⬇ d̲Aⁿ(r)rUyA	*d̲vⁿrˈi:/u:yv	ơʌʜ kʲlˈe:
II.49	jar, bowl	 d̲ḫrt	d̲A.ḥU.ʸr0.tA ⬇ d̲AḥUrtA	*d̲vḥˈi/urtv > *d̲vrˈi/uḥtv < Sem. *ṣvluḥi:t / *ṣvlloḫtv	xʌʌƨтc ʤəlˈahtəs

Moreover, 2 words display a stressed vowel preceded by a /k/. Both are written with *w* in the form *c-𓅱 + c-w = c0 +Uc = c.Uc*. They are:

II.15	chariot	 mrkbt	mA.ʸr0.k0.Ub.tA ⬇ mArkUbt(A)	*mvrkˈa/obtv	ʁpơooʏт bərkʲˈowt

II.40	(palm of) hand	 kp	k0.Up ⬇ kUp	*kʲa/op	ⳟⲟⲡ kʲop

§5.3 Period 3

• Non-Back Vowels

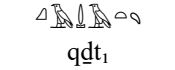
Only 21 words from Period 3 are attested in the corpus. 10 display a stressed *non-back* vowel, and they are all written without *w*. In 5 of them, the stressed vowel could be reconstructed either as /i:/ or as /u:/. The Egyptian spelling, however, points to a *non-back* vowel. Related Semitic forms can be reliably identified for 3 of them. The evidence they provide clearly support the presence of a *non-back* vowel.

Egyptian /i/,/u/ > /e/ = A > Coptic ⲁ, ⲉ, 0

III.3	stones, rocks, pebbles	 ʕⁿr	ʕA.nₗʸr0 ⬇ ʕAⁿr	*ʕʾeⁿr	ⲁⲗ ʾal
III.6	some fruit, malt	bš	bA.šA ⬇ bAšA	*bʾešʔv > *bʾeʔšv	ⲃⲉ(ⲉ)ⲥ (S/B) ⲃⲏ(ⲏ)ⲩ (S/B) bʾeʔš
III.8	back of head	mkḥ	mAk.ḥA ⬇ mAkḥA	*mʾekḥv	ⲙⲁⲕϩ mʾakh
III.10	husband	hy	hA.y0 ⬇ hAy	*hʾey	ϩⲁⲓ hʾaj
III.22	sparrow	tt	t̲A.t̲A ⬇ t̲At̲A	*t̲ʾet̲	ⳝⲁⳝ ʤʾaʤ

Egyptian /i:/,/u:/ = A > Coptic ⲏ, ⲓ

III.4	lentil	ʕršn	ʕA.ʸr0.šA.nA ⬇ ʕAršAnA	*ʕvršʾi:/u:nv	ⲁⲣⲯⲓⲛ ăršʾi:n

III.13	commerce, associate, companion	 ḫbr	ḫA.bA.(ʸ)r0 ⬇ ḫAbAr	*ḫvbˈi:/u:r < Sem. *ḫabˈer	⳩ʙнр ḫvbˈi:/u:r
III.18	burnt-offering	 qrr	qA.rA.rA ⬇ qArArA	*qvrˈi:/u:rv	ɷλιλ kʲəlˈi:l
III.19	back of hand	 qḏt₁	qA.ḏ0.ə ⬇ qAḏə	*qˈi:/u:ḏv	ɷɪɤ kʲˈi:ʤ
III.23	shrine, naos, inner sanctuary	 dbr	dA.bA.ʸr0 ⬇ dAbAr	*dvbˈi:/u:r < Sem. *dəbˈi:r	ⲧⲁ⳩ⲓⲣ tăbˈi:r

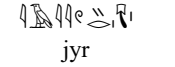
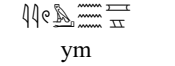
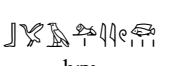
<u>• Back Vowels</u>

A stressed *back* vowel characterises instead 11 words, which are all written with *w* = *U*. The stressed vowel of 3 of them could be reconstructed either as /i:/ or as /u:/. The Egyptian spellings suggest a *back* vowel, and the Semitic evidence, available for both of them, supports this interpretation.

5 are spelled according to the form *c-w* + *c* = *cU* + *c* = *cU.c*, while 4 according to the form *c-w* = *c* +*Uc* = *c.Uc*.

2 are spelled according to the form *c-w* + *c-w* = *cU* + *Uc* = *cUc*.

Egyptian /a/ > /o/ = U > Coptic ⲟ; Egyptian /a:/ > /o:/ = U > Coptic ⲱ

III.1	stag, ram	 jyr	jA.yU.rA ⬇ jAyUrA	*ʔvyˈo:rv	ⲉⲓⲟⲩⲗ jˈu:l
III.2	sea	 ym	yU.m0 ⬇ yUm	*yˈom	ⲉⲓⲟⲙ jˈom
III.5	a fish	 bry	b0.Ur.y(U)/(U)y ⬇ bUry(U)/(U)y	*bˈoryv	ⳬ/ⲫ/ⳳⲟⲣⲓ (B/B/S) ⳳⲱⲣⲉ (S) bˈorə bˈo:rə

III.9	stronghold	mktrt$_1$	mAk.dU.Ur(.ə) ⬇ mAkdUr(.ə)	*mvkdˈol	ⲙⲉⲥⲧⲟ/ⲱⲗ (B/S) məkɨtˈo/oːl
III.15	veils, thin cloth, purse	ḫrd	ḫʸ0.Uʸrd ⬇ ḫ$_2$Uʳd	*ḫ$_2$ˈord(v)	ⲯⲟⲣⲧ šˈort
III.16	leaf, lotus	srpt	sA.ʸr0.pU.t(A) ⬇ sArpUt(A)	*svrpˈot(v)	ⲥⲁⲣⲡ/ⲫⲟ/ⲁⲧ (O/B) sărpˈot
III.17	staffs, rods	šbd	šA.b0.Ud.y(A) ⬇ šAbUdy(A)	*švbˈodyv	ⲯⲃⲟϯ (B) šəbˈotə
III.21	violence, injustice	 gns	gA/U.n0.sA ⬇ gA/UnsA	*gˈonsv	ⲥⲟⲛⲥ kʲˈons

Egyptian /iː/,/uː/ = U > Coptic ⲏ, ⲓ

III.11	vinegar	ḥmḏ	ḥU.m0.ḏ(A) ⬇ ḥUmḏ(A)	*ḥˈiː/uːmvḏ(v) *ḥˈi/umḏv < Sem. *ḥumṣv	ϩⲛⲁϫ ϩⲁϫ hˈe(ː)mdʒ
III.12	flower	ḫrr(t)	ḫU.rU.Ur ⬇ ḫUrUr	*ḫvrˈiː/uːrv	ϩⲣⲏⲉ hrˈeːrə
III.14	road, street, quarter	ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈiː/uːrv < Sem. *ḫur(r)v	ϩⲓⲣ hˈiːr

Finally, 2 words display a stressed vowel preceded by a /k/. All of them are written either with = *kU/Uk* or with *w* = *U*. They are:

III.7	chariot	mrkbt	mA.ʸr0/Ur.k0.Ub.tA ⬇ mA/UrkUbt(A)	*mvrkˈobtv	ⲃⲣⲥⲟⲟⲩⲧ bərkʲˈowt
III.20	sole of foot	 kp	k0.Up ⬇ kUp	*kˈop	ⲥⲟⲡ kʲˈop

§6 Egyptian *i/*u and *i:/*u: in light of the Semitic evidence

The present interpretative model allows to define the Egyptian vocalisations of words for which the Coptic data alone are ambiguous. In particular, Coptic vowels ϵ = /e/, ϩ = /e:/, and in some cases ι = /i:/ can derive from both the Egyptian vowels /i/ and /i:/, and /u/ and /u:/, and there is generally no way to determine the right ancestor without external data.[45] Since however /i/ and /i:/ are *non-back* vowels, while /u/ and /u:/ are *back* vowels, they are distinguished in group writing transcriptions by the absence or presence of the marker *w*. Some of these words appear to be Semitic loans, and the comparison with related Semitic forms, when available, confirms the validity of this approach.

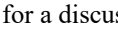
As discussed in the introduction, using Semitic data to establish the vocalic value of the groups is problematic for various reasons. Semitic forms, however, can provide precious information to verify the values defined through other sources like Coptic, as it is the case here. Naturally, issues concerning dialectal variations in Semitic, as well as the problem that the actual borrowing of a word may predate its first attestation in the Egyptian sources of decades or even centuries, have to be considered. As it appears, however, in almost all of the cases the evidence is very clear, and in agreement with the value suggested by the group writing spelling. Only one case is too ambiguous to be conclusive, and this because the Semitic evidence itself is problematic and contradictory.

Related Semitic forms can be identified for 13 words in the corpus whose stressed vowel can be reconstructed as either /i/ or /i:/, or /u/ or /u:/.

They are the following:

Coptic ⲁ/0 < A ~/i/ – Semitic /i(:)/

• I.22 “shield”

Earliest Attestation	Group Writing	Transliteration	Reconstruction	Semitic Prototype
Period 1		qArAʕA	*qˈi/ulʕv	*qilʕv

Related vocalised Semitic forms:[46] Arb. *qilʕ* “sail” ; Arm. *qilʕā* “curtians”, “sail”; Heb. *qɛlaʕ* “slingshot” ; Syr. *qilʕ* “sling”, “sail” (Hoch 1994, 299, no. 432).
Notes: See Hoch for a discussion of the semantic shift.

• II.44 “heap”, “hillock”

Period 2		tAⁿr(ə)	*tˈi/uⁿr(rv)	*til(lv)

45 Such as contemporary Akkadian transcriptions.

46 Abbreviations: Akk. – Akkadian; Arb. – Arabic; Arm. – Aramaic; Heb. – Hebrew; Syr. – Syriac; Ugr. – Ugaritic.

Related vocalised Semitic forms: Akk. *tillu* “hill”; Arb. *tall* “hill”; Arm. *tillā* “hill”; Heb. *tel* “hill”; Syr. *tellā* “hill” (Hoch 1994, 356–7, no. 527).
Related non-vocalised Semitic forms: Ugaritic *tl* “hill”
Notes: Arabic *a* is possibly irregular.

Coptic ⲁ/ⲉ < U ~/u/ – Semitic /u(:)/

• I.15, II.30 “Syrian”

Period 1		ḫUr	*ḫˈi/ur(rv)	*ḫur(rv)

Related vocalised Semitic forms: Akk. *ḫurrv* “Hurrian”, Heb. *ḥōrī* “name of a population” (see Loprieno 1995, 46)
Notes: Attested also as *Pa-ḫura* in the cuneiform transcriptions of the Egyptian name *pꜣ-ḫr* in the Amarna letters (EA 122.31). Ultimately from Hurrian.

• I.6, II.14 “spear”, “javelin”

Period 1		mUrḥ	*mˈi/urḥv	*murḥv

Related vocalised Semitic forms: Arb. *rumḥ* “spear”; Arm. *rumḥā* “spear”; Heb. *rōmaḥ* “spear”; Syr. *rumḥā* “spear” (Hoch 1994, 139, no. 179)
Related non-vocalised Semitic forms: Ugaritic *mrḥ* “spear”; Old South Arabic *rmḥ* “spear”
Notes: Ugaritic present the same *r-m* > *m-r* metathesis attested in the Egyptian form, thus suggesting a northern origin for the loan.

• II.13 “bean”

Period 2		pUr(yA)	*pˈi/ur(yv)	*pu:l

Related vocalised Semitic forms: Arb. *fūl* “ful beans”; Arm. *pōlā* “ful beans”; Heb. *pōl* “ful beans” (Hoch 1994, 118, no. 150)
Related non-vocalised Semitic forms: Phoenician *pl* = “(ful?) beans”

• II.49 “jar”, “bowl”

Period 2		ḏAḥUrtA	*ḏvḥˈi/urtv	*ṣvluḥi:t

Related vocalised Semitic forms: Amarna Cananite *ṣillaḫta* “a jar”; Arm. *ṣəluḥītā* “flask”; Heb.1 *ṣallaḥat* “dish”; Heb.2 *ṣəloḥīt* “jar”; Syr. *ṣəluḥītā* “flask” (Hoch 1994, 394, no. 593).
Notes: the Egyptian form seems to come from a form akin to Arm., Heb.2 and Syr., with consequent metathesis and deletion of unstressed /i/ thus: Sem. **ṣvluḥīt* > Eg. **ṣvluḥit* > Eg. **ṣvḥultv*.

Coptic ⲓ/ⲏ < A ~/i:/ – Semitic /i(:)/

• II.32 “lettuce”, “garlic”

Period 2		ḫ₂AṯAnA	*ḫ₂vtʿi:/u:nv	*ḫasi:nv

Related vocalised Semitic forms: Akk. *ḫaṣṣū* (pl.) “lettuce”; Arb. *ḫass* “lettuce”; Arm. pl. *ḥāsīn* (sg. *ḥāsā*) “lettuce”; Heb. *ḥāsīt* “leek plants (including garlic and onions)”; Syr. *ḥassətā* “lettuce” (Hoch 1994, 253, no. 355)
Notes: Akkadian always plural. The Egyptian form likely comes from a plural with nunantion, akin to the Aramaic form. See also Hittite *ḫa-az-zu-wa-ni-iš* “lettuce” and Sumerian *ḫi-iz*^{SAR} “lettuce”

• III.23 “shrine”, “naos”, “inner sanctuary”

Period 3		dAbAr	*dvbʿi:/u:r	*dəbi:r

Related vocalised Semitic forms: Heb. *dəbīr* “inner sanctuary” (Hoch 1994, 376, no. 561)
Related non-vocalised Semitic forms: Punic *dbr* “inner sanctuary”
Notes: the Egyptian form was clearly borrowed from a dialect where the stress had already moved to the last syllable, like in Hebrew.
It is also worth noting that at this time the length of the Egyptian vowels is clearly not conditioned any more to the nature of the syllable in which they appear, and therefore a long vowel /i:/ may be used to render a Semitic /i:/ even in a close syllable, as indicated by the group  .

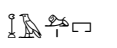
• III.13 “commerce”, “associate”, “companion”

Period 3		ḫAbAr	*ḫvbʿi:/u:r	*ḫaber

Related vocalised Semitic forms: Heb. *ḥāber* “associate” (Hoch 1994, 241, no. 333).
Related non-vocalised Semitic forms: Arb. *ḫbr* “to negotiate”
Notes: it is impossible to say if it was borrowed as /i:/ and then turned into /e:/ within Egyptian, or if it was already borrowed as /e:/. The Egyptian form was clearly borrowed from a dialect where the stress had already moved to the last syllable, like in Hebrew.

Coptic ⲓ/ⲏ < U ~/u:/ – Semitic /u(:)/

• I.14, II.29, III.14 “road”, “street”, “quarter”

Period 2		ḫUr	*ḫʿi:/u:rv	*ḫur(r)v

Related vocalised Semitic forms: Akk. *ḫurru* “hole”, “cave”; Heb. *ḥōr* “hole” (Hoch 1994, 247, no. 343)
Notes: see Hoch for the semantic development “hole”, “cave” > “street”, which is attested in the Egyptian sources.

• II.45 “oven”

Period 2		tArUr	*tvrʿi:/u:r(v)	*tv(n)nu:r(v)

Related vocalised Semitic forms: Akk. *tinūru* “oven”; Arb. *tannūr* “oven”; Heb. *tannūr* “oven”; Syr. *tannūrā* “oven” (Hoch 1994, 359, no. 351).
Related non-vocalised Semitic forms: Ugaritic *tnrr* “oven”
Notes: the first /r/ of the Egyptian form is usually assumed to be due to assimilation to the second /r/ (so Hoch). I wonder however if it could indicate that the word originates from a northern dialect akin to Ugaritic. If we assume a vocalisation **tvnrur* for the Ugaritic form, a loan from a similar form with subsequent simplification of the cluster **tvnrur* > *tv(r)rur* could also be a valid explanation.

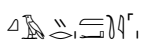
• II.25, III.11 “vinegar”

Period 2		ḥUm(A)ḏ(A)	*ḥʿi:/u:mvḏ(v) *ḥʿi/umḏv	*ḥumṣv

Related vocalised Semitic forms: Arm. *ḥūmʕā* “vinegar”; Heb. *ḥōmɛṣ* “vinegar” (Hoch 1994, 228, no. 316)
Related non-vocalised Semitic forms: Epigraphic Hebrew *ḥmṣ* “sour wine”, Ugaritic *ḥmṣ* “sour wine”.

Coptic ⲁ/0 < A ~/i/ – Semitic non-conclusive

• II.37 “ashes”, “cinder”, “embers”

Period 2		qArmAtA	*kʿi/urmv(t)	—

Related vocalised Semitic forms: Akk. *gumāru* “burning coal”; Arb. *jamra* “live coal”; Arm. *gūmartā* “burning coal”; Syr. *gəmurtā* “live coal” (Hoch 1994, 301, no. 435).
Related non-vocalised Semitic forms: Ugaritic *gmr* “burning coal”
Notes: The Semitic evidence is contradictory and inconclusive, and does not allow to suggest a single common prototype. The Akkadian form is a hapax, and it is likely directly related with the Aramaic one. It is however unclear if it is a loan from Akkadian into Aramaic, or from Aramaic into Akkadian (Abraham and Sokoloff 2012, 32). The Arabic form is related, but displays a clearly different vocalic pattern. The Egyptian form could derive from yet another unattested Semitic form characterised by a vowel /i/.

§7 Synchronic analysis

The distribution of groups with *ꜣ = A,* with *ꜣ = 0* and of isolated consonantal signs for marking stressed *non-back* vowels does not seem to reveal any clear pattern.

One cannot exclude that further studies may reverse this observation, but on the basis of the current evidence it looks like groups with *ꜣ = A/0* and single consonantal signs without it are functionally equivalent, and both can transcribe consonants followed by stressed *non-back* vowels (i.e. *–c ˈA–*), consonants followed by unstressed vowels (i.e. *–cv–*), which may have already been realised as /ə/, as well as consonants in final position or consonants followed by other consonants (i.e. *–c#* and *–c.c–*).

By contrast, some tendencies and patterns seem to emerge from a careful analysis of the forms displaying a stressed *back* vowel.

In particular, the evidence suggests that the use of *c-w = cU* or *c-w = Uc* may correlate in some way with the position of the stressed vowel within the word and in relation with the surrounding consonants.

Four specific environments, associated with specific spelling sequences, are identifiable:

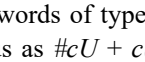
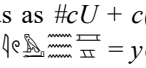
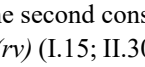
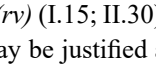
1)	#c-w + c(ꜣ) – = #cU + c(A)– = #cU.c–	attested 6 times
2)	–c(ꜣ) + c-w# = –c(A) + Uc# = –c.Uc#	attested 15 times
3a)	$–c_1$-w + c_1-w– = $–c_1U + Uc_1– = –c_1Uc_1–$	attested 4 times
3b)	$–c_1$-w + c_2-w– = $–c_1U + Uc_2– = –c_1Uc_2–$	attested 3 times
4a)	–cw + c(ꜣ) – = –cU.c(A)–	attested 12 times
4b)	–c(ꜣ) + c-w + c(ꜣ) – = –c(A) + Uc– = –c.Uc.c–	attested 4 times

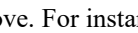
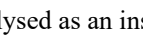
where:

= beginning/end of word,

– = any segment, including beginning/end of word.

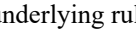
The meaning of these patterns is difficult to assess, although some observations are possible.

First, it is clear that these four environments may overlap, and therefore multiple valid spelling may exist for structurally similar words, or even for the same word. For instance, monosyllabic words of type *#cUc#* may appear either written with *w = U* after the first consonant, thus as *#cU + c(A) = #cU.c–*, such as  = *bU.n₁r0 = bUⁿr = *bˈi/ uⁿr* (II.8) and  = *yU.m0 = yUm = *yˈom* (III.2), or may also appear with *w = U* written after the second consonant, thus as *c(A) + Uc# = –c.Uc#*, such as  = *ḫ0.Ur = ḫUr = *ḫˈur(rv)* (I.15; II.30) or  = *k0.Up = kUp = *kˈop* (III.20). In the first case, the spelling may be justified as a manifestation of environment 1), while in the second it looks like a manifestation of environment 2). Other words can also be spelled in multiple, equivalent ways, that can be explain according to either one or another of the environments

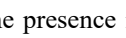
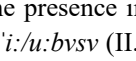
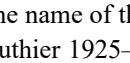
above. For instance, the spelling  = *ʕA.n$_1$r0.Ur = ʕA^{n}rUr = *ʕv^{n}r'o:rv* can be analysed as an instance of environment 2, while the alternative spelling  = *ʕA.n$_1$rU.^{y}r0 = ʕA^{n}rUr = *ʕv^{n}r'o:rv* can be associated with environment 4a).

The reasons for favouring one spelling over the other are not clear, although the fact that most words seem to be written rather consistently in only one specific way suggests that the phenomenon was not totally random. Further studies, however, would be needed to identify the underlying rules, if they existed.

Right now, we can only observe that in the case of the environment 1), it is likely that a *w* = *U* after the first consonant can only be pronounced there where it is written, because as far as we know, pre-Coptic Egyptian words could not begin with a stressed vowel, but only with a consonant (Loprieno 1995, 37, 40).

Moreover, the third environment is characterised by the presence of a *w* = *U* in two consecutive groups, such as in the case of  = *tA.rU.Ur = tArUr = *tvr'u:r(v)* (II.45). It appears that in most cases, such groups share the same vowel, and at the same time all *back* vowels between identical consonants attested in the corpus are spelled in this way.[47] This consistency in spelling can hardly be accidental. One can thus suggests the presence of an orthographic rule according to which a *back* vowel between two identical consonants should be spelled by reduplicating the corresponding *c*-*w* group. However, sequences with *back* vowel between different vowels, namely *–c$_1$*-*w* + *c$_2$*-*w–*, are also attested. In these cases, the reasons for such spellings are unclear, but it is reasonable to assumed that, like the previous ones, these sequences should also be interpreted as *–c$_1$*-*w* + *c$_2$*-*w–* = *–c$_1$U* + *Uc$_2$–* = *–c$_1$Uc$_2$–*. Some caution, however, is due: since the nature of the unstressed vowels remain out of our reach, one cannot exclude *a priori* that, at least in some cases, such spellings were indeed meant to transcribe a *–c$_1$U* + *c$_2$U–* = *–c$_1$Uc$_2$U–* sequence.

Finally, the data for Environment 4 strongly suggest that within a word, a *CU* group is by far more likely to transcribe a *CU* sequence rather than a sequence *UC*. This seems to be especially true when such group corresponds to the second consonant of the word (i.e. a *#cv.cU–* context): in 7 attestations over 9, such groups transcribe *CU* sequences. It would be tempting to correlate this observation with Environment 1, and to suggest that a *CU* group in second position, i.e. in a *#cv.cU–* syllabic sequence, can be assumed to represent *CU* rather than *UC*, because a syllabic sequence *#cU.c–* would already be covered by Environment 1, making a spelling *#c0.UC–* = *#c.UC–* for such syllabic sequence rather superfluous.

However, the presence in the corpus of two words, namely  = *ẖ0.Ub.sA = ẖUb(A)sA = *ẖ'i:/u:bvsv* (II.27) and  = *b0.Ur.y(U)/(U)y = bUry(U)/(U)y = *b'oryv* (III.5), which do use the spelling *#c0.UC–* to transcribe a sequence *#cUc–*, calls for attention. The name of the city of Ugarit, usually written in the Egyptian texts as  (see Gauthier 1925–1931, I.110 for examples) and to be read as *ʔ0.Uk.r^{y}A.t(A)* =

47 The only exception is *tt* = "sparrow" (II.46), which is spelled in two ways, namely  , thus according to the rule, but also  , thus in a irregular way. In light of what just discussed, the second spelling may be a scribal mistake.

ʔUk(A)rAt(A), can also be cited here. The reading of the name of Ugarit is confirmed by the cuneiform sources, where it is spelled *u₂-ga-ri-it/tv* = *ʔugarītv*, and there is no possibly ambiguity: the *back* vowel /u/ was located after the first consonant, not after the second one.

The reasons for such spellings, if any, remain unclear. It is possible that they are the direct or indirect consequence of specific and consciously applied orthographic rules. If so, however, the rationale behind such rules remains to be discovered, although it would probably have to be searched in the word-based rebus nature of the group writing and in the *w*-extended orthography discussed above. It may also be that, perhaps, some consonants were somehow inherently incompatible with the marker *w* = *U*, and therefore a sequence involving such consonants followed by a *back* vowel could be transcribed only through a *c(ʒ)* + *cw* = *–c0.UC–* = *–c.UC–* spelling.

For instance, neither in the corpus nor in Hoch 1994, 510 there is any reliable attestation of the use of groups **ḫw* to transcribe the sequence *ḫU*.[48] Rather, when such sequence does occur, it is transcribed through a *ḫ(ʒ)* + *cw* = *–c0.UC–* = *– ḫ.UC–* spelling. The words  *ḫ.Ur* = “road”, “street”, “quarter” (I.14;II.29; III.14)  *ḫ.Ur* = “Syrian” (I.15; II.30) and  *ḫ.Ub.sA/0* = “lamp” (II.27) in the corpus are good examples of this.

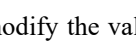
Alternatively, perhaps some sequences of consonants were strictly identified with specific words, within the rebus-nature of the group writing, and therefore were just spelled in such way because they were learnt as such.

The evidence provided by the corpus studied here is not enough to clarify these aspects, and further research is needed.

The potential theoretical ambiguity rising from the coexistence of these possible double reading of the same groups is evident. However, if one looks at the specific transcriptions of these words, one realises that in fact actual ambiguity is relatively rare.

Just to mention a few examples, the word  = **svrpʿot(v)* (III.16) could in theory be read both *sA.ʸr0.pU.t(A)* = *sArpUt(A)* or *s0.Uʸrp.t(A)* = *sUrpt(A)*, but the latter option can be safely excluded because the cluster of three consonants *rpt*, implied by the sign  , would be incompatible with the rules of Egyptian phonology as we know them, and would have probably been simplified in some way if it came from a foreign word. The same stands true for a word like  = **ḏvḥ ʿi/urtv* (II.49), where a reading *ḏA.ḥU.ʸr0.tA* = *ḏAḥUrtA* is the only possible one, because a reading *ḏ0.Uḥ.ʸr0.tA* = *ḏUḥrtA* would generate an unlikely cluster *ḥrt*. In the case of  = **ḫvlʿi:/u:lwv* (I.13), instead, the only possible reading is *ḫA.rU.r0.wɪA* = *ḫArUrwɪA*, because a reading *ḫ0.Ur.rA.wɪA* = *ḫUrrAwɪA* would imply a geminated /r/, As far as we know, however, Egyptian orthography did not spelled out geminated consonants and wrote them like normal, simple ones. Therefore, a gemnated /r/ would have likely not been spelled out with a double *r*, as this form would require (the *r* of  and that of ).

48 The only attestation recorded by Hoch,  , is not a group writing spelling but rather a case of *w*-extended orthography, and should be interpreted as *prḫ*+*w* = *prḫ*+*U* = *pUrḫ* = **poːrḫ*, from which Coptic ⲡⲱⲣϣ (S) = *poːrš*.

As it appears, the spelling of other syllables around the *c-w* group is often enough to solve the ambiguity, often thanks to the presence of a 𓏴. Moreover, the presence of a 𓏴 may trigger the application of orthographic conventions also in other contexts. For instance, cases like  = **mvḫ₂ˈi:/u:rv* (II.16) may suggest that the presence of a 𓏴 meant to modify the value of a consonant –like in the case of  = *ḫ₂–* was incompatible with the presence of a *w* = *U* in the same position. This idea seems to be supported by the absence of any  group among the hundreds of words studied by Hoch (1994, 510). This could hint to the existence of an orthographic rule according to which a string C_1UC_2 where C_1 had to be spelled with a 𓏴 sign, had to be transcribed with a sequence $c^{y}(ȝ) + cw = C^{y}(0).UC$, such as  = $ḫ^{y}(0).Ur = ḫ_2{}^{ˈ}Ur$.

These considerations may suggest that, in fact, resolving ambiguous spellings may have been a major function of the sign 𓏴, and this especially in those cases that cannot be explained as in §4.2 above. The exact rules regulating such possible use of 𓏴, however, are difficult to define on the basis of the corpus used in this study. The examples are just too few to try to extrapolate any general pattern from them. A more specific study, looking more systematically at the occurrences of 𓏴 and based on a wider corpus, including also forms unattested in Coptic, may help in clarifying this issue.

§8 Diachronic analysis

Since some of the words of the corpus are attested in different periods, the model presented in this book can be verified also from a diachronic perspective. In particular, there are 21 words attested in more than one period, and the main phonological changes postulated for the Egyptian vowels can be observed taking place through them. In particular:

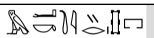
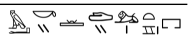
Coptic o = /o/ < Egyptian /a/

a)

	Period I			Period II			Period III		
item	id	vocalisation at the time	attested form	id	vocalisation at the time	attested form	id	vocalisation at the time	attested form
sea ym	I.2	*y'am	yAm(A)	II.2	*y'am	yAm(A)	III.2	*y'om	yUm
a fish br(y)	I.4	*b'ar(yv)	bAr(yA)	II.9	*b'aryv	bAryA	III.5	*b'oryv	bUry(U)
lotus srpt	I.17	*svrp'at	sArpAt	–	*svrp'at	– –	III.16	*svrp'ot(v)	sArpUt(A)
couch, bed krkr	I.24	*kvl'ak(kvrv)	kUrAkUrA	II.41	*kvl'ak	kArAk(A)	–	*kvl'ok	– –

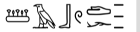
In the Coptic dialects in which it is attested, such as Sahidic and Bohairic, the shift /a/ > /o/ is usually assumed to have taken place at some point around or after 1000 BCE (see above §3.1). This development can be seen in various words of the corpus. Two of them are attested in all the periods, while one is attested only in the first two periods, and one only in the first and last. All these words are spelled without any *w* in Period 1 and 2. This is what one would expect, as at that time their stressed vowel was still the *non-back* vowel /a/. In the third period, instead, all these words are written with *w*, which implies that the presence of a *back* vowel. This, again, is exactly what one would expect, as by that time the stressed vowel /a/ is assumed to have turned into /o/.

b)

stronghold $mktrt_1$	I.9	*mvktʿa(:)l(v)	 mAktAr(A)	II.20	*mvktʿar	 mAktAr	III.9	*mvktʿor	 mAktUr(ə)

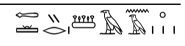
In addition, there is one word that in theory, according to the Coptic attestations, may have displayed both an /a/ > /o/ or a /a:/ > /o:/. The vocalisation in Period 1 cannot be determined, as at the time both vowels would have been perceived as *non-back* vowels. The same stands true for Period 3, whose spelling indicates a *back* vowel that could correspond to both /o/ and /o:/. However, the fact that the spelling of Period 2 implies a *non-back* vowel, rather than a *back* vowel, suggests that this word was vocalised with /a/ > /o/, as an /a:/ should have already turned into /o:/ in Period 2, and therefore should have been indicated in writing with a *w.* This therefore indicates that the Coptic variant with /o/ is the direct reflex of the Egyptian form, while the variant with /o:/ is likely a secondary development.

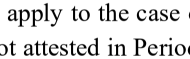
Coptic ⲱ = /o:/ < Egyptian /a:/

staffs, rods (pl.) $šbd(t_1)$	I.18	*švbʿadyv / *švbʿa:dv	 šAbAdə	II.34d	*švbʿadyv	 šAbAdə	III.17	*švbʿodyv	 šAbUdy(A)
				II.34b	*švbʿo:dv	 šAbUd(ə)			

The plural form of the word *šbd(t$_1$)* is attested in two variants in Coptic, one with stressed ⲟ = /o/ and one with stressed ⲱ = /o:/. Both forms are recognisable in Late Egyptian. The vocalisation of these two forms cannot be told apart either in Period 1, when both displayed a *non-back* vowel (/a/ or /a:/), nor in Period 3, when both such vowels had become *back* vowels (/o/ or /o:/). By contrast, they can indeed be distinguished in Period 2, when /a/ was still /a/ and was still unmarked, while /a:/ had already shifted to /o:/ and was thus marked with *w*. These parallel versions, therefore, confirm the development of both the shifts /a:/ > /o:/ and /a/ > /o/. The form attested for Period 3 can be reconstructed with a short /o/ because of the presence of  , which indicates closed syllable.

Coptic ⲓ = /i:/ < Egyptian /i:/

lentil ϥršn	–	*ϥvrš'i:/u:nv	– –	II.5	*ϥvrš'i:/u:nv	 ϥAršAnA	III.4	*ϥvrš'i:/u:n	 ϥAršAnA
burnt-offering qrr	–	*qvr'i:/u:rv	– –	II.38	*qvr'i:/u:rv	 qArArA	III.18	*qvr'i:/u:rv	 qArArA

It is usually assumed that the Coptic vowel ⲓ = /i:/ derives either from an earlier vowel /i:/, or from a vowel /u:/ when the stressed vowel is in proximity of /r/ or after a pharyngeal (Loprieno 1995, 48; Peust 1999, 231). Since neither of these conditions apply to the case of  , it can be assumed that Coptic ⲓ = /i:/ < /i:/. The word is written without -*w* in both Period 2 and 3, while it is not attested in Period 1. This spelling implies a stressed *non-back* vowel, as expected in the case of Coptic ⲓ = /i:/ < /i:/.

The same stands true also for the word *qrr*: although the Egyptian spelling display two  = *r*, the Coptic form suggest that this consonant was actually pronounced /l/. The vowel can thus be reasonably reconstructed as /i:/.

Coptic ⲏ = /e:/ < Egyptian /i:/

bucket, bs	I.5	*b'i:/u:sv	 bAsA	II.11	*b'i:/u:sv	 bAsA	–	*b'i:/u:sv	– –

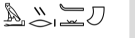
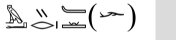
The development Egyptian /i:/ > Coptic /e:/ = ⲏ is attested by one word in the corpus. Its spelling suggests the presence of a *non-back* vowel during both Period 1 and 2. Since the group writing orthography does not allow to distinguish between /i:/ and /e:/, being all *non-back* vowels, it is not possible to determine when the specific shifts took place.

Coptic ϵ = /e/ < Egyptian /i/

a fruit bš	–	*bʿi/ušʔv	– –	II.12	*bʿi/ušʔv	 bAšA	III.6	*bʿešʔv	 bAšA

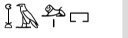
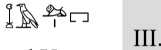
The Coptic vowel ϵ = /e/ is assumed to derive either from /i/ or from /u/. The corpus contains one word which displays a vowel /e/ in Coptic and a transcription implying a *non-back* vowel in Egyptian. The word is attested in Period 2 and 3, and both transcriptions imply *non-back* stressed vowels, as expected in the case of /i/ > /e/. Since the group writing distinguishes only between *non-back* and *back* vowel, but not between /i/ and /e/, it is not possible to use these forms to confirm that the change /i/ > /e/ took place between Period 2 and Period 3.

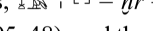
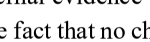
Coptic ϵ = /e/ < Egyptian /u/

spear, mrḥ	I.6	*mʿi/urḥv	 mUrḥ	II.14	*mʿi/urḥv	 mUrḥ	–	*mʿi/urḥv	– –

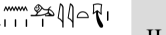
The development Coptic ϵ = /e/ < /u/ can be recognised in another word, attested only in Period 1 and 2. In both the periods this word is written with *w* = *U*; it is thus clear that the shift took place after Period 2, as in fact expected. On the basis of this evidence, however, it is not possible to say if it occurred before or after Period 3. As discussed above (§6), the *back* nature of the original stressed vowel is confirmed by the Semitic forms from which this Egyptian word was likely borrowed.

Coptic ι = /i:/ < Egyptian /u:/

street ḫr	I.14	*ḫʿu:rv	 ḫUr	II.29	*ḫʿu:rv	 ḫUr	III.14	*ḫʿu:rv	 ḫUr
dust šḥq	I.21	*švḥʿi:/u:qv	 šAḥUqA	II.35	*švḥʿi:/u:qv	 šAḥUqA	–	*švḥʿi:/u:qv	– –

As said above, it is usually assumed that the Coptic vowel ⲓ = /i:/ may come from an earlier vowel /u:/, if next to /r/ or after pharyngeal. One word of the corpus,  = *ḫr* = ϩⲣ, attests this development. It is likely that = *ḫr* comes from Semitic *ḫur(ru)* (Hoch 1994, 247–8, no. 343; Loprieno 1995, 48), and thus displayed an original /u(:)/ vowel. The word = *ḫr* is written with *w* = *U* in all the three periods, which on the one hand confirms the original *back* nature of the stressed vowel and on the other suggests that the shift /u:/ > /i:/ took place at some point after Period 3. This is a crucial observation for the understanding of such phonological development, as discussed more specifically below (§10). As for  , no external evidence can be used to infer the nature of the original vowel. The Egyptian transcriptions however consistently point to a *back* vowel, and the fact that no change is observed between the spelling of period I and period II confirms that the shift /u:/ > /i:/ took place at a later date.

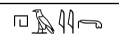
Coptic ⲏ = /e:/ or /ø:/ < Egyptian /u:/

vinegar ḫmḏ	–	*ḥˈu:mvḏ(v)	– –	II.25	*ḥˈu:mvḏ(v)	 ḤUmḏ(A)	III.11	*ḥˈu:mvḏ(v)	 ḤUmḏ(A)
flower ḫrr(t)	I.12	*ḫvrˈi:/u:rv	 ḤUrUr	II.26	*ḫvrˈi:/u:rv	 ḤUrUr	III.12	*ḫvrˈi:/u:rv	 ḤUrUr
scorpion ḏryt$_{ı}$	I.25	*ḏvⁿrˈi:/u:yv	 ḏAⁿ(r)rUyə	II.48	*ḏvⁿrˈi:/u:yv	 ḏAⁿ(r)rUyA	–	*ḏvⁿrˈi:/u:yv	– –

The Coptic vowel ⲏ may derive from either an earlier /i:/ or /u:/.

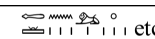
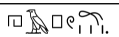
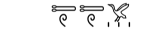
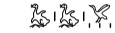
Three words in the corpus attest the second development. In the case of , the /u:/ nature of the stressed vowel is supported by the Semitic parallels (§6). In the case of and , instead, it can be inferred by the spelling with *w*, suggesting the presence of a *back* vowel. As said above (§3.1), the exact date of the development /u:/ > ⲏ is not clear. Moreover, as mentioned, it seems that Coptic ⲏ corresponded to two different *non-back* phonemes, namely an *unrounded* one –usually described as /e:/– and a *rounded* one –usually described as /ø:/–, although it is not clear how such Coptic phonemes would related with the earlier /i:/ and /u:/. In any case, what emerges from the word discussed here is that one of the ancestors of Coptic ⲏ remained a *back* vowel at least until Period 3.

Coptic ⲁ = /a/ < /e/ < Egyptian /i/

husband hy	I.10	*hʿi/uy	 hAy	II.22	*hʿi/uy	 hAy	III.10	*hʿey	 hAy

The development Egyptian /i/ > /e/ > Coptic /a/ = ⲁ is attested by one word, whose spelling suggests the presence of a *non-back* vowel during all the three Periods. Since the group writing orthography does not allow to distinguish between /i/, /e/ and /a/, being all *non-back* vowels, it is not possible to determine when these shifts took place.

Coptic ⲁ = /a/ < /e/ < Egyptian /u/

pebble ʕⁿr	–	*ʕʿi/ur	– –	II.3	*ʕʿi/ur	 ʕUⁿr	III.3	*ʕʿeⁿr	 ʕAⁿr
laws ḥp	I.11	*hʿi/up	 hUp	II.23	*hʿi/up	 hUp	–	*hʿi/up	– –
Syrian ḫr	I.15	*ḫʿu/ir(rv)	 ḫUr	II.30	*ḫʿu/ir(rv)	 ḫUr	–	*ḫʿu/ir(rv)	– –
sparrow tt	–	*ṯʿi/uṯ	– –	II.46	*ṯʿi/uṯ	 ṯUṯ	III.22	*ṯʿeṯ	 ṯAṯA

Egyptian /u/ evolves into /e/ and then into Coptic /a/ = ⲁ, except in proximity of sibilants, before /ʔ/< /ʔ/~/t/~/r/~/j/~/w/ and possibly in other phonological contexts, where it may be preserved up to Coptic as /e/ = ϵ. The first shift /u/ > /e/ is usually assumed to have taken place at some point around 1000-800 BCE (Loprieno 1995, 39 – see above §3.1), while the shift /e/ > /a/ = ⲁ followed at some later point, but still before Coptic. The development /u/ > /e/ (> /a/ = ⲁ) appears to be attested by two words in the corpus, both attested in Period 2 and 3 only. In both cases, the spellings from Period 2 indicate a *back* vowel, while those of Period 3 indicate a *non-back* vowel, thus suggesting that the first phonological shift /u/ > /e/ took place at that time, around 1000 BCE, as expected. This is indirectly confirmed by a two additional words, namely / = *ḥp*, and / = *ḫr*, which are attested in Periods 1 and 2. They are both are spelled with *w* in both periods, thus suggesting that at the time the shift had not taken place yet.

The correspondence between the readings of these words in various periods and the expected evolution of the vocalisation validates the interpretation of the group writing presented in this study. At the same time, it also confirms and in some cases allows refining our understanding of the evolution of the Egyptian vocalic system.

§9 Statistical analysis

§9.1 Theoretical background

Given the intrinsic leeway of a system that marks only two vocalic classes, and in which groups encoding *back* vowels can be read both as *cU* and as *Uc*, it is reasonable to wonder if the results presented above may actually be due to mere chance. This issue can be rephrased as a very specific probability question: with the present rules, what is the probability that a group with *-w* will always correspond to a stressed *back* vowels (either through a reading *cU* or a reading *Uc*), while a group without *-w* will always correspond to a stressed *non-back* vowel? The statistical problem underling this question is difficult to solve in a mathematical way, because multiple variables[49] play a role in the outcome. This problem, however, can be effectively addressed with an empirical statistical approach based on the so-called Monte Carlo methods.[50]

Basically, Monte Carlo methods rely on repeated random sampling to obtain empirical estimations of the probability of a given event. For instance, let us assume that we have a deck of cards. We draw 10 cards from it, and we find out that all of them are red. What is the probability of such an outcome occurred by mere chance, rather than because, for instance, someone manipulate the deck and put only red cards at the top? A possible Monte Carlo approach to solve this problem would be to perform multiple trials, each consisting in re-shuffling the deck and re-drawing 10 cards, recording each time how many black cards and how many red cards have appeared.

If enough trials are performed, the observed frequencies of the various outcomes will represent a good empirical approximation of their actual probability. If we organise the outcomes in a chart, starting from a "10 black cards" outcome and progressively moving toward a "10 red cards" one, the frequencies and therefore the probabilities of such outcomes will be distributed according to a so-called Gaussian or bell curve. The outcome "5 red, 5 black" will have the highest probability,[51] and the other outcomes will be distributed around it in a decreasing way, tending to zero toward the two edges of the chart.

A similar Monte Carlo approach can be used to assess the probability, and therefore the likelihood, that the matches between the reconstructed vocalisations and the readings of the group writing spelling suggested in this study may be due to mere chance.

The problem can be framed as follow: the number of matches between reconstructed vocalisations and suggested readings (which equals the very number of words in the corpus, as all of them can be regularly explained according to the current model) has to be compared with the number of matches that can be obtained between the same vocalisa-

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49 For instance, one has to consider that in Egyptian the frequencies of stressed *back* and *non-back* vowels are different, and that such frequencies vary depending both on the syllable in which they appear and, more in general, on the specific phonemic inventory of each period.

50 For a good, general introduction to Monte Carlo methods, see Fishman 1995.

51 Since there is an equal number of red and black cards in a deck, a 50%-50% outcome is the most probable one.

tions and the same readings when they are paired at random, over multiple trials. A match is obtained every time that, in such randomly generated pairs, the group writing spelling can be explained as a transcription of the paired vocalic pattern, according to the rules suggested for the model presented here.

If the results presented in this book were truly accidental, one would expect cases in which all group writing spellings match the corresponding randomly paired vocalic patterns to be relatively common, to be a recurrent outcome over multiple trials, and therefore to have a rather high probability to occur by chance. By contrast, if such cases happen to be overall rare, then this would strongly suggest that the results presented in this book are statistically significant and are likely not due to chance. This, in turn, would strongly suggest that the interpretative model as a whole is valid.

Such a Monte Carlo test can be easily implemented into a simple computer program that automatically performs *n* trials and counts the outcomes. The test itself can be built and encoded in various ways. A particularly easy one consists in creating an *array_1* with all the vocalic patterns attested in the corpus, an *array_2* with all the attested group writing spellings, and a *match_table* listing the various pairs of *vocalic pattern – group writing spelling* that should be considered as valid matches. The program will then perform multiple trials in which the items in *array_1* and *array_2* are first shuffled and then randomly paired. The resulting pairs will then be assessed against those recorded in the *match_table*, and the valid matches will be counted for each trial.

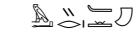
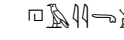
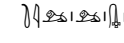
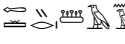
It is important to note that the corpus is composed of words displaying different numbers of syllables, and which therefore have vocalic patterns and group writing spellings of different lengths. In particular, most of the words of the corpus have either 2 or 3 syllables, while only a few are longer. This aspect has to be considered while performing the Monte Carlo test, because it is clear that each vocalic pattern should be paired only with spellings of the same length. It would not make much sense to compare, for instance, a vocalic pattern with two syllables, with a spelling composed of three groups. In order to deal with this issue, the corpus has been divided into batches of words of the same length. The Monte Carlo test has then been performed independently on the batches of disyllabic and trisyllabic words, which constitute the majority of the corpus. Longer words have been ignored, because they are too few to be meaningfully tested. I have implemented the procedure just described as a Python script, which is freely available in my github repository (https://github.com/MKilani/LingAeg_group_writing_Monte_Carlo_test).

In order to compare them, vocalic and spelling patterns need to be transcribed and encoded in a coherent way. To do so, a few factors need consideration. First, obviously, only a distinction between *non-back* and *back* vowels is needed in the transcriptions of the vocalic patterns, because only such distinction is reflected in the group writing spellings. Since only stressed vowels have been studied in the this book, unstressed vowels can be ignored in the encoding of the words and in the subsequent assessment. It has to be noted that in some cases, it is impossible to reconstruct with any certitude if the stressed vowel was a *non-back* or a *back* vowel. This is the case, for instance, of the ancestors of Coptic ϵ, which could be either /i/ or /u/ in Period 1 and 2. In these cases, the vocalic patterns must be transcribed in a way that can be matched both with the spellings implying a stressed

non-back vowel and with the spellings impying a stressed *back* one. Finally, as discussed above, preconsonantal *r-* and *n-* clustered with the following consonants. This means that from the point of view of group writing spellings, the sequences *r-* and *n-* + *consonant* behaved as single consonantal segments. Therefore, such clusters should be treated as single consonants in the transcription of the spelling patterns displaying them.

Table 3 provides a few illustrative examples of transcriptions of vocalic and spelling patterns.

Table 3 – Selected examples of transcriptions of vocalic and spelling patterns

Id Word	Meaning	Reconstructed Vocalisation	Spelling	Vocalic Pattern	Spelling Pattern
I.6	spear, javelin	*mˈurḥv		c**U**c	cc**W**
I.10	husband	*hˈi/uy		c**A/U**c	c**ȝ/0**c
I.11	law(s)	*hˈi/up		c**A/U**c	c**W**c
I.16	wool, hair	*svʕˈartv		cc**A**c	cc**ȝ/0**c
II.8	ball of eyes	*bˈi/uⁿr		c**A/U**c	c**W**c
II.30	Syrian	*ẖˈur(rv)		c**U**c	cc**W**
II.45	oven	*tvrˈu:r(v)		cc**U**c	cc**W**c**W**
III.4	lentil	*ʕvršˈi:nv		cc**A**c	cc**ȝ/0**c
…	…	…	…	…	…

Notes:
A = stressed *non-back* vowel; U = stressed *back* vowel; A/U = stressed vowel that can be reconstructed as either *non-back* or *back*; W = presence of w in the spelling; ȝ/0 = presence of ȝ, or absence of any vocalic marked in the spelling; c = any consonant.

Table 4 lists all the possible pairs of *vocalic pattern – group writing spelling* that count as positive matches.

Table 4 – List of vocalic patterns and matching spellings for disyllabic and trisyllabic words

Pairs *vocalic pattern – group writing spelling* for disyllabic words			
Vocalic pattern	*Group writing spellings*	*Vocalic pattern*	*Group writing spellings*
c**A**c	c**ȝ/0**c	c**U**c	c**W**c**W**
cc**A**	cc**ȝ/0**	cc**U**	cc**W**
c**A/U**c	c**ȝ/0**c	c**A/U**c	c**W**c
cc**A/U**	cc**ȝ/0**	c**A/U**c	cc**W**
c**U**c	c**W**c	c**A/U**c	c**W**c**W**
c**U**c	cc**W**	cc**A/U**	cc**W**

Pairs *vocalic pattern – group writing spelling* for disyllabic words			
c**A**cc	c**ɜ/0**cc	cc**U**c	ccc**W**
cc**A**c	cc**ɜ/0**c	cc**U**c	cc**W**c**W**
ccc**A**	ccc**ɜ/0**	ccc**U**	ccc**W**
c**A/U**cc	c**ɜ/0**cc	c**A/U**cc	c**W**cc
cc**A/U**c	cc**ɜ/0**c	c**A/U**cc	cc**W**c
ccc**A/U**	ccc**ɜ/0**	c**A/U**cc	c**W**c**W**c
c**U**cc	c**W**cc	cc**A/U**c	cc**W**c
c**U**cc	cc**W**c	cc**A/U**c	ccc**W**
c**U**cc	c**W**c**W**c	cc**A/U**c	cc**W**c**W**
cc**U**c	cc**W**c	ccc**A/U**	ccc**W**

Notes:
A = stressed *non-back* vowel; U = stressed *back* vowel; A/U = stressed vowel that can be reconstructed as either *non-back* or *back*; W = presence of w in the spelling; ɜ/0 = presence of ɜ, or absence of any vocalic marked in the spelling; c = any consonant.

§9.2 Results

The Monte Carlo simulation described above has been independently performed on the disyllabic and on the trisyllabic words attested in the corpus. The words have been tested first divided by period, and then all together. The results are summarised in table 5.

Table 5 – Monte Carlo simulation: results

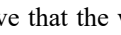
Disyllabic words				
	Period 1	Period 2	Period 3	All Periods together
Number of words:	10	23	10	43
Probability:	1.917%	0.049%	0.393%	< 0.001%
Trisyllabic words				
Number of words:	11	26	11	48
Probability:	0.209%	< 0.001%	0.011%	< 0.001%

Notes:
Probabilities of obtaining by chance a positive match for all of the words attested in the corpus in each period and all together – number of trials: 100’000.

The graphic representations of the probabilities of random matches are provided in Appendix B.

The results are clear: in all the cases, the probability of obtaining by chance a valid match for each of the pairs is extremely low. In many cases, it is so low that it cannot even be precisely estimated. These sets of data unequivocally suggest that it is statistically very unlikely that the results presented in this book are due to mere chance, and therefore they provide strong additional evidence of the validity of the system.

§10 The development of Coptic ⲏ

As mentioned above (§3.1), the development /u:/ ~ /i:/ > ⲏ is a thorny issue in Egyptian historical linguistics. The evidence presented in this book provides some new relevant data. What emerges is that during all the three periods, Coptic ⲏ could correspond to both a *non-back* and a *back* vowel. This suggests that either these two vowels never fully merged, as suggested by some scholars (see Peust 1999, 228–30), or such merging took place after Period 3. This data are in agreement with what emerged from the preliminary study of the *w*-extended orthography, which also suggested the presence of two distinct vowels, a *back* and a *non-back* one, in correspondence of Coptic ⲏ in texts dating to Period 3 (Kilani 2017a). It is also worth to observe that the word  = *hm* (II.24), attested in the corpus only in Period 2 and spelled with ⲉ, which implies a pronunciation **hˈu:mv* with /u:/, is instead spelled without ⲉ in Pap. BM EA 10474 (*Teachings of Amenemope*) 27.3,4, which dates to the 26th Dynasty (Laisney 2007, 6), thus suggesting a *non-back* stressed vowel, which may imply a pronunciation **hˈe/ø:mv*. This could therefore indicate that the /u:/ > ⲏ (= /e:/ or /ø:/?) shift took place after the end of the 22nd Dynasty (i.e. after Period 3) but before the 26th Dynasty.

The specific nature of such *back* vowels cannot be specified on the basis of the evidence emerged from this book. It can only be said that a *non-back* and a *back* vowel were involved, but it is not possible to say if such vowels were maintained as /u:/ and /i:/ during the three periods, or if they underwent some minor shift that did not change their *back* and *non-back* nature, such as /i:/ > /e:/.

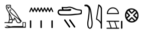
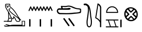
§11 The group  – additional observations

As explained above, the few examples in the corpus show that the group  encodes a *back* vowel and can be read as *dU* or *Ud*. This assumption can be confirmed on the basis of other attestations in toponyms, personal names, and words that have no direct descendant in Coptic and which, therefore, are not part of the corpus. I discuss them in detail here below.

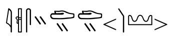
• “Armant” (toponym)

Attestations	Group Writing	Transliteration	Reconstruction	Prototype
Period 3		$mU^{n}d(t)A/0$	*mˈont(v)	see Cpt. (ⲉⲣ)ⲙⲟⲛⲧ

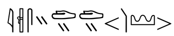
Eg.: Gloss. Gol 4.15 (AEO I no. 332–3)

The spelling  for the name of the city of Armant is attested once, in the Onomasticon of Amenope (no. 332). The name of the city is attested in Coptic as ⲣⲙⲟⲛⲧ = *(ə)rmˈont* (S) and ⲉⲣⲙⲟⲛⲧ = *ərmˈont* (B), in Greek as Ἑρμωνθις = *ermōnt*^{h}*is* and Ἑρμονθις = *ermont*^{h}*is* and in Latin as Hermunthus, Hermonthes and Hermonthis.[52] The name can be analysed as  = “the city Ôn” and  = “the God Montu”. The Coptic, Greek and Latin forms of this toponym suggest the presence of a stressed *back* vowel. The pronunciation **mˈont(ə)* can thus be reconstructed for Period 3. The group writing spelling  = *m0-Und-t0* = *mUnd/t* perfectly reflects this pronunciation. This form provides a good example of  = preconsonatal *n* being clustered with the following consonant, in this case *d*, thus resulting in  = *n* + *d-w* = *nd-U* = *Und* (see above §4.3).

• “Ashdod” (toponym)

Period 3		jAsdUd	*ʔvsdˈUd	*ʔašdo:/ud

Eg.: Gloss. Gol 4.4–5 (AEO I no. 263)

The city  is attested only once in the Egyptian sources, in the Onomasticon of Amenope (no. 263). It is usually identified with the city of Ashdod, about 30 km South of Yaffa. Its name is attested in Hebrew as *ʔašdōd* (Joshua 11:22, 15:46,47; 1 Samuel 5:5,6,7, 6:17; 2 Chronicles 26:6; Isaiah 20:1; Jeremiah 25:20; Amos 1:8, 3:9; Zephaniah 2:4; Zechariah 9:6) and *ʔašdōda* (1 Samuel 5:1; Isaiah 20:1), in Assyrian Akkadian as ^{URU}*aš*$_{2}$*-du-du* (e.g. SAA 17 082: r 6’)[53] and in Greek as Αζωτος = *azōtos* (e.g. Herodotus II:157 – *z* < *šd* because of folk etymology?).

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52 https://www.trismegistos.org/geo/detail.php?tm=37278 – last visited: 23.5.2018.

53 See: http://oracc.museum.upenn.edu/saao/saa17/corpus – last visited: 23.5.2018.

All these forms present a sequence *dōd* or *dud*, which the Egyptians transcribed as = *dU-Ud* = *dUd*.

• "skilled", "knowing", "knowledgeable"

Period 2		yUdʕA/0	*y'u:/o:d(v)ʕ(v)	*yo:diʕ

Eg.: EHT 1 (P.An. I) 17.8 = HoSW 58.64

The word appears in Papyrus Anastasi I in the expression = "skilled/learned scribe" Hoch 1994, 58, no. 64. The meaning and Semitic prototypes of the two words are clear, but their vocalisation has been a subject of debate. Hoch compares = *ṯUpAr*[54]<?> with Biblical Hebrew *sōfe*r = "scribe" (from a participle **sōpir*), and he correctly observes that the vocalisation of the Egyptian form, with a *back* vowel in the first syllable, points to a coastal North-West-Semitic dialect (Hoch 1994, 58). However, he is then puzzled by the vocalisation of ,[55] because according to his system it does not show any trace of the expected /a:/ > /o:/ shift. He thus concludes that either the spelling of was inaccurate regarding the vocalisation, or the scribe mixed forms from two different dialects, one that underwent the Canaanite shift and one that did not. This problem disappears if we consider = *dU/Ud* and therefore we interpret as *y0-Ud-ʕA/0 = yUdʕA/0*. This spelling implies the presence of a *back* vowel, and therefore perfectly reflects a North-West-Semitic prototype **yōdiʕ* = "knowing", "who knows", hence "skilled" (active participle - cf. Biblical Hebrew *yōdeaʕ*), which is what we would expect in a dialect that underwent the shift /a:/ > /o:/. It thus appears that the new reading suggested here not only provides a likely interpretation for this spelling, but it also elegantly solves the issue noticed by Hoch by showing that both = *ṯUpAr* from **sōpir* or the like, and = *yUdʕA/0* from **yōdiʕ* or the like come from a same single dialect that underwent the shift /a:/ > /o:/.

• "stand firm", "hold one's ground"

Period 2		ʕAmUd	*ʕvm'Ud	*ʕa(:)mo:d

Eg.: O.Turin 57365 4 = HoSW 70.76

The word is attested only once in the Egyptian sources, in Period 2, in the expression *jry=k ʕAmUd m pꜣ nhrn* = "you stand firm in Naharin". is certainly related with Semitic √*ʕ-m-d* = "to stand firm" – see Akkadian *emēdu* = "to stand (near) by", "to lean on"; Arabic *ʕ-m-d* = "to approach", "to support"; Aramaic *ʕămad* = "to place (G-stem)", "to place (D-stem)"; Biblical Hebrew *ʕāmad* = "to stand (up against)". The

54 He reads it, according to his system, as *ṯu*=*pi*$_3$=*ra* Hoch 1994, 364.
55 He reads it as *ya*=*di*=*ʕa*, according to his system.

root is well attested in various North-West-Semitic languages, but it is common as a verb only in Hebrew. The Egyptian construction in which this word appears would require an infinitive, and in fact the vocalisation of , with a *back* vowel in the second syllable, could indeed correspond to a North-West-Semitic infinitive in a language that underwent the Canaanite /a:/ > /o:/ shift, as attested by the Biblical Hebrew infinitive *ʕāmōd*.

• "Dor" (toponym)

Period 3		dUr	*d'Ur	*do:r/*doʔr

Eg.: LES 5 1.8

The city of is attested only once in the Egyptian sources, in the tale of Wenamun. It is usually identified with the city of Dor, about 30 km South of Haifa. Its name is attested in Hebrew as *doʔr* (Joshua 17:11) and *dōr* (1 Chronicles 7:29), and in Assyrian Akkadian as URU*du-u'-ru* (Gilboa and Sharon 2016, 241). The *back* vowel present in all these forms is reflected in the use of the group = *dU*, which in Period 3 stands for /do/, /do:/ or /du:/.

• "amorous", "lustful", " lascivious"

Period 2		dUd	*d'Ud	*do:/u:d / *do/aw(i)d

• "Dod", "Dud" (name, based on the previous one)

Period 1, 2		dUd	*d'u(:)d	*do:/u:d / *do/aw(i)d

Eg.: see HoSW 378–9.568 for attestations.

The word and the name have long been recognised as being related with the Semitic root √*d(-w)-d* = "to love (et cetera)" – see Biblical Hebrew *dōd* = "lover"; *dōdīm* = "love-(making)"; Ugaritic *ddm* = "love"; Aramaic *dōda* = "lover"; Akkadian *dādū* "love-making". Since the group has usually been read as *dy,* until now these words have been interpreted as *dydy*, *didi* and the like. However, as Hoch (1994, 379) points out, such a vocalisation is grammatically problematic and has no good parallel in any attested Semitic form. By contrast, reading the group as *dU/Ud*, and therefore the sequence as *dU* + *Ud* = *dUd* solves the issue. The word = *dUd*, can then be compared with Hebrew and Aramaic *dōd(a)* = "lover" (Hoch 1994, 379). As for the name = *dUd*, it can be compared with m*Du-u($_2$)-du*, attested in the Amarna letters as the name of an Egyptian official (EA 158:1,5,12,34; EA 164:1,10,16; 167:28; EA 169:16), This name is in turn clearly related with Biblical Hebrew *dāwid*. In fact, both the name attested in the Amarna letters and the Egyptian = *dUd* could be interpreted as

renditions of some variant *dāwid*, for instance if we assume a contraction *dāwid* > **dō(i)d*, or if we consider a variant **dōw(i)d* from a dialect that underwent the *ā* > *ō* shift.

§12 The group [hieroglyphs]

The group [hieroglyphs] presents some peculiar characteristics and therefore deserves a specific discussion. This group is not attested in the corpus, as none of the nouns presenting it has a sure direct descendant in Coptic. [hieroglyphs], however, does appear in the Period 3 spelling of a toponym, [hieroglyphs] = "Sile", which is later attested in Latin, Greek and Coptic.

This spelling [hieroglyphs] is recorded in the version of the Onomasticon of Amenope preserved in the papyrus known as the Golenischeff Onomasticon (Gardiner 1947, Vol. I, 27-9). Eight additional words characterised by a final [hieroglyphs] are present in this papyrus. Three of them end with a sequence [hieroglyphs], which suggests they may be characterised by vocalic patterns comparable to that of [hieroglyphs]. None of these words, however, survives in Coptic, and therefore their vocalisation cannot be externally verified.

The group [hieroglyphs] appears in the Onomasticon also at the end of a few more words spelled in traditional orthography. Some of these words do survive in Coptic, and therefore they provide crucial information about the value and functioning of this group. Since the Onomasticon of Amenope provides a small but rich and coherent corpus, all words displaying a final [hieroglyphs] attested in it are listed and singularly discussed in detail here below, at the end of this section.

§12.1 The group [hieroglyphs] – interpretation

In the case of [hieroglyphs], such spelling can be interpreted as follow:

III	Sile	[hieroglyphs] ṯr	ṯA.rU.U᾽ ⬇ ṯArU᾽	*ṯvrˈu:	Lat.: Sile, Selle Gr.: Σελη Cpt.: ⲥⲉⲗⲏ	< *səlˈe:

Latin *Sile* and *Selle* are the earliest vocalised attestations of this toponym, as they come from the *Itinerarium provinciarum Antonini Augusti*, 171, 2 (ca. 300 CE) and from the *Notitia dignitatum*, Or. 28, 27 [b] (ca. 395–430 CE) respectively. The Greek and Coptic forms are instead later, as they both come from the Greek and Coptic acts of the council of Ephesus of 431 CE.[56] In their case, therefore, it is not possible to exclude a reciprocal, Greek-Coptic influence, and if so it is not possible to define the direction of such influence: the city is obviously in Egypt, and therefore it is likely that the Greek spelling reflects an Egyptian pronunciation. The Coptic spelling may also reflect the same pronunciation, and may thus truly be an indigenous rendition of the same name, but it could also be a back formation shaped on the Greek form.[57] There is hardly any way to solve this issue. However, even leaving aside the Coptic form, a few observations can be made: both the Greek form Σελη and the Latin *Sile* suggest a difference between the first and the

56 See: https://www.trismegistos.org/geo/authors_georef_list.php?tm=2109 (last visited: 13.05.2018)

57 Gauthier 1925–1931, VI 67 reports also a Coptic variant ⲥⲗⲏ, which looks like a truly Coptic spelling and not as an adaptation of the Greek one, but unfortunately he did not provide any source for this form.

second vowel of the name. The Greek form suggests that such difference resides in its prosody, while the variation between Latin *Selle* and *Sile* may hint at the fact that the last vowel was perceived unambiguously as *e*, while the first one may have been perceived as less defined and somehow intermediate. By combining these considerations, one can reconstruct the pronunciation underling these forms as **səlʾeː*, which in fact is also the pronunciation that underlies the Coptic spelling. This reconstruction is confirmed also by the Akkadian spelling of the name of this city, which is attested in an Amarna letter (EA 288.46) as URU *Sí-lu-ú* = *Silû*. This latter spelling can be assumed to represent a Period 1 pronunciation **si/əlʾuː*, which can be expected to have regularly evolved into a Coptic and later pronunciation **səlʾeː* , with stressed /u:/ > /e:/ = ⲏ after Period 3. Since the spelling 𓇋𓊪𓄿𓏲𓅱 dates to Period 3, it reflects the pre-shift pronunciation. The first part 𓇋𓊪 is a rather straightforward transcription[58] for a pronunciation **si/əlʾuː*. The final 𓄿𓏲, instead, deserves more attention. Let start by leaving aside for a moment the value of the sign 𓄿, and by transcribing it just as ʾ. According to the model presented above, the group 𓄿𓏲 can be read as ʾ + *U* = ʾU/Uʾ. Overall, therefore, the spelling 𓇋𓊪𓄿𓏲𓅱 can be understood as *t̲A + rU + Uʾ = t̲ArUʾ = *t̲əruːʾ).*

This considered, I think that the group 𓄿𓏲 as a whole can be interpreted as indicating a final stressed *back* vowel. Conceptually, this group may be a final equivalent of the initial group 𓄿𓄡, which indicates the presence of an initial *non-back* or unstressed vowel possibly preceded by a glide or glottal stop (Loprieno 1995, 38 n38, 247; Allen 2013, 32). Similarly, the final stressed *back* vowel indicated by the group 𓄿𓏲 may or may not have been followed by a final glide or glottal stop – hence the transcription with ʾ here above. This last point deserves some discussion. According to the currently accepted models, Late Egyptian should not have words ending in open stressed syllables, that is there should be no word ending with a stressed vowel not followed by any consonant (Loprieno 1995, 39–40). Words ending in stressed vowels, however, do exist in other languages, including North-West-Semitic ones, and they may have thus entered Egyptian as loanwords. At that point, two scenarios were possible: either Egyptians adapted such loanwords to their native Egyptian phonotactics, and some additional element –possibly a glide or a glottal stop– were introduced after the last vowel in order to close the respective syllable, or Egyptians adopted these words as they were, and through them they introduced new, irregular prosodic patterns into the Egyptian language. In the case of 𓇋𓊪𓄿𓏲𓅱, the evidence points to the latter scenario. In particular, we know that this toponym is attested in Egyptian at least since the reign of Thutmose III in Period 1 (Urk. IV 647.11). We also know that the presence of a ⲏ/ⲏ in the Greek and Coptic forms suggests that the last vowel was a long vowel /u:/. According to the current models, in Period 1 such vowel could occur only in an open syllable.[59] The evidence from before Period 3 confirms this interpretation: this toponym is consistently spelled as 𓇋𓊪𓅱 in both Period 1 and Period

58 Where Egyptian *r* is the regular transcription of /l/, and Egyptian *t̲* is the regular transcription of *s* = Semitic samekh, see Hoch 1994, 407–8.

59 With which I agree and which in fact seems to be confirmed by the data presented above.

2.[60] These spellings can be interpreted as *ṯA* + *rU* = *ṯArU* = **ṯəru:* and as expected they show no trace of any glide or glottal stop after the final *U* = *u:*. In the case of 𓅷𓏤𓅨𓏤𓇋𓏲𓏤𓈉, therefore, the 𓇋 of the group 𓇋𓏲 seems to have no etymological phonetic value.

Moreover, the group 𓇋𓏲 can be used in combination with the group 𓇋𓈖 in what looks like a set sequence 𓇋𓈖𓇋𓏲. The most interesting example is the word 𓎡𓈖𓏭𓇋𓈖𓇋𓏲𓅨𓏤𓂋 (LEM 5 12.2 – Hoch no. 467), which does not have a Coptic descendant but which is clearly a Semitic loanword related with Biblical Hebrew *kinnōr*. This word shows that the sequence 𓇋𓈖𓇋𓏲 has to be read as *nU*,[61] because the resulting reading 𓎡𓈖𓏭𓇋𓈖𓇋𓏲𓅨𓏤𓂋 = *kAn-nU-Ur* = *kAn(n)Ur* is the only possible one that is both in agreement with the Semitic forms[62] and internally coherent.[63] Moreover, this word suggests that the sequence 𓇋𓈖𓇋𓏲, and therefore the group 𓇋𓏲, encode for a plain *back* vowel, because in this word there is no place where a glide or glottal stop could be expected.

The sequence 𓇋𓈖𓇋𓏲 is attested in various words, usually at their end. For instance, the words 𓎼𓈖𓇋𓈖𓇋𓏲𓀜𓐛𓏤, 𓎼𓈖𓇋𓈖𓇋𓏲𓀜𓍱𓏲𓈉 and 𓊪𓅂𓇋𓈖𓇋𓏲𓇋𓏤𓏥 appear in the Onomasticon of Amenope. Neither of them has a Coptic reflex, therefore their vocalisation cannot be directly reconstructed. On the basis of what has just been discussed, however, it can be inferred that they ended with a stressed *back* vowel in an open syllable, as further discussed in the list below (§12.2).

These observations seem to suggest that the group 𓇋𓏲 was indeed transcribing just a plain *back* vowel.

At the same time, however, there is evidence showing that this same group 𓇋𓏲 was also used there where a final glide could be expected because of etymological reasons. In particular, the Period 3 vocalisation of the word 𓈉𓏤𓇋𓏲𓏲𓈉 = "mountain" can be reconstructed as **ḏ'ow*, on the basis of Coptic тооү (S) = *t'ow*. In this case, therefore, the 𓇋𓏲 group seems to transcribe the sequence *-ow*, which was perhaps perceived as *-o*^{w}, that is as a *back* vowel *-o* followed by a glide *-*^{w}.

The fact that in some cases the final stressed syllable indicated by the group 𓇋𓏲 may have been closed, and therefore a glide or a glottal stop may have been present, at least historically, is suggested also by another observation.

In the same way as the group 𓇋𓄿 could be added to word written in standard orthography to indicate a vocalic prefix (see e.g. Junge 2005, 97–8), it seems that the group 𓇋𓏲 could be added to words written in standard orthography to indicate, I think, a final stressed *back* vowel. The Onomasticon of Amenope presents multiple such examples. As it appears from the list below, most of these words have two characteristics in common:

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60 With some variation in the classifiers, see Gauthier 1925–1931, VI 67 for attestations.

61 As already suggested by others scholars, see e.g. Edel 1966; Hoch 1994, 508.

62 Either by representing a pronunciation **kin(n)'o/ur* directly corresponding for instance to Hebrew *kinnōr*, or by reflecting a pronunciation **kin(n)'or* deriving from an earlier ***kin(n)'ar* which in turn would directly correspond to an earlier Semitic form *kinnār*.

63 As the final *-n* of 𓎡𓈖𓏭 matches the initial *n-* of 𓇋𓈖𓇋𓏲 = *nU*, and the *U* of 𓇋𓈖𓇋𓏲 = *nU* matches the *U* of 𓅨𓏤.

1) most of them derive from Middle Egyptian roots which are usually assumed to have ended with a weak consonant *-j* / *-w* or with *-ꜣ*.
2) for those words that have a Coptic reflex, the corresponding Period 3 forms can be reconstructed as ending with a stressed *back* vowel, often followed by a glide. In particular: [hieroglyphs] – ⲏⲓ < **ʕˈu:j* ; [hieroglyphs] – ⲙⲟⲩⲓ < **mˈo:j* ; [hieroglyphs] – ⲙⲁⲛⲏⲩ < **mvjnˈu:w* ; [hieroglyphs] – ⲛⲏ/ⲉⲓ (B) < **nˈu:j* ; [hieroglyphs] – ⲧⲟ/ⲱⲟⲩ (S/B) < **tˈo:w* (see list below for detailed discussion).

The words [hieroglyphs] *ṯsˀ* = “chief” and [hieroglyphs] *jqdˀ* = “builder” are attested in Coptic only in their absolute state (ⲉⲕⲱⲧ and ϫⲟ(ⲓ)ⲥ respectively), while the Egyptian forms discussed here are likely in the construct state, as they are clearly the first elements of genitival constructions. As discussed below, a direct comparison is therefore not possible, as the forms may be different.

It thus appears that the group 𓇋𓏲 can be used to represent both plain final stressed *back* vowels, and final *back* vowels followed by some form of glide or etymological glottal stop. Two parallel scenarios can be put forward to explain this situation. A first possibility is that the Egyptians did not conceptualise such final glides and glottal stops as full consonants, and therefore they perceived final stressed *back* vowel with and without them as equivalent, at least from a writing perspective. The second possibility, instead, is that the phonotactics of Egyptian strictly required final stressed syllables to be closed, and words that did not comply to this rule were automatically extended with such a coda. Such codas were then indicated with the group 𓇋𓏲, at least in Period 3. It seems to me that the first scenario is more likely, but I do not think that, for now, the evidence available is conclusive.

Another word which is relevant for the current discussion is [hieroglyphs] = “storm-cloud”, “storm”, no. 10 in the Onomasticon of Amenope. A semi-reduplicated form [hieroglyphs] also exists (see attestations in WB and TLA), and survives in Coptic as ⲕⲗⲟⲟⲗⲉ, *klˈoʔlə* = “cloud”. The first, short form is well attested in Egyptian in various periods, and from the comparison of such variants its vocalisation can be safely reconstructed as **qvrˈa:* > **qvrˈo:*. The stressed final vowel is clearly long and therefore the final syllable probably open, because the shift from *non-back* to *back* vowel seems to have taken place between Period 1 and 2 (see below for the relevant evidence). By contrast, on the basis of Coptic, the vocalisation of the long form can be safely reconstructed as **qvrˈaʔrv(ʔ)* > **qvrˈoʔrv(ʔ)* – with *r* = Coptic ⲗ. A few intriguing observations stem from these two forms and from their comparison. First, it appears that the basic root of the word was √*q-r-j*, with a final weak consonant, as demonstrated by the early attestations of the short form spelled with a final -𓇋 (e.g. Middle Kingdom [hieroglyphs] – see WB and TLA), and by the Coptic reflex of the longer form, where such weak consonant both survives in the middle of the word as a glottal stop and is implied at the end by the final -ⲉ. It is thus clear that the longer form originated from a partial reduplication of the root according to a pattern $\sqrt{c_1\text{-}c_2\text{-}c_3}$ > $c_1vc_2vc_3c_2vc_3$, that is √*q-r-j* > *qvrvjrvj*. The stress falls in both forms on the second vowel, which can be reconstructed either as a short or as a long /a/. This identity in the quality of the vowel strongly supports the validity of these reconstructions.

Moreover, as said, the vowel of the short form is long, which suggests that the final syllable was open. This, in turn, indicates that at some point the final weak consonant

must have completely disappeared,[64] thus triggering the lengthening of the final vowel. This process must have taken place both at a time when the phonotactic rules *stressed close syllable => short vowel* and *stressed open syllable => open vowel* were still actively operating in the language and before the New Kingdom, as the New Kingdom spellings record the expected development of a long vowel.

This is a crucial observation, for multiple reasons. First of all, these attestations show once again that the group 𓏲𓂝 can be used to mark a final stressed long *back* vowel, and this not only in loanwords, but also in native words. This, in turn, is worthy of attention, because according to most of the current models, it should not have been possible to have a final stressed open syllable in final position in New Kingdom and pre-New Kingdom Egyptian.[65] For instance, forms like ꜥpı *hrʾiː* = "endive" and ϭλн *kʲlʾeː* = possibly "strengthen" are usually reconstructed as **hvrʾiːjvj* and **qvnʾiːʲuːjvj* respectively (see e.g. Osing 1976, 102, 193), with a never-attested[66] sequence of weak consonants and glides at their end to prevent the stressed open syllable to be in final position.

The forms discussed here, however, show that there must have been a period before the New Kingdom when such limitation was not valid any more and when open syllables with long vowels could indeed emerge in final position as the result of the fall of a final weak consonant.

As a result, this suggests that the same ꜥpı *hrʾiː* and ϭλн *kʲlʾeː* may rather be interpreted as the outcome of a diachronic phenomenon in which the final vowel got lengthened *after* the disappearance of the final weak consonant, rather than being long *before* it, because of the presence of an additional syllable. These developments, therefore, can be reconstructed as follow: **hvrʾij* > **hvrʾi* > **hvrʾiː* > ꜥpı *hrʾiː* and **qvnʾiʲuj* > **qvnʾiʲu* > **qvnʾiːʲuː* > ϭλн *kʲlʾeː*.

The postulation of such a lengthening of the final stressed vowel after the disappearance of a final weak consonant provides an elegant alternative to the current glide-rich models, at least in the case of those forms displaying a final long vowel in open syllable.

§12.2 The group 𓏲𓂝 – Attestations in the Onomasticon of Amenope

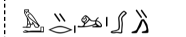
Here below all the attestations of the final group 𓏲𓂝 in the Onomasticon of Amenope are presented and singularly discussed.

64 I would say either by being dropped or by being assimilated to the preceding vowel.

65 See e.g. Loprieno 1995, 37, 40.

66 And rather clumsy, I would say.

cU-jU

Spellings attested in the Onomasticon of Amenope (Period 3)								
groom, squire	 mr𓄿		mA.rU.U𓄿 ⬇ mArU𓄿		*mvrʿu:		—	
Diachronic spellings								
Period 1			Period 1			Period 1		
*mvrʿu:(ʔ)		mArU𓄿	*mvrʿu:(ʔ)	 	mA(r)rU mArU?A/0 mArU𓄿	*mvrʿu:(ʔ)		mArU𓄿
P.Cairo 58054 v8			P.Mayer A v11.8; EHT 1 (P.An. I) 1.8 and elsewhere; EHT 2 (P.Koller = P.Berlin 3043 = LEM 11) 1.2 and elsewhere			Gloss. Gol. 3.11 (AEO I no. 203)		

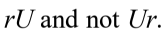
See also HoSW 132–3.173.

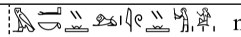
This word is usually interpreted as a loanword from Semitic (Hoch 1994, 132–4, no. 173) and it is compared with Akk. *murʔu* = "some kind of official" and Ugr. (pl.) *mrů* = *mur-ú* = "member of a group or class", "chief groom (?)", which in turn may be of foreign (Hurrian?) origin.[67]

The final stressed vowel of this word must have been /u:/, because this is the only vowel that consistently remains a *back* vowel, spelled with *w* = *U*, in all three periods. This reconstruction is in agreement with the Semitic evidence.

Two of the spellings attested in Period 2 are worthy of attention. The use of in is unique, and somehow surprising. If it is not just a mere mistake of the scribe, it may have been used either to mark a geminated pronunciation of the /r/ or perhaps to explicitly

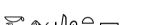
67 Hoch 1994, 132–3, no. 173 compares also Arb. *ʔimruʔu* = "man"; Old Arm. *m-r-ʔ* = "lord", "sir", but the connection is not clear. Both DULAT 571–2 and CAD 10 228–9 consider the Ugaritic and Akkadian words as possible borrowings.

indicate that the following group  had to be read *rU* and not *Ur*. The final group  in the spelling  , which I read as *mA.rU.ʔA/0 = mArUʔA/0*, may suggest the presence of a pronounced glottal stop (or glide?) after the final *back* vowel. This would agree with the Semitic prototype of this word, which indeed had a /ʔ/ as its third and last consonant.

merchant(s)	 mkrʾ			mAk.rU.Uʾ ⬇ mAkrUʾ		*mvk(v)rʿUʾ		—	
—	—	—	—	—	—	*mvk(v)rʿUʾ		mAkrUʾ	
—			—			Gloss. Gol. 3.12 (AEO I no. 212)			

The word  is attested only in the Onomasticon. It is usually interpreted as a Semitic loanword, related with Akk. sg. *mākiru* – pl. *makirū* = “trader(s)”, Heb. sg. *moḵer* – pl. *moḵrīm* = “vendor(s)”, as well as Punic *mkr* = “trader”, Old. South Arb. *mkr(m)* = “trader(s)” and Ugaritic *mkr(m)* = “trader”.

The Egyptian form seems to be plural, as indicated by the classifiers  . Its vocalisation matches that of the plural of the Akkadian form, and the lack of any trace of a North-West-Semitic *-m/-n* plural marker supports this interpretation. This observation is interesting, from a socio-linguistic point of view, and may reflect the status of *lingua franca* that Akkadian enjoyed in the context of diplomatic and economic exchanges in the region during the Late Bronze Age.

prison (?)	 krʾ			kA.rU.Uʾ ⬇ kArUʾ		*kvrʿUʾ		—	
—	—	—	—	—	—	*kvrʿUʾ		kArUʾ	
—			—			Gloss. Gol. 6.2 (AEO I no. 451)			

The word is attested only in the Onomasticon. Hoch 1994, 328, no. 474 compares it with Heb. *kɛlɛʔ* = “prison”, “confinement” and with the related root √*k-l-ʔ* attested in Akkadian, Arabic, Aramaic, Ge’ez, Syriac and Ugaritic with the meaning of “to guard”, “to restrain”. The vocalisation of the Egyptian word does not match any attested Semitic form. The presence in Egyptian of a stressed final *back* vowel

may suggest that the Semitic prototype had a vocalic pattern *cvcāc* > *cvcōc* or *cvcūc*, and the long vowel in the second syllable may have been perceived as stressed by the Egyptians. *cvcāc* > *cvcōc* would be a likely candidate, as such patterns are common in Semitic languages.

If so, the most likely interpretation is that the Egyptian form derives from a *nomen actionis*, possibly originally used in an expression comparable to Hebrew *bēt kɛlɛʔ* = "house of confinement" = "prison" (see Hoch 1994, 328).

If instead the vowel was *ū*, then it may reflect a noun of a dwelling place built on the originally collective pattern *cucūc*, as it is the case for Hebrew *zəḇūl* = "habitation", "temple". The use of plural forms for single dwelling such as "house" and "palace" is indeed attested in both Hebrew and Ugaritic (Fox 2003, 209–12 and especially 211–2).

Sile			t̲r˒	t̲A.rU.U˒ ⬇ t̲ArU˒		*t̲vrˈu:		Lat.: Sile, Selle Gr.: Σελη Cpt.: ϲⲉⲗⲏ səlˈe:
*t̲vrˈu:		t̲ArU	*t̲vrˈu:		t̲ArU	*t̲vrˈu:		t̲ArU˒
Urk. IV 647.11 and elsewhere			LEM 6 24.7 and elsewhere			Gloss. Gol. 5.13 (AEO I no. 419)		

See above for the discussion of this term.

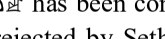
cA-jU

a toponym			jrm˒	jA.rm0.U˒ ⬇ jArmU˒		*ʔvrmˈU˒		—
—	—	—	—	—	—	*ʔvrmˈU˒		jArmU˒
—			—			Gloss. Gol. 4.8 (AEO I no. 282)		

This word appears only once in a section of the Onomasticon listing various toponyms. No reliable identification has been suggested, although Gardiner wondered if it could be related with either "Arameans", or with the Nubian toponym Gardiner 1947, 290*, no. 282. Because of the lack of sure attestations from other periods, nothing can be said about the specific nature of its stressed final *back* vowel.

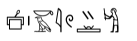
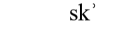
<table>
<tr><td colspan="2">Medja (troops)</td><td> 
mḏ.ˀ < mḏ3w</td><td colspan="2">mA.ḏ0.U.ˀ
↓
mAḏU.ˀ</td><td colspan="2">*mvḏˈu:</td><td colspan="2">—</td></tr>
<tr><td colspan="9">Singular</td></tr>
<tr><td colspan="2">—</td><td>—</td><td>—</td><td>*mvḏˈu:(yə)</td><td>  mAḏU.ˀ
  mAḏUy</td><td colspan="2">—</td><td>—</td><td>—</td></tr>
<tr><td colspan="3">—</td><td colspan="3">LEM 5 2.6 and elsewhere; PdT 16.2 and elsewhere</td><td colspan="3">—</td></tr>
<tr><td colspan="9">Plural</td></tr>
<tr><td>*mvḏˈu:y(ə)</td><td>  </td><td>mAḏUy</td><td>*mvḏˈu:(yə)</td><td>  mAḏU.ˀ
  mAḏUy</td><td>*mvḏˈu:</td><td colspan="2">  </td><td>mAḏU.ˀ</td></tr>
<tr><td colspan="2">T.Carn. 1 11, 12</td><td colspan="3">LEM 5 10.5 and elsewhere; LEM 6 18.6 and elsewhere</td><td colspan="4">Gloss. Gol. 3.8 (AEO I no. 188)</td></tr>
</table>

The form attested in the Onomasticon is probably a plural, given the classifiers  .

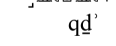
In the past, the word  has been connected with Coptic ⲙⲁⲧⲟⲓ = “soldier(s)” (see e.g. the entry DZA 24.499.380 in the TLA). This connection, however, was rejected by Sethe (1916, 124–31), who rather derived the Coptic word from Egyptian  *m.dU.y* = “Medes”.[68] This interpretation was accepted by later scholars such as Gardiner (1947, Vol. I, 81*), Černý (1976, 93), and Vycichl (1984, 125). Sethe’s intuition can now be further supported on the basis of the vocalisation underlying the word . In fact, as appears from the attestations above, the plural of this word was characterised by a *back* vowel since Period 1, while a *back* vowel is attested in the singular at least since Period 2. This means that the word was probably vocalised with a stressed /u:/. Since /u:/ usually develops into ⲏ in Coptic, and not into ⲟ, this Egyptian word can hardly be related with the Coptic ⲙⲁⲧⲟⲓ.

68 This attestation of the group  was not discussed above because it is obviously much later than the chronological frame considered in this book. It is however clear that this spelling does agree with the conclusions reached above, and it indicates that the reading = *dU/Ud* is valid also after the end of the New Kingdom.

In Middle Egyptian, the word was consistently written with a final *-ꜣ*, which at the time was consonantal and which may be related with the 𓄿𓄿 of some of the spellings listed here. This may suggest that a glide, or possibly an extra syllable, was present at least until Period 2. Such extra syllable would justify the length of the vowel /u:/.

an officer		 sk’	sA.k0.U’ ⬇ sAkU’		*svkˈo:/u:		—	
—	—	—	*svkˈo:/u:		sAkU	*svkˈo:/u:		sAkU’
	—		LEM 10 9.5 and elsewhere			Gloss. Gol. 3.10 (AEO I no. 198)		

According to Hoch (1994, 268–9, no. 381), this word may be related with the Semitic root √*ś-k-y* = “to look”, “to watch”, although no direct prototype or precise parallel can be identified. As discussed elsewhere (Kilani 2017a, 201, see also here below II.33 in Appendix A), the group 𓅱 is likely to stand for *sU*/*Us*. The final stressed *back* vowel was likely /o:/ or /u:/, because the attested examples indicate the presence of a *back* vowel also in Period 2.

plasterer		 qḏ’	qA.ḏ0.U’ ⬇ qAḏU’		*qvḏˈo:/u:		—	
—	—	—	*qvḏˈo:/u:		qAḏAy	*qvḏˈo:/u:		qAḏU’
					qAḏU’			
					qAḏU’			
	—		P.Turin 2071/224 + 1960 2.7; O.Cairo 25605 5 and elsewhere; O.DeM 330 1 and elsewhere			Gloss. Gol. 3.7 (AEO I no. 182)		

Multiple attestations of this word exist in Period 2, and their spellings usually indicate the presence of a final *back* vowel. The only exception is (P.Turin 2071/224 + 1960 II, 7 = KRI VI, 637–8), which seems to point to a pronunciation with a *non-back* vowel. I do not know how to explain this form, and I wonder if it is just a mistake of the scribe, possibly influenced by the related word = *qAḏA* “gypsum” (Hoch 1994, 307–8, no. 442), which is usually written without a final *back* vowel. The final stressed *back* vowel was likely /o:/

or /u:/, because of the spellings with *back* vowel in Period 2. The word [hieroglyphs] = *qAḏA* "gypsum" is likely a Semitic loanword related with Akk. *gaṣṣu*, Arb. *jiṣṣ*, Arm. *geṣā*, Heb. *geṣ*, all meaning "plaster", "gypsum". By contrast, Hoch thinks that the word [hieroglyphs] = "plasterer" may be an Egyptian formation derived from such Semitic loanword.

some part of animals?	[hieroglyphs] ḏ꜀	ḏ0.U꜀ ➞ ḏU꜀	*ḏˈo:/u:	—				
—	—	—	ḏˈo:/u:	[hieroglyphs]	ḏU꜀	ḏˈo:/u:	[hieroglyphs]	ḏU꜀
—			P.Berlin 10462 (see AEO I no. 596)			Gloss. Gol. 7.11 (AEO I no. 596)		

The word appears as part of the expression [hieroglyphs], and probably refers to some part of the body (of animals?). The spelling with *U* from Period 2 suggests that the final vowel was either /o:/ or /u:/.

jn-jU

sweetmeats	[hieroglyphs] hn꜀	hA.(j)n-U꜀ ➞ hAnU꜀	*hvnˈo(ʔ/j) (?)	—				
—	—	—	*hvnˈaʔ/jy(ə)	[hieroglyphs]	h-n-ʔ/jAy	*hvnˈo(ʔ/j)	[hieroglyphs]	hAnU꜀
—			KRI V 130.1 and elsewhere			Gloss. Gol. 3.1, 7.3–4 (AEO I no. 149, I 555)		

All the attested forms seem to be plural. [hieroglyphs] appears twice in the Onomasticon, once as an independent entry (no. 555) and once as part of the expression [hieroglyphs] = "maker of sweetmeats" (no. 149). The word is attested also in offering lists from Medinet Habu, where it is spelled without any *back* vowel. This may suggest, as implied in the reconstruction offered here, that the *back* vowel emerged only in Period 3, as a result of the /a/ > /o/ shift. In fact, if the vowel were /u:/ or /o:/, it should have been marked with *U* already in Period 2. This is however just a tentative suggestion and should be taken with due caution, both because the Period 2 attestations are not spelled in full group writing and because they come from monumental inscriptions, and therefore they may reflect different orthographic conventions.

tired land		[hieroglyphs] dn'		d.(n).(j)n-U' → d.(n)nU'		*dvn'U'		—
—	—	—	—	—	—	*dvn'U'	[hieroglyphs] [hieroglyphs]	dA(n)nU' t-nU'
—			—			Gloss. Gol. 1.11 (AEO I no. 54) P.Hood I 2.10 (AEO II no. 54)		

Aside the attestation in the copy of the Onomasticon in Pap. Hood where it is spelled [hieroglyphs], this word is usually attested with the traditional spelling [hieroglyphs] and the like (see attestations in WB and TLA). Since this word has no Coptic descendant, and no group writing or partial group writing spelling is attested in other periods, it is not possible to define the exact nature of the final stressed *back* vowel. However, the variant from P. Hood does confirm that the groups [hieroglyphs] are equivalent to the sequence [hieroglyphs] and have thus to be read as *nU*.

Danu		[hieroglyphs] dn'		d.(n).(j)n-U' → d.(n)nU'		*dvn'U'		—
—	—	—	—	—	—	*dvn'U'	[hieroglyphs]	dA(n)nU'
—			—			Gloss. Gol. 4.1 (AEO I no. 244)		

This spelling is a hapax. However, the word can be recognised as an ethnonym, because it appears in the Onomasticon among other names of populations. It has been suggested (see Gardiner 1947, Vol. I, 124*-7*) that this name is the same as the *dA.(j)n-U'.nA* = *dAnUnA* mentioned four times in Period 2, once as [hieroglyphs] = *dA.(j)n-U'.nA/0* = *dAnUnA/0* in Pap. Harris I 76.7 and three times in Ramses III's inscriptions in Medinet Habu as [hieroglyphs] = *dA.(j)n-U'.nA* = *dAnUnA/0* (*KRI* V 36.7-8), [hieroglyphs] = *dA.(j)n-U'.nA* = *dAnUnA/0* (*KRI* V 37.1), and [hieroglyphs] = *dA.(j)n-U'* = *dAnU* (*KRI* V 40.3-4). It is unclear if the last spelling is a mistake of the scribe or a variant without the final [hieroglyphs] = *-nA*, which should then be considered as some sort of suffix. In this latter case, the word would indeed appear as being very close to the [hieroglyphs] = *dA(n)nU'* in the Onomasticon. The *dAnU(nA)* of Ramses III have been tentatively identified with the Danuna attested in the Amarna letters (EA 151.52) and possibly with the Greek Danaoi (e.g. Gardiner 1947, Vol. I, *124–7). If this is correct, the Amarna form would confirm the presence of a *back* vowel after the first *n*.

• Words Spelled in Traditional Orthography with Final jU

The use of the group 𓇋𓏲 is clearly optional in words spelled in traditional orthography. This means that its presence indicates the presence of *back* vowel, while its absence does not necessarily imply the presence of a *non-back* vowel. Rather, the absence of the group 𓇋𓏲 may simply be due to a more conservative and traditional spelling in which the vocalisation was not marked at all. In determining the nature of the vowel lying behind the *U*, therefore, it is only the presence of the group 𓇋𓏲 in a given period that is significant and should be considered, while its absence from some of the attestations is not necessarily meaningful.

Words with Coptic reflexes

arm, hand		𓂝𓏏𓇋𓏲𓂧 ʕ’	ʕ.U’ ⬇ ʕU’		*ʕˈu:j	ʜɪ ˈe:j		
—	—	—	—	—	—	*ʕˈu:j	𓂝𓏏𓇋𓏲𓂧	ʕU’
—			—			Gloss. Gol. 4.11 (AEO I no. 306)		

Cpt.: CrCD 66b; ČeCED 41; VyDELC 53.

The Coptic word ʜɪ means “pair”, “couple” and derives from the Egyptian 𓂝𓏏 = ʕ “arm”, “hand”, as well as “pair”, “couple” Vycichl 1984, 53.

This spelling, which occurs in the title 𓎛𓂝𓏏𓇋𓏲𓂧 *ḫry-ʕ* = “subordinate”, “assistant” (lit. “one who is under the hand(s)”), is attested only here. The word itself is obviously extremely common, but it is usually written with the classical spellings 𓂝 or 𓂝𓏏. The use of the group 𓇋𓏲 suggests a final stressed *back* vowel, which can be reconstructed as /u:/ on the basis of Coptic.

The grammatical number of all these expressions is difficult to ascertain: although they seem to be considered (in Coptic) and spelled (in Egyptian) as singular, they may ultimately derive from a dual form *ʕ.wy*. If so, the title 𓎛𓂝𓏏𓇋𓏲𓂧 should be understood as “one who is under the (two) hands”, and the final glide and long vowel could be explained as traces of the original following extra syllable, i.e. **ʕˈu:j* < **ʕˈu:wvy*. If so, however, one may expect the final glide to emerge in Coptic as *-w* = -ⲟⲩ rather than as *-j* = -ⲓ, as in the case of ⲥⲛⲁⲩ *snˈaw* < **svnˈawwvy* = “two” or ⲡⲁϩⲩ *pˈahw* < *pˈaḫwvy* = “buttocks”. It has to be noted, however, that the vocalic patterns of these two words are different (i.e. *(cv)cˈvc+wvy* versus *cv:+wvy*), which perhaps may justify a different development, in the case of 𓂝𓏏, for the final glide derived from the ending *-wvy*.

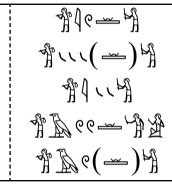
lion	𓃒 m(ȝ)ʾ	m(.ʔ).Uʾ ⬇ m(-ʔ)Uʾ	*mˈoːʔ/j	ϺΟΥΙ mu:j
Singular				
*mˈaːʔ/j	𓃒 m(-ʔ)-ʾ 𓃒𓏲 m(-ʔ)-y 𓄡 m(-ʔ)-ʾ	*mˈoːʔ/j	𓃒 m(-ʔ)Uʾ 𓃒 m(-ʔ)Uʾ 𓃒 m(-ʔ)(Uʾ) 𓄡 m(-ʔ)-ʾ 𓄡 m(-ʔ)Uʾ	*mˈoːʔ/j	𓃒 m(-ʔ)Uʾ
Urk IV 184.7; DZA 23.679.890; DZA 23.680.430 and elsewhere		LES 4 14.7; P.Leiden 345r G 2.7 and elsewhere; PdT 120.10; DZA 23.680.420 and elsewhere; DZA 23.680.200 and elsewhere		Gloss. Gol. 5.6 (AEO I no. 383)	
Plural					
*mˈaːʔvw	𓄡 m(-ʔ)-ʾ-w	*mˈoːwv(ʔ)	𓃒 m(-ʔ)Uʾ	—	— —
T.Carn. 1 15 and elsewhere		EHT 1 (P.An. I) 19.2 and elsewhere		—	

Cpt.: CrCD 160b; ČeCED 79; VyDELC 109; WeKH 88

In the Onomasticon of Amenope, the word is attested in the toponym 𓊪𓃒.

The Coptic form allows to reconstruct the vocalisation of this word in the three periods as **mˈaːʾ* - **mˈoːʾ* - **mˈoːʾ* respectively, where *ʾ* stands for either a glide *-j* or a glottal stop *-ʔ* developing into a glide. The attested spellings agree with these reconstructions, and support the conclusions about that the group 𓎛 suggested above. By contrast, reconciling these forms with earlier forms is less straightforward. In Middle Egyptian the word was usually spelled 𓃒, which suggests a disyllabic word **mˈvːȝvj*. If this is correct, one may suggest a development **mˈvːȝvj* > **mˈvːȝ* > **mˈvːj*, that is characterised by the fall of the final syllable and by the consequent shift *-ȝ* > *-j*. This is the interpretation followed for instance by Vycichl (1984, 109). Alternatively, a metathesis may have taken place, thus resulting in the development **mˈvːȝvj* > **mˈvːjvȝ* > **mˈvːj*.

The 𓄿 attested in the plural forms may be consonantal, rather than being a marker of a *back* vowel, as a plural ⲙⲱⲟⲩⲓ (B) = *mˈowə* is attested in Coptic (CrCD 160b).

herdsman	mjnʾ	m.j.n.Uʾ ⬇ m-j-nUʾ	*mvjnˈu:w	ⲘⲀⲚϤ mănˈe:w
Singular				
*mvjnˈu:w(ə)	m-j-n0-U m-j-nU	*mvjnˈu:w(ə)	 m-j-nUʾ m-j-n(Uʾ) m-j-n(Uʾ) m-j-n0-U m-j-nU	*mvjnˈu:w	m-j-nUʾ
RAD 3 1.5; P.Berlin 9785 2 and elsewhere		P.Turin 1953/PdT 135.7 and elsewhere; P.Turin 1895+2006/PdT 156.7 and elsewhere; P.Mayer A r2.3 and elsewhere; LES 3 7.3; LES 3 8.3 and elsewhere		Gloss. Gol. 3.1 (AEO I no. 152, 228)	
Plural					
?	 m-j-nUy m-j-nU	?	 m-j-nU	—	— —
Both forms attested in the Abydos Decree of Seti I at Nauri (pl. 40 21; pl. 41 57 in Griffith 1927) and elsewhere		P.Leiden I 344 r9.2		—	

Cpt.: CrCD 173b; ČeCED 84; VyDELC 115–6; WeKH 94

This word appears twice in the Onomasticon, both times as an independent entry (no. 152 and no. 228).

The spellings of all the three periods consistently indicate the presence of a stressed *back* vowel, which can therefore be reconstructed as /u:/. This word can thus be vocalised as ***mvjnˈu:w(ə)***.

Two main forms are attested in Coptic. The first and most common one is ⲙⲁⲛⲉ = *m'anə* < **m'i/ujnv* or the like.[69] The second one, ⲙⲁⲛⲏⲩ (S), ⲙⲉⲛⲉⲩ (B), is rarer. A plural ⲙⲁⲛⲏⲩ (S), ⲙⲁⲛⲏⲟⲩ (B) is also attested. The singular form ⲙⲁⲛⲏⲩ (S), ⲙⲉⲛⲉⲩ (B) has often been interpreted as a compound noun from *mjnꜣ-ꜥw.t* = "herdsman of cattle" (Crum 173b implicitly, Černý 84). Vycichl (1984, 115–6), however, disagreed with such interpretation, arguing that *ꜥw.t* should have resulted in -ⲏⲩⲉ, not -ⲏⲩ; he thus wondered if this form could derive from a plural used as singular/collective.

I think that Coptic ⲙⲁⲛⲏⲩ (S) is the form underlying the Egyptian spellings, as its New Kingdom vocalisation can be reconstructed as **mvjn'u:w(ə)*. As for its origin, I wonder if it is an independent alternative form, as implicitly suggested by Vycichl, or if it is rather the result of a (pre-New-Kingdom) lexicalisation of the expression *mjnꜣ-ꜥw.t*, which resulted in a new, etymologically obscure form. I find the first solution somehow easier, but I do not think the evidence available is conclusive.

At any rate, the form ⲙⲁⲛⲉ = *m'anə* < **m'i/ujnv* could be a secondary form or an innovation that become common only later.

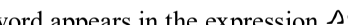
The Period 1 plural [hieroglyphs], which displays a [hieroglyphs], may suggest a slightly different vocalic pattern, perhaps something like **mv(jv)nw'u:y/w(ə)*. This form may be at the origin of the Coptic plural ⲙⲁⲛⲏⲩ (S), ⲙⲁⲛⲏⲟⲩ (B), which would then have a different origin from the singular ⲙⲁⲛⲏⲩ (S), ⲙⲉⲛⲉⲩ (B). The difference in the Bohairic forms may support this interpretation. This suggestion is however very speculative, as the evidence is not clear enough to be conclusive.

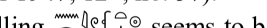
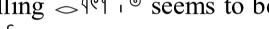
Vycichl (1984, 116) mentioned also a personal name ᵐ*ma-ni-e* from cuneiform sources contemporary to the 18th Dynasty, which he analysed as a possible variant of this word with the stress on the last syllable. Such a vocalisation, however, matches neither the Egyptian nor the Coptic attested forms, and I actually doubt it is related at all.

	time, return of the year	[hieroglyphs] n(r)ꜣ		n(.r).Uꜣ ⬇ n(-r)Uꜣ	*n'u:j		ⲛⲏ/ⲉⲓ (B) n'e:/ej	
—	—	—	—	—	—	*n'u:j	[hieroglyphs]	n(-r)Uꜣ
	—			—		Gloss. Gol. 1.12 (AEO I no. 57)		

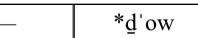
Cpt.: CrCD 219a; ČeCED 105; VyDELC 141; WeKH 120

69 Perhaps through a metathesis **m'i/ujnv* > **m'i/unjv* ?

In the Onomasticon, this word appears in the expression  = “low-lying shoal” (lit. “it comes in the return of the year (?)” – see Gardiner 1947, 12*, no. 57).

The spelling  seems to be unique and attested only in the Onomasticon. Usually, this word is written according to its classical spelling  and the like.

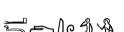
As discussed above, Coptic /e:/ and /e/ can derive from /i:/ or /u:/ and from /i/ or /u/ respectively. On the basis of Coptic, Vycichl (1984, 141) reconstructed the vocalisation and development of a feminine variant of this word as *n ˈiryat > *n ˈiɜyat > *n ˈiyɜat > *n ˈiy > Coptic *n ˈej*, thus implying a parallel development *n ˈi:rvy > *n ˈi:ɜvy > *n ˈi:yvɜ > *n ˈi:y > Coptic *n ˈe:j* for the parallel form with long vowel. The spelling in the Onomasticon, however, suggests that the stressed vowel was a *back* vowel, not a *non-back* one. Therefore, I would rather reconstruct the following development: *n ˈu:rvy > *n ˈu:ɜvy > *n ˈu:yvɜ > *n ˈu:y > Coptic *n ˈe:j*.

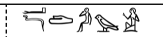
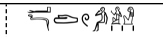
mountain			ḏ.Uʾ ⬇ ḏUʾ		*ḏˈow	ⲧⲟ/ⲱⲟⲩ (S/B) to/o:w		
—	—	—	—	—	—	*ḏˈow		ḏUʾ
—			—			Gloss. Gol. 4.6–7 (AEO I no. 275)		

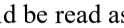
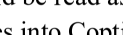
Cpt.: CrCD 440b–441b; ČeCED 199; VyDELC 224; WeKH 253

The use of the group in the Onomasticon is exceptional, as the word is usually written according to the classical spelling and the like, although instances of alternative spellings, such as (sg.), are also known (see attestations in WB and TLA). The use of the group indicates a final stressed *back* vowel in Period 3, and the Coptic form confirms this interpretation. Such final vowel can be reconstructed as an /o/ followed by a glide /w/.

Words without direct Coptic reflexes

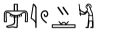
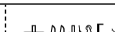
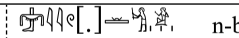
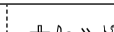
boy	 ʕḏ(d)ʾ	ʕ.ḏ.Uʾ ⬇ ʕ-ḏUʾ	*ʕvḏʾu:(/o:)	—

Singular								
*ʕvḏʾu:(/o:)		ʕ-ḏ	*ʕvḏʾu:(/o:)		ʕ-ḏ(U)ʾ ʕ-ḏU ʕ-ḏU ʕ-ḏUʾ/y	*ʕvḏʾu:(/o:)		ʕ-ḏUʾ
P.An. IX v2			LEM 6 8.6 and elsewhere; LEM 7 31 and elsewhere; P.Leiden 371 v10; LEM 12 v2.1 and elsewhere			Gloss. Gol. 4.11 (AEO I no. 301)		
Plural								
*ʕvḏʾu:		ʕ-ḏU	*ʕvḏʾu:		ʕ-ḏUʾ ʕ-ḏU	—	—	—
P.Leiden I 350 5.8			O.Berlin P 10627 10 and elsewhere; PdT 116 10, 11 and elsewhere			—		

The word is widespread in Late Egyptian sources, but it does not have any direct Coptic descendant. Its consonants are usually read as *ʕ-ḏ-d*, following the conventions of Middle Egyptian. I think however that the variants  and  indicate that its actual reading was *ʕ-ḏ*, and the sequence should be read as a group where only the *ḏ* is pronounced, while the *d* is silent. This interpretation is supported by the fact that the verb evolves into Coptic *ϫo:*, where the *d* was not pronounced anymore. The possible vocalic value of this group, if any, is hard to determine on the basis of this single word. [70] Here again, the group indicates the presence of a final stressed *back* vowel. Its use in both Period 2 and Period 3 hints at either a vowel /o:/ or a vowel /u:/. The presence of a in the plural in Period 1 favours a vowel /u:/, but the fact that only spellings without it are attested in the singular may suggest that the singular had a different vocalic pattern than the plural.

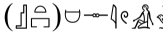
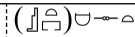
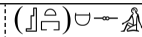
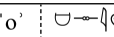
70 There are a few possibilities: a *non-back* vowel *A* from a Period 1 pronunciation **ḏa:*, or a *back* vowel *U* from a later pronunciation **ḏo:*? Or both depending on the period? Or none?

In that case, a vowel /a:/ > /o:/ would be a better candidate. However, in words written in standard orthography, the presence of a final 𓐍 is an explicit indicator of the presence of a *back* vowel, while its absence is not necessarily an indicator of the absence of a *back* vowel. The current available evidence, therefore, is not conclusive.

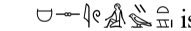
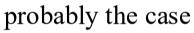
goldsmith	 nb’	n.b.U’ ⬇ n-bU’	*nvbʿo:/u:	—
*nvbʿa:/u:y(ə)	 n-b-y	*nvbʿo:/u:y(ə)	 n-bUy  n-bUy	*nvbʿo:/u:	 n-bU’
P.Boulaq XII 12		P.Sallier 2 4.7 and elsewhere; P.Mayer A v4.10		Gloss. Gol. 3.2 (AEO I no. 159) and elsewhere	

The spelling (P.Mayer A v4.10) from Period 2 may represent *. A spelling (P.Sallier 2 4.7), attested in Period 2, may perhaps be reconstructed as *.

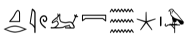
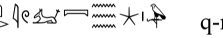
The word is not attested in Coptic, but it is obviously a derivative of = Coptic ⲛⲟⲩⲃ < *n ʿa:bvw*. The spelling in Period 2 suggests that the stressed final *back* vowel was either /o:/ or /u:/. Vycichl 1984, 139–40 considers it as a *nisbe*, which could imply a vocalisation as **nvb ʿa:yij* > **nvb ʿo:yv* or the like, with /o:/. The attestations from Period 1, which do not show any evidence of a *back* vowel, may support this interpretation.

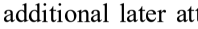
living room	 ḫms’ < ḫmst	ḫ.m.sU’ ⬇ ḫ-m-sU’	*ḫvm(v)sʿo’	—
*ḫvm(v)sʿa’	 ḫ-m-s-(t)	*ḫvm(v)sʿa’	 ḫ-m-s	*ḫvm(v)sʿo’	 ḫ-m-sU’
P.BM EA 10102 v13		P.Leiden I 347 10.4		Gloss. Gol. 5.13 (AEO I no. 424)	

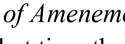
The word appears in the Onomasticon in the expression = “living room” (lit. “place of sitting”/“place to sit”). The same expression is attested also in Period 1 and 2.

 is likely an infinitive of the *IV-infirmae* verb *ḥmsj* = “to sit”, which in Middle Egyptian would have appeared as *ḥmst*, with an ending *-t* replacing the final weak consonant (Allen 2010, 164). By the New Kingdom, however, this final *-t* was not pronounced anymore, being lenited to *-ʔ* or possibly completely dropped (Loprieno 1995, 38). Traces of it could survive in writing, as historical spellings, as it is probably the case for  of Period 1.

This observation is important, because it means that the final syllable of this word was etymologically closed, being *-cvt* > *-cvʔ*, and therefore its vowel etymologically short. This means that the final *back* vowel represented by 𓄿 in Period 3 in the Onomasticon must have been /o/, because this is the only short *back* vowel available in the Egyptian vocalic inventory of the time. The attestations from Period 1 and 2, both written without any indication of a *back* vowel, agree with this interpretation. The vocalisation of the infinitive of this and comparable IV-inf. verbs, therefore, can be reconstructed as **cvcc ˈat* > **cvcc ˈo ʾ* (Period 3), which is likely a variant of the **cvcc ˈaj/w* > **cvcc ˈo ʾ* pattern already recognised by Osing (1976, 47–8) for other IV-inf. verbs.

storm-cloud, storm	 qr’		q.r.U’ ⬇ q-rU’		*qvrˈo:		—	
*qvrˈa:		q-r-’	*qvrˈo:		q-rU’	*qvrˈo:		q-rU’ q-r-’
KRI II 173.14			P.BM EA 10042 (= Harris Magical Pap.) 5.9			Gloss. Gol. 1.6 (AEO I no. 10); P.Hood I 2.5 (AEO II no. 10)		

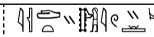
The word is known in all the three periods, and an additional later attestation spelled  can be found in Pap. BM EA 10474 (*Teachings of Amenemope*), dating to the 26th Dynasty (Laisney 2007, 6). This last form points to a vowel /o:/, because as discussed above (§3.1), by that time the vowel /u:/ seems to have already turned into a *non-back* vowel /e:/ or the like.

The Period 1 spelling  (KRI II 173.14), without *back* vowel, agrees with this interpretation.

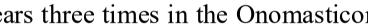
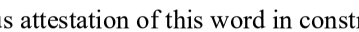
For a detailed discussion, see above.

Words in construct state

maker, builder	jqd’	j.q.d/t.U’ ⬇ j-q-d/tU’	*ʔvq(a)dʿU’	—

—	—	—	—	—	—	*ʔvq(a)dʿU’	 j-q-d/tU’
—		—		Gloss. Gol. 3.7, 3.7, 3.8 (AEO I no. 184, 185, 186)			

Cpt.: CrCD 122b–123a; ČeCED 65; VyDELC 40; WeKH 71

This word appears three times in the Onomasticon, in the following expressions:  = “maker of little (vessels?)” (no. 184),  = “maker of *hn*-vessels” (no. 185), and  = “builder of walls” (no. 186). I could not find any previous attestation of this word in construct state.

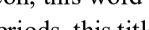
See below for discussion.

commander	 ṯs’ < ṯsy	ṯ.s.U’ ⬇ ṯ-sU’	*ṯvsʿU’	—

—	—	—	—	—	—	*ṯvsʿU	ṯ-sU’
—		—		Gloss. Gol. 3.15–6 (AEO I no. 234, 235)			

Cpt.: CrCD 787b–788a; ČeCED 320; VyDELC 324–5; WeKH 416

In the Onomasticon, this word appears in the title  = “commander of the archers”, which is repeated twice (nos 234–5).

In previous periods, this title is usually spelled  and the like, which obviously does not provide any information about it vocalisation. See here below for discussion.

§12.3 Words in construct state – Some observations

 = "commander" and  = "builder" have direct descendants in Coptic, namely ϫο(ι)c and ϵκωτ. However, the syntactical state of the Egyptian forms underlying these spellings is different from that attested for their Coptic descendants, the first being in the *construct state* and the latter being attested only in the *absolute state*. The difference between these two states is essentially prosodic: on the one hand words in the *absolute state* are either autonomous prosodic units or core elements of larger prosodic sequences, while on the other hand words in *construct state* are prosodically subordinate elements within larger prosodic units, which usually consist of simple direct genitival constructions or direct genitival constructions lexicalised as compound nouns. The expressions  "maker of little (vessels?)" (no. 184),  = "maker of *hn*-vessels" (no. 185),  = "builder of walls" (no. 186), and  = "commander of the archers" (nos 234–5) discussed here (see below) may belong to the latter case, both because they are listed as entries in a lexical list, which may suggest they were perceived as single lexical units by the Egyptians, and because simple direct genitival constructions are relatively rare in Late Egyptian.

The prosodic profile of a word in *absolute state* depends exclusively on morphological features (e.g. number or gender) of the word itself, while the prosodic profile of a word in *construct state* may and do change due to its subordinate relation with other prosodic elements of the sentence. Simple direct genitival constructions and compound nouns, and therefore the *construct state*, were common features in Middle Egyptian, but they are rare and restricted to a limited number of words in Coptic. The *construct state* is therefore attested in Coptic only for a few words, and it is generally characterised by the absence of any stressed syllable and therefore by the reduction of all its vowels (e.g. Cpt. ⲙⲛⲧⲣⲱⲙⲉ = *məntrˈoːmə* < **mˈanvt* + **rˈaːmvt* – see Loprieno 1995, 57). Moreover, scanty evidence from cuneiform transcriptions seems to suggest that the *construct state* prosodic patterns of simple genitival constructions and of compound names may have been different, in ways that are far from being completely understood (Loprieno 1995, 56–7). Therefore, it is generally impossible to use Coptic forms in their *absolute states* to reconstruct the vocalisation and stress patterns of *construct states* in previous periods.

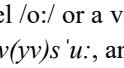
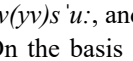
For these reasons, it is not possible to compare the forms and  , in *construct state*, with their Coptic descendant, attested only in *absolute state*. What is possible to do, instead, is to use the group writing spelling of these words to infer some information about the vocalisation of the *construct state* of these words in Period 3.

On the basis of the Coptic forms, the vocalisation of the *absolute state* in Period 3 can be reconstructed as ϫο(ι)c < **t̲ˈoys(ə)* and ϵκωτ < **ʔvqˈoːdə*, which reflect the earlier vocalic pattern *cˈoccv(y/w)* < *cˈaccv(y/w)* and *cvcˈoːcv(w/y)* < *cvcˈaːcv(w/y)* respectively. The group writing spelling of these words can instead be interpreted as **t̲v(yv)sˈUˈ* and **ʔvq(v)dˈUˈ*. It thus appears that in contrast with the *absolute* state, in the *construct state* the last syllable was stressed and characterised by a *back* vowel.

In order to determine the precise nature of such stressed *back* vowels, two considerations have to be taken into account. As mentioned above, according to the standard models, final

stressed syllables in native words should be closed, and therefore their vowels should be short. One may wonder if such rule, if it existed at all (see above), was relevant also for the first elements of compound nouns, because in those contexts, those syllables would not be prosodically final any more. In such cases, it may have been possible, at least in theory, that an originally unstressed final open syllable[71] became stressed in the *construct state*, and could manifest itself as stressed open syllable, because although it was still the final syllable of the first morpheme, it was not prosodically final any more.

This considered, three different vocalisations can be suggested. If their stressed final syllables were closed and their corresponding vowel were short, then these words must have been vocalised **t̲v(yv)s ˈo ʾ* and **ʔvq(v)d ˈo ʾ*, because /o/ was the only short *back* vowel available in Period 3.

By contrast, if the final syllable was open, then these *U* may have stood for either a vowel /o:/ or a vowel /u:/, and therefore  may have been vocalised as **t̲v(yv)s ˈo:* or **t̲v(yv)s ˈu:*, and  as **ʔvq(v)d ˈo:* or **ʔvq(v)d ˈu:*.

On the basis of these words, it can thus be tentatively suggested that the *construct state* of the vocalic patterns *c ˈoccv(y/w) < c ˈaccv(y/w)* and *cvc ˈo:cv(w/y) < cvc ˈa:cv(w/y)* was characterised by the movement of the stress to the last syllable and therefore had the form *cvc(v)c ˈo ʾ ~ cvc(v)c ˈo: ~ cvc(v)c ˈu: < cvc(v)c ˈa ʾ ~ cvc(v)c ˈa: ~ cvc(v)c ˈu:* or the like. Further evidence is needed to determine whether this behaviour is specific of these two words, or it is rather characteristic of these (and other?) vocalic patterns in general.

71 Whose possible existence has been variously suggested – see e.g. Loprieno 1995, 36, 62–3.

§13 The case of *ym* - ⲉⲓⲟⲙ

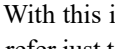
As it appears from the previous paragraphs and from Appendix A here below, the spelling of the word *ym* - ⲉⲓⲟⲙ appears to be generally regular, with a stressed *non-back* vowel for Periods 1 and 2 (when the word expected vocalisation was **yam* - see Appenidx I.1, II.2) and with a *back* vowel in Period 3 (when the word expected vocalisation was **yom* - see III.2).

There are, however, a few additional attestations which appear to be related with this word and which seem to be somehow irregular. Two in particular need attention.

1)  – Astarte Papyrus

The first of such attestations, spelled , comes from the Papyrus Astarte (pBN 202 1.2, 1.x+6, 1.x+13, 2.x+2, 2.x+6, 2.x+11, 2.x+18, 17.y – see Collombert and Coulon 2000), dating to the reign of Amenhotep II. Since the text comes from Period 1, if the word was the same as *ym* = ⲉⲓⲟⲙ, one would expect a spelling implying a *non-back* vowel. However, the form clearly suggest a *back* vowel. This becomes even more problematic if we considered that at the time, not only the shift /a/ > /o/, but also the shift /a:/ > /o:/ had not occurred yet.

The first aspect to consider is the nature of the text (see Collombert and Coulon 2000 for discussion). The papyrus of Astarte is an Egyptian text which records a mythical tale of evident North-West-Semitic origins related with the storm good Ba'al, identified in the text with Seth. The story may have had various episodes, as it was the case for the Ugaritic cycle of Ba'al, but only very small fragments of the papyrus survive, and only an episode of a fight between the storm god Ba'al/Seth and the sea god Yam can be identified. The language and style of the papyrus is also worthy of attention: although it is written in proper Late Egyptian, the text contains multiple unusual expressions that have perfect parallels in North-West Semitic sources.[72]

With this in mind, the first thing to note is that the word  of P.Astarte does not refer just to the "sea" as an extension of water, in general, but rather it refers to the sea as a divine entity. Such deity clearly corresponds to Yammu, the Cananite god of the sea, whose name is indeed identical with the word for "sea" in North-West-Semitic languages. This distinction in the meaning of the word is crucial for two reasons. First, being this word a personal name of a specific god, it may have to be considered as lexically distinct from the word *ym* - ⲉⲓⲟⲙ. Second, this Egytian form could be based on, and could thus reflect, the pronunciation of this divine name in a specific North-West-Semitic tradition, rather than being a transcription of the contemporary pronunciation of the general noun *ym* - ⲉⲓⲟⲙ = "sea". This possibility becomes even more likely if the narrative preserved in the papyrus was based on a North-West-Semitic original.

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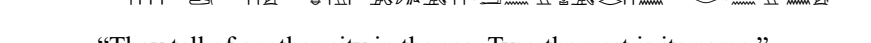
72 The similarities are so remarkable that it has even been suggested (Gaster 1952) that the text may be a translation of a North-West-Semitic original, possibly realised in a cultic environment – a possibility that I indeed find worth of attention.

2)  – P.Anastasi I

The second exceptional attestation is spelled and appears in P.Anastasi I 21.1, which dates to Period 2. In this case, judging from the context, the word does seem to mean just “sea”:



“They tell of another city in the sea, Tyre-the-port is its name.”

The spelling clearly suggests the presence of a *back* vowel, but in Period 2 a *non-back* vowel would be expected. Once again, the first aspect to consider is the nature of the text in which this attestation appears. P.Anastasi I preserves a copy of the so-called *Letter of Hori*, a text relatively widespread in the New Kingdom and likely used for didactic purposes (see Gardiner 1911, passim; Fischer-Elfert 1992, passim, Allen in Hallo and Younger 1997–2002, III.9). One of the characteristic features of this text is the abundance of North-West-Semitic words.[73] Moreover, it is also worth noticing that the word appears in a passage that specifically describes the city of Tyre, which is located in Lebanon and was one of the main Phoenician centres during the Iron Age.

Besides the two attestations just discussed, a few occasional comparable forms spelled with a *back* vowel exist also in other documents.[74] Such forms may be all related, and they may share the same origin as those of P.Astarte or P.Anastasi I, or may have been influenced by comparable forms.

In this case, one may suggest that the word of the Astarte papyrus had to be read as **yum(mv)~*yu:mV* in Egyptian,[75] while in the case of Pap. Anastasi I a reading **yo:mV* could also be possible. This form may reflect a North-West-Semitic prototype **yum(mu) ~ *yūm(mu) ~ *yōm(mu)* which, however, does not seem to be attested: the available North-West-Semitic evidence seems to point to a contemporary prototype **yam(mu)*, with a *non-back* vowel /a/, not with a *back* vowel /u(:)/~/o:/.[76] These exceptional spelling are, therefore, difficult to explain. If they are not mere mistakes of the Egyptian scribes, these Egyptian spellings may reflect an otherwise unattested secondary North-West-Semitic post-Cananite shift form **yōm(mu) ~ *yōm(u)*, deriving from a pre-Cananite shift prototype ***yām(mu) ~ **yām(u)*, with a long vowel. If this is the case, a main Egyptian form **yam(mV)* < N-W-Sem. **yam(mu)* and a secondary, les common

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73 Including a whole North-West-Semitic sentence appearing in P.An. I 23.5. It is possible that one of the purposes of this text was to familiarise the Egyptian students to words in foreign languages that may have been useful in their future career as scribes, hence the high concentration of North-West-Semitic words and loanwords.

74 In particular P.Harris I and P.Turin 21 and 22 (Pleyte and Rossi 1869) – see digitalised slips for *ym* in the online database of the Berlin *Wörterbuch der ägyptischen Sprache.*

75 With *U* = /u(:)/ as at the time this was the only *back* vowel available in the language.

76 The Phoenician form may have been been /yom/, but the Phoenician development of short /a/ into /o/ is usually considered to be later than the Egyptian texts discussed here, and therefore can hardly explain these spellings.

form **yum(mu)* ~ **yūm(mu)* ~ **yōm(mu)* may have coexisted at least until Period 3, when the vocalic shift /a/ > /o/ made them indistinguishable in writing.

§14 Conclusions

It is clear that the interpretative model presented here still needs to be refined. However, it is the first system that allows to explain all the forms of a methodologically sound and solid corpus, and does so by attributing only one vocalic value to each group – although it does allow for two possible readings *CV*/*VC*. The validity of the system can be argued both on synchronic and diachronic ground, and it is strongly supported by the results of the statistical analysis described in §9.

Some aspects, however, still need to be clarified and, hopefully, explained. For instance, it is still unclear if monoliteral signs were functionally different from *c+ȝ* groups. The evidence analysed here seems to suggest that they were equivalent and no difference existed between them. However, further studies could help to support this conclusion, or could lead to alternative interpretations.

The same stands true also for the question of the sign ꜣ. I think that the evidence presented in this book convincingly shows that the sign ꜣ was not used as a vocalic marker and illustrates some of its other specific functions. Nevertheless, in some contexts the reasons for the presence of ꜣ still remain unclear, and would need further investigation. A systematic reanalysis of Semitic loans attested in group writing, whether they survive in Coptic or not, may help in clarifying these aspects.

The interpretative model presented here, and in general a more reliable understanding of the functioning of the vocalisation of group writing, opens numerous doors for further research. First and foremost, this new interpretation provides an innovative powerful tool to explore the vocalisation of the Egyptian language and its evolution through the Egyptian texts themselves, thus providing a considerable amount of fresh data. Its potential is not only limited to forms attested in Coptic, as those forming the corpus used in this study, but it extends to any word written in group writing, even to those known only from Late Egyptian sources. This is particularly true for those terms that are attested over more than one period: by combining the data from the different attestations, it would be possible to guess not only if the word had a *back* or *non-back* vowel, but also the specific nature of such vowel. For instance, if a word is attested with a *non-back* vowel in Period 1 and with a *back* vowel in Period 2, we can assume that such vowel was an /a:/ that turned into an /o:/, as this is the only vocalic change that took place at that time that could explain such a difference in spelling. By contrast, for instance, a word displaying a *non-back* vowel in Period 2 and a *back* vowel in Period 3 would imply the presence of an /a/ turning into /o/, while a word displaying a *back* vowel in Period 1, 2 and 3 would imply the presence of a vowel /u:/ or /u/, as those are the only *back* vowels that remain stable across the three periods.

The possibility of recognising the nature of the stressed vowel would also provide information about the syllabic structure of such word, as the presence of an /a:/ > /o:/ in Period 1–2 would imply the presence of an open syllable, and therefore of a specific syllabic structure for the whole word. By contrast, the presence of an /a/ > /o/ would

imply the presence of a closed syllable in Period 1-2, and therefore an altogether different syllabic pattern.[77]

More in general, to be able of reconstructing the vocalisation also for words which are not attested in Coptic or in other external sources[78] provides a whole new range of possibilities to deepen our understanding of various linguistic aspects of the Egyptian language. For instance, the vocalisation of verbal forms could be studied. For the reasons explained in §3.1, no verb was included in the corpus used in this book. Nevertheless, various verbs are indeed attested in group writing, and their study could shed new light on crucial grammatical issues.

The vocalisation inferred from group writing spellings could also be used to date the texts in which they appear. It is clear that if the group writing spelling of a word in a given text suggests a stressed /o:/, while that of another word in the same text suggests a stressed vowel /a/, then the that text should likely be dated[79] to Period 2, because only then the vowels /o:/ and /a/ could coexist.

Similarly, the appearance of Semitic loanwords attested in group writing could be used to estimate when they have entered Egyptian, for instance by correlating their vocalisation with the so-called Canaanite vocalic shift. This in turn may help in better defining the chronological and sociocultural frames of the interactions that brought these words into Egyptian.

More in general, this new reading of group writing words could certainly bring new crucial data also for the study of (North-West-)Semitic languages and dialects, for a period for which only few scanty traces are otherwise available.

Finally, this new interpretation of group writing could also be applied to historical sources, such as the topographical lists, not only to obtain a better reading of the names themselves, but also to verify the identifications suggested so far, which until now have usually been based only on the consonantal skeleton of these names.

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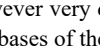
77 This, for instance, could be used to dismiss doubtful Coptic etymology. For instance Černý (1976, 340) suggested to link Coptic ϭογϫ “safflower” “cardamom” with Egyptian *kꜣ* “some herb or flower”. This etymology was however very doubtful and was not endorsed by any other scholar. Now it can also be rejected on the bases of the Egyptian evidence itself. The Egyptian word *kꜣ* is in fact spelled  = *kAꜣ(A)* in Period 1,  = *kAꜣ(A)* in Period 2, and  = *kUꜣ(A)* in Period 3. This sequence *A-A-U* clearly indicates the presence of a stressed short /a/ shifting to /o/. The Coptic form, however, requires a long /a:/, which would have shifted to /o:/ already in Period 2. Therefore, the Egyptian and Coptic forms cannot be directly related.

78 Such as Akkadian transcriptions.

79 Either in its composition or in its redaction – this is actually an aspect that indeed need to be further researched.

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Appendix A

Abbreviations

Languages

Akk.	Akkadian
Arb.	Arabic
Arm.	Aramaic
Eth.	Ethiopic – mainly Ge'ez or Proto Ethiopic
Cpt.	Coptic
Eg.	Egyptian
Heb.	Hebrew
Sem.	Semitic (as a linguistic group, or as Common/Proto-Semitic)
Syr.	Syriac
Ug.	Ugaritic

Egyptian Dictionaries and Lexical studies

HoSW	*Semitic Words in Egyptian Texts*, Hoch, 1994
LeLE	*A Dictionary of Late Egyptian*, Lesko, 2002–2004
TLA	*Thesaurus Linguae Aegyptiae*, http://aaew.bbaw.de/tla/index.html
WB	*Wörterbuch der aegyptischen Sprache*, Erman, Grapow, 1926-1963

Coptic Dictionaries

ČeCED	*Coptic Etymological Dictionary*, Černý, 1976
CrCD	*A Coptic Dictionary*, Crum, 1939
CAD	Chicago Assyrian Dictionary, Gelb, etc, 1956–2011
DULA	*A Dictionary of the Ugaritic Language in the Alphabetic Tradition*, Olmo Lete, Sanmartín, 2003
VyDELC	*Dictionnaire étymologique de la langue copte*, Vycichl, 1984
WeKH	*Koptisches Handwörterbuch*, Westendorf, 1965

Other sources

Note: for questions of space, only basic references are given in the appendix for the Egyptian attestations. For the specific publications, see the bibliographic references in HoSW *Semitic Words in Egyptian Texts* Hoch 1994, in LeLE *A Dictionary of Late Egyptian* Lesko 2002–2004 and in the online database and digitised slips of the Berlin *Wörterbuch der ägyptischen Sprache – Thesaurus Linguae Aegyptiae* (http://aaew.bbaw.de/tla/ : last visited 5.11.2017)

AEO I	*Ancient Egyptian Onomastica* Gardiner 1947
BM EA	British Museum Catalogue
Gloss. Gol.	Glossary Golenischeff (see AEO I)
C.DAI	Caminos, *Duplicate of Papyrus Anastasi I* Caminos 1958
EHT	*Egyptian Hieratic Texts* Gardiner 1911
H.O.	*Hieratic Ostraca* Černý and Gardiner 1957
P.Ch. Beatty	Papyri Chester Beatty = HPBM 3
HPBM	*Hieratic Papyri in the British Museum* (series with various authors)
Inscr. Hamm	Inscriptions Wadi Hammamat
JEA	*Journal of Egyptian Archaeology*
KRI	Kitchen *Ramesside Inscriptions* Kitchen 1975–1990
LEM	*Late-Egyptian Miscellanies* Gardiner 1937
LES	*Late-Egyptian Stories* Gardiner 1932
LLR	London Leather Roll = BM EA 10379
LRL	*Late Ramesside Letters* Černý 1939
O.Berlin	Ostraca Berlin
O.BM EA	Ostraca British Museum
O.Cairo	Ostraca Cairo
O.DeM	Ostraca Deir el-Medina
O.Gard.	Ostraca Gardiner
O.IFAO	Ostraca Institut français d'archeologie orientale
O.Petrie	Ostraca Petrie
O.ROM	Ostraca Royal Ontario Museum, Toronto
O.Turin	Ostraca Turin
O.Vienna Aeg.	Ostraca Vienna, Egyptian collection
P.Abbott	Papyrus Abbott = BM EA 10221
P.An.	Papyri Anastasi
P.Berlin	Papyri Berlin
P.BM EA	Papyri British Museum
P.Boulaq	Papyri Boulaq
P.Cairo	Papyri Cairo
P.DeM	Papyri Deir el-Medina
PdT	*Papyrus de Turin* Pleyte and Rossi 1869
P.Ebers	Papyrus Ebers
P.Harris I	Papyrus Harris I = BM EA 9999
P.Harris 500	Papyrus Harris 500 = BM EA 10060
P.Hood I	Papyrus Hood I = BM EA 10202
P.Leiden	Papyri Leiden
P.Mallet	Papyrus Mallet = Louvre 1050 Louvre E 11006
P.Mayer	Papyrus Mayer
P.Push. 127	Papyrus Pushkin Museum 127
P.Sallier	Papyrus Sallier
P.Salt 124	Papyrus Salt 124 = BM EA 10055

P.Turin	Papyri Turin
RAD	Ramesside Administrative Documents Gardiner 1948
RdE	*Revue d'Egyptologie*
T.Carn. 1	Tablet Carnarvon 1 (Gardiner 1916)
TR	*The Great Tomb-robberies of the Twentieth Egyptian Dynasty* Peet 1977
Trismegistos	http://www.trismegistos.org (last visited 5.11.2017)
Univ.Board	University College Writing Board = AEO I 64-8
Urk. IV	*Urkunden der 18. Dynastie* Sethe and Helck 1906–1958

Attestations

Period 1

I.1	a jar	 jkn	jA.kU.nA ⬇ jAkUnA	*ʔvkˈa:/o:nv	ⲁⲕⲱⲛⲉ ăkˈo:nə

Eg.: Urk. IV 665.16 = HoSW 42.36; Urk. IV 717.16 = HoSW 42.36; Urk. IV 722.3 = HoSW 42.36; Urk. IV 731.11 () = HoSW 42.36
Cpt.: WeKH 484
Sem.: **ʔagga(:)n(nv)* – cf. Akk. *agannu*; Arb. *ʔijjāna*; Warka Arm. *ag-gan-nu*, *ag-ga-nu*; Syr. *ʔaggānā*, all referring to some kind of vessel.
Notes: the form *a-ku-nu* appearing in an Amarna letter is likely a transcription of the Egyptian form, rather than of Semitic prototype, both because of the *k* instead of *g* and because the word appears in a list of vessels sent from Egypt. If so, the spelling *ku* would confirm once again the early shift /a(:)/ > /o:/ in Egyptian (see above §4.5.1).
It is worth noticing that a variant  is also attested (LeLE i.50 H.O. 87v5). This form is clearly spelled according to the *w*-orthography and has to be read as *jkn-w = jkwn*. This spelling is important because it confirms the *back* nature of the stressed vowel and therefore confirms the reading of the form spelled in group writing.
Finally, two variants ⲉⲕⲱⲛⲉ and ⲉⲅⲱⲛⲉ are also attested in Sahidic.

I.2	sea	 ym	yA.m(A) ⬇ yAm(A)	*yˈam	ⲉⲓⲟⲙ jˈom

Eg.: P.Leiden I 350 1.11 = HoSW 52-3.52; Ramses II Tanis stele (Yoyotte Kemi 10 pl. VI 15) () = HoSW 52-3.52; KRI II 230.10 () = LeLE i.28 = HoSW 52-3.52
Cpt.: CrCD 77a; ČeCED 46; VyDELC 63; WeKH 49
Sem.: **yam(mv)* – cf. Amorrite *yammum*; Arb. *yam*; Arm. *yamm(ā)*; *Heb. yam*, all “sea”
Notes: see discussion §13.

I.3	branch of date-palm	 bʕyt$_1$	bA.ʕA.y0.ə ⬇ bAʕAyə	*bvʕˈi:/u:y(wv) > *bvyˈi:/u:ʕ(wv)	ⲃⲁⲉⲓⲏ (pl.) băjˈe:

Eg.: P.Harris 500r 2.4
Cpt.: CrCD 27b; ČeCED 20; VyDELC 24; WeKH 19

Notes: The Egyptian form is a plural/collective, and so is the Coptic ⲃⲁⲉⲓⲛ Vycichl 1984, 24. The corresponding Coptic singular is ⲃⲁ / ⲃⲁⲉ.

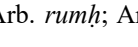
			bA.ʸr0.yA		ɋ/ϕ/ʙορι (B/B/S)
I.4	a fish	 bry	⬇	*bʿar(yv)	ʙωρϵ (S) bʿorə
			bAr(yA)		bʿo:rə

Eg.: P.Leiden I 350 3v.4 = LeLE i.136
Cpt.: CrCD 42a; ČeCED 25; VyDELC 30; WeKH 26
Notes: According to Vycichl 1984, 25, the Coptic forms with -o- are originally plural. They could also just alternative singular forms. This latter option is supported by the Egyptian spelling (also in Period 2 and 3), as the use of  implies that the first syllable was closed, and therefore had a short vowel.

			bA.sA		
I.5	pail, bucket	 bs	⬇	*bʿi:/u:sv	ʙнсϵ bʿe:sə
			bAsA		

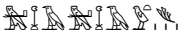
H.O. 65 2v.3 = LeLE i.139
Cpt.: CrCD 44b; ČeCED 27; VyDELC 31–2; WeKH 27
Notes: see Janssen 1975, 206

			m0.Uʸrḥ		ʜєр(є)ϩ
I.6	spear, javelin	mrḥ	⬇	*mʿi/urḥv < Sem. *murḥv	ʜєрє/ʜϩ mʿerəh
			mUrḥ		mərʿe:h

Eg.: LEM 11 1.5 = LeLE i.194 = HoSW 138.179; LEM 5 17.1 = LeLE i.194 = HoSW 138.179; KRI II 789.9 () = HoSW 138.179
Sem.: **rumḥ(v)* – cf. Arb. *rumḥ*; Arm. *rumḥā*; Eth. *ramḥ*; Heb. *rōmaḥ*; Syr. *rumḥā*, all "spear"
Cpt.: CrCD 184a; ČeCED 90; VyDELC 121; WeKH 101
Notes: the form attested in KRI II 789.9 may be a plural. The Coptic form ʜєрнϩ suggest the existence of an alternative form **mvrʿi:/u:hv*, which also may in fact have originally been a plural.
For the metathesis in the Egyptian form see Ug. *mrḥ* and see above, §6.

			mA.ʸr0.k0.Ub.tA		
I.7	chariot	 mrkbt	⬇	*mvrkʿa/obtv	ʙрϭооүт bərkʲowt
			mArkUbt(A)		

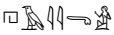
Eg.: H.O. 75 v.6 = HoSW 145-6.189
Cpt.: CrCD 44b; ČeCED 27; VyDELC 31; WeKH 27
Sem.: **markabt(v)* – cf. Akk. *narkabtu*; Arb. *markaba*; Arm. *markaḫtā*; Heb. *mɛrkāḫā*; Syr. *markaḫtā*; Ug. *markabt-* , all "chariot"

I.8	flowers (purslane)	 mḫmḫwt$_1$	mA.ḫ0.mA.ḫ.w$_1$0.ə ⬇ mAḫmAḫw$_1$ə	*mvḫmˈaḫwv	*ⲙⲉϩⲙⲟϩⲩⲉ *mehmˈohwə

Eg.: P.Harris 500r 7.3 = LeLE i.201
Cpt.: CrCD 211b; ČeCED 99; VyDELC 131; WeKH 112
Notes: the presence of  and the plural strokes suggests that the Egyptian form is plural. No distinct plural form is attested in Coptic, but a plural *ⲙⲉϩⲙⲟϩⲩⲉ - **mehmˈohwə* can be assumed from sg. SB ⲙⲉϩⲙⲟⲩϩⲉ, by analogy with sg. ⲡⲉ - pl. ⲡⲏⲩⲉ "sky"-"skies" (CrCD 259a).

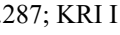
I.9	stronghold	 mktr	mA.k0.tA.r(A) ⬇ mAktAr(A)	*mvktˈa(:)l(v)	ⲙⲉⲑⲧⲟ/ⲱⲗ (B/S) məkʲtˈo/o:l

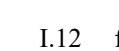
Eg.: KRI I 10.1 = LeLE i.212 = HoSW 169.224
Cpt.: CrCD 214b; ČeCED 102; VyDELC 132; WeKH 114
Sem.: **mi/agda:l(v)* – cf. Heb. *migdāl* (n.loc. *migdōl*); Arm. *mi/agdlā* all "tower", "fortress"; see also Akk. n.loc. *magdali*

I.10	husband	 hy	hA.y0 ⬇ hAy	*hˈi/uy	ϩⲁⲓ hˈaj

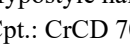
Eg.: P.Harris 500r 7.8,8.4; P.Leiden I 348 v11.1
Cpt.: CrCD 636b; ČeCED 269; VyDELC 290; WeKH 357

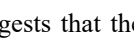
I.11	law(s)	 hp	h0.Up ⬇ hUp	*hˈi/up	ϩⲁⲡ hˈap

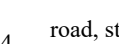
Eg.: KRI I 55.9 = LeLE i.287; KRI I 76.1 = LeLE i.287 ()
Cpt.: CrCD 693b–5a; ČeCED 289; VyDELC 306; WeKH 381
Notes: this form may actually be spelled according to the *w*-orthography, rather than in group writing.

I.12	flower	 ḥrr(t)	ḥU.rU.Ur ⬇ ḥUrUr	*ḥvrˈi:/u:rv	ϩϸϩϵ hrˈe:rə

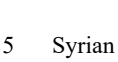
Eg.: Harris 500 7.7-8 (); KRI I 109.16 (); DZA 27.265.150 - Luxor Hypostyle hall, Amenhotep III ()
Cpt.: CrCD 704a; ČeCED 294; VyDELC 310; WeKH 388

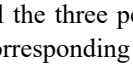
I.13	beetle, worm	 ḥrrw(t)	ḥA.rU.r0.w$_1$A ⬇ ḥArUrw$_1$A	*ḥvlˈi:/u:lwv	*ϩϪϫϵϫϒϵ (A) hălˈelwə

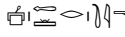
Eg.: P.Ebers 19.16
Cpt.: CrCD 669a; ČeCED 279; VyDELC 297; WeKH 366
Notes: as in the case of  above (I.8), the presence of and the plural strokes suggests that the Egyptian form is plural. No distinct plural form is attested in Coptic, but a plural *ϩϪϫϵϫϒϵ - **hălˈelwə* can be assumed from sg. A ϩϪⲗϫ, by analogy with sg. ⲡϵ - pl. ⲛⲏϒϵ “sky”-“skies” (CrCD 259a).

I.14	road, street, quarter	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈi:/u:rv < Sem. *ḫur(r)v	ϩⲓⲣ hˈi:r

Eg.: KRI 273.9 = HoSW 247.343
Cpt.: CrCD 696b; ČeCED 291; VyDELC 307; WeKH 384
Sem.: **ḫur(ru)* – cf. Akk. *ḫurru* “hole”, “cave”; Heb. *ḥōr* “hole”; see HoSW for the semantic development

I.15	Syrian	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈu/ir(rv) < Sem. *ḫur(rv)	ϩⲁⲗ hˈal

Eg.: Urk. IV 743.8
Cpt.: CrCD 665a; ČeCED 277; VyDELC 295–6; WeKH 363
Sem.: **ḫur(rv)* –Akk. *ḫurru*; Heb. *ḥōrī* “name of a population”, ultimately from Hurrian (see Loprieno 1995, 46).
Notes: the Coptic word means “servant”, “slave”. This word is attested multiple time in all the three periods, especially in the plural, and so are adjectival forms as well as the corresponding geographical term,  = “Hurrian land”, “Syria”. However, since the Coptic form is singular, only substantives in the singular are listed in this appendix, both here and for the other periods below.

I.16	wool, hair	 sʕrt	sA.ʕA.r0.tA ⬇ sAʕArtA	*svʕˈartv	сорт sˈort

Eg.: KRI III 500.2, 500.10-11, 502.12, 503.11-12 = LeLE ii.15 = HoSW 256.359
Cpt.: CrCD 356b; ČeCED 162; VyDELC 197; WeKH 195
Sem.: **śaʕrat(v)* – Akk. *šārtu* “hair”, “pelt”, “wool”; Arb. *šaʕra* “hair”; Eth. *šəʕərt* “hair”; Heb. *śaʕărā* “hair”; Ug. *šaʕartu*; masculine forms are also attested in various Semitic languages.
Notes: Given the plural stroke, the Egyptian from may be a collective. The nature of the vowel, however, would not change in this period.

I.17	lotus	 srpt	sA.ʸr0.pA.t ⬇ sArpAt	*svrpˈat	сарп/фо/ат (O/B) sărpˈot

Eg.: P.Harris 500r 2.7-8 = LeLE ii.58
Cpt.: CrCD 356b; ČeCED 161–2; VyDELC 196; WeKH 195
Sem.: **sarpad(v)* – cf. Heb. *sirpād* “some plant”, “nettle”, in turn from Middle Egyptian *sꜣpt* (not in Hoch, see Vycichl 1984, 196
Notes: As pointed out by Černý 1976, 162 the Late Egyptian word is likely a borrowing from a Semitic language, but in turn the Semitic form is likely a borrowing from earlier Middle Egyptian *sꜣpt* “lotus”. Note that the Semitic form preserves the final Egyptian /t/ as /d/ and the /r/ suggests that the word was borrowed from Egyptian when *ꜣ* was still pronounced as a trill. At the same time, as observed by Vycichl 1984, 196, the preservation of the final /t/ and the pronunciation with /r/ in the Late Egyptian (and the Coptic) word indicate that this form must have been a borrowing from Semitic, because if it were a direct descendant of Middle Egyptian *sꜣpt* the final /t/ should have disappeared and the /ꜣ/ should have been pronounced and transcribed, as a glottal stop, not as /r/.

I.18	staffs, rods (pl.)	 šbd(t$_1$)	šA.bA.d0.ə ⬇ šAbAdə	*švbˈadyv *švbˈa:dv	цвоꝋ (B) цвшт (S) šəbˈotə šəbˈo:t

Eg.: P.Harris 500r 2.3 = LeLE ii.117-8 = HoSW 276-8.397
Cpt.: CrCD 554a; ČeCED 238; VyDELC 258; WeKH 305
Sem.: **šibṯ(v)* – cf. Arm. *šiḇṭā*; Eth. *šəbṭ*; Heb. *šeḇɛṭ*; Syr. *šaḇṭā*, all “rod”, “staff”; cf also Akk. *šabātu* “to beat”.
Notes: see §8 for discussion – Both Egyptian and Coptic forms are plural and could correspond to either II.34b or II.34d of Period 2.

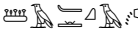
Since in this period the prototypes of both the Coptic forms would have been pronounced with a *non-back* vowel, there is no way and no need to distinguish them.
Note that the vocalic structure of the Coptic, and therefore the Egyptian forms does not agree with any of the vocalic patterns characterising the Semitic forms.
A solution, however, may come from the regular plural of the Heb. form, which is *šəbāṭīm*. Such a form (possibly through a dialect or a variant without mimation **šəbāṭī* ?) may have been at the origin or may have influenced the vocalic pattern of the Egyptian word.

I.19	father/mother in law	 šm	šA.m0 ⬇ šAm	*šʿam	⳩ⲟⲙ šʿom

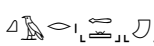
Eg.: JEA 66.100 = LeLE ii.122
Cpt.: CrCD 564a; ČeCED 243; VyDELC 263; WeKH 314

I.20	scale of fish	 šnft$_1$	šA.n0.f0.ə ⬇ šAnfə	*šʿi/unfv	⳩(ϵ)ⲛⲥϵ šʿenfə

Eg.: Hymnus an Aton, line 10 (tombs no. 1 - Huya and no. 3 - Ahmose)
Cpt.: CrCD 574a; ČeCED 247; VyDELC 267; WeKH 320

I.21	dust	 šḫq	šA.ḥU.qA ⬇ šAḥUqA	*švḥʿi:/u:qv	⳩(ϩ)ιϭ šəhʿi:kʲ

Eg.: HPBM3 CB 9 vB 18.10 = HoSW 267.411
Cpt.: CrCD 612b; ČeCED 263; VyDELC 277; WeKH 341
Sem.: no comparable Semitic form is attested, but according to Hoch the word is likely related with Sem. √*šḥq* “to grind”, “to pulverise”, see Heb. √*šḥq* “to pulverise (stone)”; Akk. *šêqu* “to smooth”, “to level off”; Arb. *saḥaqa* “to crush”, “to pulverise”; Arm. *šəḥaq* “to grind”, “to rub”, “to pound”; Syr. *šəḥaq* “to pulverise”. The Egyptian form may derive from a *qatīl* passive/stative particle Fox 2003, 187–96.

I.22	shield	 qrʕ	qA.r0.ʕA ⬇ qArʕA	*qʿi/ulʕv < Sem. *qilʕv	ϭ(ⲗ)ⲗ kʲʿal

Eg.: KRI II 6.10 = LeLE ii.156 = HoSW 298.432
Cpt.: CrCD 806a; ČeCED 326; VyDELC 337; WeKH 448
Sem.: **qilʕ(v)* – cf. Arb. *qilʕ* “sail”; Arm. *qilʕā* “curtains”, “sail”; Heb. *qɛlaʕ* “slingshot”; Syr. *qelaʕ* “sling”, “sail”; for the meaning, see Ug. *qlʕ* “shield”.

Notes: A spelling  is attested in O. Turin 57365.
KRI II 6.6 and KRI II 6.7 have two attestations which are not written in group writing, but are characterised by a final  . The meaning of this final sign is puzzling, especially at the beginning of the 19th Dynasty. However, I think it can be excluded that it was a marker of vocalisation (as it was spelled with , not with  as it is usually the case in *w*-orthography), and therefore does not really concerns us here. Perhaps it was a attempt to write some form of ending (perhaps a case?) in the original Semitic language. A specific study of the monumental orthography of the period would be needed to clarify this point, but this is obviously beyond the scope of this study.

			kA.rA.rA		
I.23	vessel for unguent	 krr	⬇	*kvlˈa:lv	ʞєλѡλ kəlˈo:l
			kArArA		

Eg.: P.Boulaq XIII frag. 11.3 = LeLE ii.176
Cpt.: CrCD 104a; ČeCED 56; VyDELC 77; WeKH 62
Notes: see BIFAO 83 (Pl.48) p.244.

			kU.rA.kU.rA		
I.24	couch, bed	 krkr	⬇	*kvlˈak(kvrv)	ɞλoɞ kʲəlˈokʲ
			kUrAkUrA		

Eg.: Urk. IV 667.2 = LeLE ii.117 = HoSW 333–4.486
Cpt.: CrCD 815a, var.s: ɞλoɞ, τλ. (S); ɞλox (BF); xλ. (B); ɞλaɞ (AA²F); ɞλєx (F); ČeCED 330; VyDELC 340; WeKH 454
Sem.: **kvlak(kv)* – cf. Akk. *kalakku* “long chair”; perhaps also related with Arm. *gəlīltā* “folding couch; cot” and Heb. √*gll* “turning”, “folding”

			ḏA.n$_1$rU.y0.ə		
I.25	scorpion	 ḏ^{n}ryt$_1$	⬇	*ḏv^{n}rˈi:/u:yv	ɞλʜ kʲlˈe:
			ḏA^{n}rUyə		

Eg.: HPBM3 CB 7r 6.7
Cpt.: CrCD 810a; ČeCED 327; VyDELC 337; WeKH 449
Notes: misspelled in Pap Berlin 3038,  [...]¦ Date unsure, attributed here to Period 1 because found with administrative document of Ramses II (see: http://sae.saw-leipzig.de/detail/dokument/papyrus-berlin-p-3038/ last visited: 3.11.2017)

			ḏA.n0.Uḥ		
I.26	arm (of oar)	 ḏnḥ	⬇	*ḏvnˈa/i/uḥ	ϫʜɑʔ jənˈah
			ḏAnAḥ		

Eg.: KRI I 273.10 = LeLE ii.270
Cpt.: CrCD 777a; ČeCED 317; VyDELC 329; WeKH 428
Notes: the Coptic form means “arm”, “shoulder”.
The spelling of the Egyptian form suggests an original vowel /u/, and such a vowel could indeed be the ancestor of Coptic ⲁ in front of ϩ. It is worth noting that a *back* vowel was also implied by a form spelled in *w*-orthography that I discussed a previous work (Kilani 2017a, 194–5). At the time, such form puzzled me, and I suggested that the -w may have actually been a dual ending. The group writing spelling of the form discussed here, however, clearly shows that the word was characterised by a stressed *back* vowel. This is a crucial observation as it constitutes a double validation of the *w*-orthography: on the one hand it is an internal confirmation of the presence of a *back* vowel in a word spelled with the marker -*w*, and on the other it allows to explain, and thus to eliminate, the only exception in the series of words with tonic ⲁ, which therefore appear to be always coherently spelled without the marker -*w* when they do not derive from an earlier vowel /u/ (see Kilani 2017a, 193–5).

Period 2

II.1	a purple dye-plant, madder	 jp	jA.pA ⬇ jApA	*ʔvpʿi:(cv)	ⲁⲡⲉⲓ ăpʿi:

Eg.: LEM 10 4.6 = LeLE i.25
Cpt.: CrCD 14a; ČeCED 11; VyDELC 14; WeKH 10

II.2	sea	 ym	yA.m(A) ⬇ yAm(A)	*yʿam	ⲉⲓⲟⲙ jʿom

Eg.: LES I 8.9 = LeLE i.28 = HoSW 83.100; LEM 3 3.1 = HoSW 52.52; Medinet Habu 600.5,7 = HoSW 52.52 ( ,); KRI V 91.9 = HoSW 52.52 ()
Cpt.: CrCD 77a; ČeCED 46; VyDELC 63; WeKH 49
Sem.: see attestations in Period 1 above.
Notes: see attestations in Period 1 above.

II.3	pebble	 ʕⁿ/ʸ(r)r	ʕ0.Unₗ/ʸ(r)r ʕU.nₗʸr0 ⬇ ʕUⁿr	*ʕʿi/ur	ⲁⲗ ʿal

Eg.: EHT 1 (P.An. I) 23.3 () = LeLE i.69; EHT 1 (P.An. I) 24.2 () = LeLE i.69; TR 10052 (Pl.34) 14.4 () = LeLE i.69; P.Turin 1879 vI2.4 ().

Cpt.: CrCD 3b; ČeCED 4; VyDELC 6; WeKH 3

Notes: Possibly plural or collective. No different form for the plural is attested in Coptic, and it is possible that this was the case also in Late Egyptian. Alternatively, it is likely that the plural had a structure **ʕˈi:/u:lv*. In this case, the length of the stressed vowel would have been different, while its nature would have been the same as in the singular.

II.4	stones, rocks, pebbles	 ʕⁿrr	ʕA.n$_i$r0.Ur ʕA.n$_i$rU.^{y}r0 ⬇ ʕAⁿrUr	*ʕvⁿrˈo:rv	ⲁⲗⲱⲗⲉ ălˈo:lə

Eg.: RAD 18 4r.5 () = LeLE i.69; Oriens Ant. 6 (Pl.16) 1.3 ()

Cpt.: CrCD 4a; VyDELC 8; WeKH 485

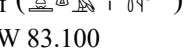
II.5	lentil	 ʕršn	ʕA.^{y}r0.šA.nA ⬇ ʕAršAnA	*ʕvršˈi:/u:nv	ⲁⲣⲯⲓⲛ ăršˈi:n

Eg.: LEM 4 1 = LeLE i.73 = HoSW 74.84; LEM 5 15.11 = HoSW 74.84; O.Turin 57383 v4 = HoSW 74.84; O.DeM 454 9 () = HoSW 74.84

Cpt.: CrCD 16b; ČeCED 12; VyDELC 16; WeKH 12

Sem.: **ʕad(a)ši:n* (pl.) – cf. Heb. *ʔădāšīm* (pl.) and see Arb. *ʔadas* (col.), both "lentils"; note that the Egyptian form derives from a Semitic plural with nunation, as it could be expected from Aramaic, rather than from a plural with mimation like in Hebrew. Moreover, the Coptic form suggests the syncope of the middle vowel, although it is impossible to say if such syncope occurred in Egyptian or characterised already the Semitic prototype, and in this respect a Semitic form **ʕadšīn* (pl.), however, would certainly not be surprising or problematic.

II.6	wagon, chart	 ʕgrt	ʕA.gA.r0.tA ⬇ ʕAgArtA	*ʕvgˈaltv	ⲁⲅⲟⲗⲧⲉ ăkʲˈoltə

Eg.: Inscr. Hamm. 12ff () = LeLE i.82 = HoSW 83.100; KRI VI 63,16 () = HoSW 83.100

Cpt.: CrCD 26a; ČeCED 19; VyDELC 24; WeKH 19

Sem.: **ʕagalt(v)* – cf. Arb. *ʕajala*; Arm. *ʕăgaltā*; Heb. *ʕăgālā*; Syr. *ʕagaltā*, all "wagon", "chart"

II.7	young bird which cannot fly	 wr	wA.ʸr0 ⬇ wAr	*wˈi/ur	{ⲟⲩⲁⲣ}ⲟⲩⲁⲗ wˈal

Eg.: H.O. 38 1v.3
Cpt.: CrCD 208a; ČeCED 98; VyDELC 129; WeKH 110
Notes: Vycichl derives ⲟⲩⲁⲣⲟⲩⲁⲗ from Demotic *mḥwl* and Egyptian *mḥwn* “dovecote”, Černý suggests the same etymology, but in addition he analyses *mḥwn/l* as deriving from *mḥ* + *wr*, namely “nest” + “young bird”, and identify the second element *wr* with Late Egyptian .

II.8	ball of eyes	 bⁿr	bU.n$_1$r0 ⬇ bUⁿr	*bˈi/uⁿr	ⲃⲁⲗ bˈal

Eg.: LES 4 10.4 = LeLE i.134
Cpt.: CrCD 31b; ČeCED 22; VyDELC 27; WeKH 22
Notes: Possibly plural or dual. No different form for the plural is attested in Coptic, and it is possible that this was the case also in Late Egyptian. Alternatively, it is likely that the plural had a structure **bˈi:/u:ⁿrv*. In this case, the length of the stressed vowel would have been different, while its nature would have been the same as in the singular.

II.9	a fish	 bry	bA.ʸr0.yA ⬇ bAryA	*bˈaryv	ⳉ/ⲫ/ⲃⲟⲣⲓ (B/B/S) ⲃⲱⲣⲉ (S) bˈorə bˈo:rə

Eg.: H.O. 35 1rII.3 (); H.O. 85 1v.13-14 (); LEM 5 15.7-8 (); LEM 3 2.7 () = LeLE i.136
Cpt.: CrCD 42a; ČeCED 25; VyDELC 30; WeKH 26
Notes: see notes to the attestations in Period 1.
In Period 2, it is attested twice in O.Petrie 31, always with  instead of , once misspelled
According to the slip of the *Berlin Wörterbuch*, a spelling  is attested in an unpublished papyrus from the Museum of Turin, which I was unable to identify. According to the slip, however, the text is related with the trial of thieves probably in connection with the Ramesside tomb robberies, and therefore it must belong to Period 2.

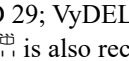
II.10	God Bes	 bs	bA.sA ⬇ bAsA	*bˈi:/u:sv	ⲃⲏⲥ bˈe:s

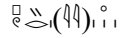
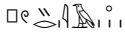
Eg.: P.Abbott 5.17, 6.11
Cpt.: VyDELC 31; WeKH 27

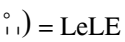
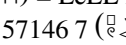
II.11	pail, bucket	 bs	bA.sA ⬇ bAsA	*bʿi:/u:sv	ʙнсє bʿe:sə

Eg.: O.IFAO 1017 v.4-5; O.Gard. 139 3; O.Berlin 11 260.6; O.Berlin 12 652.v3
Cpt.: CrCD 44b; ČeCED 27; VyDELC 31–2; WeKH 27
Notes: see Janssen 1975, 206

II.12	some fruit, malt	 bš	bA.šA ⬇ bAšA	*bʿi/uʔšv > *bʿi/ušʔv	ʙє(є)ɯ ʙн(н)ɯ bʿe(:)ʔš

Eg.: HPBM3 CB 5 r8.9
Cpt.: CrCD 46b; ČeCED 29; VyDELC 33; WeKH 29
Notes: a form  is also recorded in the archive of digitalised slips of the Berlin *Wörterbuch der ägyptischen Sprache* (DZA 22.932.550). The word is said to come from line 22 of a stele from the temple of Ramses III in Karnak. I was however unable to track down this attestation.

II.13	bean	 pr(y)  pr(j)	pU.rA(.yA) ⬇ pUr(yA)	*pʿi/ur(yv) < Sem. *pu:l	ɸєλ (B) pʰʿel

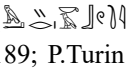
Eg.: H.O. 85 1r.11 () = LeLE i.148,151 = HoSW 118.150; H.O. 29 2v.3 () = HoSW 118.150; O.Turin 57146 7 () = HoSW 118.150; H.O. 31 1vII.2,5 (); LEM 5 15.11 = LeLE i.148,151 ()
Cpt.: CrCD 514a; ČeCED 225; VyDELC 244; WeKH 146
Sem.: **pu:l(u)* – cf. Arb. *fūl* “ful beans”; Arm. *pōlā* “ful beans”; Heb. *pōl* “ful beans”
Notes: the form with *y* and *jA* could be morphologically plural. This, however, would not affect the *back* nature of the first vowel.

II.14	spear, javelin	mrḥ	m0.Uʸrḥ ⬇ mUrḥ	*mʿi/urḥv < Sem. *murḥv	ʍєрє(є)ƨ ʍєрє/нƨ mʿerəh mərʿe:h

Eg.: O.BM EA 50733 + O.Petrie 30 i,2/O.Petrie 30 ii,7 (KRI VII 333.11,16) = HoSW 138.179

Cpt.: CrCD 184a; ČeCED 90; VyDELC 121; WeKH 101
Sem.: see attestations in Period 1 above.
Notes: see attestations in Period 1 above.

II.15	chariot	mrkbt	mA.ʸr0.k0.Ub.tA ⬇ mArkUbt(A)	*mvrkˈa/obtv	ʙрɞооʏт bərkʲˈowt

Eg.: LEM 3 6.8 = LeLE i.195 = HoSW 145-6.189; LEM 5 16.7 () = HoSW 145-6.189; EHT 1 (P.An. I) 26.1, 5 () = LeLE i.195 = HoSW 145-6.189; LEM 3 6.7 () = HoSW 145-6.189; O.Edinburg 916 r.3,5,6,8,10,12,13, v.4,6,8,10,13 () = HoSW 145-6.189; KRI IV 409.4 () = HoSW 145-6.189; P.Turin 1923 v.5 () = HoSW 145-6.189; P.Turin 1885 v1.7 () = HoSW 145-6.189.
Cpt.: CrCD 44b; ČeCED 27; VyDELC 31; WeKH 27
Sem.: see attestations in Period 1 above.

II.16	basket, box	mḫr	mA.ḫʸ0.Ur ⬇ mAḫ₂Ur	*mvḫ₂ˈi:/u:rv	ʜɯɟıр məšˈi:r

Eg.: H.O. 61 3v.2 = LeLE i.202 = HoSW 151.195;
Cpt.: CrCD 206a; ČeCED 97; VyDELC 129; WeKH 109
Sem.: no precise parallel can be identified, but Hoch suggests it may related with Sem. √*mḫr* "to receive", cf. Akk. *maḫāru* "to receive", *namḫāru* "bowl", "jug".
Notes: Coptic: pot, box for incense, censer possibly also H.O. 63. 1V2 – [= KRI VI, 162,10-163,6.
Hoch mentions also an attestation in H.O. 85 1v.6, but it is a mistake: that is an attestation of *mḫr* = "6th month", not of *mḫr* = "basket", "box" (see below II.17)

II.17	6th month	 mḫr	mA.ḫ0.Ur ⬇ mAḫUr	*mvḫˈi:/u:rv	ʜɯɟıр məšˈi:r

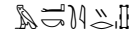
Eg.: P.Cairo 86637 Cv14.6; H.O. 85 1v.6
Cpt.: CrCD 206a; ČeCED 96; VyDELC 129; WeKH 109
Notes: Coptic /i:/ < /i:/~/u:/ because of the following /r/ (see §3.1 Table 2 above).
A spelling  is attested in O. IFAO 344.3. The ostracon is unpublished, but it is mentioned in Černý 1943, 174 and Walsem 1982, 222. It comes from Deir el-Medina, and it likely date to Period 2. Finally, a spelling  is attested in O.DeM 1265 col i.18, dating to the late 19th Dynasty. In this case either the group is a mistake for , or perhaps the form should be considered as spelled in *w*-orthography.

II.18	metal tool	 mssbt$_1$	mA.sA.sU.Ub.ə ⬇ mAsAsUbə	*mvsvsˈo:bv	(ϵ)ⲙⲥⲱⲃⲉ məsˈo:bə

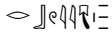
Eg.: Unpublished Hieratic Ostracon Gardiner 146, at the Ashmolean Museum, Oxford.
Cpt.: CrCD 186b; ČeCED 91; VyDELC 122; WeKH 102
Notes: The Coptic word refers to a “large needle”. See Černý 1976, 122 for the Egyptian form.

II.19	comb	 mšddt$_1$	mA.š0.dU.Ud.ə ⬇ mAšdUdə	*mvšdˈo:dv	ⲙⲯⲧⲱⲧⲉ məštˈo:tə

Eg.: O.Vienna Aeg. I 9 = LeLE i.210 = HoSW 164.212
Cpt.: CrCD 207b; ČeCED 97; VyDELC 129; WeKH 109
Sem.: **mušda:t(v)* (pl.) – cf. Akk. *mušdu* (sg.), *mušdātu* (pl.) “comb”; the Egyptian may come form a morphologically plural form akin to the Akkadian. The Egyptian vocalisation suggests that the borrowing occurred before the shift /a:/ > /o:/ in Egyptian, namely before Period 2, or that the word was borrowed in Period 2 from an unattested North-West-Semitic form which already underwent the change /a:/ > /o:/ characteristic of the Canaanite vocalic shift.
Notes: see JEA 65 p.96.

II.20	stronghold	 mktr	mA.k0.tA.ʸr0 ⬇ mAktAr	*mvktˈar	ⲙⲉⲅⲧⲟⲗ (ⲃ) məkʲtˈol

Eg.: LEM 6 20.2 = LeLE i.212 = HoSW 169.224
Cpt.: CrCD 214b; ČeCED 102; VyDELC 132; WeKH 114
Sem.: see attestations in Period 1 above.

II.21	lioness, she-bear	 rb(y)	rA.bU.yA ⬇ rAbUyA	*rvbˈo:y(v)	*ⲗⲁⲃⲱⲓ *lăbˈo:j

Eg.: HPBM3 CB 2 r2.6-7 (LES 3) = LeLE i.270 = HoSW 202.273
Cpt.: CrCD 136b; ČeCED 69; VyDELC 94; WeKH 75
Sem.: a single common form is hard to reconstruct, but the word is well attested: Arb. *labwa*; Akk. *labbatu*; Heb. *lāḇīʔ*, *ləḇīyāʔ*, all meaning “lioness”.
Notes: the Egyptian form is plural. Only the singular ⲗⲁⲃⲟⲓ (SB) is attested in Coptic, but a plural *ⲗⲁⲃⲱⲓⲉ / **lăbˈo:jə* can be reconstructed from it on the model of sg. ϣⲗⲟⲗ – pl. ϣⲗⲱⲗ or sg. ϩⲧⲟ – pl. ϩⲧⲱⲣ. Such a plural would have been pronounced **rvbˈo:y(v)*, with

a *back* vowel, as suggested also by the group writing spelling, as the shift /a:/ > /o:/ had already taken place by this time.

II.22	husband	 hy	hA.y0 ⬇ hAy	*hˈi/uy	ʔʌɪ hˈaj

Eg.: LES 2 3.10,4.7,4.7-8,4.10,12.4,16.2 = LeLE i.284; O.DeM 1639 r7; O.DeM 1223 r4; P.DeM 1 r x 13.6; LES 4 6.9; O.Berlin 10629 v8; O.Berlin 12630 2; P.Leiden I 344 r4.9; P.Leiden I 371 v4; HPBM3 CB 4 r8.1.
Cpt.: CrCD 636b; ČeCED 269; VyDELC 290; WeKH 357
Notes: Although the classifiers may vary (,  ,), the phonetic part of the word is consistently written  .

II.23	law(s)	 hp	h0.Up ⬇ hUp	*hˈi/up	ʔʌп hˈap

Eg.: EHT 1 (P.An. I) 9.2 = LeLE i.287; C.DAI II.2
Cpt.: CrCD 693b–5a; ČeCED 289; VyDELC 306; WeKH 381

II.24	fare	 hm	h0.Um ⬇ hUm(A)	*hˈi:/u:mv	ʔнмє hˈe:mə

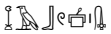
Eg.: LEM 1 11.8 = LeLE i.288
Cpt.: CrCD 675b; ČeCED 282; VyDELC 300; WeKH 371
Notes: probably also in HPBM3 CB 4 v1.4, although now lost in a lacuna. The text is a parallel of LEM 1 11.8.

II.25	vinegar	 ḥmḏ	ḥU.m(A).ḏ(A) ⬇ ḥUm(A)ḏ(A)	*ḥˈi:/u:mvḏ(v) *ḥˈi/umḏv < Sem. *ḥumṣv	ʔнчх ʔчх hˈe(:)mʤ

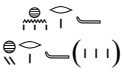
Eg.: O.ROM 906 20.2 = LeLE i.315 = HoSW 228.316
Cpt.: CrCD 682b; CrCD 285; VyDELC 303; WeKH 375
Sem.: ***ḥumṣ(v)*** – cf. Arm. *ḥūmʕā*; Heb. *ḥōmɛṣ*, both "vinegar"

II.26	flower	 ḥrr(t)	ḥU.rU.Ur ⬇ ḥUrUr	*ḥvrˈi:/u:rv	ʔрнрє hrˈe:rə

Eg.: LES 2 8.4,8.9,10.3,12.6,17.4 = LeLE i.328; P.Harris I 5.2, 8.4, 8.12, 21a.2, 21a.6, 21a.7, 21a.8, 21a.9, 21a.10, 21b.1, 29.6, 36b.11, 40b.3, 47.11, 49.8, 56a.8, 73.5 = LeLE i.328; LEM 5 14.6 = LeLE i.328; KRI VI 735.4 () = LeLE i.328; HPBM3 CB 5 r2.10
Cpt.: CrCD 704a; ČeCED 294; VyDELC 310; WeKH 388
Notes: various attestations, both with and without plural strokes. The forms with plural strokes may be collectives. The digitalised slips of the Berlin *Wörterbuch der ägyptischen Sprache* record also the following forms, which date to the II period but which I was unable to track down:  (DZA 27.264.170 - Medinet Habu, Room7),  (DZA 27.265.040 - block from the temple of Khonsu at Karnak). Another one,  (DZA 27.265.270 - Louvre without no.), is just date to the New Kingdom.

II.27	lamp	 ḫbs	ḫ0.Ub.sA ⬇ ḫUb(A)sA	*ḫˈi:/u:bvsv	ⲥ/ϩⲏⲃⲥ (S/B) hˈe:bs

Eg.: LEM 2 5,6 = LeLE i.355; LEM 10 7.7 = LeLE i.355; P.Salt 124 1r.20 = LeLE i.355; RAD 22 1r.1 = LeLE i.355; H.O. 35 3r.2 = LeLE i.355
Cpt.: CrCD 658a; ČeCED 275; VyDELC 290; WeKH 354

II.28	tooth, fang	 ḫⁿr ḫ₂r	ḫA.n₁r0 ⬇ ḫAⁿr	*ḫˈaⁿr *ḫ₂ˈar	ϣⲟⲗ šˈol

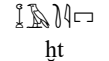
Eg.: KRI V 70.12 () = LeLE i.365 = HoSW 243.336; KRI V 63.3 () = LeLE i.365 = HoSW 243.336; KRI V 98.2 () = LeLE i.365 = HoSW 243.336.
Cpt.: CrCD 557b; ČeCED 239; VyDELC 260; WeKH 309
Sem.: a Semitic origin for this word in not obvious. The comparison with Semitic **šin*, although semantically perfect, is problematic because of unusual correspondence (for this period) of Sem. *š* and Eg. *ḫ*. Hoch suggests a possible link with the Sem. √*ḥll* "to pierce", "to bore".

II.29	road, street, quarter	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈi:/u:rv < Sem. *ḫur(r)v	ⲥⲓⲣ hˈi:r

Eg.: LEM 5 11.9 = LeLE i.349; LEM 6 17.5 = LeLE i.349 = HoSW 247.343; LEM 8 9.10 = HoSW 247.343; LEM 5 11.9 = HoSW 247.343
Cpt.: CrCD 696b; ČeCED 291; VyDELC 307; WeKH 384
Sem.: see attestations in Period 1 above.

II.30	Syrian	 ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈu/ir(rv) < Sem. *ḫur(rv)	ϩⲁⲗ hˈal

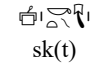
Eg.: KRI IV 79.12 = LeLE i.349
Cpt.: CrCD 665a; ČeCED 277; VyDELC 295–6; WeKH 363
Sem.: see attestations in Period 1 above.
Notes: the Coptic word means “servant”, “slave”.

II.31	forecourt	 ḫt	ḫA.tA ⬇ ḫAtA	*ḫˈi/utvj > *ḫˈi/ujtv	ϩⲁⲉⲓⲧ hˈajt

Eg.: TR 10052 (pl.25) 1.3 = LeLE i.350
Cpt.: CrCD 713b; ČeCED 298; VyDELC 293; WeKH 360

II.32	lettuce, garlic	 ḫtn	ḫʸA.ṯA.nA ⬇ ḫ₂AṯAnA	*ḫ₂vṯˈi:/u:nv < Sem. *ḫasi:nv	ⲱϫ/ϩϫⲏⲛ (S/O) šəʤˈe:n

Eg.: O.Cairo 25678 v4 = LeLE i.378 = HoSW 253.355; P.Harris I 19a.13, 72.10 = HoSW 253.355
Cpt.: CrCD 615b; ČeCED 263; VyDELC 278; WeKH 342
Sem.: **ḫasi:n(v)* – cf. Akk. *ḫaṣṣū* (pl.) “lettuce”; Arb. *ḫass* “lettuce”; Arm. pl. *ḥāsīn* (sg. *ḥāsā*) “lettuce”; Heb. *ḥāsīt* “leek plants (including garlic and onions)”; the Egyptian form likely comes from a plural with nunantion, akin to the Aramaic form.
Notes: Coptic morphologically plural or collective, like the Egyptian form?

II.33	ass’s foal	 sk(t)	s0.Uk(.ə) ⬇ sUk(ə)	*sˈi:/u:kv	ⲥⲏⲟ sˈe:kʲ

Eg.: LRL 9v.15
Cpt.: CrCD 388a; ČeCED 175; VyDELC 207; WeKH 215
Notes: the group  is problematic, and since it is attested only once in the corpus, only in this word, it is difficult to offer a clear interpretation. The problems are two: on the one hand the value of the sign  , and on the other the function, if any, of the sign  . Since the neither the Coptic form nor the other Egyptian attestations of the word show any trace of a *t*, I am inclined to assume that in this case the sign is spurious, it is just a graphic element without any distinct phonetic value. As for the , I tend to think that as in all the other similar cases discussed in a previous study (Kilani 2017a, 200–1), in this case it had to be interpreted as a graphic variant of influenced by the (graphic) presence

of the 𓎛. This considered, I thus tentatively suggest to read the group 𓎡 as *k-w* = *kU/Uk*. Caution, however, is needed, and some additional confirmation of this interpretation would be welcome.

II.34a	staff, rod (sg.)	 šbd	šA.bA.dA/d0.ə ⬇ šAbAdA/də	*švbˈad	ⲥⲃⲟⲧ (S) šəbˈot

Eg.: P.Mallet 1.7 () = HoSW 276.397; HPBM3 CB 5 r7.2 () = HoSW 276.397; LEM 6 16.6 () = LeLE ii.117-8 = HoSW 276.397; LEM 8 6.6 () = LeLE ii.117-8 = HoSW 276.397; RAD 18c 5v.7 () = LeLE ii.117-8 = HoSW 276.397

Cpt.: CrCD 554a; ČeCED 238; VyDELC 258; WeKH 305

Sem.: see attestations in Period 1 above.

Notes: these forms, both Egyptian and Coptic, are singular. Two variants are attested for both the singular and the plural in Coptic, suggesting the existence of two parallel forms of the same word. See II.34a,b,c,d for the distribution and possible attestations of these forms in Period 2.

II.34b	staffs, rods (pl.)	 šbd	šA.bU.d(A) šA.b0.Ud(.ə) ⬇ šAbUd(ə)	*švbˈo:dv	ⲥⲃⲱⲧ (S) šəbˈo:t

Eg.: LEM 8 6.6 () = LeLE ii.117-8 = HoSW 276.397; LEM 13 1v.9 () = LeLE ii.117-8 = HoSW 276.397

Cpt.: CrCD 554a; ČeCED 238; VyDELC 258; WeKH 305

Sem.: see attestations in Period 1 above.

Notes: these forms, both Egyptian and Coptic, are plural. Two variants are attested for both the singular and the plural in Coptic, suggesting the existence of two parallel forms of the same word. See II.34a,b,c,d for the distribution and possible attestations of these forms in Period 2.

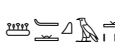
II.34c	staff, rod (sg.)	 šbd	šA.bU.Ud šA.bU.t0(.ə) ⬇ šAbUd(ə)	*švbˈo:dv	ⲥⲃⲱⲧ (B, S?) šəbˈo:t

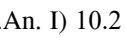
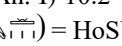
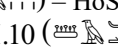
Eg.: O.Gard. 296.2 () = HoSW 276.397; O.Gard. 135.2-3 () = HoSW 276.397; O.Turin 57387 10 () = HoSW 276.397; O.Berlin 12398 () = LeLE ii.115 = HoSW 276.397

Cpt.: CrCD 554a; ČeCED 238; VyDELC 258; WeKH 305
Sem.: see attestations in Period 1 above.
Notes: these forms, both Egyptian and Coptic, are singular. Two variants are attested for both the singular and the plural in Coptic, suggesting the existence of two parallel forms of the same word. See II.34a,b,c,d for the distribution and possible attestations of these forms in Period 2.

II.34d	staffs, rods (pl.)	 šbd	šA.bA.d0.ə ⬇ šAbAdə	*švbˈadyv	⳩ϧⲃⲟϯ (B) šəbˈotə

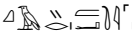
Eg.: LEM 10 7.2 = LeLE ii.117-8 = HoSW 276.397
Cpt.: CrCD 554a; ČeCED 238; VyDELC 258; WeKH 305
Sem.: see attestations in Period 1 above.
Notes: these forms, both Egyptian and Coptic, are plural. Two variants are attested for both the singular and the plural in Coptic, suggesting the existence of two parallel forms of the same word. See II.34a,b,c,d for the distribution and possible attestations of these forms in Period 2.

II.35	dust	 šḫq	šA.ḥU.qA ⬇ šAḥUqA	*švḥˈi:/u:qv	⳩(ϩ)ⲓⲥ šəhˈi:kʲ

Eg.: EHT 1 (P.An. I) 10.2 () = LeLE ii.133 = HoSW 287-8.411; O.Berlin 11236 () = HoSW 287-8.411; O.Cairo 25553 7 () = HoSW 287-8.411; C.DAI II.10 () = HoSW 287-8.411
Cpt.: CrCD 612b; ČeCED 263; VyDELC 277; WeKH 341
Sem.: see attestations in Period 1 above.

II.36	basket	 škrʕ	šA.kA.rA.ʕA ⬇ šAkArAʕA	*švkˈi:/u:rvʕv	⳩ⲕⲓⲗ šəkˈi:l

Eg.: TR 10068 (Pl.12) 5r.17 = LeLE ii.137, H.O 20 2.5-6 = LeLE ii.137
Cpt.: CrCD 556b; ČeCED 238–9; WeKH 308
Notes: the Coptic form means “curl/plait of hair”.

II.37	ashes, cinders, embers	 qrmt	qA.ʸr0.mA.tA ⬇ qArmAtA	*kˈi/urmv(t) < Sem. —	ⲕ(ⲉ)ⲣⲙⲉ kˈermə

Eg.: KRI IV 9.11 = LeLE ii156 = HoSW 301.435.
Cpt.: CrCD 117a; ČeCED 62; VyDELC 85–6; WeKH 68
Sem.: see discussion §6
Notes: The Egyptian is likely collective. Vycichl 1984, 85–6 think that there the Coptic form may have been influenced by a confusion with the words for "fire", "smoke" and "darkness".

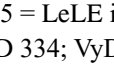
II.38	burnt-offering	 qrr	qA.rA.rA ⬇ qArArA	*qvrˈi:/u:rv	ϭλιλ kʲəlˈi:l

Eg.: DZA 30.402.230; DZA 30.402.240; P.Turin 1882r/PdT 73ii.3 ([ )
Cpt.: CrCD 811a; ČeCED 328; VyDELC 338; WeKH 452
Notes: I was unable to track down the precise location of the first two attestations mentioned in the digitalised slips of the Berlin *Wörterbuch der ägyptischen Sprache* (DZA 30.402.230; DZA 30.402.240). According to the slips, however, they come from walls in Karnak and date to the reign of Ramses III.

II.39	precious stone	 qrt	qA.r0.tA ⬇ qArtA	*qˈi/ultv	ϭλτє kʲˈeltə

Eg.: P.Harris I 64a.9; HPBM3 CB 4 v8.6
Cpt.: CrCD 813a; ČeCED 329; VyDELC 339; WeKH 453
Notes: Coptic Morphologically plural or collective, like the Egyptian form? The Coptic means "ring (with a seal)"

II.40	(palm of) hand	 kp	k0.Up ⬇ kUp	*kˈa/op	ϭοπ kʲˈop

Eg.:  KRI IV 8.15 = LeLE ii.172 = HoSW 317-8.457
Cpt.: CrCD 824b; ČeCED 334; VyDELC 344; WeKH 462
Sem.: **kap(pu)* – cf. Akk. *kappu*; Arb. *kaff*; Arm. *kappā*; Eth. *kāf*; Heb. *kaf*; Syr. *kappā*, all "palm", "sole"
Notes: Forms of the type  (+ dets) are widely attested (see HoSW 317-8.457 LeLE ii.172), but I think they may have to be interpreted as instances of *w*-orthography rather than as examples of group writing.

II.41	couch, bed	 krk	kA.rA.k(A) ⬇ kArAk(A)	*kvrˈak	ⳟλοⳟ kʲəlˈokʲ

Eg.: O.Gard 158.6 () = LeLE ii.117 = HoSW 333-4.486; O.Vienna H 1.4 () = HoSW 333-4.486; O.Gard 194 II.18 () = HoSW 333-4.486; O.Cairo 25679 12 () = HoSW 333-4.486; O.DeM 434 II.4 () = HoSW 333-4.486
Cpt.: CrCD 815a, var.s: ⳟλοⳟ, τλ. (S); ⳟλοx (BF); xλ. (B); ⳟλⲁⳟ (AA^{2}F); ⳟⲁλϵx (F); ČeCED 330; VyDELC 340; WeKH 454
Sem.: see attestations in Period 1 above.

II.42	hair-cloth, sacking, sack	 gwn	gA.w0.nA ⬇ gAwnA	*kˈawnv	ⳟooγɴϵ kʲˈownə

Eg.: KRI IV 14.8 = LeLE ii.186 = HoSW 347.508
Cpt.: CrCD 836a; ČeCED 339; VyDELC 349; WeKH 470, 574
Sem.: unclear, possibly related with Arb. jūna “basket”?
Notes: Morphologically plural or collective, like the Egyptian form?

II.43	finger-ring	 gsr	gA.s0.Ur ⬇ gAsUr	*gvsˈo:rv	ⲕⲥoγⲣ kəsˈu:r

Eg.: P.Harris I 13a.6, 13b.2, 64a.15, 64b.7, 64b.10 = LeLE ii.195 = HoSW 355.523
Cpt.: CrCD 121b; ČeCED 64; VyDELC 154; WeKH 70
Sem.: **qiθu:r(v)* – cf. Arm. *qīṭṭūrā* “wreathing”, “plaiting”; Heb. *qiššūrīm* (pl.) “breast-bands?”, “beads”, “ornaments”; see also Heb. √*qšr* “bind on ornaments”
Notes: on the basis of the context, the Egyptian word is likely singular (see HoSW 355.523)

II.44	heap, hillock	 tⁿr	tA.n$_1$r(.ə) ⬇ tAⁿr(ə)	*tˈi/uⁿr(rv) < Sem. *til(lv)	τⲁλ tˈal

Eg.: LEM 9 2v.6 = LeLE ii.214 = HoSW 356.527; LEM 3 2.5 () = HoSW 356.527
Cpt.: CrCD 408a; ČeCED 185; VyDELC 213; WeKH 229
Sem.: **til(lv)* – cf. Akk. *tillu*; Arb. *tall*; Arm. *tillā*; Heb. *tel*; Syr. *tellā*, all “hill”
Notes: Akkadian, Aramic, Hebrew and Syriac point to **til(lu)*; the Arabic with /a/ is thus clearly irregular.

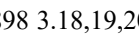
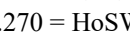
II.45	oven	 trr	tA.rU.Ur ⬇ tArUr	*tvrˈi:/u:r(v) < Sem. *tv(n) nu:r(v)	ⲧⲣⲓⲣ tərˈi:r

Eg.: LEM 2 8.4 = LeLE ii.215 = HoSW 359.531; O.Gard. 166 () = HoSW 359.531
Cpt.: CrCD 431b; ČeCED 195; VyDELC 221; WeKH 244
Sem.: **tv(n)nu:r(v)* – cf. Akk. *tinūru*; Arb. *tannūr*; Heb. *tannūr*; Syr. *tannūrā*, all "oven"
Notes: misspelled in LEM 8 7.8.

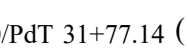
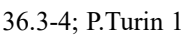
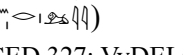
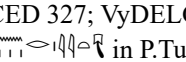
II.46	sparrow	 tt	t̲U.t̲0 t̲U.Ut̲ ⬇ t̲Ut̲	*t̲ˈi/ut̲	ϫⲁϫ ʤˈadʒ

Eg.: LEM 6 16.2 () = LeLE ii.237; LEM 8 6.4 () = LeLE ii.237
Cpt.: CrCD 798b; ČeCED 323; VyDELC 333; WeKH 441
Notes: Possibly plural. No different form for the plural is attested in Coptic, and it is possible that this was the case also in Late Egyptian. Alternatively, the plural may have been built according to a structure **t̲ˈi:/u:t̲v*. In this case, the length of the stressed vowel would have been different, while its nature would have been the same as in the singular.

II.47	self-bent rods	 d̲ⁿr	d̲A.n₁r0 ⬇ d̲Aⁿr	*d̲ˈi/uⁿr	ϫⲁⲗ (B) ʤˈal

Eg.: P.Turin 1898 3.18,19,20 () = HoSW 389-91.586; LEM 5 17.4 () = LeLE ii.270 = HoSW 389-91.586; O.DeM 46 12 () = HoSW 389-91.586
Cpt.: CrCD 765b; ČeCED 312; VyDELC 325; WeKH 418
Sem.: no clear Semitic etymology can be proposed, but according to Hoch the word may be connected with Sem. √*zll* "shake", from which Heb. *zalzallīm* "twigs", "branches or tendrils of grape vine". The required semantic shift, however, suggests caution.
Notes: Possibly plural. No different form for the plural is attested in Coptic, and it is possible that this was the case also in Late Egyptian. Alternatively, it is likely that the plural had a structure **d̲ˈi:/u:lv*. In this case, the length of the vowel would have change in respect to the singular, but not its nature.
The Egyptian word is often attested in a reduplicated form. Such forms, however, does not match the words attested in Coptic, and therefore they are not discussed here.

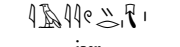
II.48	scorpion	 ḏry(t)	ḏA.n$_{1}$r0.rU.yA ⬇ ḏA^{n}(r)rUyA	*ḏv^{n}r$^{\prime}$i:/u:yv	ϭλʜ kʲlʼe:

Eg.: P.Turin 1993 r10/PdT 31+77.14 (); P.Turin 1993 v4/PdT 135.10; P.Turin 1993 v5/PdT 136.3-4; P.Turin 1993 v6/PdT 137.4; HPBM3 CB 5 r3.1 (), 3.2 ()
Cpt.: CrCD 810a; ČeCED 327; VyDELC 337; WeKH 449
Notes: misspelled  in P.Turin 1993 v8/PdT 120.10.

II.49	jar, bowl	ḏḥrt	ḏA.ḥU.^{y}r0.tA ⬇ ḏAḤUrtA	*ḏvḥ$^{\prime}$i/urtv > *ḏvr$^{\prime}$i/uḥtv < Sem. *ṣvluḥi:t	ϫλϧϩτϲ ʤəlʼahtəs

Eg.: O.DeM 318v 8 = HoSW 394.593
Cpt.: CrCD 770a; ČeCED 314; VyDELC 326; WeKH 421
Sem.: **ṣvluḥi:t* / **ṣvlloḫt(v)* – cf. Amarna Cananite *ṣillaḫta* “a jar”; Arm. *ṣəluḥītā* “flask”; Heb.1 *ṣallaḥat* “dish”; Heb.2 *ṣəloḫīt* “jar”; Syr. *ṣəluḥītā* “flask”
Notes: Coptic: “deep pit”, “vessel”. The -c of ϫλϧϩτϲ is either the common Coptic suffix, or should be emended into -ϵ as suggested by Crum (770a).

Period 3

III.1	stag, ram	 jyr	jA.yU.rA ⬇ jAyUrA	*ʔvyʼo:rv	ϵιογλ jʼu:l

Eg.: LES 5 3.68 = LeLE i.12 = HoSW 17.1
Cpt.: CrCD 77a; ČeCED 46; VyDELC 62; WeKH 49
Sem.: **ʕayyal(u)* – cf. Akk. *ayyalu*; Amorite *ʕayyalum*; Arb. *ʕayyil*, *ʕi/uyyal*; Arm. *ʕayyālā*; Eth. *hayyal*; Heb. *ʕayyāl* “stag”, Syr. *ʕayyəlā*, all “stag”
Notes: the Coptic word means “hart”, “hind”. The Egyptian form implies the presence of a *back* vowel, which suggests either than the word was borrowed into Egyptian before the Egyptian shift /a:/ > /o:/, therefore before Period 2, or that it was borrowed from a Semitic language in which this word underwent the shift /a:/ > /o:/ within the frame of the Canaanite vocalic shift. In the latter case, Phoenician would likely be the best candidate, as already noticed by Hoch 1994, 17.

III.2	sea	 ym	yU.m0 ⬇ yUm	*yʼom	ϵιοʜ jʼom

Eg.: LES 5,1,8 1,23 1x+13 1x+14 =LeLE i.28 = HoSW 52-3.52; Gloss. Gol 1.8 (AEO I no. 25) = HoSW 52-3.52; P.Hood I 7-8 (AEO II no. 25) = HoSW 52-3.52; LLR r9 (AEO I no. 25) = HoSW 52-3.52
Cpt.: CrCD 77a; ČeCED 46; VyDELC 63; WeKH 49
Sem.: see attestations in Period 1 above.
Notes: see attestations in Period 1 above.

III.3	stones, rocks, pebbles	 ʕⁿr	ʕA.n$_{1}$^{y}r0 ⬇ ʕAⁿr	*ʕˈeⁿr	ɑλ ˈal

Eg.: Gloss. Gol. 6.13-4 (AEO I no. 527)
Cpt.: CrCD 3b; ČeCED 4; VyDELC 6; WeKH 3

III.4	lentil	 ʕršn	ʕA.^{y}r0.šA.nA ⬇ ʕAršAnA	*ʕvršˈi:nv	ɑᴘɯɪɴ ăršˈi:n

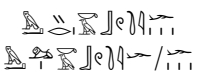
Eg.: LES 5 2.41 = LeLE i.73 = HoSW 74.84
Cpt.: CrCD 16b; ČeCED 12; VyDELC 16; WeKH 12
Sem.: see attestations in Period 2 above.

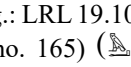
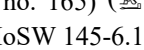
III.5	a fish	 bry	b0.Ur.y(U)/(U)y ⬇ bUry(U)/(U)y	*bˈoryv	ɋ/ɸ/ʁoρɪ (B/B/S) ʁɯρɛ (S) bˈorə bˈo:rə

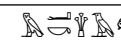
Eg.: LEM 17.13 = LeLE i.136
Cpt.: CrCD 42a; ČeCED 25; VyDELC 30; WeKH 26
Notes: see notes to the attestations in Period 1.

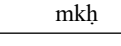
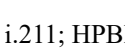
III.6	some fruit, malt	 bš	bA.šA ⬇ bAšA	*bˈešʔv > *bˈɛʔšv	ʁɛ(ɛ)c (S/B) ʁн(н)ɯ (S/B) bˈɛʔš

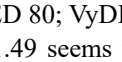
Eg.: Gloss. Gol. 6.10 (AEO I no. 504)
Cpt.: CrCD 46b; ČeCED 29; VyDELC 33; WeKH 29

III.7	chariot	 mrkbt	mA.^{y}r0/Ur.k0.Ub.tA ⬇ mA/UrkUbt(A)	*mvrkˈobtv	ʁрѳооʏт bərkʲˈowt

Eg.: LRL 19.10 () = LeLE i.195 = HoSW 145-6.189; Gloss. Gol. 3.4 (AEO I no. 165) () = HoSW 145-6.189; HPBM4 NY r.54 () = HoSW 145-6.189
Cpt.: CrCD 44b; ČeCED 27; VyDELC 31; WeKH 27
Sem.: see attestations in Period 1 above.

III.8	back of head	  mkḫ	mAk.ḥA ⬇ mAkḥA	*mˈekḫv	ⲙⲁⲕϩ mˈakh

Eg.: LES 5 1.49 = LeLE i.211; HPBM4 T 2v.9 = LeLE i.211
Cpt.: CrCD 162b; ČeCED 80; VyDELC 111; WeKH 90
Notes: Coptic: LES 5 1.49 seems to have  , but the second  is clearly a dittography induced by the change of line (See also Gardiner's note to the corresponding passage of LES).

III.9	stronghold	 mktrt$_1$	mAk.dU.Ur(.ə) ⬇ mAkdUr(.ə)	*mvkdˈol	ⲙⲉⲥⲧⲟ/ⲱⲗ (B/S) məkˈtˈo/oːl

Eg.: Gloss. Gol. 6.1 (AEO I no. 450) = HoSW 169.224
Cpt.: CrCD 214b; ČeCED 102; VyDELC 132; WeKH 114
Sem.: see attestations in Period 1 above.
Notes: Hoch spells this word with  instead of , however in his publication of the text Gardiner (AEO I no. 450) points out that the corresponding hieratic form can stand for both or . The parallel Med. Habu 42 (see HoSW 167), where a toponym based on the same Semitic root is spelled  , with , suggests, I think, that in this case the correct reading is , not . A reading with , however, would not be impossible, and would not be problematic from the point of view of the group writing: simply, the spelling would imply a transcription *mAktUr(.ə) < mAk.t0.Ur(.ə)*, rather than *mAkdUr(.ə) < mAk.dU.Ur(.ə)*.

III.10	husband	 hy	hA.y0 ⬇ hAy	*hˈey	ϩⲁⲓ hˈaj

Eg.: P.Boulaq IV r16.15, r19.15
Cpt.: CrCD 636b; ČeCED 269; VyDELC 290; WeKH 357
Notes: As in the attestations in Period 2, although the classifiers may vary ( , ,), the phonetic part of the word is consistently written .

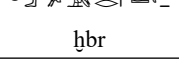
III.11	vinegar	 ḥmḏ	ḥU.m0.ḏ(A) ⬇ ḥUmḏ(A)	*ḥˈi:/u:mvḏ(v) *ḥˈi/umḏv < Sem. *ḥumṣv	ⲥⲏⲙⲭ ⲥⲙⲭ hˈe(:)mʤ

Eg.: Gloss. Gol. 7.7 (AEO I no. 572) = LeLE i.315 = HoSW 228.316
Cpt.: CrCD 682b; CrCD 285; VyDELC 303; WeKH 375
Sem.: see attestations in Period 2 above.

III.12	flower	 ḥrr(t)	ḥU.rU.Ur ⬇ ḥUrUr	*ḥvrˈi:/u:rv	ⲥⲣⲏⲣⲉ hrˈe:rə

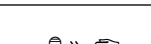
Eg.: P.Boulaq IV r5.3
Cpt.: CrCD 704a; ČeCED 294; VyDELC 310; WeKH 388

III.13	commerce, associate, companion	 ḫbr	ḫA.bA.(ʸ)r0 ⬇ ḫAbAr	*ḫvbˈi:/u:r < Sem. *ḫabˈer	ⲩⲃⲏⲣ ḫvbˈi:/u:r

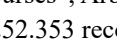
Eg.: HPBM4 L 6v.16 () = LeLE i.354 = HoSW 240.333; LES 5 1.x+24 (), 2.1 () = LeLE i.354 = HoSW 240.333
Cpt.: CrCD 553a; ČeCED 237; VyDELC 257; WeKH 304
Sem.: **ḫaber* – cf. Heb. *ḥāber* “associate”

III.14	road, street, quarter	ḫr	ḫ0.Ur ⬇ ḫUr	*ḫˈi:/u:rv < Sem. *ḫur(r)v	ⲥⲓⲣ hˈi:r

Eg.: P.Berlin 3053 16.2 = HoSW 247.343
Cpt.: CrCD 696b; ČeCED 291; VyDELC 307; WeKH 384
Sem.: see attestations in Period 1 above.
Notes: The papyrus is dated to the 22nd Dynasty or later (see Trismegistos no. 57094 for references)

III.15	veils, thin cloth, purse	 ḫrd	ḫʸ0.Uʸrd ⬇ ḫ₂Uʳd	*ḫ₂ˈord(v)	ⲩⲟⲣⲧ šˈort

Eg.: LES 5 2.40 = LeLE i.373 = HoSW 252.353
Cpt.: CrCD 588b; ČeCED 252; VyDELC 270; WeKH 326

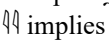
Sem.: no clear parallel has been identified, but Hoch suggests a possible connection with Heb. *ḥărīṭīm* “purses”, Arb. *ḫariṭa* “bag” or Akk. *ḫurdatu* “a garment or cover”.
Notes: HoSW 252.353 record a late (25 dyn) spelling  = *ḫʸ0.Ur.d0* = *ḫ₂Urd* from Kawa (see above §4.5.2).

III.16	leaf, lotus	 srpt	sA.ʸr0.pU.t(A) ⬇ sArpUt(A)	*svrpˈot(v)	сарп/фо/ат (O/B) sărpˈot

Eg.: LES 5 2.45 = LeLE ii.58
Cpt.: CrCD 356b; ČeCED 161–2; VyDELC 196; WeKH 195
Sem.: see attestations in Period 1 above.
Notes: see attestations in Period 1 above.

III.17	staffs, rods (pl.)	 šbd	šA.b0.Ud.y(A) ⬇ šAbUdy(A)	*švbˈodyv	⳩ʙоϯ (B) šəbˈotə

Eg.: P.Boulaq IV r22.8 = HoSW 276.397
Cpt.: CrCD 554a; ČeCED 238; VyDELC 258; WeKH 305
Sem.: see attestations in Period 1 above.
Notes: In this case the Egyptian form can be interpreted as a transcribing a form corresponding to Coptic ⳩ʙоϯ (B), šəbˈotə, rather than Coptic ⳩ʙѡт (S), šəbˈo:t, because the presence of  implies that the previous stressed syllable is closed (i.e. *-bˈod-*) and that the stressed vowel was a short.

III.18	burnt-offering	 qrr	qA.rA.rA ⬇ qArArA	*qvrˈi:rv	ϭλιλ kʲəlˈi:l

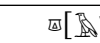
Eg.: RdE 31,40 = LeLE ii.157
Cpt.: CrCD 811a; ČeCED 328; VyDELC 338; WeKH 452

III.19	back of hand	 qḏt$_1$	qA.ḏ0.ə ⬇ qAḏə	*qˈi:ḏv	ϭɪⲭ kʲˈi:dʒ

Eg.: HPBM4 T 2v.21 = LeLE ii.162
Cpt.: CrCD 839b; ČeCED 340; VyDELC 350; WeKH 472

III.20	(palm of) hand	 kp	k0.Up ⬇ kUp	*kʲop	ⲕⲟⲡ kʲop

Eg.: HPBM 4 T 2v.22 = LeLE ii.172 = HoSW 317-8.457
Cpt.: CrCD 824b; ČeCED 334; VyDELC 344; WeKH 462
Sem.: see attestations in Period 2 above.
Notes: see attestations in Period 2 above.

III.21	violence, injustice	  gns	gA/U.n0.sA ⬇ gA/UnsA	*gʲonsv	ⲅⲟⲛⲥ kʲons

Eg.: P.Push. 127 3.6 () = LeLE ii.190 = HoSW 349.512; HPBM4 L 6v.47 () = LeLE ii.190 = HoSW 349.512
Cpt.: CrCD 822a; ČeCED 332; VyDELC 342; WeKH 459
Sem.: no precise parallel can be identified, but Hoch think it may be related with Sem. √*ngś*, cf. Heb. √*ngś* “to press”, “to drive”, “to oppress”; Eth. *nagša* “to reign”, “to wield power”.
Notes: spelling of P.Push 127 is notoriously bad Caminos 1977, 6, 7n1, so it has to be taken with caution. Moreover, the second sign of the word is partially in a lacuna, and it is therefore impossible to ascertain if it was a or a . Similarly, the sign of HPBM4 L 6v.47 may stay for both or . Overall, therefore, the Egyptian attestations of this word are not conclusive, but it is possible that they fit within the model presented in this study, and therefore are worth being mentioned here. It is also worth noticing that a form is attested in the later BM EA 10474 8.20, 13.11, 18.17 (Teachings of Amenemope – 26th dyn.; see Laisney 2007, 18). It has however been observed that that papyrus was probably written in an Egyptian dialect ancestor of or related with Coptic Akhmimic (in particular because of the presence of superfluous suffixes *.ty* added to some verbs, which likely correspond to the verbal suffixes -ⲧⲉ so characteristic of Akhmimic Coptic – see Laisney 2007, 18). This is an crucial observation, because in Akhmimic Coptic Egyptian /a/ > ⲁ, rather than ⲟ, and in fact in Akhmimic the form of this word is ⲅⲁⲛⲥ, with ⲁ, not ⲅⲟⲛⲥ as in other dialects (see CrCD 822a).
Since ⲁ is a *non-back* vowel, a spelling without -*w*, such as , not only would not be surprising, but it would even been expected in a text written in such a dialect. In fact, this form could indeed be an additional confirmation of the Akhmimic nature of the Egyptian dialect of BM EA 10474.

III.22	sparrow	 tt	t̲A.t̲A ⬇ t̲At̲A	*t̲ʲet̲	ϫⲁϫ ʤʲadʒ

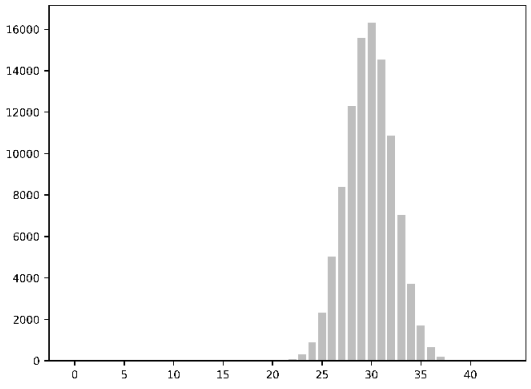
Eg.: P.Push. 127 5.1 = LeLE ii.237

Cpt.: CrCD 798b; ČeCED 323; VyDELC 333; WeKH 441

III.23	shrine, naos, inner sanctuary	 dbr	dA.bA.ʸr0 ⬇ dAbAr	*dvbʿi:/u:r < Sem. *dəbʿi:r	ⲦⲀⲃⲓⲣ tăbʿi:r

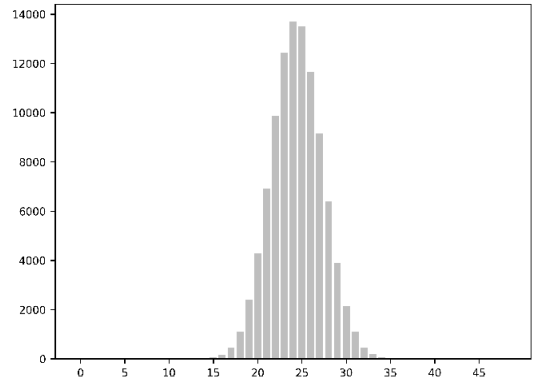
Eg.: Univ.Board v2 (AEO I p.66) = HoSW 376.561
Cpt.: CrCD 400b; ČeCED 183; VyDELC 211; WeKH 223
Sem.: **dəbi:r* – cf. Heb. *dəbīr* “inner sanctuary”

Appendix B



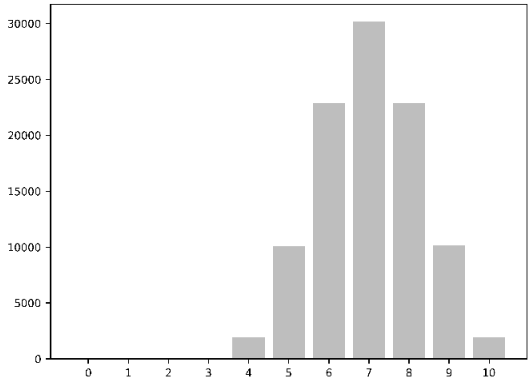
Nr. of Trials : Nr. of Matches		
0 : 0	15 : 0	30 : 16329
1 : 0	16 : 0	31 : 14527
2 : 0	17 : 0	32 : 10874
3 : 0	18 : 0	33 : 7037
4 : 0	19 : 0	34 : 3723
5 : 0	20 : 3	35 : 1689
6 : 0	21 : 17	36 : 665
7 : 0	22 : 62	37 : 190
8 : 0	23 : 297	38 : 40
9 : 0	24 : 892	39 : 9
10 : 0	25 : 2337	40 : 0
11 : 0	26 : 5027	41 : 1
12 : 0	27 : 8404	42 : 0
13 : 0	28 : 12301	43 : 0
14 : 0	29 : 15576	

App. B Fig. 1: probabilities of random matches for all disyllabic words.



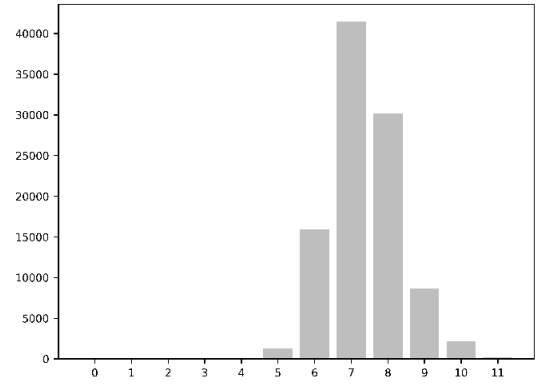
Nr. of Trials : Nr. of Matches		
0 : 0	17 : 457	34 : 56
1 : 0	18 : 1113	35 : 22
2 : 0	19 : 2402	36 : 4
3 : 0	20 : 4281	37 : 1
4 : 0	21 : 6905	38 : 1
5 : 0	22 : 9886	39 : 1
6 : 0	23 : 12428	40 : 0
7 : 0	24 : 13714	41 : 0
8 : 0	25 : 13505	42 : 0
9 : 0	26 : 11642	43 : 0
10 : 0	27 : 9153	44 : 0
11 : 0	28 : 6394	45 : 0
12 : 0	29 : 3888	46 : 0
13 : 1	30 : 2141	47 : 0
14 : 10	31 : 1107	48 : 0
15 : 61	32 : 457	
16 : 170	33 : 200	

App. B Fig. 2: probabilities of random matches for all trisyllabic words.



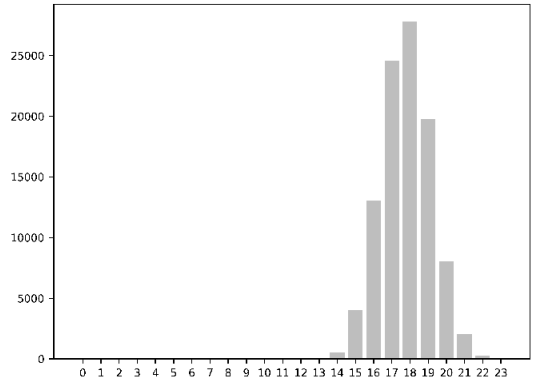
Nr. of Trials : Nr. of Matches
0 : 0
1 : 0
2 : 0
3 : 0
4 : 1963
5 : 10050
6 : 22863
7 : 30194
8 : 22871
9 : 10142
10 : 1917

App. B Fig. 3: probabilities of random matches for disyllabic words in Period 1.



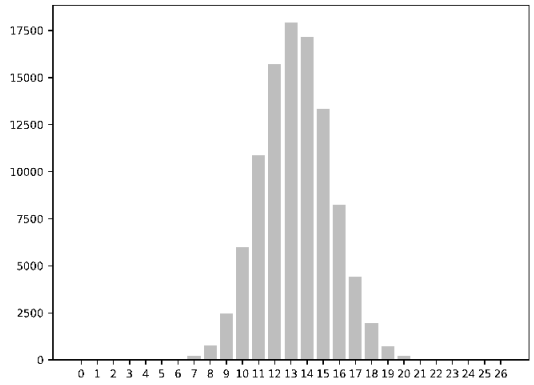
Nr. of Trials : Nr. of Matches
0 : 0
1 : 0
2 : 0
3 : 0
4 : 0
5 : 1282
6 : 15973
7 : 41516
8 : 30175
9 : 8650
10 : 2195
11 : 209

App. B Fig. 4: probabilities of random matches for trisyllabic words in Period 1.



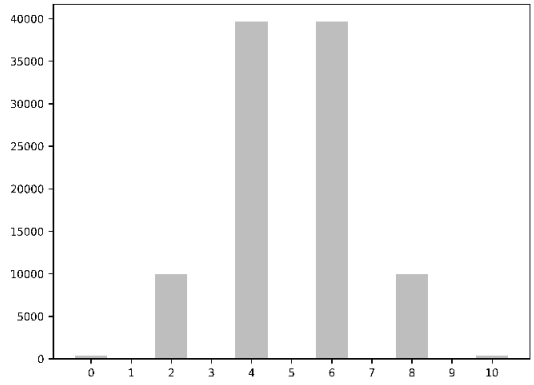
Nr. of Trials : Nr. of Matches	
0 : 0	12 : 0
1 : 0	13 : 0
2 : 0	14 : 525
3 : 0	15 : 3987
4 : 0	16 : 13016
5 : 0	17 : 24534
6 : 0	18 : 27815
7 : 0	19 : 19782
8 : 0	20 : 8011
9 : 0	21 : 2016
10 : 0	22 : 265
11 : 0	23 : 49

App. B Fig. 5: probabilities of random matches for disyllabic words in Period 2.



Nr. of Trials : Nr. of Matches	
0 : 0	14 : 17165
1 : 0	15 : 13350
2 : 0	16 : 8253
3 : 0	17 : 4417
4 : 0	18 : 1942
5 : 5	19 : 719
6 : 22	20 : 195
7 : 196	21 : 33
8 : 767	22 : 12
9 : 2470	23 : 1
10 : 5968	24 : 0
11 : 10854	25 : 0
12 : 15698	26 : 0
13 : 17933	

App. B Fig. 6: probabilities of random matches for trisyllabic words in Period 2.

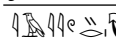
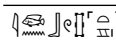
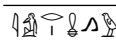
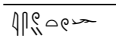
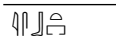
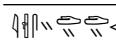
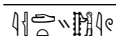
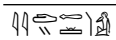
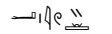
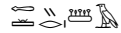
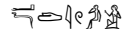


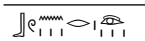
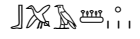
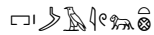
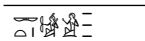
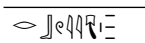
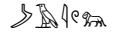
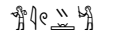
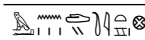
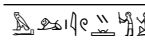
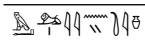
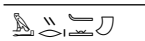
Nr. of Trials : Nr. of Matches
0 : 394
1 : 0
2 : 9918
3 : 0
4 : 39690
5 : 0
6 : 39673
7 : 0
8 : 9932
9 : 0
10 : 393

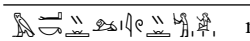
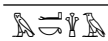
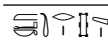
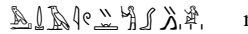
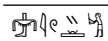
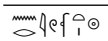
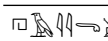
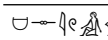
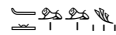
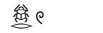
App. B Fig. 7: probabilities of random matches for disyllabic words in Period 3.

Note: the apparently curious distribution of probability is due to the fact that only 10 disyllabic words are attested in Period 3, 5 of which can be reconstructed with a *non-back* vowel, and 5 with a *back* one. This means that if one valid match for a word of vocalic class (*back* or *non-back*) is obtained, then there will always be at least aother valid match for a word belonging to the other vocalic class. This means that only a even numbers of valid matches can be obtained.

Index of Egyptian words mentioned in the text

Word	Transliteration	Translation	Page	Appendix A
j				
	jyr	stag, ram	41	III.1
	jwnw-mnd	Armant	67	—
	jp	a purple dye-plant, madder	35	II.1
	jnb	wall	91	—
	jrm	a Nubian toponym	78	—
	jrmʾ	a toponym	78	—
	jswt	long plank	23	—
	jsbt	seat, throne	5n5	—
	jsdd	Ashdod	67	—
	jkrt	Ugarit	48	—
	jkn	a jar	28, 34	I.1
	jqdʾ	maker, builder	74, 91, 92, 93	—
y				
	ym	sea	28, 31, 34, 41, 47, 51, 95, 96	I.2; II.2; III.2
	ydʕ	skilled, knowing, knowledgeable	68	—
ʕ				
	ʕʾ	arm, hand	74, 83	—
	ʕmd	stand firm, hold one’s ground	68, 69	—
	ʕⁿr	pebble	24, 26, 38, 40, 56	II.3; III.3
	ʕⁿrr	stones, rocks, pebbles	20, 37, 48	II.4
	ʕršn	lentil	35, 40, 53, 61	II.5; III.4
	ʕgrt	wagon, chart	34	II.6
	ʕḏ(d)ʾ	boy	88	—

w				
	wr	young bird which cannot fly	35	II.7
b				
	bʕytı	branch of date-palm	32	I.3
	bⁿr	ball of eyes	38, 47, 61	II.8
	bry	a fish	31, 34, 41, 48, 51	I.4; II.9; III.5
	bs	pail, bucket	32, 35, 53	I.5; II.11
	bs	God Bes		II.10
	bš	some fruit, malt	36, 40, 54	II.12; III.6
	btʸ < bdt	emmer	23	—
p				
	pr-m(ɜ)ʾ	a toponym	84	—
	pr	bean	38, 44	II.13
	prḫ+w = pUrḥ	to blossom	49n48	—
	pḏt	archers	91	—
r				
	rb(y)	lioness, she-bear	37	II.21
	rʸrʸ	a constellation (the Boar?)	23	—
m				
	m(ɜ)ʾ	lion	74, 84	—
	mjnʾ	herdsman	74, 85, 86	—
	mnd	God Montu	67	—
	mrʾ	groom, squire	76, 77	—
	mrynt	a vessel	11n13	—
	mrḥ	spear, javelin	3, 26, 33, 38, 44, 54, 61	I.6; II.14
	mrkbt	chariot	2, 28, 34, 39, 42	I.7; II.15; III.7
	mḫr	basket, box	22, 38, 50	II.16
	mḫr	6th month	22, 23, 38	II.17
	mḫmḫwtı	flowers (purslane)	22, 31	I.8
	mssbtı	metal tool	37	II.18
	mšddtı	comb	3, 29, 37	II.19

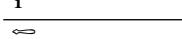
	mkrʾ	merchant(s)	77	
	mkḥ	back of head	40	III.8
	mktr	stronghold	29, 31, 34, 42, 52	I.9; II.20; III.9
	mḏʾ < mḏ3w	Medja (troops)	79	—
n				
	nbʾ	goldsmith	89	—
	n(r)ʾ	time, return of the year	74, 86, 87	—
	nty < nḏ(j)	flour	23	—
	nḏs	little (vessels?)	91	—
h				
	hy	husband	32, 36, 40, 56, 61	I.10; II.22; III.10
	hp	law(s)	33, 38, 56, 61	I.11; II.23
	hm	fare	38, 65	II.24
	hn	hin vessel	91	—
	hnʾ	sweetmeats	73, 81	—
ḥ				
	ḥmsʾ < ḥmst	to sit	89, 90	—
	ḥmḏ	vinegar	38, 42, 46, 55	II.25; III.11
	ḥrr(t)	flower	33, 38, 42, 55	I.12; II.26; III.12
	ḥrrw(t)	beetle, worm	33, 49	I.13
ḫ				
	ḫbr	commerce, associate, companion	22, 41, 45	III.13
	ḫbs	lamp	22, 39, 48, 49	II.27
	ḫpr	to happen	15, 16	—
	ḫr	Syrian	22, 33, 39, 44, 47, 49, 56, 61	I.15; II.30
	ḫr	road, street, quarter	22, 33, 39, 42, 45, 49, 54, 55	I.14; II.29; III.14

	ḫrd	veils, thin cloth, purse	22, 26, 29, 42	III.15
	ḫⁿr	tooth, fang	22, 35	II.28
	ḫt	forecourt	22, 36	II.31
	ḫtm	fortress, enclosure	17n23	—
	ḫtn	lettuce, garlic	22, 36, 45	II.32
ḥ				
	ḥry-ʕ	subordinate	83	—
s				
	sʕrt	wool, hair	31, 61	I.16
	srpt	lotus	2, 3, 31, 42, 49, 51	I.17; III.16
	sk(t)	ass's foal	39	II.33
	skʾ	an officer	80	—
	st-ḥmsʾ < ḥmst	living room	89	—
š				
	šbd(tı)	staffs, rods	20, 21, 32, 35, 37, 42, 52	I.18; II.34a; II.34b; II.34c; II.34d; III.17
	šm	father/mother in law	32	I.19
	šnftı	scale of fish	27, 32	I.20
	šḫq	dust	33, 39, 54, 55	I.21; II.35
	škrʕ	basket	36	II.36
q				
	qrʾ	stormcloud, storm	74, 90	—
	qrʕ	shield	32, 43	I.22
	qrr	stormcloud, storm	74	—
	qrr	burnt-offering	36, 41, 53	II.38; III.18
	qrmt	ashes, cinders, embers	36, 46	II.37
	qrt	precious stone	36	II.39
	qḏ	gypsum	80	—
	qḏʾ	plasterer	80, 81	—
	qḏtı	back of hand	41	III.19

k				
	kp	(palm of) hand	28, 40, 42, 47	II.40; III.20
	knr	musical instrument (kinnor)	73	—
	kr’	prison (?)	77	—
	krr	vessel for unguent	32	I.23
	krkr	couch, bed	32, 35, 51	I.24; II.41
	kṯ	some herb or flower	100n77	—
g				
	gw	steed	23	—
	gwn	hair-cloth, sacking, sack	35	II.42
	gns	violence, injustice	42	III.21
	gsr	finger-ring	37	II.43
t				
	tⁿr	heap, hillock	15, 36, 43	II.44
	trp	goose	5n4	—
	trr	oven	3, 39, 46, 48, 61	II.45
	t-sb	God Teshub	15, 20	—
ṯ				
	ṯpr	scribe	68	—
	ṯr’	Sile	71, 72, 78	—
	ṯrp	goose	5n4	—
	ṯs’ < ṯsy	commander	74, 91, 92, 93	—
	ṯṯ	sparrow	39, 40, 48n47, 56	II.46; III.22
d				
	dbr	shrine, naos, inner sanctuary	41, 45	III.23
	dn’	tired land	73, 82	—
	dn’	Danu	73, 82	—
	dr	Dor	69	—
	dd	amorous, lustful, lascivious	69	—

	dd	Dod, Dud	69	—
ḏ				
	ḏ’	some part of animals?	81	—
	ḏ’ < ḏw	mountain	73, 87	—
	ḏⁿr	self-bent rods	36, 55	II.47
	ḏⁿryt	scorpion	33, 39	I.25; II.48
	ḏnḥ	arm (of oar)	33	I.26
	ḏḫrt	jar, bowl	39, 44, 49	II.49

Index of groups appearing in the corpus, including variants (Appendix A)

Group	Transliteration	Words in Appendix A containing the group
pre-consonant		
	-rC	I.4; I.6; I.7; I.17; I.22; II.3; II.4; II.5; II.6; II.7; II.9; II.13; II.14; II.15; II.16; II.20; II.35 (misspelling?); II.37; II.41; II.47; II.49; III.1; III.3; III.4; III.7; III.13; III.15; III.16; III.23; see §4.3
	-nC	I.2; I.25; II.3; II.4; II.8; II.28; II.44; II.47; II.48; III.3; see §4.3
j		
	jA	I.1
	jA	II.13; II.48 (misspelling?); III.1
	jA	II.1
	ʾU / Uʾ	See §12.2
y		
	yA	I.2; I.3; I.4; I.10; I.25; II.2; II.9; II.13; II.21; II.22; II.48; III.10; III.17
	yU / Uy	III.1; III.2; III.5
ʕ		
	ʕA	I.3; I.16; I.22; II.3; II.4; II.5; II.36; III.3; III.4
	ʕA	II.6
	ʕU / Uʕ	II.3
w		
	wA	I.8
	wA	II.7; II.42
b		
	bA	I.18; II.34a; II.34b; II.34d; III.17
	bA	I.4; I.5; II.9; II.10; II.11; II.12; III.5; III.13
	bA	I.3; II.12; III.6; III.13; III.23
	bU / Ub	I.7; II.8; II.15; II.18; II.21; II.27; II.34c; III.7
p		
	pA	I.11
	pA	I.17; II.1
	pU / Up	I.11; II.13; II.23; II.40; III.16; III.20

f		
	fA	I.20
m		
	mA	I.19
	mA	I.2; I.6; I.7; I.8; II.2; II.14; II.15; II.16; II.17; II.18; II.19; II.25; II.37; III.2; III.7; III.11
	mU / Um	II.24
	mAk	I.9; II.20; III.8; III.9
n		
	nA	I.20
	nA	I.1; I.26; II.5; II.32; II.42; III.4; III.21
	nU	See §12.2
	nA (?)	III.21
r		
	rA	II.21
	rA	I.9; I.16; I.22; I.23; I.24; II.3; II.4; II.6; II.8; II.28; II.36; II.38; II.39; II.41; II.44; II.47; II.48; III.13; III.18
	rU / Ur	I.12; I.13; I.14; I.15; I.25; II.3; II.4; II.16; II.17; II.26; II.29; II.30; II.43; II.45; II.48; III.5; III.7; III.9; III.12; III.14; III.15
	rU / Ur	I.13
h		
	hA	I.11
	hA	I.10; II.22; II.23; II.24; III.10
	hU / Uh	I.11
ḥ		
	ḥA	I.13
	ḥA	III.8
	ḥU / Uḥ	I.6; I.12; I.21; I.26; II.14; II.25; II.26; II.35; II.49; III.11; III.12
ḫ		
	ḫA	II.28; III.13
	ḫA	I.8; I.14; I.15; II.17; II.27; II.29; II.30; II.31; III.13; III.14
	ḫ₂A	II.16; II.17; II.28; II.32; III.15
s		

	sA	III.16
	sA	I.5; I.16; [I.17]; II.10; II.11; II.18; II.27; II.33; II.43; III.21
	sU / Us	II.18
š		
 /	šA	I.18; I.19; I.20; I.21; II.5; II.12; II.19; II.34a; II.34b; II.34c; II.34d; II.35; II.36; III.4; III.6; III.17
q		
	qA	I.21; I.22; II.35; II.37; II.38; II.39; III.18; III.19
k		
	kA	I.7; I.23; II.15; II.36; II.40; II.41; III.7; III.20
 /	kU	I.1; I.24
	kU	II.33
g		
	gA	II.6; II.42; II.43; III.9
	gA ? gU / Ug ?	III.21
t		
	tA	I.9; II.44
	tA	I.7; I.16; I.17; II.6; II.15; II.20; II.31; II.34c; II.37; II.39; II.45; II.49; III.7; III.16
	tA	II.44
	tA	II.45
ṯ		
	ṯA	II.32; II.46; III.22
	ṯU / Uṯ	II.46
d		
	dA	I.18; II.34a; II.34d; III.23; III.15
	dU / Ud	II.19; II.34c; III.15; III.17; see §11
	dU / Ud	II.34b
ḏ		
	ḏA	II.25
	ḏA	I.25; I.26; II.47; II.48; II.49; III.11; III.19

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Lingua Aegyptia − Studia Monographica 21

Eléments de la terminologie du temps en égyptien ancien

Gaëlle Chantrain

This book has a double scope: first, bringing a contribution to the knowledge and understanding of the time conceptions in Ancient Egypt through a lexical study and, second, contributing to the definition of a methodological frame for lexical semantics in Ancient Egyptian.

In the introduction, the reader will first find a state of the art from the point of view of time-related studies in Egyptology, lexical semantics studies, and classifiers studies. The next introductory sections deal with the links between time, space and motion, with the complexity of time conceptions in Ancient Egypt, and with the impact of this plural vision on the lexicon.

The first part of the core study aims at establishing a proposition of canvas for the semasiology of nouns. It also presents the semasiological analysis of eight lexemes belonging to the UNBOUNDED TIME domain: *ȝ.t* (moment), *wnw.t* (hour), *nw* (moment), *tr* (time), *hȝw* (epoch), *rk* (epoch), *ḥꜥw* (lifetime) and *ḥnty* (period).

The second part is dedicated to the onomasiology of the UNBOUNDED TIME domain, as well as some of its connections with some contiguous domains like SPACE.

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