Chapter 22

Egyptian and Coptic Phonology

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22.1. Introduction

At the present state of our knowledge, a discussion of Egyptian and Coptic phonology must be addressed primarily as an issue of *diachronic*, rather than synchronic linguistics. While it is possible to recognize regular patterns of sound change in the history of the Egyptian language as a whole, including in many cases its Afroasiatic antecedents, the synchronic systems of phonological oppositions at any given time in the four millennia of the productive history of this language often defy a clear analysis. Furthermore, the dynamic models of historical phonology tend to hide many uncertainties behind the regularity of a reconstructed paradigm, conveying the misleading impression that for each of the different phases of the language (Early Egyptian, Middle Egyptian, Late Egyptian, Coptic) we are indeed able to establish a discrete phonological system.

The phonetic realities underneath the abstract phonological reconstructions are even more elusive: the traditional pronunciation and transliteration of many hieroglyphic phonemes rest upon hardly anything more than scholarly conventions, and even for the relatively well-known Coptic, in which Egyptian sounds are rendered in a Greek-based alphabet, it is difficult to assess reliable phonetic values for some of the Greek signs and of the Demotic graphemes that were added to the Greek alphabetic set.

In fact, the main reason for the difficulties in reconstructing the phonology of Ancient Egyptian lies in the very nature of the writing systems: Hieroglyphs, Hieratic, and Demotic represent the mere consonantal skeleton of a word (and sometimes only a portion thereof), followed by indicators of lexical classes, the so-called “determinatives.” Semivocalic phonemes are rarely indicated, vowels practically never. As for Coptic, in which vowels are indeed rendered, one should not underestimate the methodological difficulty inherent in the widespread assumption of a phonological or phonetic identity between a specific Coptic sign and its original value in the Greek system—an identity which is by no means unquestionable.
Therefore, the reconstruction of the phonological inventor of the phonetic values in any period of the history of Egyptian is bound to remain highly hypothetical: it can only be approached through a heuristic procedure in which three dimensions are checked against each other and mutually verified (cf. § 22.2): the reconstruction of Afroasiatic prehistory,¹ the information drawn from contemporary sources in other (mostly Semitic) languages with a better investigated phonology (Hoch 1991), and the laws of phonological evolution leading from older Egyptian to Coptic.²

22.2. Heuristic criteria

In spite of these difficulties, the study of Egyptian phonology has achieved significant progress since the initial studies of the late 19th century, both in the assessment of consonantal values and in the reconstruction of vocalic phonemes and prosodic rules. To achieve this goal, scholars rely on four procedures of linguistic reconstruction.³

22.2.1. Comparative Afroasiatic linguistics

Egyptian is a language of the Afroasiatic phylum, and the presence of established etymological correspondences offers a fundamental source for the reconstruction of phonological values. E.g., since Eg. <q3b> corresponds to Sem. qrb meaning 'interior part', one can confidently establish that Eg. <q> = /q/ and that <b> = /b/.

22.2.2. Contemporary transcriptions in foreign languages

Many Akkadian texts, especially from the archive of el-‘Amarna (15th–14th c. B.C.E.), contain Egyptian words, names, and short phrases in cuneiform transcription. Although the phonology and the graphemics of Akkadian are themselves by no means fully decoded, these transcriptions provide a valuable insight into the contemporary pronunciation of Egyptian. E.g., Eg. <stpm> ‘the-one-whom-(the-god-)Ra-has-chosen’ (royal name of King Ramses II) appears in cuneiform as ša-te-ep-na-ra-i-e-a, a form on the basis of which one can both determine the contemporary Egyptian pronunciation as */sa-te-ep-na-ra-i-a/ and observe the correspondence Eg. <s> // Akk. <š>, both of which were probably realized as [s] or as a sound very close to it (at least in some dialects).⁴

22.2.3. Egyptian renderings of foreign words, especially of Northwest Semitic origin

This criterion represents the symmetrical counterpart to the preceding one: it provides an insight into the phonology of contemporary Egyptian while at the same time offering the possibility of verifying scholarly assumptions on Semitic phonology. E.g., Northwest Sem. *sōbēr ‘scribe’ ⇒ Eg. <tu-pa-r>.

The relevance of this piece of evidence is twofold: on the one hand, it raises questions about the phonological status and the phonetic realization of Eg. /l/, which is the palatal phoneme usually transcribed ū by Egyptologists, while on the other, it can also be used to shed some light on the value of the phoneme /s/ (samekh), which originally must have been an affricate [s] in Semitic (cf. Faber 1990: 627; Hoch 1991: 484f.; Faber 1992).

22.2.4. The evidence provided by Coptic

The latest stage in the development of Egyptian provides the broadest basis for the study of the phonology of older periods of the language as well. E.g., Eg. <wb> ‘pure’, ‘to be pure’, ‘priest’ appears in Coptic in the lexemes ṭeCē ‘holy’, ṭeC ‘to be pure’, ṭek ‘priest’. This evidence enables us to reconstruct three different vocalization patterns underlying the same graphic reality of hieroglyphic Egyptian: the stative *wa’dab ‘he is pure’, the infinitive *wa’dab ‘to become pure’, and the noun *wa’dab ‘priest’. At the same time, this piece of evidence raises questions of consonantism, i.e., the fate of the phoneme */t/ and the reason for the alternance *w vs. *n in the Coptic forms as opposed to <b> in both cases in their Egyptian antecedents.

In the practice of Egyptian phonological reconstruction, these four aspects appear constantly combined: while each of them, if considered individually, proves largely inadequate in order to determine a synchronic stage, together they convey a relatively homogeneous picture of the fundamental laws of Egyptian phonological development. What follows in the next paragraphs (§§ 22.3–6) is a tentative historical phonology of Egyptian from its Afroasiatic roots to alphabetic Coptic. Transcriptions from Egyptian and

2. The most complete description of these rules and of the patterns of Egyptian vocalization is found in Osing 1976: 10–30.
3. Cf. Schenkel 1990: 23–28. This book presents the most up-to-date and compact picture of Egyptian phonology (pp. 24–93). I shall make specific references to it only in the rare cases in which my analysis differs from Schenkel’s in a significant way.
Semitic follow the established conventions in these respects add and are rendered in *italics*; transliterations of graphemes without reference to their phonological status are indicated in angle brackets (<x>); phonemes (/x/) and tentative phonetic values ([x]) are represented according to IPA conventions.

At this point, a methodological warning is in order: in the case of Egyptian (and of many other 'philological' languages known only through written records), the distinction between the phoneme as the distinctive minimal unit of the language (/x/) and the often much larger inventory of sounds ([x]) representing its physical realizations is heuristically less practicable than for languages with a better-known phonological structure: while scholars can strive for the reconstruction of the "sound units" of the language, the technical assessment of their phonological status, which would require in each case the minimal pair test, often proves a very problematic endeavor: on the one hand, our only source of information is represented by a complex writing system which combines phonetic and semantic principles; on the other hand, because of the restrictiveness of cultural conventions governing the use of writing in Egyptian society,7 our knowledge of the lexicon is doomed to remain far from exhaustive.

### 22.3. The prehistory of Egyptian phonology

Before the emergence of Egyptian as a written language, a few adjustments within the stock of phonemes inherited from "Afroasiatic"6 seem to have taken place. Three major evolutions from the original phonological stock characterize the Egyptian domain as it begins its recorded history.7


(b) Among the liquids, the original opposition between nasal *n,* lateral *l,* and vibrand *r* underwent a profound reorganization, not yet fully understood in its specific details, in which a role was also played by dialectal varieties. AA *n* and *r* were kept as Eg. /n/ and /l/—the latter being the phoneme conventionally transcribed ' by Egyptologists and traditionally taken to be a variety of glottal stop /l/ but, in early Egyptian probably a "uvular trill" (cf. jnk *jának* (Kammerzell 1991b: 201), Sem. *jánaku,* 1st sg. pronoun, or Eg. *ksm* *karmwfl* (Osing 1976: 857), Sem. *karm* 'vineyard'. On the contrary, AA *r* does not display uniform Egyptian correspondences nor is Eg. /l/ indicated by an independent grapheme, in spite of its almost certain presence in the phonological inventory of the language: AA *l* corresponds to Eg. /n/, e.g., AA *lis* 'tongue' > Eg. /nis/, cf. Coptic *aac,* Sem. *lā ś-an* to Eg. /n/, e.g., *zjَ* /jaðr-wfl/ 'tamarisk', cf. Sem. *rā th* to Eg. /r/, e.g., *s* 'to speak foreign languages', cf. Sem. *ljz* (see above); and to Eg. /j/, e.g., AA *lib* 'heart' > Eg. /jib/, cf. Sem. *libb* or AA *lwa* 'color' > Eg. /jwn* /ja’win/ (Osing 1976: 316), cf. Sem. *lwna.* Presumably, proto-Eg. *r* merged with other sonorants in the dialect which eventually led to the written language, while still being kept in less normative varieties of the language: in the New Kingdom, when Later Egyptian became the written form of the language for the domain of administration and literature, a specific grapheme <f> was created in order to express the phoneme /l/. In Demotic, /l/ is autonomously indicated by a grapheme <l>, a diacritical variety of /f/.

(c) The AA velar plosives *k,* *g,* and *kh* display two outcomes in Eg.: either they are maintained as /k/ /g/ /kh/ or they are palatalized to /ql/ /gfl/ and /dl/ respectively: cf. the 2nd person suffix pronoun masc. /k/ > *-ka-ku* vs. fem. /ql/ > *-ki* (Kammerzell 1991b: 198ff.) or the opposition between the two Eg. roots /sd/ (cf. /sd/* /swas/ 'green') and /jaq/ (cf. /jaq/* /juaqat/ 'vegetables') from an identical AA root /wrd/.

(d) The phonemes corresponding to the so-called "emphatic" series of other branches of the AA phylum lost their phonological status in Egyptian, merging either with the corresponding voiceless fricative, as in the labial language, cf. Sem. *ląz* (Ar. *lağaza* 'to speak enigmatically', Hebr. *lź* 'to speak a foreign language'); AA *dwh* 'fly' > Eg. *līj* *muffjīl* > Coptic *aq* (cf. Sem. *dbb* (Akk. *dubbum*, Ar. *dubhūb*, Hebr. *zuwb*).

5. What is often referred to as "rules of decorum": cf. Eyre and Baines 1989.

6. "Afroasiatic" is here used as a conventional term to indicate the set of linguistic features which Egyptian shares with a certain number of other language families (Semitic, Berber, Cushitic, Chadic), without implying the belief in the existence of an actual proto-language ancestral to these families. The different theoretical models are discussed in Loprieno 1986: 1–12, 187–90.

7. In the following transcriptions, *v* denotes an unidentified short vowel (*a,* *i,* or *u,* corresponding (for typographic reasons) to the Egyptian convention *v*).

8. Cf. the comparable evolution from Proto-Sem. *d* to Aram. *qrp,* later /s,: *ḥd* > *ṣaqa* > *ṣarba* 'earth' (Brockelmann 1908: 134).

9. A possible remnant of the early pronunciation of this phoneme is perhaps its outcome as Coptic /l/ in specific phonetic surroundings: 8kou 'sickle' < h b t *ṣaḥabīt/ (?), with [ən] > [k'ən]. Cf. the references in Westendorf 1965: 67.
series, in which AA *p develops into Eg. /h/: AA *spy 'se' > Eg. sfhyw *safyjaw, cf. Sem. *sb; or with the corresponding voiced plosive: (1) the AA emphatic dentals *t and *s merge into Eg. /d/: Eg. dwn 'to stretch' /dwa:n/, cf. Sem. twt 'to be long'; Eg. wdpw 'servant', cf. Ar. wasfl; (2) in specific phonetic environments, the AA emphatic velars *k and *x merge into the voiced palatal stop /j/, the phoneme conventionally transcribed 3 by Egyptologists; AA *wak > Eg. wdp *wasjy 'green', cf. Sem. *war ji 'leaf'; AA *nsw > Eg. ngsn *nasjim 'sweet', cf. Sem. *nsw. As we just saw, in absence of palatalization, AA *k is kept in Eg. as /q/, which was probably articulated as ejective [γ'] (see § 22.6 for Coptic evidence of this articulation): from AA *khr/khb are derived both Eg. q3b 'interior' (cf. Akk. qerbum 'inside') and Eg. qnh 'to turn' (cf. Ar. qlb 'to turn around'). As for AA *x, when not subject to palatalization it merges into the voiceless pharyngeal fricative /h/: AA *xal > Eg. hr *har 'on', cf. Sem. *sal.

22.4. The phonological system of Early Egyptian (about 2500 B.C.E.)

At the beginning of its written history, i.e., during the historical period known as the “Old Kingdom” (2800–2150 B.C.E.), one can assume that the Egyptian language displayed the phonological inventory shown in Table 22.1. Here, x indicates the traditional Egyptological transcription, /x/ the posited phoneme, [x] a tentative phonetic reconstruction (if different from /x/).

Some contemporary scholars, following Rössler 1971 (among Egyptologists cf. primarily Schenkel 1990: 24–57; cf. also Kammerzell 1992: 169ff.; Zeidler 1992: 204ff.) and a long tradition going back to the 19th century, offer a partially different analysis of these phonemes: since Eg. <d> and <3> represent, as we just saw, the heirs of AA “emphatics” (*l/s and *k/x respectively), these phonemes, rather than as “voiced” /d/ and /3/, should be understood as “voiceless emphatic” <d> = /h/ and <3> = /h/, although the actual phonetic realization of the feature [+EMPHATIC], whether pharyngealization, velarization, or glottalization, cannot be determined with certainty (Kammerzell 1992: 169).

Yet, because of the presence of just two, rather than three phonemes in the respective Egyptian consonantal series, I prefer to analyze them as poles of the simpler binary opposition “voiceless” vs. “voiced.”10 However, an important discovery of the alternative approach to Egyptian phonology must

10. An excellent discussion of adequacy and advantages of this simpler solution is offered by Hoch 1991: 508 ff.
be borne in mind and accounted for: on the basis of both com­ mutative evidence and diachronic signals, Egyptian mediae often appear to have neutralized the feature [+voiced] to have been realized— together with the uvular plosive /q/—as ejective stops.13 Ejectivity, the existence of which can also be inferred through indirect Coptic evidence (cf. § 22.6), brought these phonemes into the phonetic proximity of Semitic (and Afroasiatic) “emphatics”: most likely /d/ = [t'], probably also /j/ = [c'], /q/ = [k'], and /q/ = /q/. A possible explanation of this phenomenon of especially initial devoicing is that the feature [+voiced] must have progressively become redundant under the competition of the optional aspiration which, at least in some varieties of the language and specific environments, characterized Egyptian voiceless stops: /p/ = [p'] and /t/ = [t'], probably also /c/ = [c'] and /q/ = /q/.[15] This is shown by the fact that Eg. /p/ and /t/ are rendered in the Greek transcriptions by Φ and θ respectively: ἄρχον ‘(the god) Ptharth’ > ΦΘάρθ, and Eg. /c/ and /q/ often by Θ and ϒ respectively: τεντρως > τεντρω, and the neutralization (or) /zh/ > and the neutralization of /zh/ is probably also /g/ > and the neutralization of /g/ = /ɣ/. The same holds true for /z/, /s/, /ʃ/ and /ʒ/. (As defended here): for “consonantal epenthesis” (as in the case of [z] > [s] in Semitic) or <nz> = [nə] > [nə] = [nə] or AA <nz> <nts> (cf. Hoch 1991: 512 ff.).

PiA. 

Of another, the heir of AA *s and *s is continued by Eg. s (δ), i.e., by the second phoneme listed above: cf. AA *su: ‘he’ > Eg. sw *swl (cf. Kammerzell 1991b: 190ff.), Sem. *swar > AA *Σαπάτ ‘lip’ > Eg. sp.1 *ηpate (Oising 1976: 870ff.), Sem. *Σαπάτ. It is quite possible, therefore, that Eg. s/w/ was characterized by a supplementary articulatory feature, whose precise phonetic nature (path of lateral or palatal type) is impossible to determine. Eg. z, on the other hand, is the heir of AA *θ and *s, as is shown by such correspondences as the already mentioned Eg. jen *jερεν ‘tamarisk’, cf. Sem. *p;t/ or AA *sulquam ‘locust’ > Eg. zh/sm *٪sul umieins (Oising 1976: 454), cf. Hebr. sol ‘λμ. Here I reconstruct x as /h/ but it needs to be stressed that the phonological opposition between /h/ and /s/ was neutralized by the beginning of the Middle Kingdom, at which time <z > and <s> had become graphic variants of the same phoneme /s/. However, the articulation and the phonological status of sibilants in the whole phylum remains a thorny issue of AA linguistics.

The Eg. phoneme /j/ represents the outcome of AA *j (Eg. jm ‘right side’, therefore ‘West’, the point of reference being represented by the sources of the Nile, i.e., the South, vs. Sem. *ywn ‘right side’, therefore ‘South’, the point of reference being the place where the sun rises, i.e., the East) and of AA *j (Eg. jwn ‘color’, cf. Sem. *lawn, see also § 22.3) when subject to palatalization. Probably by the beginning of the Middle Kingdom, as part of the global reorganization of liquid phonemes which took place in Egyptian (with /l/ > /l/) and the neutralization of the opposition between /l/ and other sonorants, cf. Table 22-1), /j / turned into /l/ before an unstressed vowel in

16. Schenkel 1986 suggests the interpretation of x as affricate [ʃ], because it stands for /h/ in the word nsw ‘king’, whose more traditional writing is nsw. Whether an affricate (as suggested by Schenkel and by the equation with AA *s) or a fricative (as suggested by the correspondence with AA *θ), it is not surprising that this phoneme should be used to indicate a sibilant immediately following a nasal, a phonetic surrounding which often tends to generate affrication: lsw < ents, <nex > [nə] (à la Schenkel) or <nex > [nə] > <nts> = [nə] as defined here: for “consonantal epenthesis” (as in the case of [s] > [ʃ]) cf. Hock 1991: 117 f.
22.4.1. Vowels
The vocalic system of early Egyptian can be reconstructed as in Table 22-2.

Table 22-2. Early Egyptian Vowels

<table>
<thead>
<tr>
<th></th>
<th>Short</th>
<th>Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>/i/</td>
<td>/i:/</td>
</tr>
<tr>
<td>Central</td>
<td>/a/</td>
<td>/a:/</td>
</tr>
<tr>
<td>Back</td>
<td>/u/</td>
<td>/u:/</td>
</tr>
</tbody>
</table>

The three vocalic qualities posited for early Egyptian are inherited directly from the AA prehistory of the language. While never spelled out in writing, vocalic phonemes can be reconstructed with a sufficient degree of systematic reliability on the basis of the four criteria formulated in § 22.2. For the earliest phase in the development of the Egyptian phonological system we do not posit the existence of a phoneme shwa.

Unlike stressed vocalic phonemes, unstressed vowels cannot be reconstructed with any degree of reliability. E.g., in ntr */nacar/ 'god', while the stressed vowel can be reconstructed directly from Coptic NTOK (with */na:/ > /nac/, cf. § 22.6), the quality of the unstressed vowel in */car/ can only be inferred indirectly through the feminine form ntrt */nacarat/ > Coptic NTOROE (with */car/ > */h/; cf. § 22.6). The extent to which a whole paradigmatic class should be posited on the basis of analogy is still a matter of intense scholarly debate.

22.4.2. Syllabic structures
As a general rule, the opposition between short and long vowel is not phonological, but determined by the respective syllabic structure: long vowels appear in open stressed syllables, short vowels in closed and in open unstressed syllables. Major exceptions are represented by the presence of a long vowel in closed stressed syllable in the infinitive of biconsonantal verbal roots and, at least according to some scholars, the possibility of long or doubly-closed syllables in final position. Accordingly, the following five or seven patterns of syllabic distribution (patterns 6–7 are not universally accepted) are characteristic for early Egyptian (C = consonant, V = vowel, # = word boundaries):

1. 'CVC
   jnn */ja'nan/ ‘we’
2. (_)/CV(_)
   rmt */ramac/ ‘man’
3. 'CV:
   htp */hapi/ ‘pleasing’
4. #CV: _
   tpj */ta'pij/ ‘first’
5. #CV:C#
   mn */man/ ‘to stay’
6. _/CVCC#, _/CV:C#
   mdw.w */ma'duww/ ‘words’17
7. _/CV#, _/CV: #
   stp.k(w) */šwpa'ku/ ‘I chose’18

Table 22-3 shows the syllabic paradigms admissible in early Egyptian. Parentheses signify that the presence of the corresponding syllabic structure is not universally accepted. This is the case of the doubly-closed stressed syllable, which characterizes a certain number of plural forms of bisyllabic nouns, and of the open unstressed syllable in final position, typical for the endings of specific verbal forms (pattern -CV#) and personal pronouns (pattern -CV: #).

Table 22-3. Early Egyptian Syllabic Structures

<table>
<thead>
<tr>
<th></th>
<th>Pretonic</th>
<th>Tonic</th>
<th>Posttonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>#CV:</td>
<td>#CV:</td>
<td>(_/CV#)</td>
</tr>
<tr>
<td>Closed</td>
<td>#CV:</td>
<td>'CV</td>
<td>_/CV:C#</td>
</tr>
<tr>
<td>Doubly-closed</td>
<td>CVCC#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long</td>
<td>'CV:C#</td>
<td></td>
<td></td>
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</tbody>
</table>

In historical Egyptian, the stress falls either on the ultimate (oxygen) or on

22.4.3. Text sample (CT II 209c-210c)

Here is a short text sample of Early Egyptian. The conventional Egyptological transliteration of the original hieroglyphic text (drawn from the funerary corpus of the Coffin Texts, about 2000 B.C.E.) is followed by a translation and a tentative phonological reconstruction.

\[\text{jr.t \ hprw.w \ m \ hjk \ aq \ std \ snq \ ntr.w} \\
\text{rs \ aq.t \ bks.tj \ hr \ mtw.t \ sn=s \ wsfr} \\
\text{\textit{\textasciitilde{f} \ hjm.t \ wn.t \ jb=s \ ndm.w \ m \ mtw.t \ sn=s \ wsfr}}\]

'To make transformations as a falcon. The lightning flash will strike, the gods will be afraid. Isis will wake up pregnant from the seed of her brother Osiris.'

22.5. The phonological system of Later Egyptian (about 1000 B.C.E.)

By the end of the New Kingdom (1550-1000 B.C.E.), the phonological system described in the preceding section had undergone a certain number of developments which profoundly modified all its components. The phonology of later Egyptian is better known to us than the hypothetical reconstruction of older Egyptian thanks primarily to the cuneiform transcriptions of Egyptian words and phrases.

The major changes can be indicated as follows.

22.5.1. Consonants

(a) From the velar to the dental series, oppositions between voiced and voiceless phonemes become progressively neutralized: ts.wj */tarw.wj > Akk. transcription *ta-a-wa 'the Two Lands'; dbn */dib-an > Akk. transcription ti-ba-an 'dbn-weight' (Osing 1976: 420, 619-20). (b) While palatal phonemes are regularly kept in a number of lexemes, they often tend to acquire a dental realization: psdw */pi\textasciitilde{a}sijw > Akk. transcription pi\textasciitilde{a}-si-it 'nine' (Schenk 1990: 89). (c) The dental phonemes /t/ and /l/ and the glides /j/ and /w/ undergo a process of lenition to /l/ at the end of a syllable, and eventually to /l/ at the end of a word: pd.t */pisjat > Akk. *pi-ta 'bow'; hwn */hunaw > Akk. transcription h\textasciitilde{a}-na 'jar'; *mar\textasciitilde{a}-w > Akk. transcription ma\textasciitilde{a}-ia, ma\textasciitilde{a}-i 'beloved' (Osing 1976: 463, 809-10). (d) The uvular trill /\textasciitilde{f}/ completes its evolution to glottal stop /\textasciitilde{f}/ and eventually to /l/ at the end of a syllable (cf. § 22.4): while in the exeption texts of the Middle Kingdom the writing <\textasciitilde{f}j\textasciitilde{f}m> renders the Sem. toponym *yarmut\textasciitilde{a} (Hoch 1991: 590), in the group writing of the New Kingdom <\textasciitilde{f}a> has come to indicate the a-vowel (ibid. 599).

22.5.2. Vowels

A series of major developments alters the vocalic system of Egyptian during the late New Kingdom, after the reign of Rameses II, i.e., from around 1200 B.C.E. onward: (a) Parallel to the so-called 'Canaanite vowel shift' in contemporary Northwest Semitic languages, long stressed */a/ becomes */\textasciitilde{f}\textasciitilde{a}/: hrw

She will stand up—the stening woman—with her heart rejoicing over the seed of her brother Osiris.'
(the god) Horus' *ḥa-rnw/*ḥa-nra (cf. the Akk. transcription of the Neo-Assyrian period -ḥuru; Fecht 1960 § 172). (b) This sound change provokes other adjustments within the system, most importantly the change of long stressed *ḥw into *ḥw/*ḥw: Snj ‘tree’ *ḥwɔj/*ḥwɔal (cf. the Akk. transcription of the Neo-Assyrian period -šini; Fecht 1960 § 172; Osing 1976: 148). (c) Already in the early New Kingdom, short stressed *ḥi had become *ḥi/*ḥi: cf. the Eg. anthroponym mnj ‘Menes’ *ḥi-ni/*ḥi-ni (cf. the Akk. transcription ma-ne-i); at a later date, probably around 1000-800 B.C.E., short stressed *ḥi/*ḥi and *ḥi/*ḥi merged into the realization *ḥi/*ḥi: cf. the Eg. toponym ḍn.t ‘Tanis’ *ḥi-ni/*ḥi-ni, borrowed in Hebrew at a time when the original vocalization was clearly productive (*šu>n > šo’an), but transcribed as s-e- ma-ni-a-m-nu in the Neo-Assyrian period (Schenkel 1990: 87–88; Osing 1976: 377). (d) Unstressed vowels, especially in posttonic position, merged into the mid central */a/ (the so-called shwa): ḥw ‘(the god) Re’ *ḥi-nu/*ḥi-nu (Akk. transcriptions -ri-ia, -re-e) ~ nfr ‘good’ *ma-ni/*ma-ni (Akk. transcription -na-a-pa) ~ ms ‘*muša/d (Akk. transcription -mu-a; Osing 1976: 20, 605–6, 149). (e) A merely phonetic evolution which probably did not affect the phonological level is */e/ > *[e] in proximity of /i/ and /j/: ḥw ‘soldier’ *wišu/*wišu (cf. the Akk. transcription from el-Amarna ḏ-i-ḥu > *[we:ša] (cf. later transcriptions d-e-eḥ, d-e-e, d-e-ḥ); mhj.t ‘North-wind’ *ma-hi-i/*ma-he-; (cf. the Akk. transcription -ma-he-e; Osing 1976: 20–21).

Thus, we can posit the vocalic system in Table 22-4 for later Egyptian around 1000 B.C.E. While at the phonetic level the vocalic sounds have indeed evolved from the ‘earlier system presented in § 22.4, the number of vocalic phonemes (six) remains unchanged.

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<th>Table 22-4. Later Egyptian Vowels</th>
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<tr>
<td>Unstressed</td>
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</table>

22.5.3. Syllabic Structures

Because of the loss of the final dentals and of the semivocalic glides caused by the strong tonic stress, the system of syllabic structures undergoes a partial reorganization, with the emergence of previously unknown or poorly documented syllabic patterns: (a) The development of -CV:C# in plurisyllabic words (in early Egyptian, the pattern #CV:C# had a reduced functional yield, being limited to the infinitive of biradical verbs): mhjt ‘(the goddess) Mehat’ /ma-hu-t/> */ma-hu-t/, cf. the Akk. transcription -ma-hu-u, Greek -makhis (with *hu > η). hmnw ‘eight’ /xa-ma-nw/> */xa-ma-nw/, cf. el-Amarna ha-ma-an (Osing 1976: 730, 476). (b) The same development affects the pattern -CVCC#, previously limited to some plurals of the type *maduw: zsjw.tj ‘(the city of) Asyut’ */ṣa-jaw-tj/> */ṣa-jaw-tj/, cf. Neo-Assyrian cuneiform ši-ia-a-u-ut (Schenkel 1990: 87). (c) The fall of final consonants increases the presence of unstressed open syllables of the pattern ’CV#, which, in the earlier phase of the language were limited to the endings of specific verbal forms (pattern -CV#) and personal pronouns (pattern -CV#): ḫrj-pg ‘overseer of the troop’ /ha-rji-pjat/> */ha-rji-pjat/, cf. cuneiform a/i-ni-ri-pi-ta (ibid. 463).

<table>
<thead>
<tr>
<th>Table 22-5. Later Egyptian Syllabic Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretonic</td>
</tr>
<tr>
<td>Open</td>
</tr>
<tr>
<td>Closed</td>
</tr>
<tr>
<td>Doubly-closed</td>
</tr>
<tr>
<td>Long</td>
</tr>
</tbody>
</table>

22.5.4. Text Sample (Wenamun 1,47-1,48)

Here is a short text sample of later Egyptian. The conventional egyp:1cal transliteration of the original hieratic text from the literary tale of Wenamun (about 1000 B.C.E.) is followed by the translation and a tentative phonological reconstruction.

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>jw dws w ḫpr. w jw=f ḫab jw=f j3y= ḫ r-ḥrj</td>
</tr>
<tr>
<td>jw p3 ntr ḫtp.w m p3 jmnw nmj-sw jm-f sp.t p3 ym</td>
</tr>
</tbody>
</table>

‘Then morning came, and he sent and brought me up, while the god was resting in the tent in which he was, on the shore of the sea.’
22.6. The phonological system of Coptic (about 400 C.E.)

Unlike earlier stages of the language, Coptic, which is written in an alphabetic system derived from Greek, is documented in a number of closely related "dialects." These dialects, however, do not necessarily reproduce local varieties of the language: they represent, to a large extent, discrete sets of mainly graphic conventions for rendering Egyptian in an inadequate foreign script (cf. Loprieno 1981). The two major poles of the continuum of Coptic dialects are Sahidic, normally considered to reflect the Theban, upper Egyptian variety of the language, documented from the 4th century C.E. and representing the language of classical Coptic literature, and Bohairic, the dialect of the Nile delta, documented from the 5th century C.E. and progressively established as the dialect of the liturgy of the Coptic church. Since Sahidic represents classical Coptic, it has been chosen here for the basic presentation of Coptic phonology. However, I shall refer to other dialects, especially Bohairic, whenever such references become necessary for the purpose of an historical or a typological analysis.

During the first millennium B.C.E. and the first centuries C.E., Egyptian continued to undergo a number of phonological changes. In the consonantal system, the tendencies described in §22.5(a) developed further, leading to a complete neutralization of voiced plosives in the dental, palatal, and velar series: the phonemes /d/, /g/, and /z/ are present only in Greek borrowings, the rare exceptions to this rule being the result of sonorization in proximity of /n/ (e.g., /nt vs. /nk/). In the labial series, the situation is more complex: the voiced phoneme /b/ was probably articulated as a fricative [β], which by this time was strongly pronounced as a fricative [β], and /l/ is kept in all initial and medial positions (βουκ 'servant', ιβισ 'ibis', ΤΙΑΚ 'ten thousand'), and in final position whenever it did not immediately follow the tonic vowel of a closed syllable in the earlier stages of the language, although this

<table>
<thead>
<tr>
<th>Consonant</th>
<th>Bilabial</th>
<th>Labio-dental</th>
<th>Alveolar-palatal</th>
<th>Postpalatal</th>
<th>Velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiced</td>
<td>/b/</td>
<td>/β/</td>
<td>/d/</td>
<td>/ɡ/</td>
<td>/z/</td>
</tr>
<tr>
<td>Fricative</td>
<td>/β/</td>
<td>/d/</td>
<td>/ɡ/</td>
<td>/z/</td>
<td></td>
</tr>
<tr>
<td>Nasal</td>
<td>/m/</td>
<td>/n/</td>
<td>/ŋ/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibrant</td>
<td>/w/</td>
<td>/l/</td>
<td>/r/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glide</td>
<td>/y/</td>
<td>/j/</td>
<td>/ŋ/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

22. Two insightful presentations of the problems faced by linguists in the reconstruction of Coptic phonology are Satzinger 1979 and Hinze 1980.
may indeed be synchronically the case in Coptic: ΝΟΥS < *h₁ aw/ 'gold'. If final /h/ did follow the tonic vowel of an etymological closed syllable, whether in monosyllabic or multisyllabic words, it became in Coptic voiceless /p/; ΌΟΥS < */waʔah/ 'to be pure', ΤΑΠ < */dib/ 'horn'.

Guttural fricatives of earlier Egyptian merge in Sahidic either into /w/ (especially /j/: e.g., h₂ 'thousand' */xawar/ > */xawar/ > /go/, or into /j/ (especially /h/ and /l/, sometimes also /j/: e.g., h₃ 'beginning' */muət/ > /₂h, h(w)t/ 'body' */qumawat/ > /₂h, h(w)v/ 'voice' */jraw/ > /₂poy/. Other dialects appear more conservative: Bohairic and Akhmim keep the uvular fricative /j/ (written 9 in Bohairic, e.g. 9poyj, and 2 in Akhmimic, e.g., 29poy 'voice'). Finally, the glottal stop /ʔ/, which represents the development of */ʔ/ and */N/, on the one hand, and of the fall of final /ʔ/ and /h/ on the other, is not expressed by an independent grapheme, but is rendered in Sahidic by <έ> at the beginning and the end of a word (e.g., ἀκόκ πα'άνακ/ 'I < *ja'άνακ, το/ ταʔ/ 'and' < */taʔ/ and, except in Bohairic, by the reduplication of the vocalic grapheme when immediately following the stressed vowel of a word (e.g., 9poyj /kōʔp/, 9l9poyj, 9poyj /jorj/ 'to be' < ḥpr.w */χαrhoaw/ 'has become').

Bohairic spelling conveys a traditional feature of Egyptian phonetics, namely the aspirated realization of stops, which are expressed by the corresponding aspiratae of the Greek alphabet: voiceless stops become aspirated when immediately preceding a tonic vowel, semivowels, and sonorant consonants (including b):

\[
\begin{align*}
\pi /p/, \tau /h/, \lambda /c/, \kappa /k/ & \to \phi [p^\prime], \Theta [t^\prime], \delta [c^\prime], \chi [k^\prime] \\
\end{align*}
\]

Examples: 59poyj vs. 99poyj 'the sun', 9l9poyj vs. 9l9poyj 'this (fem.)', 9l99poyj vs. 99poyj 'lord', ΚΟΥΛΒΑ vs. ΚΟΥΛΑΒ 'you are holy'. This phonetic rule proves that 6 [c'] represents in Bohairic the aspirated variety of the palatal plosive /c/; the value of the sign 6 in this dialect, therefore, differs from its function in all other Coptic traditions, where it indicates the postpalatal plosive /k/, a phoneme absent from the phonological inventory of Bohairic, where it has merged with /h/.

The rule of aspiration in Bohairic, however, exhibits an extremely interesting property: when /l/ and /k/ are the outcome of older d/l/, d /l/, g /l/, and q /q/ respectively, no aspiration immediately preceding the tonic vowel takes place: 8TAΠ 'horn' < Eg. ḏb */dib/, 8ΤΟΠ < ḏib parallel to 8ΤΟΠ 'hand' < Eg. ḏt */dtnat/, 8ΧΙΜ < * /dib/ 'to find' < Eg. γιντ * /dtnat/, 8ΚΑΣ 'bone' < Eg. qs * /qes/; in pre-sonorant environments, on the other hand, the rule of aspiration is upheld: 8ΕΡΕΧ < dj:jr, 8ΟΛA 'ten thousand' < ḏb /jadb/, 8ΗΡΧΑI 'dowry' < ggr.t /ɡawjut/, 8ΒΑΟΑ 'to become cool' < qbb /qa'ab/ (Worrell 1934: 17-23).

This phenomenon can be conveniently interpreted by assuming that in spite of the forward movement of their point of articulation which took place in later Egyptian (cf. § 22.5) from the palatal to the dental (d > /d/), from the velar to the palatal (g > /g/), and from the uvular to the velar region (q > /k/), these three phonemes of older Egyptian did in fact preserve their prevocalic ejective articulation down to Coptic (/y = [c] > /d = [t], /l = [kl] > /l = [c], /q = [k] > /k = [k]); hence the use of the Greek tenemis rather than of the Greek mediae to indicate them in the writing: τ for /d = [t], x for /l = [c], k for /k = [k]). On the contrary, etymological τ /t/, t /cl/ and k /kl/ were not ejective, maintained the aspiration under the phonetic contexts described above. Again, we can consider this aspiration graphically rendered only in Bohairic, but phonetically present in Coptic as a whole: 8ΣΤΑΠ vs. 8ΣΕΛΑ 'spittle' /tːθl/ = [t(h)af] < Eg. t * /θl/ = [t(h)if], 8ΣΤΟΠ vs. ΒΤΟΠ 'willow' /toːρα/ = [t(h)ora] < Eg. τζ * /cawt/ = [c(h)awt], 8ΤΑΝ vs. 8ΩΙ 'to take' /kːʔ/ = [c(h)iʔ] < Eg. ʔζj.ʔ /c(i)ʔ/; 8ΚΗΜΑ vs. 8ΧΙΜΑ 'Egypt' /kemːa/ = [k(h)emːa] < Eg. km embark /kumːat/ = [k(h)umːat]. This would point to a phonological, rather than phonetic status of the underlying opposition ‘voiceless: ejective’, an opposition graphically conveyed only by Bohairic and displayed by the presence of minimal pairs such as 8ΤΟΠ 'hand' < ḏt: 8ΤΟΠ 'willow' < trj or 8ΧΙΜΑ 'dish' < ḏt: 8ΗΜΑ 'quince', of uncertain etymology.

Therefore, as in the case of its Egyptian antecedents, the phonology Coptic dialects may actually exhibit a higher degree of complexity than

24. However, final /l/ is expressed by <έ> in Sahidic and <έ> in Bohairic in doubly closed syllables, cf. below.

25. Indirect evidence of the ejective character of voiceless stops in Bohairic is provided by the 13th century Arabic version of the ‘Apophthegmata Patrum’ in Coptic: cf. Sadtlinger 1971: 40-65; 1991. As a rule, <έ> and <έ> are used in this text to render Ar. ḏl and q, and <έ> and <έ> for Ar. ḏl and ql respectively (in final position Ar. ḏl is sometimes rendered by <έ>, and Ar. ḏl always by <έ>).

26. The reason for rendering aspirated stops in dialects other than Bohairic with the corresponding Greek tenemis would be that Greek aspiratae generally represent in Coptic the combination of the corresponding voiceless phoneme followed by the glottal fricative: φ = [pʰ/ (rather than ḏp)], Θ = [tʰ/ (rather than ḏt)], χ = [kʰ/ (rather than ḏk)].
betrayed by a superficial graphemic analysis. In our concrete sample, we probably have to posit for the entire Coptic domain (although graphemically mirrored only in Bohairic) the presence of three stops in the dental, prepalatal, and velar region: (a) a voiceless series, characterized by an optional aspiration; (b) a voiced series, limited to Greek borrowings (with a few exceptions due to sonorization in proximity to /h/, cf. above); (c) an ejective series, the heir of the old voiced stops, which never exhibit aspiration and therefore resist a total fusion with the corresponding voiceless phonemes. Graphemically, the voiceless series is conveyed by the Greek tenses and Coptic ξ (or by the aspiratae or θ in Bohairic in stressed pre-vocalic or pre-sonorant phonetic context), the voiced series—limited to the Greek component of the lexicon—by the Greek mediae, and the ejective series—limited to the Egyptian vocabulary—again by the Greek tenses, but this time without...
22.6.1. Vowels

Table 22-7 presents the vocalic system of Sahidic Coptic around 400 C.E.

<table>
<thead>
<tr>
<th>Unstressed</th>
<th>Short</th>
<th>Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;(e)&gt; /i/</td>
<td>(&lt;(e)&gt; /e/</td>
<td>(&lt;(e)&gt; /e/</td>
</tr>
<tr>
<td>Central</td>
<td>(&lt;(e)&gt; /o/</td>
<td>(&lt;(e)&gt; /o/</td>
</tr>
<tr>
<td>Back</td>
<td>(&lt;(e)&gt; /u/</td>
<td>(&lt;(e)&gt; /u/</td>
</tr>
</tbody>
</table>

As we saw above, /e/ = \(<\(e\)> in Sahidic, Akhmimic, and Lycopolitan, while /e/ in Bohairic, /o/ or /e/ in Fayyumic before sonorant phonemes (including b). For other possible signals of a preservation of the phoneme /e/ in final position cf. the discussion on the glottal stop in § 22.6.2.

When compared with the preceding phases in the history of Egyptian, the vocalic system of Coptic exhibits the continuation of the later Egyptian Lautverschiebung. Later Eg. stressed /a/ becomes /o/ in the two major dialects (Eg. sn /s/an ‘brother’ > SB \(<\(e\)> 'Coptic, \(<\(e\)> 'Coptic), following the pattern of the evolution /a/ > /o/ (Eg. rm /ra:mmac ‘man’ > /roma/ > /\(<\(e)\)> 'man’) which had already taken place around 1000 B.C.E. (cf. § 22.3). Moreover, Later Eg. stressed /e/,

rendered as \(<\(e\)> Fayyumic before etymological guttural fricative (SL \(<\(e\)> ‘ten thousand’ vs. \(<\(e)\)> ‘ambush’). 34

The outcome of /e/ is more complex: it develops as expected into \(<\(e)\> or even \(<\(e)\> in the minor dialects: \(<\(e)\>, \(<\(e)\>, \(<\(e)\>, \(<\(e)\>, \(<\(e)\>, \(<\(e)\> ‘physician’, \(<\(e)\> ‘god’. Moreover, the following phenomena take place: (a) All dialects exhibit an evolution /a/ > /o/ (\(<\(e)\> instead of /a/ > /o/), regularly after nasal consonants, and occasionally following other consonants as well: /nt/ /naa:\(e)\> /\(<\(e)\>/ ‘god’. Akhmimic also displays \(<\(e)\> in final position or if the vowel is followed by the glottal stop, i.e., by a reduplication of the vocalic grapheme: \(<\(e)\>

34. For other possible signals of a preservation of the phoneme /e/ in final position cf. the discussion on the glottal stop /\(<\(e)\> in § 22.6.2.
A pattern of tonic open syllable with short vowel ('CV') is apparently documented in words such as Μέ 'heaven' < p.t. *phit, τό 'land' < τά *tad, ξαλέ 'to tell' < σάδι 'sədί' or σάδιτ, or ένοιτ 'occupation' < ἤπωιτ *japwai, 'street' (Sem. loanword). However, I adopt here a more economic approach to Coptic phonology, which displays the supplementary advantage of establishing a continuity between earlier Egyptian and Coptic. It consists in analyzing this syllabic pattern as closed (CV) or doubly closed (CVCC), by positing the existence of a final glottal stop /ʔ/; thus Μέ = ίπέʔ, τό = τόʔ, ξαλέ = ξάλαʔ, and ένοιτ = ένοιπ 'to lay' parallel to the pattern ΤΑΝ = τάν or ΤΟΤΤΙ = τοτότι 'chosen'.

Two important elements in favor of this analysis are: (a) thegraphic rendering of this glottal phoneme as final /ʔ/ (in Akhmimic and Lycopolitan or /t/ in Bohairic and Fayyumic) in dialects other than Sahidic, and occasionally in Sahidic itself: cf. κέ, Μέ, σάλ, κέ, Μέ, Μό, Μέ, Μέ, Μύ, Μύ 'truth' = in all cases /mWʔ/; (b) the Akhmimic (and partially Lycopolitan) treatment of etymological /t/ as /t/ (or sometimes /t/ rather than /t/) and of etymological /t/ as /t/ rather than /t/ in final position and before reduplication of the vowel (Σάλτοτή, Μότη, Μάτη 'his hand' Σάλτοτη, Μάτη 'you (fem.)', κέ, Μέ, κέ, /kay(e)/, Αλκόυ 'to lay'; Θάλαμινι).
etymological level (coming from the lenition and eventual/e fall of an earlier consonant, cf. § 22.5).

That this final glottal stop is not expressed in the writing should hardly be surprising, since this is the regular fate of /w/ in Coptic in all initial and final positions, unless it represents the last phoneme of a doubly-closed syllable of the type we considered above (εωτες = /jopʔ/). Accordingly, a structure such as τοε 'part' < δαυτ 'danjut' (cf. Osing 1976: 440) should probably be analyzed as /toʔ/[
], the sequence of two glottal stops at the end of the doubly-closed syllable being the reason for the variety of writings of this word (τοε, τα(ε), το, to mention just the Sahidic forms).

Conversely, the apparent and utterly un-Egyptian presence of patterns long unstressed vowel (CV: _ as in ΟΥΤΑ ‘fruit’ or _CV: as in ΤΙΡΟΥ ‘all of them’) is easily removed from the phonological system of Coptic by interpreting <ΟΥ> in these cases as /w/: ΟΥΤΑ = /wtaβ/, pattern 'CCVC and ΤΙΡΟΥ = /te:raw/, stressed pattern 'CV: and posttonic pattern 'CVC#. In both cases, the hypothetical [u:] in *[u:taβ] or *[te:raβ] represents the realization of /w-/ and /-aw/ respectively in these specific phonetic contexts.

22.6.3. Text sample

Here is a short passage from the works of Shenute (4th century C.E.), one of the main figures of the Coptic church and one of the classical authors of Coptic literature, after Till 1970: 293-94. The Coptic text is followed by the conventional scholarly transliteration. Greek borrowings are transliterated and transcribed in italics.

'...The rest of the work of this book, i.e., the remaining (of the things) which we said and wrote in the second year after we built this house, at the time when the Barbarians plundered, until they reached the city called Qus, at the time when this huge crowd stayed with us.'

22.7. Further reading

The most accessible introduction to the study of Egyptian phonology is offered by Schenkel 1990, where the reader will find a history of the scholarly endeavors involving Egyptian phonological reconstruction, a description of the different methodological approaches, and a presentation of the contemporary state of the art, covering the Afroasiatic background, pre-Coptic phonology, and the fundamental rules of phonological development from older Egyptian to Coptic.

The most complete reference book for the study of vocalism throughout the history of Egyptian is Osing 1976, which systematizes the approach inaugurated by Fecht 1960. Two works by Schenkel were conceived on the footsteps of Osing's treatise, completing it and revising some of its assumptions: 1983a, 1983b. Of major significance for the study of Egyptian syllabic orthography and of the phonological correspondences between Egyptian and Semitic is the doctoral dissertation by J. E. Hoch (1991).

A radically different paradigm from the one followed by Fecht, Osing, and Schenkel has been pursued by scholars who assumed a much higher degree of correspondences between Egyptian and Semitic phonology and especially morphology; in this tradition cf. Vergote 1973-83 and Vyvichl 1990.


References


Chapter 23

Berber Phonology

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23.1. Berber languages

The Berber languages, spoken in North Africa by some 15 to 20 million people, are a branch of the Afro-Asiatic phylum.

The largest population of Berberophones can be found in Morocco. Approximately 45% of the total Moroccan population (26 million) speaks a Berber language as a mother tongue. People of the High Atlas and the Anti-Atlas mountains and the Sous valley speak Tashelhit (tasliit), also called Sous Berber (tasusit). This language is spoken by some 7 million. It is, together with Kabyle in Algeria, the most important Berber language in terms of number of speakers. Tashelhit Berber has some dialect variation, but not so strong as the Berber language spoken in the Middle Atlas mountains. This language, often called Tamazight (tamasit), is spoken by some 3 million people in various dialects. Strong dialect variation can also be found in the Moroccan Rif mountains. The Riffian language (tariqit) has some 2 million speakers.

In Algeria, 25% of the total population (about 26 million) speaks a Berber language. In a densely populated area in the north of Algeria, Kabyle Berber (targayaq) is spoken by approximately 7 million. In Algeria, Berber is also spoken in the Aurès mountains, the Mzab region, the Ouargla oasis, and by the sedentary population of the Sud Oranais area. Touareg, a Berber language spoken by a million, is found not only in the Algerian Sahara but also in neighboring areas of the Sahel republics of Mali and Niger. The Tamahaq (tamaahaq) dialect is spoken in the Ahaggar region in southern Algeria. The Tamajeq (tamaajeq) dialect is spoken in the Ayr region of Niger. The Tamaksh dialect (tamaqsh) is spoken in the Adrar des Ifoghas region in Mali. The Tawlemmer dialect (tawlammem) is spoken by the Wlemmmeden Touaregs on the Mali–Niger borderland.

In Tunisia, Berber is spoken by the population of fewer than six villages on the Tunisian mainland. On the island of Djerba one finds some five...