

ANCIENT
EGYPTIAN
PHONOLOGY

The background of the cover is a reproduction of an ancient Egyptian wall painting. It depicts a figure, likely a deity or a person of high status, with a light-colored head and a green tunic. The figure is shown in profile, facing right, with arms raised and holding a large cross-shaped staff. The figure is seated on a decorated throne with a red and white striped band and a fringe of dark, teardrop-shaped pendants. The entire scene is framed by a dark border, and the background is a light, textured surface. Hieroglyphs are visible in the top, bottom, and side margins of the image.

JAMES ALLEN

ANCIENT EGYPTIAN PHONOLOGY

In *Ancient Egyptian Phonology*, James P. Allen studies the sounds of the language spoken by the ancient Egyptians. Using the internal evidence of the language, he proceeds from individual vowels and consonants to the sound of actual ancient Egyptian texts. Allen also explores variants, alternants, and the development of sound in texts, and touches on external evidence from Afroasiatic cognate languages. The most up-to-date work on this topic, *Ancient Egyptian Phonology* is an essential resource for Egyptologists and will also be of interest to scholars and linguists of African and Semitic languages.

James P. Allen is the Charles Edwin Wilbour Professor of Egyptology at Brown University. A scholar of ancient Egyptian language and thought, he is the author of *Middle Egyptian: An Introduction to the Language and Culture of Hieroglyphs* and *The Ancient Egyptian Language: An Historical Study*. Since 2010 he has been one of the leading scholars in a complete re-evaluation of the grammar as well as the phonology of the language.

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JAMES P. ALLEN



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PREFACE

The study of the ancient Egyptian language is comparable in some ways to paleontology. Except for Coptic, the remnants of the language survive in skeletal form, like the bones of dinosaurs, and our attempts to understand the living language is like the efforts of paleontologists to understand dinosaurs by rearticulating their skeletons and studying whatever clues are left of their behavior.

The first paleontologists, in the nineteenth century, were not always certain how the bones went together. They also thought that dinosaurs belonged to the lizard family, and that belief endured into the twentieth century, governing the understanding and analysis of the creatures. It turns out to be true, but not for all dinosaurs. A significant group of them – theropods, including the *Tyrannosaurus rex* – were ornithoids, the ancestors of birds.

In Egyptology, the analogy to 19th-century paleontology is the analysis of ancient Egyptian as a Semitic language. The first Egyptologists were trained in Semitic languages and naturally understood the newly deciphered addition to the Afro-Asiatic family from that perspective. Phonology, as well as grammar, is

the heir to that tradition: for example, the transcription of  as *i*—“sometimes /j/ and sometimes /ʔ/”—and of  as *ʔ*—“strong /ʔ/.”¹ The Semitic viewpoint persists, and not just as tradition: the most influential study of Egyptian phonology in the past half-century has been the 1971 article of a Semitist, Otto Rössler, “Das Ägyptische als semitische Sprache.”

To be fair, the early Egyptologists had few clues as to the nature of the language. It was only natural for Semitists to see traces of Asiatic languages in its features, just as those trained in African languages have sometimes recognized non-Semitic traits. Unfortunately, experts in Afroasiatic linguistics have often made questionable analyses because their knowledge of Egyptian has been based on dictionaries and studies rather than the first-hand knowledge that would allow them to make informed judgments, and the same is true for Egyptologists looking for cognates, whose knowledge of Afroasiatic linguistics is generally superficial at best.

In our passion to articulate and reconstruct the hieroglyphic skeleton, we have forgotten that correspondence is not the same as identity. The fact that Arabic speakers heard ancient Greek Πτολεμαῖος as بطليموس *baṭlaimūs* does not reveal that Greek τ was an “emphatic” consonant like Arabic ط *t*. To assess the true value of τ, we have to look at its place within the ancient Greek phonological system. The same is

1 Slant marks (/x/) enclose phonemes.

true for ancient Egyptian phonology. Although ancient Egyptian *dwn* “stretch” is cognate with Arabic طول *ṭūl* “length,” for example, that is not necessarily justification for interpreting Egyptian *d* as an “emphatic” dental or Egyptian *n* as [l], any more than the cognate relationship of Spanish *jungla* with English *jungle* means that the two *j*’s necessarily represent the same sort of consonant.

In assessing the features of ancient Egyptian phonology, primary weight must be given to internal evidence: the variants, alternants, and developments of a sound within the language itself, insofar as they can be traced, before external evidence is brought to bear. The present study is an attempt to do just that. With respect to the external evidence of Afroasiatic cognates, I claim no specific expertise, and I fully realize that some of my conclusions may be called into question by those with more knowledge and experience in Afroasiatic linguistics than I. With respect to Egyptian, however, I am fully convinced of the validity of both the method and the conclusions adopted in this book. Some of the latter are different from what I advocated in my 2013 study, *The Ancient Egyptian Language: An Historical Study*. That is as it should be. Scholarship, like science, needs to be open to new ideas and new conclusions.

The overriding principle in this study is that the Egyptian evidence must be looked at for itself, and not as a simulacrum of other languages. We cannot appreciate Egyptian art if we

view it as a primitive version of Renaissance painting, or Egyptian grammar if we look for equivalents of the tenses and moods of Western languages. In our efforts to see the reality behind the skeleton of the hieroglyphic writing system, we must realize that its skin might turn out to be not the scales of lizards, but the feathers of birds.

This book is partly the result of a graduate seminar on the topic that I led at Brown in the Spring semester of 2018. I am grateful to its students, Vicky Almansa, Julia Puglisi (Harvard), and Silvia Štubňová, for their insights, which helped me refine some of my own. I am especially grateful to Christian Casey for reading parts of this book and debating most of it with me, and to Andréas Stauder, for reviewing and amending my original manuscript. The present version is the better for their input.

I offer this study as one hopeful step in advancing the understanding of both Egyptian itself and its true place within the larger Afroasiatic family of languages.

PART I

PHONEMES AND
PHONES

1. COPTIC

Any study of ancient Egyptian phonology must be based on Coptic, because that is phonologically the most transparent stage of the language. Coptic is written in an alphabet derived from the Greek, with additional signs from Demotic primarily for sounds not present or not represented in Greek. It appears fully formed in the third century AD but has written antecedents at least six centuries earlier.¹ Coptic had six major dialects: Akhmimic (A), Bohairic (B), Fayumic (F), Lycopolitan (L, formerly Subakhmimic A₂, also known as Lyco-Diospolitan), Oxyrhynchite (or Mesokemic, M), and Saidic (S). These vary from one another grammatically in some respects, but mainly phonologically.

GRAPHEMES

The graphemes found in texts from the six major Coptic dialects are the following, in the order of the Greek alphabet:

¹ Most recently, Quack 2017. The antecedents are often termed “Old Coptic” (OC).

COPTIC	VAR/ALT	GREEK	COPTIC	VAR/ALT	GREEK
Ⲁ	Ⲉ	Α	Ⲣ	ⲭ	Ρ
Ⲫ	ⲐϚ, ϣ, ⲡ	Β	Ⲅ	Ⲍ, Ϟ	Σ
Ⲧ	Ⲕ	Γ	Ⲥ	ⲛ, †, ϙ	Τ
Ⲉ	Ⲥ	Δ	Ϛ	Ⲉ, Ⲑ, ⲛ	Υ
Ⲉ	ⲭ, –	Ε	ϥ	ⲡϚ; ⲡ; ⲡ (B)	Φ
Ⲍ	Ⲅ	Ζ	Ⲉ	ⲔϚ; Ⲕ; Ⲕ (B)	Χ
ⲛ	Ⲑ, Ⲉ, Ϛ, ⲭ	Η	ϥ	ⲡⲄ	Ψ
ϙ	ⲤϚ; Ⲥ; Ⲥ (B)	Θ	Ⲑ	Ⲑ	Ω
Ⲑ	Ⲉ	Ⲑ	ϥ	Ⲅ	
Ⲕ	Ⲧ, ϥ, Ⲉ	Κ	ϣ	Ⲫ, ⲐϚ	
ⲭ	Ⲣ	Λ	Ⲍ	Ⲍ, ϥ	
ⲡ	ⲡ	Μ	Ⲍ (A)	Ⲍ, ϥ	
ⲡ	ⲡ	Ν	ϥ (B)	Ⲍ, ϥ	
Ⲍ	ⲔⲄ	Ξ	Ⲉ	Ⲥϥ, ϥ	
Ⲑ	ⲐϚ	Ο	ϥ	Ⲉ; Ⲉ (B)	
ⲡ	Ⲫ, ϥ	Π	†	ⲤⲐ	

The graphemes **Γ**, **Δ**, and **Ζ** are used mainly in Greek loan-words, but **Γ** and **Ζ** also occur as variants of **κ** and **ϙ**, respectively: e.g., **ⲁⲛⲕ**/**ⲁⲛⲦ** “I,” **ⲁⲛⲌⲛⲪⲈ**/**ⲁⲛⲄⲪⲈ** “school-room.” The graphemes **Ⲍ**, **ϥ**, and **†** are monograms in all dialects, for **ⲔⲄ**, **ⲡⲄ**, and **ⲤⲐ**, respectively.

The graphemes **ϙ**, **ϥ**, and **Ⲉ** are monographic for **ⲤϚ**, **ⲡϚ**, and **ⲔϚ**, respectively, in all dialects except Bohairic, where they replace **Ⲥ**, **ⲡ**, and **Ⲕ**, respectively, in certain words and phonetic environments: for example, B **ϥⲛⲐⲐⲐ** vs. AM **ⲡⲛⲐⲐⲐ**, F **ⲡⲛⲐⲐⲐ**,

LS **ⲡⲏⲭⲉ** “heaven.” Bohairic also has a similar alternation between its **ⲥ** and the **ⲭ** of other dialects: e.g., B **ⲥⲏⲟⲩ** vs. AFLS **ⲭⲏⲟⲩ** “ask.”

The graphemes **ⲉ** and **ⲛ** exist in Akhmimic and Bohairic, respectively; they are replaced by **ⲉ** or **ⲟ** in other dialects: e.g., A **ⲉⲉ**, B **ⲛⲉ**, F **ⲉ**, LMS **ⲉⲉ** “manner” and A **ⲉⲟⲡⲉ**, BF **ⲟⲟⲡⲓ**, LS **ⲟⲟⲡⲉ**, M **ⲟⲟⲡⲉ** “become.”

In some dialects, the grapheme **ⲓ** is also spelled **ⲉⲓ**, as well as **ⲓ** before or after a vowel: e.g., AL **ⲓⲛⲉ**, BF **ⲓⲛⲓ**, AMS **ⲉⲓⲛⲉ** “bring”; AFM **ⲡⲉⲓ**, B **ⲡⲉⲓ**, L **ⲡⲉⲉⲓ**, S **ⲡⲉⲓ** “this.” The grapheme **ⲩ** is used primarily in **ⲟⲩ**, representing [u] and [w], and after vowels: **ⲁⲩ**/**ⲁⲟⲩ**, **ⲉⲩ**/**ⲉⲟⲩ**, **ⲏⲩ**/**ⲏⲟⲩ**, **ⲟⲟⲩ**, and **ⲟⲩ**/**ⲟⲟⲩ**; it occurs by itself either in Greek loan words or as a variant of **ⲉ**, **ⲏ**, or **ⲓ**: e.g., F **ⲧⲉⲃⲛⲏ** ~ **ⲧⲩⲃⲛⲏ** “animal.”

A graphemic feature of most Coptic dialects is a supraliteral stroke (e.g., **ⲡ̄**) or, in Bohairic, a dot or acute accent (e.g., **ⲡ̇**/**ⲡ̈**). Both are used in some manuscripts to mark a grapheme that represents a syllabic consonant or a separate syllable: for example, B **ⲛ̇ⲟⲟⲕ**, S **ⲛ̈ⲟⲟⲕ** “you.” In some cases, the supraliteral mark varies with **ⲉ** both within and across dialects: e.g., A **ⲉ̄ⲛ**, B **ⲛ̇ⲉⲛ**, F **ⲉ̄ⲛ**, FLMS **ⲉ̄ⲛ** “in.”

PHONES

The phonetic value of Coptic graphemes can be deduced from both the Greek graphemes on which they are based and from language-internal instances of alternation and variation.

For the former, it is clear that Coptic graphemes do not always represent the values they had for Greek speakers in the era when Coptic is first attested, but rather those of the Greek language some six centuries earlier.⁴ The phonetic value of some Greek graphemes changed between the Classical age (fifth and fourth centuries BC) and the Koine period (third century BC to third century AD), and the Coptic values are for the most part those of the older language.⁵

GREEK GRAPHEME	CLASSICAL VALUE	KOINE VALUE	COPTIC GRAPHEME	COPTIC VALUE
Γ	[g]	[ɣ]	Ⲁ	[k]
Δ	[d]	[ð]	Ⲃ	[t]
Η	[ɛ:]	[ɪ, i]	Ⲅ	[ɛ, e]
Θ	[t ^h]	[θ]	Ⲇ	[t ^h], [t ^h]
Φ	[p ^h]	[φ, f]	Ⲉ	[p ^h], [p ^h]
Χ	[k ^h]	[x]	Ⲋ	[k ^h], [k ^h]

These correspondences agree with the earliest evidence for Egyptian words and texts written in the Greek alphabet during the Ptolemaic Period, and they argue for the preservation of that scribal tradition even as the pronunciation of Greek itself evolved.

⁴ Satzinger 2003.

⁵ Allen 1987, 12–32, 62–79; Horrocks 2010, 117–20. This study uses the symbols of the International Phonetic Alphabet, between square brackets, to indicate pronunciation, with the exception that post-syllabic ' is used to mark stress: e.g., ⲙⲓⲧⲟⲛ [m-tɔn'].

Greek words that appear in Coptic texts, however, generally reflect contemporary Koine phonology, clearly indicating that the Greek characters used for Coptic sounds in the third century did not derive from contemporary Greek: for example,

GREEK	CLASSICAL VALUE	KOINE GREEK VALUE	GREEK EXAMPLE	COPTIC RENDERING		
AI	[ai]	[ɛ]	δικαιος	ΔΙΚΕΟC	[ti'-ke-ɔs]	"just"
B	[b]	[β, v]	βλάπτειν	ΦΛΑΠΤΕΙ	[flap'-ti]	"hinder"
H	[ɛ:]	[ɪ, i]	ἐπιστήμη	ΕΠΙCΤΗΜΕΙ	[ɛ-pis-ti'-mi]	"prudence"
OI	[ɔi]	[ɪ, i]	έτοιμος	ΖΕΤΕΙΜΟC	[he-ti'-mɔs]	"ready"
Y	[y]	[ɪ, i]	πύλη	ΠΙΛΙ	[pi'-li]	"gate"
X	[k ^h]	[x]	χαρακτήρ	ΧΑΡΑΚΤΗΡ	[xa-rak-ter']	"mark"

Of vowels, **ε** is the most common, as well as the most common Coptic grapheme. Its correspondence with Koine [ɛ], as in **ΔΙΚΕΟC** for *δικαιος*, indicates that it had a similar value in Coptic. Its use as a variant of the signs for a syllabic consonant, however, point to a realization closer to [ə]: e.g., **Μ̄ΤΟΝ** ~ **ΕΜΤΟΝ** "rest" [m-tɔn'] ~ [əm-tɔn']. Its value may therefore have encompassed, and lain between, mid-central [ɛ] and [ə], with realization probably conditioned by both dialect and phonological environment. **ε** also occurs as a variant of **α**, both within and across dialects – for example, **S** **ΧΑCΤQ**, **M** **ΧΕCΤQ** "exalt him" (Matt. 23:12). This suggests a phonetic value for **α** close to that of **ε**, probably back central [a] ~ [æ]. Coptic **η** was likely pronounced [ɪ/i] in Greek loanwords, and this may account for its occasional variance with **ι** in Coptic

words – e.g., S **NHBE** ~ **NIBE** “swim” – but it also varies with **Ε** and **Λ** – e.g., S **PAT** ~ **PET** ~ **PHT** “foot” – and was therefore most likely close in value to those vowels in native words, probably ranging between [ɛ] and [e]. The other vowels correspond to their Greek counterparts in loanwords and presumably had similar phonetic realizations: **Ι** [i/i], **Ο** [ɔ], **ΟΥ** [u], and **Ω** [o].

The consonants represented by Greek letters correspond pretty much to their pre-Hellenic ancestors. **Γ**, **Δ**, and **Ζ** were probably pronounced like **κ**, **τ**, and **ç**, respectively, judging from their variance with those graphemes in Coptic words. **Β** alternates with **Π** and varies with **ϸ** and **ΟΥ**: A **ΟΥΛΛΒΕ**, B **ΟΥΛΒ**, FLS **ΟΥΛΛΒ**, M **ΟΥΕΒ** “pure” and A **ΟΥΛΠ**, S **ΟΥΟΠ** “become pure”; S **ΩΒΤ** ~ **ΩϸΤ** “goose”; B **ΟΥΙϸΙ** ~ **ΒΙϸΙ**, S **ΟΥΕΙϸΕ** ~ **ΒΙϸΕ** “saw.” The alternation suggests a phonetic realization not only as a stop ([b] → [p]) but also as a bilabial fricative [β], which explains its variance with **ΟΥ**. Variation with **ϸ** suggests that the latter may also have been bilabial, distinguished from **Β** by voicing. Thus, **Β** → [b]/[p]/[β] and **ϸ** → [φ].

The values of the other graphemes derived from Demotic can also be deduced from variances and correspondents: **ϣ** [ʃ] (Arabic أشمون *ašmūn* from **ϣΜΟΥΝ** “Hermopolis”), **Ϩ** [h] (**ϨΕΒΡΩΝ** for **ḥbrōn** *hebrōn* “Hebron”), **Ϡ** [tʰ] (F **ΧΟΥΙΑ**, B **ΤΨΟΥΙΕ** “dry” – [tʰ] ~ [tʃ]), **Ϻ** [kʰ] (S **ΦΑΔΑΡΕΝ** from Greek φακίᾱριον “turban”⁶ – [kia] → [kʰa]).

6 Girgis 1967–1968, 58.

In most dialects, **ϕ** **θ** **χ** are monograms for **π****ζ** **τ****ζ** **κ****ζ**, respectively; AFLS **π****ζ****ω****β** and M **π****ζ****ο****β** “the (**π**) thing (**ζ****ω****β**/**ζ****ο****β**),” for example, can also be spelled **ϕ****ω****β**/**ϕ****ο****β**. In Bohairic, however, they represent, like their Greek ancestors, the aspirated counterparts of **π** **τ** **κ**, respectively. Aspiration occurs before a stressed vowel and before a sonant (**β** **λ** **μ** **ν** **ρ**) or **ο****γ** and **ι**/**ει** preceding a stressed vowel:⁷ e.g., **ϕ****αι** [p^hai] “this one” vs. **π****αι****ρ****ω****μι** [pai-ro'-mi] “this man,” **χ****β****ω****ψ** [k^hβoj] “you loosen” vs. **κ****σ****ω****ψ** [ksoφ] “you defile.” Similarly, in Bohairic **σ** is [t^hj], the aspirated counterpart of **ς** [t']: e.g., B **σ****ι****κ****ι** “exalt” (ALMS **ς****ι****κ****ε**, F **ς****ι****κ****ι**). Its phonetic value in that dialect can also be gauged from variants such as **μ****ο****ρ****σ****ν****α****γ****ζ** ~ **μ****ο****ρ****ψ****ν****α****ζ** [mɔr'-t^hjnawħ] ~ [mɔr'-šnaħ] “scapular” ([t^hj] lenited to [ʃ]) and **σ****ω****ν****τ** ~ **ς****ω****ν****τ** [t^hjɔ'-nt] ~ [t'ɔ'-nt] “try” ([t^hj] deaspirated to [tʲ]).

The alternation of **ϕ** ↔ **π** is environmentally conditioned and therefore reflects a single phoneme, but the other alternants are phonemic: B **θ****ω****ρ****ι** “willow” vs. **τ****ω****ρ****ι** “handle,” **χ****ρ****ω****μ** “fire” vs. **κ****ρ****ω****μ** “safflower,” **σ****ο** “plant” vs. **ς****ο** “hunchback.” The phonemic status of the aspirates is reflected in their preservation where environmental aspiration is not required: e.g., **σ****ι****κ****ι** [t^hjɪ'-si] “exalt” and **σ****ε****ς****φ****ν****ο****γ****†** [t^hjɛs-p^hnu'-ti] “exalt God.”

7 Shisha-Halevy 1991, 54. In turn, therefore, aspiration was perhaps neutralized in other environments, similar to [t^h] ~ [t] in American English: e.g., *bat* [hæt^h] vs. *batter* [hæt'-ɪ].

Aspiration is not visible in the other dialects: for example, B **ΘΩΡΙ** vs. S **ΤΩΡΕ** “willow,” B **ΧΡΩΜ** vs. F **κλωμ** and S **κρωμ**, B **ΘΙCΙ** vs. ALMS **ΧΙCΕ** and F **ΧΙCΙ**. Whether this reflects an absence of aspirates in these dialects or merely a graphemic neutrality (i.e., AFLMS **τ** representing both [t] and [tʰ]) is not self-evident. The fact that these dialects use graphemes derived from the unaspirated graphemes of (Classical) Greek (κ, π, and τ) might suggest the former. Arabic renderings of Coptic words, however, sometimes show a correspondence between [t] and *t*, on the one hand, and [tʰ] and *tʰ*, on the other: e.g., A **ΤΩΒΕ**, B **ΤΩΒΙ**, S **ΤΩΒΕ**/**ΤΩΒΕ** “brick” ≙ Arabic طوبة *tūba*; B **ΘΑϞ**, S **ΤΑϞ** “spit” ≙ تف *taff*.⁸ This may or may not reflect the influence of Bohairic,⁹ but it is also visible in place-names from non-Bohairic areas: e.g., S **CΙΟΟΥΤ** “Asyut” ≙ أسيوط *asyūt*.¹⁰

PHONOTACTICS

Coptic words have a single nodal stress around which everything else is reduced as much as is possible phonetically: e.g., S **ΖΟΕΙΝΕ** [hɔi'-ne] “some” + **ΡΩΜΕ** [ro'-me] “man” + **†ΜΕ** [ti'-me] “village” → **ΖΕΝΡΗ†ΜΕ** [hɛn-rm-ti'-me] “villagers.” In

8 Bishai 1964, 46.

9 The prevalence of Bohairic in the north at the time of the Arab conquest has also been called into question: Kahle 1954, 249–52.

10 B **CΙΟΟΥΤ**. The association of Arabic *t* with unaspirated [t] is also visible in Greek Πτολεμαῖος “Ptolemy” ≙ Arabic بطليموس *batlaimūs*. Cf. also Bishai 1964, 41: “The velarization of **τ** is normal owing to its unaspirated nature.”

native words, the vowels **o**, **ω**, and usually **h** carry primary stress; the other vowels can be stressed or not: e.g., SB **anao** [a-naʃ'] "oath," SBF **ene2** [ε-neħ'] "eternity," BF **ini** [i'-ni] "bring," ABFLMS **oynoʃ** [u-nu'] "hour."

A basic distinction in Coptic words is between stressed syllables that end in a vowel (open) and those that end in a consonant (closed). These have an effect on vowel quality for the following pairs:

CLOSED	OPEN	EXAMPLES
a/o	ω	AFL can , BS con "brother" vs. ALS cōne , BF cōni "sister": [san/sɔn] vs. [so'-ne/so'-ni]
ε/a	h	AFLM ʒpek , BS ʒpak "your (ms) face" vs. ABFLMS ʒpht̄n "your (pl) face": [hrek/hrak] vs. [hre'-t̄n]
ε/a	i	AFLM xectoʃ , S xactoy "exalt them" vs. ALMS xice , F xici "exalt": [t̄es'-tu/t̄as'-tu] vs. [t̄i'-se/t̄i'-si]

These alternants have traditionally been described as "short" (**a ε o**) and "long" (**h i ω**) vowels.¹¹ In Oxyrhynchite, however, the first alternation usually does not occur, while the second and third do: M **con** "brother" vs. M **cōne** "sister." This indicates a difference in vowel quality rather than length: probably lax (−T) **a ε o** versus tense (+T) **h i ω**. The

11 The classic study is Edgerton 1947 (published before the description of Oxyrhynchite).

vowel **oy** [u] does not exhibit syllabic alternation, and therefore does not seem to exhibit $\pm T$ as a feature. It does, however, appear as an open alternant of **ε/λ** after **h** and **n**: for example, ABLS **naʒmn**, FM **neʒmn** [naħ'-mn], [neħ'-mn] “save us” vs. F **noyʒem**, LMS **noyʒm** [nu'-ħem], [nu'-ħm] “save.” Since **ω** does not normally occur after **h** and **n**, this alternation indicates a general change of **ω** → **oy** in that environment: i.e., **mω/nω** → **moʒ/noʒ**.

On the basis of these alternants, Coptic can be described as having a general rule whereby an open syllable produces tenseness in a stressed vowel, and in a closed syllable, laxness (with the exception of **o** in Oxyrhynchite): thus, $\alpha \text{OPEN} \rightarrow \alpha T$.¹² The primary exception to this rule is the pattern **1ω2/1oy2** of some verbs: e.g., BFS **oywn** “open” (M **oyon**) and ABFLMS **moyn** “remain.” Because of its restricted environment, this feature has been judged a secondary vocalization of an original pattern represented by AL **oyen** “open.”¹³ In some cases, however, exceptions are only apparent: e.g., BLMS **ʋwt**, a variant of FLS **ʋʋwt** “cut,” and B **kel** “doorbolt,” probably reflecting [kel'-i], as indicated by S **klle** [kl'-lə].

Since both **h** and **l** have **λ** and **ε** as lax alternants, the alternation appears to affect relaxation of the tense vowels in closed

12 The symbol α indicates a correspondence between + and -: i.e., $+\text{OPEN} \rightarrow +T$ and $-\text{OPEN} \rightarrow -T$.

13 Steindorff 1951, § 245.

syllables rather than tensing of the lax vowels in open ones. The generation of **ⲁ** or **Ⲅ** as a lax alternant of **ⲕ** and **ⲓ** is determined mostly by dialect: both tense vowels generally become **ⲁ** in BS and **Ⲅ** in AFLM. Phonetically, therefore, BS **ⲁ** may have been **Ⲅ**-like, possibly low front [æ], and AFLM **Ⲅ** may have been **ⲁ**-like, possibly mid front [ɛ]. In turn, BS **Ⲅ** could therefore represent mid central [ə] rather than [ɛ]. The generation of **ⲁ** or **ⲟ** as a lax alternant of **ⲱ** is similarly determined largely by the same dialectal distinction: generally **ⲁ** in AFLM and **ⲟ** in BS.

Exceptions to this distribution are environmentally conditioned. In a closed syllable before **ⲱ**, **ⲓ**, and **ⲕ**, **ⲱ** becomes BS **ⲁ** and FM **Ⲅ** rather than BS **ⲟ** and FM **ⲁ**: for example, F **ⲱⲱⲱⲧ**, S **Ⲙⲱⲱⲧ** /šo'-št/, /so'-št/ "stop" → F **ⲱⲄⲱⲧⲥ**, S **Ⲙⲁⲱⲧⲥ** /šəš'-tf/, /saš'-tf/ "stop him," M **ⲛⲟⲩⲓⲙ** /nu'-hm/ "save" → **ⲛⲄⲓⲙⲛ** /nɛh'-mn/ "save us," B **ⲱⲱⲕⲧ**, S **ⲱⲱⲓⲧ** /p^ho'-xt/, /po'-ht/ "bend" → B **ⲱⲁⲕⲧⲥ**, S **ⲱⲁⲓⲧⲥ** /pax'-ts/, /pah'-ts/ "bend it." Stressed /i/ followed by a sonant (**ⲕ ⲁ ⲙ ⲛ ⲣ**) in a closed syllable becomes B **Ⲅ** and F **ⲕ** rather than B **ⲁ** and F **Ⲅ** and disappears in the other dialects, producing a syllabic consonant: B **ⲕⲓⲙⲓ**, F **ⲕⲓⲛⲓ**, ALMS **ⲕⲓⲛⲄ** /ti'-mi/, /ki'-ni/, /ki'-nɛ/ "find" → B **ⲕⲄⲙⲧⲱⲩ**, F **ⲕⲄⲛⲧⲱⲩ**, ALMS **ⲕⲄⲛⲧⲱⲩ** /tɛm'-tu/, /kɛn'-tu/, /kn'-tu/ "find them." Before **ⲓ/Ⲅ** and **ⲟⲩ**, /o/ regularly becomes **ⲱ** rather than **ⲟ** in Bohairic and /e/ before **ⲓ/Ⲅ** becomes **ⲕ** rather than **Ⲅ** in Bohairic and Fayumic: e.g., B **ⲱⲱⲓⲧ** /moit/ vs. ALM **ⲱⲁⲓⲧ**, F **ⲱⲁⲓⲧ**, S **ⲱⲱⲄⲓⲧ** /maɪt/, /mɔɪt/