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**THE SECOND COLUMN (SECUNDA) OF ORIGEN'S HEXAPLA
IN LIGHT OF GREEK PRONUNCIATION**

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**THE SECOND COLUMN (SECUNDA) OF ORIGEN'S HEXAPLA
IN LIGHT OF GREEK PRONUNCIATION**

BY

BENJAMIN PAUL KANTOR

DISSERTATION

PRESENTED TO THE FACULTY OF THE GRADUATE SCHOOL OF
THE UNIVERSITY OF TEXAS AT AUSTIN
IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS
FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT AUSTIN

DECEMBER 2017

ACKNOWLEDGEMENTS

First of all, I would like to thank my advisor John Huehnergard. Much of who I am academically has been shaped by the many hours of time Prof. Huehnergard has invested in me, whether that be through teaching me various Semitic languages, meeting with me to discuss the many issues of historical Hebrew linguistics, or the continuous help he has been to me on this dissertation. He has been a model of both scholarly excellence and humility and I truly regard it as a privilege to have been one of his final students.

I would also like to thank Jo Ann Hackett and Na'ama Pat-El, who, in addition to their helpful comments on this dissertation, have also invested countless hours in my education. Prof. Hackett has always encouraged me to think thoroughly through issues I am researching. I have been challenged by the high bar she sets for biblical scholarship and I have fond memories of discussions she led on points of Hebrew grammar in the "Turbo Hebrew" seminar at UT. I have learned a great deal from Prof. Pat-El with respect to syntax in the Semitic languages, but I think what I will remember most that she imparted to me is a sense for careful linguistic argumentation. I also owe much gratitude to Jonathan Kaplan, who has served as an exemplary model of biblical scholarship and has been a help in many other practical ways as well. Throughout all my years at UT, these four professors have been a constant support. They have all demonstrated care for me both academically and personally and it has been a pleasure to know them. Finally, I would like to thank Geoffrey Khan, my external reader, who generously agreed to be on my committee and has provided me with helpful comments and discussion on various points of my work. He has had a great influence on my approach to the *Secunda* as a Hebrew reading tradition and I am indebted to him both for his excellent scholarship and for his specific help with the dissertation.

I also owe a special thanks to the Biblioteca Ambrosiana in Milan, Italy and its director Federico Gallo for their generosity in allowing me to come and examine the Hexapla palimpsest in September of 2016. I would also like to thank Stefano Serventi, Trifone Cellamaro, and Ferdinando Righetto for their warm welcome, utmost kindness, and readiness to help daily as I examined the manuscript in the reading room. The generosity of everyone at the Biblioteca to give me such an opportunity has contributed greatly to my dissertation

research. Finally, I thank Todd Hanneken and his team for the outstanding work they have done spectral imaging the palimpsest and giving me access to and discussing the results.

I am also grateful to the UT Austin professors in Arabic and Modern Hebrew, with whom I have studied and worked. I would especially like to thank Kristen Brustad, who introduced me to the world of the Arabic dialects, sociolinguistics, and language ideology. The lessons I have learned from her regarding how to think about and analyze language have been a perennial help. Likewise, I thank the Middle Eastern Studies department as a whole for giving me the opportunity to be involved in building and teaching an intensive Biblical Hebrew course for three years, which served to deeply increase my knowledge of Hebrew. Discussing linguistic and other matters with my fellow students in the Hebrew Bible program, for whom I am grateful, has also been a favorite and much appreciated pastime of mine. I especially thank Philip Zhakevich, a great friend and predecessor in the program, who has continued to be an encouragement and help in many ways. David Justh, the graduate program coordinator for most of my time at UT, was a continuous help in all matters relating to the university. I also owe a great deal of thanks to my professors at the Hebrew University of Jerusalem, especially in the Classics Department. They invested many hours to train me in Greek and Latin and gave me a top-notch education. Finally, I would like to thank Randall Buth (and all those) from the Biblical Language Center, from whom I have learned so much and with whom it has been a joy to work, teaching Hebrew or Greek together in various and diverse parts of the world.

I would like to thank my community in Austin and my family near and far. From my very first weeks in Austin, my church has been a continuous source of support and help in any possible difficulty I have faced. Most of all, I thank my family. I thank my parents, David and Sharon, for all the care and support they have given me throughout my life and especially for supporting my moving to Israel just weeks before my eighteenth birthday for studies. I thank my brother Jeremy and my sister Andrea for their support. Finally, I would like to thank my wife Olivia, who has been a loving, supportive, and helpful wife through many long days of dissertation writing all while expecting our first child. Moreover, no matter how long I worked, unlike the wife of the seventeenth-century Chrysostom scholar Henry Savile, she never threatened to burn my manuscripts (see note 332).

THE SECOND COLUMN (SECUNDA) OF ORIGEN'S HEXAPLA IN LIGHT OF GREEK PRONUNCIATION

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THE UNIVERSITY OF TEXAS AT AUSTIN, 2017

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This dissertation addresses the phonology and orthography of the second column (Secunda) of Origen's (185–254 CE) Hexapla, which constitutes a Greek transcription of Biblical Hebrew. The transcription text is analyzed in light of its Hellenistic/Roman Near Eastern background, the phonology and orthography of Roman Palestinian Koine Greek, and roughly contemporary Greek transcription conventions for other languages.

Aside from the brief introduction (chapter 1) and conclusion (chapter 7), this dissertation is comprised of five substantial chapters. Chapters 2 and 3 address the historical and social background of the text of the Secunda. In chapter 2, I argue that Origen did not have enough Hebrew knowledge to compose the text himself. In chapter 3, on the basis of comparative evidence from the Hellenistic, Roman, and Byzantine Near East, I argue that the Secunda originated among the Jewish scholarly community of Caesarea as a didactic aid in the second or third century CE. Chapters 4 and 5 address the linguistic background of the text of the Secunda. Chapter 4, based on a thorough analysis of the epigraphic evidence from ancient Palestine, provides a reconstruction of contemporary Greek pronunciation. Chapter 5, based on a linguistic analysis of comparative transcription material, surveys typical Greek transcription conventions from roughly the same period. Chapter 6 applies the data from the previous sections to the Hebrew vocalization tradition reflected in the text of the Secunda, addressing the phonemic and phonetic value of the consonants, vowels, and *shewa* as well as the syllable structure. Methodologically, the phonology and orthography of Secunda Hebrew are approached from the perspective of historical (Hebrew) linguistics, Greek pronunciation and orthography, linguistic studies on cross-language perception, and moraic phonology.

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CITATION OF PRIMARY TEXTS AND CITATION CONVENTIONS

CITATIONS OF THE SECUNDA

Citations of the Secunda are based on my personal examination of the Ambrosiana palimpsest (O 39 sup.) in consultation with the readings of MERCATI (1958; 1965) and YUDITSKY (2017). Accent and breathing marks have generally been omitted, but *trema* (¨) on *iota* (i.e., ï) has been retained in the representation of the Secunda transcriptions. A transcribed word is followed by one asterisk (*) when it indicates a reasonably hypothesized emendation, in many instances following YUDITSKY (2017). For example, we may reasonably suppose that paleographically similar δ (Δ) was mistaken for λ (Λ) in transmission in the transcription φαλιθ פְּדִיתָה 'you redeemed' (Ps. 31:6). Accordingly, it is emended to φαδιθ and represented with an asterisk: φαδιθ*. Forms with two asterisks ** indicate unattested or impossible forms. Forms with three asterisks *** indicate reasonably hypothesized but unattested forms (see 6.4).

I occasionally cite quotations of the Secunda not found in the Ambrosiana palimpsest. These quotations are often found in the early church fathers' writings or in marginal notes on manuscripts of the Septuagint (LXX). Like YUDITSKY, I refer to these as being found in "external sources" ("מקורות חיצוניים" in Hebrew) (2017, 1–2, 108). Most of these Secunda quotations from external sources are found in FIELD (1875), HATCH and REDPATH (1897, vol. 3, 199–216), BRÖNNO (1943), MURTONEN (1988, vol. I/Ba), or YUDITSKY (2017), but I have added a number of Secunda quotations found in the early church fathers as a result of my own searches in the *TLG* database (see note below on *TLG*). I also once cite an attestation of the Secunda from the highly fragmentary Cairo Genizah palimpsest (TAYLOR 1900; see 6.4.5.6).

CITATIONS OF ANCIENT GREEK AND LATIN AUTHORS

Most citations of ancient Greek authors, such as the early church fathers, are from the *Thesaurus Linguae Graecae*® Digital Library (<http://www.tlg.uci.edu>) (*TLG*). Usually, *TLG* follows the text of MIGNE's *Patrologia Graeca* (*MPG*). When an ancient Greek work is cited with two or three numbers separated with a period (e.g., *Selecta in Genesim* [12.100.23]), the first indicates the volume, the second the page, and the third the line in *MPG*. Occasionally, other sources have been used such as SAVILE (1611) for Chrysostom, *Die griechischen*

christlichen Schriftsteller (GCS) for Eusebius's church history (MOMMSEN 1908), MOUTSOULAS (1973) for Epiphanius, and HOFFMAN (2007) for Nikolaos of Otranto. Ancient Latin authors, such as Jerome, are typically cited from MIGNE's *Patrologia Latina* (MPL), whose system of citation follows that of MPG. Finally, other sources are occasionally used, such as or *Corpus Scriptorum Ecclesiasticorum Latinorum* (CSEL) for Jerome's letters (HILBERG 1910).

CITATIONS OF ANCIENT PAPYRI

The full bibliographical information for each of the papyri, typically expressed in abbreviated form (e.g., P.Berol.21246, *P.Oxy.* XLVI.3315, *P.Lund* I.5), may be found at *Papyri.info* (<http://www.papyri.info>), *Trismegistos* (<http://www.trismegistos.org>), or *POxy: Oxyrhynchus Online* (<http://www.papyrology.ox.ac.uk/POxy>). Note that names of papyri in *italics* signify that they belong to a multi-volume collection.

OTHER ONLINE/ELECTRONIC TOOLS UTILIZED

A number of other online and electronic tools (not mentioned above) have been utilized for this dissertation. For ancient rabbinic texts, I have made use of the *Sefaria* online database (<https://www.sefaria.org>), which includes the *William Davidson Talmud*. For Hebrew and Aramaic lexica, I have made use of the electronic edition of *Brown-Driver-Briggs Hebrew and English Lexicon* (BDB), JASTROW's *Dictionary of the Targumim, the Talmud Babli and Yerushalmi, and the Midrashic Literature* (1926) (<http://www.tyndalearchive.com/tabs/jastrow>), and the *Comprehensive Aramaic Lexicon* (CAL) (<http://cal1.cn.huc.edu>). Finally, a number of Hebrew, Aramaic, and Greek texts have been accessed through Accordance Bible Software, including the Göttingen LXX critical edition of *Psalmi cum Odis* (RAHLFS 2008).

EMPHASIS (BOLD OR ITALICS) IN QUOTATIONS

Note that any **bold** or *italic* font in a quotation is my own emphasis and not present in the original, except perhaps in those cases (in modern scholarship) in which it is used in a conventional manner (*italic* for Latin words, *italic* for transliteration of foreign words, etc.).

ABBREVIATIONS AND SYMBOLS

BIBLIOGRAPHICAL

A	Aleppo Codex
<i>b</i>	Babylonian Talmud
<i>BDB</i>	BROWN, FRANCIS, S. R. DRIVER, AND CHARLES A. BRIGGS. 2008. <i>The Brown-Driver-Briggs Hebrew and English Lexicon</i> . Peabody, MA.: Hendrickson Publishers.
BM	British Museum tablet number
<i>CAL</i>	<i>Comprehensive Aramaic Lexicon Project</i> (http://cal1.cn.huc.edu)
<i>CIIP</i>	AMELING, WALTER, HANNAH M. COTTON, LEAH DI SEGNI, WERNER ECK, BENJAMIN ISAAC, ALLA KUSHNIR-STEIN, HAGGAI MISGAV, JONATHAN J. PRICE, ISRAEL ROLL, ADA YARDENI, MARFA HEIMBACH, and NAOMI SCHNEIDER, eds. 2010–. <i>Corpus Inscriptionum Iudaeae/Palaestinae: A Multi-Lingual Corpus of the Inscriptions from Alexander to Muhammad</i> . Berlin/Boston: De Gruyter.
<i>CSEL</i>	<i>Corpus Scriptorum Ecclesiasticorum Latinorum</i> (http://csel.sbg.ac.at/en/)
<i>EHLL</i>	KHAN, GEOFFREY, ed. 2013. <i>Encyclopedia of Hebrew Language and Linguistics</i> . Leiden/Boston: Brill.
G-JUDEAN-T	The <i>Greek Judaeen Desert Manuscripts</i> electronic database accessed through Accordance Bible Software corresponding to the Greek section of ABEGG, MARTIN, JAMES BOWLEY, and EDWARD COOK. 2015. <i>The Dead Sea Scrolls Concordance</i> . Leiden/Boston: Brill.
<i>GCS</i>	1897–. <i>Die griechischen christlichen Schriftsteller der ersten [drei] Jahrhunderte</i> . Leipzig.
HSM	Harvard Semitic Museum
<i>KAI</i>	DONNER, HERBERT, and WOLFGANG RÖLLIG, eds. 1971. <i>Kanaanäische und aramäische Inschriften</i> . Wiesbaden: Harrassowitz.
L	Leningrad Codex
LXX	Septuagint
<i>m</i>	Mishnah
<i>MPG</i>	MIGNE, J. P., ed. 1857–. <i>Patrologiae Cursus Completus: Series Graeca</i> . Paris: Migne.
<i>MPL</i>	MIGNE, J. P., ed. 1844–. <i>Patrologiae Cursus Completus: Series Latina</i> . Paris: Migne.
MT	Masoretic Text
<i>t</i>	Tosefta

<i>TLG</i>	<i>Thesaurus Linguae Graecae</i> ® (http://www.tlg.uci.edu)
VAT	signature of tablets located in the museums of Berlin
y	Jerusalem Talmud

OTHER

AE	American English
ASCII	American Standard Code for Information Interchange (i.e., the numerical value of a character/text)
Bab.	Babylonian Hebrew Tradition
<i>CG</i>	Category-Goodness Difference
cl.	classical
cod.	codex
F1	first formant
F2	second formant
fem.	feminine
fs	feminine singular
IPA	International Phonetic Alphabet
L1	first/native language
L2	second language
masc.	masculine
mp	masculine plural
ms	masculine singular
MS	manuscript
MSS	manuscripts
NENA	Northeastern Neo-Aramaic
OCP	Obligatory Contour Principle
Pal.	Palestinian Hebrew Tradition
<i>PAM</i>	Perceptual Assimilation Model
<i>PAM-L2</i>	Perceptual Assimilation Model for learners of a second language
PNWS	Proto-Northwest Semitic
<i>r</i>	recto
SSBE	Southern Standard British English

<i>SBH</i>	Standard Biblical Hebrew
<i>SC</i>	Single-Category Assimilation
<i>SCL</i>	Syllable Contact Law
<i>SLM</i>	Speech Learning Model
<i>SSP</i>	Sonority Sequencing Principle
<i>TC</i>	Two-Category Assimilation
<i>Tib.</i>	Tiberian Hebrew Tradition
<i>UU</i>	Both Uncategorizable
<i>v</i>	verso
<i>*</i>	precedes etymological or reconstructed form (but note citation of Secunda above)
<i>**</i>	precedes unattested or impossible form (but note citation of Secunda above)
<i>***</i>	follows reconstructed Greek transcription form (note citation of Secunda above)
<i>//</i>	encloses phonemic transcription of words or phonemes
<i>[]</i>	encloses phonetic transcription of words or phones
<i>(*)X > Y</i>	X developed into Y
<i>X < (*)Y</i>	X developed from Y
<i>μ</i>	represents a mora in phonological trees
<i>σ</i>	represents the syllable node in phonological trees
<i>ω</i>	represents the word node in phonological trees

1. INTRODUCTION

1.1. INTRODUCTION

The second column (*Secunda*) of Origen's (185–254 CE) Hexapla, which contains Biblical Hebrew transcribed into Greek letters, constitutes the best direct evidence we have for ancient Hebrew pronunciation, inasmuch as it is the earliest vocalized Hebrew of any significant length. Since the discovery of the Ambrosiana palimpsest (O 39 sup.) at the end of the nineteenth century, the *Secunda* has been incorporated into much research on historical Hebrew phonology and has been the focus of several larger works (SPERBER 1925–1934; BRØNNØ 1943; JANSSENS 1982; and YUDITSKY 2017).

However, despite the attention the *Secunda* has received, there are a few areas in need of further research. First, a firm consensus is lacking regarding the original date and social setting of the *Secunda*. Second, while cursory references to ancient Greek pronunciation are found in various treatments of the *Secunda*, none of the previous works have engaged in an in-depth study of contemporary Greek phonology and orthography. Third, a phonetic transcription of the pronunciation of the *Secunda* has yet to be produced.

The present dissertation seeks to address these issues by giving greater attention to the social context of comparable texts in the Hellenistic/Roman Near East, the phonology and orthography of Palestinian Koine Greek, the conventions of Greek transcription of other lan-

guages in the Hellenistic/Roman Near East, and the relevance of modern linguistic studies on cross-language perception. Primarily, this dissertation addresses the phonology and orthography of the Secunda in light of the pronunciation and orthography of Palestinian Koine Greek.

1.2. PREVIOUS RESEARCH

For a long time, the Hexapla only survived as references in other sources. These citations were collected and published by FIELD in a two volume work, *Origenis Hexaplorum quae supersunt*, in 1875. However, within this massive two-volume work, citations of the Secunda are few and far between. It was not until 1894 that MERCATI discovered a palimpsest containing eleven mostly-fragmentary Psalms (18, 28, 29, 30, 31, 32, 35, 36, 46, 49, 89). Not long after, a number of scholars worked on the material.

MARGOLIS used the Greek transcriptions of Origen to treat the pronunciation of *shewa* (1905). SPEISER wrote a series of articles in *The Jewish Quarterly Review* describing and analyzing various phonological issues in the Secunda (1925–1934). A few more contributions to research on the Secunda followed. PRETZL and STAPLES published short articles on the Secunda in 1932 and 1939, respectively. Sperber's 1938 work, "Hebrew Based upon Greek and Latin Transliterations," which is a collection of the Greek and Latin transcription material, contains the Greek transcriptions found in Origen's Hexapla. A summary of this early period of research is presented nicely in YUDITSKY (2013, 803–804; 2017, 6–7).

All this led up to the publication of what is still regarded as the most comprehensive work published on the Secunda to date. In 1943, BRØNNO published *Studien über hebräische Morphologie und Vokalismus: auf Grundlage der Mercatischen Fragmente der zweiten Kolumne der Hexapla des Origenes*. To describe the work as "utterly comprehensive" is by no means an exaggeration, in that he covers every form present in MERCATI's manuscript. His treatment is well-organized and very systematic. He classifies all the forms into appropriate grammatical, morphological, and phonological categories, while discussing and explaining unusual forms. He essentially analyzes the data with respect to two reference points, the

historical etymological form of a word and the Tiberian form of a word, the former playing only a minor part in the work and the latter being far more prominent. The historical linguistics in the book is relatively sound, though it cannot help but be a product of its time. Moreover, treating the Hexaplaric material from the perspective of how it parallels Tiberian Hebrew can be a problematic methodology. Although it may make the Hexaplaric material more approachable, it encourages a tendency to see Secunda Hebrew through the lens of Tiberian Hebrew and thus creates confusion even in historical-linguistic matters—a shortcoming pointed out by both JANSSENS and YUDITSKY.

The next monograph to be published on the Secunda was JANSSENS's *Studies in Hebrew Historical Linguistics Based on Origen's Secunda* (1982). JANSSENS specifically contrasts his methodology with that of BRØNNO. Though both attempt to provide sound rules to explain the Secunda vocalization, JANSSENS criticizes the fact that BRØNNO approaches the material statistically, constantly comparing the Secunda to Tiberian Hebrew. JANSSENS, on the other hand, treats the material from a historical-linguistic perspective, attempting to delineate consistent sound rules to trace the development from the etymological (proto-Semitic) form to the Secunda form. While JANSSENS's work marked an attempt at analyzing the Hexaplaric material with a more historically-grounded linguistic approach, the historical linguistics in the book is not sound (for a more comprehensive history of research, see BRØNNO 1943, 1–14; JANSSENS 1982, 25–36; YUDITSKY 2013, 803–804; 2017, 5–14).

The most recent scholar to work on the material is YUDITSKY, who published a series of articles from 2005–2016 and has recently followed them up by publishing the culmination of his work in a monograph in 2017. In this work, he covers the phonology and morphology of the Secunda comprehensively, dealing with all the forms in the palimpsest and numerous quotations from external sources. Methodologically, YUDITSKY emphasizes the importance of treating the Secunda as a Hebrew tradition in its own right and not relying on conformity to other traditions such as Tiberian. Accordingly, he first analyzes the Secunda by itself and only

subsequently compares it to the base of Hebrew shared across the various other traditions such as Tiberian, Babylonian, Palestinian, and Samaritan (2017, 13–14). His work should be commended and is currently the best treatment of the Secunda material available.

There are, however, three points to be made. First, while his methodology is sound, the emphasis on treating the Secunda as a tradition in its own right sometimes leads to too sharp a distinction between the Hebrew of the Secunda and the other traditions. We must remember that the main Hebrew reading traditions have ancient roots and certain features, like *shewa*, are probably quite old (see 6.5). Second, while YUDITSKY does address the phonology and orthography of Greek in his book (2017, 46), there are two weaknesses in his approach. The first weakness is that, on the basis of the conservatism of writing, he assumes that the orthography of the Secunda reflects a pronunciation hundreds of years older than its composition. However, orthography is only conservative when there is an established spelling tradition. Transcription, by nature, is far more indicative of current pronunciation. The second weakness is that the comments YUDITSKY makes about Greek are based on a general overview of Greek pronunciation and not specific to the Greek spoken in Palestine. Both of these weaknesses lead to inaccuracies. Third, his assumption that one letter can only represent one sound in the Secunda, while convenient, is not necessarily the most nuanced approach for analyzing the transcriptions. Moreover, a comparison with transcription conventions of other languages into Greek indicates that such an assumption is unfounded.

The work of all of these scholars, especially that of YUDITSKY, will be addressed in greater detail in the body of the dissertation.

1.3. METHODOLOGY

My analysis of the phonology and orthography of the Secunda transcriptions essentially involves four strands of methodology. While the first methodological approach, namely, historical (Hebrew) linguistics, is not novel, my dissertation implements three methodological approaches that have gone either unimplemented or lightly implemented in studies of the

Secunda: an emphasis on the pronunciation of Roman Palestinian Koine Greek, theoretical models of cross-language perception, and moraic phonological theory.

1.3.1. Historical (Hebrew) Linguistics

First, an analysis of the phonology of the Secunda is undergirded by principles of historical linguistics generally and historical Hebrew linguistics specifically. Each form in the Secunda is analyzed with respect to its etymological form both in Proto-Northwest Semitic (PNWS) and Proto-Hebrew. It is generally assumed that the realization of a particular word in the Secunda falls somewhere on the spectrum between the Proto-Hebrew form and its realization in the various reading traditions and dialects of Hebrew attested throughout history if no other innovative development is apparent (for a more detailed discussion, see 6.2).

1.3.2. Greek Pronunciation and Orthography

Second, an analysis of the phonology of the Secunda is based on an in-depth analysis of the pronunciation of Roman Palestinian Koine Greek. This is necessary because the Greek text of the second column is regarded as a *transcription* and not a transliteration. It is necessary, therefore, to understand the correspondences between the Greek graphemes and phonemes in the contemporary local Greek pronunciation. Because there is no evidence that the Secunda transcriptions emerged out of a centuries-old tradition of transcribing continuous Hebrew texts into Greek, there is no reason to suggest a conservative spelling system. For a *transcription* to be functional, if it does not reflect an established convention, it must reflect contemporary pronunciation. Accordingly, we will assume that the transcriber chose each particular Greek grapheme because the Greek phoneme (or phone) that it represented best "approximated" a given Hebrew sound (see below). An analysis of the conventions for transcribing other languages into Greek will serve to provide comparative evidence for how such approximations tend to come to fruition. The methodology for analyzing Greek pronunciation in Roman Palestinian Koine and Greek transcription conventions in the Hellenistic/Roman Near East is described in more detail in chapters 4 and 5 (4.2; 5.2).

1.3.3. Cross-Language Perception in Modern Linguistics

Third, an analysis of the specific correspondences between the Greek graphemes and the *Hebrew* phones will be aided by modern linguistic studies on cross-language perception. Although it seems obvious that mapping the sounds of one language onto the graphemic-phonemic system of another would be inextricably linked to perception, previous scholars writing on the *Secunda* have not availed themselves of the advancements of modern linguistics on the topic. To address this lack in scholarship, I turn to modern linguistic studies on cross-language perception to support and complement my interpretations of *Secunda* phonology.

In order to understand cross-, or non-native-, language perception, we must first begin by understanding native-language perception. When speakers conceive of their own native language, unless they are phonologists or phoneticians, they typically process it phonemically. Thus, two non-contrastive allophonic realizations of a particular phoneme are unlikely to be intuitively perceived any differently by a native speaker. For example, English speakers do not typically distinguish the /p/ in *happy*, realized as an unaspirated [p], from the /p/ in *pie*, realized as [p^h] (DIRVEN and VERSPOOR 2004, 115; MARTIN and PEPERKAMP 2011, 2334–36).

Because individual speakers' perceptual systems are built to process the phonemes of their own native languages (MARTIN and PEPERKAMP 2011, 2337), a number of different phenomena occur when processing non-native speech sounds. The modern linguistic discipline of cross-language perception has yielded primarily two theoretical models for predicting and describing how non-native sounds are perceived, namely, the *Perceptual Assimilation Model (PAM)* and the *Speech Learning Model (SLM)*.

The core principle of the *Perceptual Assimilation Model* is that non-native speech sounds are perceived with reference to the phonemes and the phonological space of one's native language. In the *PAM*, a non-native speech sound is described as being perceived in one of three different ways. First, non-native sounds that are similar but not identical to native phonemes tend to *perceptually assimilate* to the native phonemic category. In this case, the

non-native sound's approximation of the native category can be either good, acceptable but not ideal, or markedly different. For example, speakers of English, in which no ejective consonants exist, were found to assimilate the Ethiopic ejectives /pʔ/ and /tʔ/ to the English non-ejective plosives /p/ and /t/. Second, a non-native sound may perceptually assimilate as belonging to the native phonological space but not to any particular native phoneme. In other words, it is perceived as a speech sound in between the existing phonemes of the native language. Third, a non-native phone may not assimilate at all to the native phonetic space and thus be regarded as a nonspeech sound. For example, some foreign sounds, such as clicks, may not even be regarded as part of speech for an English speaker due to their stark dissimilarity to any native sounds (BEST 1995, 193–96).

The perception of *contrasts* between non-native phonemes follows from these various patterns of assimilation and may be realized in various ways. According to BEST and TYLER's extension of *PAM* to learners of a second language (L2), henceforward referred to as *PAM-L2*, there are four different ways that L2 contrasts might assimilate to L1 phonological categories. First, according to the *Two-Category Assimilation (TC Type)*, the non-native sounds assimilate to *two different* native phonemic categories and thus are perceived as contrasting. Second, according to the *Category-Goodness Difference (CG Type)*, both non-native sounds assimilate to *one* native phonemic category, but one is a significantly better exemplar of the native category and thus the sounds are perceived as distinct. Third, according to the *Single-Category Assimilation (SC Type)*, both non-native sounds assimilate to *one* native phonemic category, yet both are poor exemplars of the native category and thus are not distinguished well. Fourth, and finally, according to the *Both Uncategorizable (UU Type)*, both non-native sounds do not assimilate to any category, yet fall within the native phonetic space, and are distinguished in perception according to their proximity to one another (BEST and TYLER 2007; FABRA and ROMERO 2012, 493).

The other theoretical model, namely, the *Speech Learning Model*, addresses how *both* L1 and L2 sounds affect one another. The model is grounded in two primary assumptions. First, the learning of L2 speech is not relegated to an early developmental stage of life. Second, the faculties monolinguals utilize to learn their L1 are accessible for L2 learning throughout their lifetime. The main claim of the *SLM* is that the phonemic categories of the L1 and L2 systems of a bilingual coexist in a "common phonological space" and thus affect one another. The phonetic categories of each subsystem (i.e., L1 and L2) may either assimilate or dissimilate. The *SLM* argues that learners of an L2 can, but do not necessarily, form new categories for the sounds of L2. To put it simply, the more similar an L2 sound is to an L1 sound, the more likely it is to assimilate and the more dissimilar an L2 sound is to an L1 sound, the more likely it is to dissimilate and have a new category formed. Moreover, FLEGE has shown that the phonetic categories of an L2 can actually influence the production of an L1 phonetic category so that it comes to differ slightly from that of native monolinguals. This sort of assimilation and dissimilation depends, to a large degree, on the linguistic experience of the speaker and the age at which they learned their L2 (FLEGE 2007, 366–376; FABRA and ROMERO 2012, 493).

The applicability of these theoretical models to the *Secunda* transcriptions should be apparent. By necessity, transcribing Hebrew phones into Greek script requires the assimilation of a Hebrew speech sound to a Greek phonetic category. Moreover, it is probably the case that the transcriber was (at least) bilingual, since there are instances in which he seems to transcribe Hebrew phonemically rather than phonetically (see chapter 6). Accordingly, we may assume that the same sorts of principles outlined in the *PAM*, *PAM-L2*, and *SLM* were at work in the process of transcription. In light of this assumption, modern linguistic studies on cross-language perception are cited throughout chapter 6 in support of various interpretations of the phonology of the *Secunda*. In these cases, studies are sought that best replicate the specific situation in question. For example, I argue that the Hebrew phoneme /e/ (< */i/), which

is represented by Greek ϵ , was phonetically realized as [ɪ]. Because the vocalic system of Roman Palestinian Koine had [ɛ] (or [ɛ̄]), [e], and [i], but not [ɪ], I cite cross-language perception studies of how a non-native [ɪ] is assimilated to the phonetic categories of languages with [ɛ], [e], and [i] on the front axis but not [ɪ] (e.g., Italian, Catalan, Korean) (see 6.4.2.4).

1.3.4. Moraic Phonology

Fourth, and finally, our analysis of Secunda phonology, specifically with respect to syllable structure, is based on the moraic model outlined by HYMAN (1985), HAYES (1989), and VAN OOSTENDORP (2005). Moraic theory essentially regards syllables as consisting of an onset and one or two morae. Heavy syllables contain two morae and light syllables contain one (VAN OOSTENDORP 2005). In the following trees, σ signifies a syllable node and μ signifies a mora:

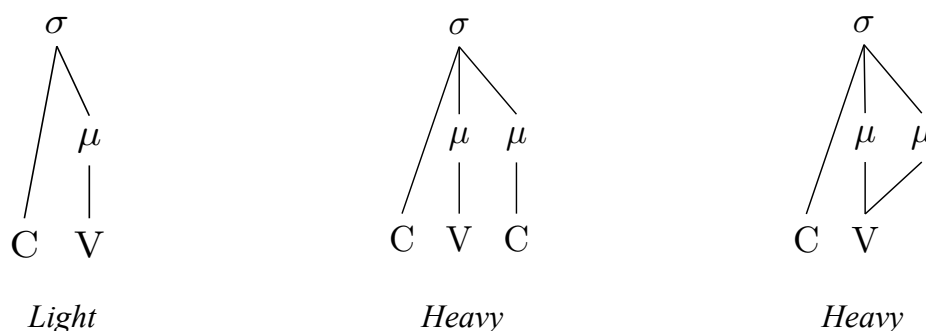


Figure 1: Examples of Heavy and Light Syllables in Moraic Phonology

If an entire word is represented, the word node is signified by ω :

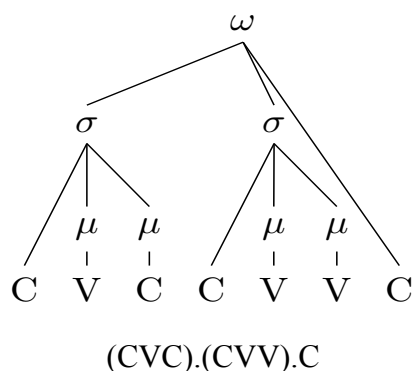


Figure 2: Example of Word in Moraic Phonology

The specific application of moraic phonology in the analysis of Secunda Hebrew syllable structure follows the work of KIPARSKY on Arabic (2003) and KHAN on Biblical Hebrew (1987; 2013b). A primary distinction of their approach involves interpreting certain consonantal morae in complex onsets and complex codas as extra-syllabic or "semisyllables" (6.5).

2. ORIGEN AND THE SECUNDA

2.1. INTRODUCTION

If the Greek transcriptions of the second column of the Hexapla were originally composed by Origen, then the date and provenance of the text are straightforward. It was composed in Caesarea Maritima in Palestine sometime after the year 233 CE (see 2.3.1). If, on the other hand, Origen acquired the text of the second column as he did the other five columns, then the issue of its original date and provenance remains an open question. The first of these two alternatives may be dismissed if it can be determined that Origen lacked sufficient skill in Hebrew to compose the second column himself.

Accordingly, the first part of this chapter will be a comprehensive treatment of Origen's knowledge of Hebrew based on his own writings. It will be demonstrated that Origen did not have the requisite Hebrew knowledge to compose the second column of the Hexapla himself. Also flowing out of the analysis of Origen's Hebrew knowledge is a better understanding of how Origen used the second column and why he included it in the Hexapla. Finally, having pulled the original composition of the Secunda out from under Origen's pen, this chapter will conclude with a discussion regarding the nature of the second column as it relates to the compositional history of the Hexapla.

2.2. ORIGEN'S KNOWLEDGE OF HEBREW

The history of scholarship regarding Origen's knowledge of Hebrew begins within a couple centuries after his death in the writings of Eusebius (260/65–339/40 CE) and Jerome (347–420 CE). Concerning Origen's impetus for compiling the Hexapla, Eusebius writes (*Historia Ecclesiastica* 6.16.1):

So great an exacting study of the divine words was introduced to Origen, that he thoroughly learned the Hebrew language, and acquired as his own possession the original scriptures held by the Jews in the very letters of the Hebrews.¹

In the beginning of his account of Origen's work on the Hexapla, Jerome states (*De viris illustribus* 54):

Who is ignorant also how greatly he was invested in the study of the divine scriptures, such that even the Hebrew language, contrary to the nature of his time and his people, he learned thoroughly?²

The verbs used to describe Origen's study of Hebrew both in Eusebius's Greek account (ἐκμανθάνω) and in Jerome's Latin account (*edisco*) signify a thorough knowledge gained through study. It should be noted, however, that Jerome is likely working from Eusebius's text in this passage (GRAFTON and WILLIAMS 2006, 317). The parallel language (e.g., τοσαύτη || *quod tantum*, τῶν θείων λόγων || *Scripturis divinis*, ὡς...ἐκμαθεῖν || *ut...edisceret*) strongly supports this claim. Nevertheless, the fact that Jerome follows Eusebius in this regard shows that he found no reason to contradict Eusebius's claim that Origen knew Hebrew well.

Despite the statements of Eusebius and Jerome, most modern scholars who have investigated Origen's Hebrew knowledge have come to the conclusion that his skill in Hebrew was by no means expert. The most extensive treatments regarding Origen's Hebrew knowledge have been carried out by ELLIOTT (1877–87, 855–59), HANSON (1959, 167–75), and DE

1. Τοσαύτη δὲ εἰσήγετο τῷ Ὀριγῆναι τῶν θείων λόγων ἀπηκριβωμένη ἐξέτασις ὡς καὶ τὴν Ἑβραϊδα γλῶτταν ἐκμαθεῖν τὰς τε παρὰ τοῖς Ἰουδαίοις ἐμφορομένας πρωτοτύπους αὐτοῖς Ἑβραίων στοιχείους Γραφάς κτῆμα ἴδιον ποιήσασθαι.

2. *Quis ignorat et quod tantum in Scripturis divinis habuerit studii, ut etiam Hebraeam linguam, contra aetatis gentisque suae naturam edisceret?*

LANGE (1976, 21–23, 152–54), all of whom conclude that Origen had a limited knowledge of Hebrew.³ At the same time, some scholars (e.g., HANSON 1959, 167) acknowledge evidence in favor of Origen having some knowledge of Hebrew, even if it was not expert.

The purpose of this section is to summarize and build upon the work of previous scholars to provide the most comprehensive treatment of Origen's Hebrew knowledge to date. The first part of this section will discuss the limits of Origen's Hebrew knowledge and its ramifications for the authorship of the *Secunda*. The second part of this section will address the nature and extent of Origen's Hebrew knowledge in terms of what he *did* know. Following this, the third and final part of this section will describe how Origen used the second column and how the way he utilized it relates to the reason that he included it in the Hexapla.

2.2.1. The Limits of Origen's Hebrew Knowledge

Arguments for Origen's limited Hebrew knowledge are based primarily on his deferral to Hebrew experts, his mistaken etymologies, and his reliance on Greek (translation or transcription) instead of Hebrew.

2.2.1.1. Origen's Deferral to Experts

One of the most common evidences cited to prove the deficiency of Origen's Hebrew knowledge is the fact that when discussing a matter of Hebrew philology, he often defers to those who are experts in Hebrew (for the examples below, see ELLIOTT 1877–1887, 856–57; BARDY 1925, 217–19; HANSON 1959, 171–72; DE LANGE 1976, 152; MARCOS 2000, 205).

In *Contra Celsum* (1.34), when discussing the meaning of the Hebrew word עַלְמָה in Isaiah 7:14, he states that "it is found, *as they say*, also in Deuteronomy referring to a virgin."⁴ The verse in Deuteronomy (22:23) has the same Greek word in the LXX as in Isaiah 7:14 (παρθένος), but a different Hebrew word in the MT (בְּתוּלָה) (HANSON 1959, 167; see also 2.2.1.3.3). In *Homilies on Genesis* (XII), when discussing the etymology of Esau, he prefaces

3. For various opinions on the nature of Origen's Hebrew knowledge, see also WUTZ 1914, 37–38; BARDY 1925, 217–19; KAHLE 1947, 87; LIETZMANN 1950, 302; SPARKS 1959, 276–77.

4. κείται, ὥς φασι, καὶ ἐν τῷ Δευτερονόμῳ ἐπὶ παρθένου.

his information with the the phrases, "as those who interpret Hebrew names say" and "as it seems to others."⁵ In *Epistula ad Africanum* (11.61), when attempting to discern if the play on words in the Greek *History of Susanna* would be present in a Hebrew original, he writes, "I referred the matter to not a few Hebrews in my attempt to learn the answer."⁶ In *Homiliae in Canticum Canticorum* (I.6), he writes that "the Hebrews say that *Cedar* is interpreted as darkness."⁷ In his comments on Psalm 24:10 (*Selecta in Psalmos*, 12.1269), when discussing the Hebrew word צִדְקָה, he cites "those who have come to an exact understanding of the matters of the Hebrews."⁸ Finally, in *Homiliae in Librum Numerorum* (16.1), when discussing whether or not the word referring to God in the story of Balaam refers necessarily to the God of Israel, he cites "those who read Hebrew literature" as an authority and concludes the discussion with, "let it be asked of one who is able."⁹ This homiletical passage¹⁰ has been taken

5. *ut aiunt qui Hebraea nomina interpretantur ... ut aliis visum est.*

6. οὐκ ὀλίγοις Ἑβραίοις ἀνεθέμην πυνθανόμενος.

7. *Aiunt Hebraei Cedar interpretari tenebras* (13.44).

8. οἱ τὰ Ἑβραίων ἡκριβωκότες. The phrase, referring to those expert in Hebrew, may be a technical term. The word ἡκριβωκότες 'having investigated exactly' bears a striking similarity to those words in the Hebrew grammatical tradition formed from the root דקדק. For example, when discussing the reading of the *shema*, the Mishnah discusses one who "recited but was not exact (לֹא דִקְדָק) in its letters" (*mBer*: 2.3). In the Jerusalem Talmud, it is said regarding R. Hosha'yah that he "read and translated all the exact details of the *parashah*" (יהי' קורא ומתרגם כל דקדוקי הפרשה) (*jYoma* 3.8).

9. *qui Hebraicas litteras legunt ... de quo qui potest requirat.*

10. The full passage is:

In Hebrew literature the name of God, that is, God (*Deus*), or Lord (*Dominus*), is said to be written in various ways. For in one way god is written, whatever is a god. In another way God himself, of whom it is written, "Hear, O Israel, the Lord (*Dominus*) your God (*Deus*), is one God (*Deus*)." Therefore, that God of Israel, one God and creator of all, is written with a certain definite sign of letters, which is called the *tetragrammaton* by them. Therefore, when God is written under this sign in the scriptures, there is no doubt at all that it is said about the true God and creator of the world. However, when it is written with other letters, that is, common letters, it is considered uncertain whether it is said regarding the true God, or regarding another ... Now those who read Hebrew literature/letters say that in this place, God is not referenced under the sign of the *tetragrammaton*. Let it be asked of one who is able.

In Hebraeorum litteris nomen Dei, hoc est Deus, vel Dominus, diverse scribi dicitur. Aliter enim scribitur Deus, quicunque Deus: aliter Deus ipse, de quo dicitur: Audi, Israel, Dominus Deus tuus, Deus unus est." Iste ergo Deus Israel, Deus unus et creator omnium, certo quodam litterarum signo scribitur, quod apud illos tetragrammaton dicitur. Si quando ergo sub hoc signo in Scripturis scribitur Deus, nulla est dubitatio quin de Deo vero et mundi creatore dicatur. Si quando vero aliis, id est communibus litteris scribitur, incertum habetur utrum de Deo vero, an de aliquo...Aiunt ergo qui Hebraicas litteras legunt in hoc loco Deus non sub signo tetragrammati esse positum de quo qui potest requirat.

to imply that Origen was not able to consult the Hebrew manuscripts himself to see whether יהוה or אלהים was written there. However, based on the full context of the passage, it is conceivable that Origen is not simply referring to the difference between the words יהוה and אלהים, but rather to some sort of accompanying symbol¹¹ or the practice of writing the divine name in the Paleo-Hebrew script.¹² Origen was not only aware of this practice, but regarded the writing of the divine name in ancient Hebrew letters as indicative of a most accurate manuscript.¹³ Therefore, Origen's need to defer to experts may involve a more complex distinction than merely the presence of יהוה or אלהים in the Hebrew text. His comments in this passage may be—not without confusion—referring to multiple elements at the same time.

In sum, two main facts about Origen's Hebrew knowledge are made clear from the quoted passages. First, he was in contact with and depended upon Jewish scholars for much of his knowledge of Hebrew. Second, Origen did not regard himself among those who were expert in Hebrew and certain questions regarding the Hebrew language were beyond Origen's linguistic skill.

11. The phrase *sub hoc signo* 'under this sign' used in the passage (see previous note) may indicate that there was a particular sign written above the word אלהים to signify that it was referring to the one true God. In the Babylonian pointing tradition, albeit much later, the *dagesh* and *rafeh* signs, written above the word אלהים, served this purpose (YEIVIN 1985, 918).

12. The fact that Origen states that the word for God can be written in *communibus litteris* 'in common letters' may indicate that the word for the one true God was sometimes written in a different script in some manuscripts. It is well-known that the *tetragrammaton* was written in Paleo-Hebrew script in the scrolls from Qumran.

13. *Selecta in Psalmos*, 12.1104:

There is a four-letter word unpronounced by them, which is even written on a leaf of gold of the high priest, and it is said with the appellation *Adonai* ... Among the Greeks it is pronounced with *Kurios*. And in the most accurate manuscripts, the name is found in Hebrew characters, not contemporary Hebrew characters, but rather the most ancient. For they say that in the captivity Ezra passed down to them characters different from the first characters.

ἔστι δέ τι τετραγράμματον ἀνεκφώνητον παρ' αὐτοῖς, ὅπερ καὶ ἐπὶ τοῦ πετάλου τοῦ χρυσοῦ τοῦ ἀρχιερέως ἀναγράφεται, καὶ λέγεται μὲν τῇ Ἀδωναὶ προσηγορίᾳ ... παρὰ δὲ Ἑλλήσι τῇ Κύριος ἐκφωνεῖται. Καὶ ἐν τοῖς ἀκριβεστέροις δὲ τῶν ἀντιγράφων Ἑβραίοις χαρακτηῖται τὸ ὄνομα, Ἑβραϊκοῖς δὲ οὐ τοῖς νῦν, ἀλλὰ τοῖς ἀρχαιοτάτοις. Φασὶ γὰρ τὸν Ἑσδραν ἐν τῇ αἰχμαλωσίᾳ ἐτέρους αὐτοῖς χαρακτηῖται παρὰ τοὺς προτέρους παραδεδοκέναι.

2.2.1.2. Etymologies

The etymologies of Hebrew names in Origen's writings are derived primarily from Jewish sources (HANSON 1956, 120–22). These Jewish sources may be further subdivided into a list of biblical names arranged "consecutively" and a more traditional onomastic list of biblical names accompanied by interpretations (1956, 119).¹⁴ It is supposed that only on a few occasions does Origen attempt his own etymology (1956, 103–105). Scholars cite the faulty etymologies belonging to this group as evidence of Origen's ignorance of Hebrew (for the examples below, see ELLIOTT 1877–1887, 856–58; WUTZ 1914, 37–38; HANSON 1956, 104; HANSON 1959, 170–71).¹⁵

By way of example, in *Selecta in Genesim* (12.100.23), Origen interprets the word כּוֹשׁ as 'darkness' (σκότος), but at the same time expounds the text as if it refers to dust, presumably on the basis of the meaning of the Greek word χοῦς 'dust' (HANSON 1959, 170). Elsewhere in the same book, he interprets קטורה as 'smaller' (cf. קטנה) (12.120.39), Στῦρα as 'lofty' (cf. אָרַם ~ רום) (12.117.34), and אבִידע as 'the height of my father' (cf. אֲבִירָם) (12.121.8).

There are also a few other examples of supposedly faulty etymologies cited in the literature which, in my view, are not inconsistent with a knowledge of Hebrew. In *Selecta in Genesim* (12.136.8), Origen interprets Symmachus's rendering of צִפְנֹת פִּעֲנָה (Σαφθφανη) as 'he has revealed hidden things' (κακερσυμμένα ἀπεκάλυψε). HANSON makes the implausible argument that Origen might have read the word as a combination of יצא 'to go out' and ἐφάνη 'appeared' (1956, 104). He seems not to realize that Origen's interpretation is perfectly consistent with the Hebrew root letters. The root פִּעַנָה is attested in later Hebrew with the meaning of 'revealing hidden things' and the root צִפֵּן is attested elsewhere in the Bible with the meaning of

14. Origen follows the etymology of Philo in a few instances (HANSON 1956, 103–104). For example, he interprets חנוך *Enoch* as 'your favor' (cf. חֲנֻכָּה) (ELLIOTT 1877–1887, 857).

15. The two most significant works on the etymologies of names in Origen are WUTZ (1914) and HANSON (1956), both of which contain many more etymologies than are cited here. For their discussions of Origen's faulty etymologies, see WUTZ (1914, 37–38) and HANSON (1956, 104).

'hiding'. Moreover, the explanation of the name in the various Targumim typically includes the idea of 'revealing' and 'hidden things'.¹⁶

In his *Commentarium in evangelium Matthaei* (12.16.21) and *In Ezechielem Homiliae* (13.4), Origen interprets the meaning of the place name צִידוֹן as 'hunters' (θηρῶντες). HANSON suggests that this is due to a mistaken reading of Psalms 124:7 based on a divergent text (1956, 104), but there is no reason that a root-based interpretation (צִיד associated with the meaning of hunting) could not explain Origen's etymology. Finally, ELLIOTT cites Origen's interpretation of שְׁמוּאֵל as 'there is God himself' (שָׁם הוּא אֵל) as evidence of his "defective" Hebrew (ELLIOTT 1877–1887, 857). However, such an interpretation based on breaking up the word in a non-etymological manner would not be out of place even among the rabbis. For example, in *Selecta in Genesim* (12.133.47), Origen interprets the word which the Egyptian herald declares before Joseph in Genesis (41:43), אֲבִרָה (Αβρη), as 'gentle father' (πατὴρ ἀπαλός) (אב רך). Origen goes on to explain that "it reasonably calls Joseph gentle father, since although he was gentle according to his age, as a father he demonstrated himself to be a ruler bringing salvation to the Egyptians" (*Selecta in Genesim*, 12.133.48–50).¹⁷ A similar interpretation is found in Rashi's commentary on the Torah, who quotes R. Yehudah saying that "Joseph is אֲבִרָה because he is a father in wisdom and gentle in years" (אֲבִרָה זֶה יוֹסֵף שֶׁהוּא אֵב) (בחכמה ורך בשנים).¹⁸

In my view, criticizing Origen's Hebrew knowledge on the basis of etymologies is an unfruitful endeavor. The fact that he is even criticized for a method of etymological interpretation found among the rabbis should serve as a humbling reminder that modern scholars are

16. Targum Onkelos interprets the name as 'a man to whom hidden things are revealed' (גִּבְרָא דְּמִסְתְּרִין גִּלְיָן לֵיהּ), Targum Neofiti as 'a man to whom hidden things have been revealed' (גִּבְרָא דְּמִסְתְּרִתָּא גִּלְיָן לֵיהּ), Targum Pseudo-Jonathan as 'a man who reveals hidden things' (גִּבְרָא דְּמִסְתְּרִין מְפָרְסֵם), and the Cairo Genizah Targum as 'the hidden things are revealed to him' (טְמִירְתָּהּ מִתְגַּלִּיין לֵיהּ).

17. Εἰκότως πατέρα ἀπαλὸν ἐκάλεσε τὸν Ἰωσήφ, ἐπειδήπερ ἀπαλὸς ὢν κατὰ τὴν ἡλικίαν, ὡς πατὴρ σωτήριον ἀρχὴν Αἰγυπτίους ἐνεδείξατο.

18. As far as I am aware, the connection between Origen's interpretation of אֲבִרָה and the rabbinic explanation has not been acknowledged in the literature (cf. WUTZ 1914, 347, 522).

too quick to dismiss or misinterpret ancient ways of thinking as ignorance. As ELLIOTT himself admits, "it is unsafe ... to attach too much importance to etymological errors" (1877–1887, 856–57). This is especially true when we take into account the fact that most of his etymological interpretations are derived from other sources and that it is not always clear which, if any, etymological interpretations are original to Origen. However, it should be noted that in those instances where Origen reproduces a clear mistake of one of his sources, it would be evidence of a less-than-expert knowledge of Hebrew.

2.2.1.3. Reliance on Greek Translation/Transcription over Hebrew

Perhaps that which betrays Origen's lack of Hebrew expertise more than anything else is his utter reliance on Greek translation and transcription. Such a reliance is evident in his writing not only when he makes mistakes because of it, but also when it leads him to ignore the Hebrew entirely (for the examples below, see ELLIOTT 1877–1887, 856–58; HANSON 1959, 167–68, 170–71; DE LANGE 1976, 152–53).

2.2.1.3.1. No Acknowledgement of Hebrew Variants

Numerous scholars have pointed out that Origen frequently relies on the Greek translations to such an extent that he seems oblivious to significant divergences in the Hebrew (ELLIOTT 1877–1887, 856–58; DE LANGE 1976, 152).

For a number of passages, in which there is a significant difference between the LXX and the Hebrew, Origen expounds the LXX reading without referring to the reading in Hebrew. For Genesis 2:2, he follows the Greek reading of 'on the sixth day' (ἐν τῇ ἡμέρᾳ τῇ ἕκτῃ) with no comment on Hebrew 'on the seventh day' (בַּיּוֹם הַשְּׁבִיעִי) (*Selecta in Genesim*, 12.97.24). For Numbers 24:17, he follows the Greek reading of 'a man will arise' (ἀναστήσεται ἄνθρωπος) with no discussion of Hebrew 'a scepter will arise' (שֵׁבֶט יָקֻם) (*Adnotationes in Numeros*, 17.21.38). For Isaiah 53:8, he accepts the Greek reading of 'to death' (εἰς θάνατον) without a comment on Hebrew 'to him' (לָמוֹ) (*Contra Celsum*, 1.54.36). For Jeremiah 11:19, he quotes the Greek reading of 'let us throw wood into his bread' (ἐμβάλωμεν ξύλον εἰς τὸν ἄρτον αὐτοῦ) with no mention of Hebrew 'let us destroy the tree with its fruit [lit.

"bread"]' (בֶּלֶם יֵץ בְּלֶחֶם) (*In Jeremiam*, 10.1.21). However, some of these examples, such as Deuteronomy 32:8 and Psalms 81:7, may represent text-critical issues.¹⁹

There are also a number of passages in which Origen refrains from commenting on the Hebrew when it would be expected. When discussing the various readings of the beginning words of 1 Samuel, Origen compares the readings of various Greek translations without reference to the Hebrew (*Homiliae in Librum Regum*, 12.998–999.4).²⁰ When discussing the mark placed on the foreheads of those grieved by the sins of Jerusalem in Ezekiel 9:2–7, Origen cites the translations of Aquila and Theodotion ('the mark of the *taw*' [Σημείωσις τοῦ Θαῦ]), who merely transcribe the Hebrew (תָּ) into Greek (Θαῦ), rather than referring to the Hebrew itself (*Selecta in Ezechielem*, 13.800.50). Origen's comments that "God wiped out the name ... of *Sarah* (Σάρας), calling her *Sarrah* (Σάρραν)" may convey that he believed her renaming consisted of *Sarah* acquiring an additional *r*, rather than *Sarai* (סָרַי) becoming *Sarah* (סָרָה) as in the Hebrew (*Selecta in Psalmos*, 12.1188.40–42).²¹ Origen's contention that a grammatical mistake is present in the phrase σπεῖρον σπέρμα κατὰ γένος 'bearing seed according to kind' and that it ought to be amended to κατὰ γένος σπεῖρον σπέρμα 'according to kind bearing seed' seems unreasonable if he was familiar with the Hebrew (*Selecta in Genesim*, 12.92.22–12.93.3). Finally, when discussing the text of Daniel, he bases his claim about the order of the verses "in the Hebrew versions" (ἐν τοῖς Ἑβραϊκοῖς) on the fact that "so Aquila, serving the Hebrew idiom, has rendered it in his version" (Οὕτω γὰρ Ἀκύλας δουλεύων τῇ Ἑβραϊκῇ λέξει ἐκδέδωκεν εἰπών) (*Epistula ad Africanum*, 11.52.15–21).

19. For Deuteronomy 32:8, Origen follows the Greek 'according to the number of the angels of God' (κατὰ ἀριθμὸν ἀγγέλων θεοῦ) with no discussion of Hebrew 'according to the number of the sons of Israel' (לְמִסְפַּר בְּנֵי יִשְׂרָאֵל) (*Commentarii in evangelium Joannis*, 13.50.332.6). However, 4Q37 12:14 has בְּנֵי אֱלֹהִים in this verse. For Psalms 81:7, Origen accepts the Greek 'they served' (ἐδούλευσαν) with no comment on Hebrew 'they pass over' (תַּעֲבֹרָה) (*Commentarium in evangelium Matthaei*, 11.2.49). It is easy to conceive of how תַּעֲבֹרָה 'they pass over' could be mistaken as תַּעֲבֹדָה 'they serve', but Symmachus and Jerome both support a Hebrew text of תַּעֲבֹרָה (FIELD 1875, II 233; ELLIOTT 1877–1887, 858).

20. See also ELLIOTT's comments on Origen's treatment of Genesis 45:27 and Exodus 4:10/6:30 (1877–1887, 858).

21. Ἐξήλειψε δὲ ὁ Θεὸς...τὸ ὄνομα...τῆς Σάρας καλῶν αὐτὴν Σάρραν.

Although these examples seem to paint the picture of a scholar totally unaware of the Hebrew text, the passages require a more nuanced approach. HANSON has shown that even though Origen was well aware of the differences between the Hebrew and Greek text, he regarded the LXX as divinely inspired. In fact, according to HANSON, while the Hebrew text was regarded as the original authoritative text for Origen, nevertheless, because of his view of inspiration, even in instances where he acknowledges that the LXX has changed the original Hebrew, he views such alterations as inspired changes (1959, 162–67). Such a view may seem unusual, but it is essential for understanding how someone like Origen, who knew very well the differences between the Hebrew and Greek versions, would feel perfectly comfortable expounding the text of the LXX in its own right without any reference to the differences in the original Hebrew text. Nevertheless, even in light of Origen's view of the inspiration of the LXX, the examples above do not support the idea that Origen knew Hebrew well.

2.2.1.3.2. Mistakes with Hebrew Letters

There are a couple instances in which Origen's errors regarding Hebrew letters are best explained as the result of approaching the Hebrew through the Greek. In *Selecta in Psalmos* (12.1068), when discussing the mention of *Abimelech* in the superscription of Psalm 34, he writes:

It seems that the one named Ahimelech, of the first of the kingdoms, is called Abimelech. The letters among the Hebrews, I refer to *kaph* and *beth*, have such great similarity, so that one may not differentiate between them by anything, except a small tittle only.²²

Before proceeding to Origen's error, we ought to note that this passage clearly demonstrates Origen's familiarity with the Hebrew alphabet. In the Hebrew-Aramaic script of Origen's day, *beth* (ב) and *kaph* (כ) were indeed distinguished by very little. However, the name Ahimelech (אחימלך) is spelled with a *heth*—not a *kaph*—in Hebrew and thus would not have been confused scribally with the ב in Abimelech (אבימלך). That Origen suggests scribal confusion be-

22. ἔοικε τὸν τῇ πρώτῃ τῶν Βασιλειῶν Ἀχιμέλεχ ὀνομασμένον Ἀβιμέλεχ ἀποκαλεῖν. τῶν στοιχείων παρ' Ἑβραίοις, λέγω δὲ τοῦ χάφ καὶ τοῦ βῆθ, πολλὴν ὁμοιότητα σωζόντων, ὥς κατὰ μηδὲν ἀλλήλων διαλλάττειν, ἢ βραχεῖα κεραία μόνῃ.

tween *beth* and *kaph* seems to suggest that he was first thinking of the name in Greek (Ἀχιμέλεχ) and then envisioning how that name might be spelled in Hebrew (אֲחִימֶלֶךְ**).

In Origen's *Epistula ad Africanum* (11.77), it seems likely that he has conflated Hebrew *shin* (שׁ) and *sin* (שׁ) based on their identical Greek transcription of σ. When attempting to demonstrate how a Greek translator might preserve a play on words present in Hebrew also in the Greek translation, he writes:

The Hebrews say that the woman was called *essa* and that 'I took' is made clear from the word, as is evident from the [verse], '*Chos isouot essa*', which is translated as, 'I will take up the cup of salvation'. And the man is *is*, as is apparent from the [verse], '*Esre ais*', which is, 'Blessed is the man'. According to the Hebrews, then, *is* [is a man] and *essa* [is] of a man, for from *is*, her husband, she was taken.²³

In Hebrew, the play on words lies in the phonological similarity between the name for 'man' (אִישׁ) and 'woman' (אִשָּׁה). An equivalent play on words in Greek would have been to attach a feminine ending to the Greek word for 'man' (άνήρ). In fact, Symmachus does just this in his translation, substituting an invented word άνδρίς (άνήρ 'man' + fem. ending -ις) for 'woman' instead of the more common γυνή.²⁴ This translation would have served Origen's argument far better and would have helped him to realize what precisely the play on words was. Instead, the fact that Origen connects Genesis 2:23 (וַיִּקַּח אֱלֹהִים אֶת הָאִשָּׁה וַיְהִי אֶחָד בָּרֶגֶל וַיִּשָּׂא אֹתָהּ וַיִּבְרָא אֹתָהּ מֵעַצְמוֹ וַיִּשָּׂא אֹתָהּ וַיִּבְרָא אֹתָהּ מֵעַצְמוֹ 'for from man she was taken') with Psalms 116:13 (אֲשָׁר תִּשָּׂא כַּסֵּאִי וְיִשְׂכַּח אֶת כַּסֵּאִי 'I will take up the cup of salvation') seems to indicate that he thought that the play on words lay in the phonological similarity between the words 'woman' and 'take'. This only makes sense if he was working from Greek translation and transcription and not the original Hebrew. Even though different Hebrew verbs are used in each of these verses—Genesis 2:23 has קָחַ and Psalms 116:3 has שָׂא—they are both translated into Greek with forms of the verb λαμβάνω 'to take'. Moreover, even though the words

23. Φασὶ δὲ οἱ Ἑβραῖοι ἐσσά μὲν καλεῖσθαι τὴν γυναῖκα· δηλοῦσθαι δὲ ἀπὸ τῆς λέξεως τὸ ἔλαβον, ὡς δῆλον ἐκ τοῦ· Χὼς ἰσουὼθ ἐσσά, ὅπερ ἐρμηνεύεται· ἵς δὲ τὸν ἄνδρα, ὡς φανερόν ἐκ τοῦ· Ἑσρή αἴς, ὅπερ ἐστί· Μακάριος ἄνθρωπος. Κατὰ μὲν οὖν Ἑβραίους ἵς καὶ ἐσσά ἄνδρὸς, ὅτι ἀπὸ ἵς ἄνδρὸς αὐτῆς ἐλήφθη αὕτη.

24. Symmachus (Gen. 2:23): She will be called woman (άνδρίς), for from man (άνδρὸς, gen. of άνήρ) she was taken. αὕτη κληθήσεται άνδρίς, ὅτι ἀπὸ άνδρὸς ἐλήφθη αὕτη (FIELD 1875, 15).

הַאִשָּׁה 'woman' and אֶשְׂקֶה 'I will take up' were pronounced with different sibilants in Hebrew *during Origen's time* (/ʔeššō/ [ʔɪʃːo:] 'woman' and /ʔeśšō/ [ʔɪsːo:] 'I will take up'), they were both transcribed into Greek as εσσα.²⁵ The fact that Origen skips over the obvious play on words in Hebrew brought out in Symmachus's translation for a far less intuitive pun seems to show that Origen was working primarily from Greek translation and transcription when accessing the Hebrew (cf. ELLIOTT 1877–1888, 858).

Two other instances of apparent conflation of Hebrew /š/ and /ś/ (or /s/) due to Greek transcription are found in Origen. First, as cited earlier, Origen connects the etymology of the Hebrew word כֹּוֹשׁ /kūš/ to Greek χοῦς 'dust' (HANSON 1959, 170). Second, in *Selecta in Iudices* (12.949.12–20), when commenting on the *shibboleth* incident in Judges 12:6, Origen claims that the distinction was between those who could say σεβηλα and those who pronounced it as σεβηλω. He seems to ignore the fact that the distinction *in the Hebrew text* was between those who could pronounce /š/ and those who pronounced it as [s].²⁶ According to DE LANGE, Origen heard this illustration or found it in a Greek translation (1976, 152).

2.2.1.3.3. Indiscriminate Copying

In a couple of instances Origen seems to copy a line from the second column indiscriminately without separating its parts. In *Commentarium in evangelium Matthaei* (14.16), when discussing the Hebrew words for 'male' and 'female' in the creation story (Gen. 1:27), he writes:

At the same time, notice that regarding those made in the image it is not said 'man and woman', but 'male and female'. This we also have observed in the Hebrew. For man is signified by the word *IS*, and male by the word *ZACHAR*. And again, woman by the word *ESSA*, and female by the word *OUNKIBA*.²⁷

25. For etymological */i/ being realized as /e/ [ɪ] in the Secunda, see 6.4.2.

26. Some scholars suggest that the Gileadites pronounced the ש in the word שֶׁלַח 'stream' as an interdental fricative /θ/ [θ], while the Ephraimites, in whose dialect there was no such phoneme, articulated [s] when trying to pronounce [θ] (see RENDSBURG 2013b). FABER suggests that /š/ was present in Gileadite but not Ephraimite Hebrew and thus the Ephraimites pronounced it as [s] or [ɪ] (1992). However the original context is to be explained, we must remember that in Origen's day, the only apparent distinction for those familiar with the biblical text would have been that between ש [š] and ס [s].

27. ἄμα δὲ πρόσχεῖς ὅτι ἐπὶ μὲν τῶν κατ' εἰκόνα οὐκ ἀνὴρ καὶ γυνή εἴρηται, ἀλλὰ ἄρρεν καὶ θῆλυ. τοῦτο δὲ καὶ ἐν τῷ Ἑβραϊκῷ τετηρήκαμεν. ἀνὴρ μὲν γὰρ δηλοῦται τῇ ΙΣ φωνῇ, ἄρρεν δὲ τῇ ΖΑΧΑΡ. καὶ πάλιν γυνή μὲν τῇ ΕΣΣΑ φωνῇ, θῆλυ δὲ τῇ ΟΥΝΚΗΒΑ.

In the Hebrew of this passage from Genesis, the words 'male' and 'female' come in a pair (זָכָר וּנְקֵבָה) with the conjunctive *waw* attached to the word 'female' (see also Gen. 5:2; 6:19; 7:3, 9, 16). It seems that Origen has copied the entire line, treating the whole phrase 'and female' (וּנְקֵבָה) as one word (OYNKHBA) (HANSON 1959, 168). Such a mistake is unlikely if Origen knew the Hebrew word, but is far more likely if he was working *from* the Greek translations of the Hexapla and simply copied whole-cloth the word in the second column that fell on the same line, not being careful, or able, to analyze its Hebrew components (see reconstruction below; based on FIELD [1875, 10]):²⁸

Hebrew	Secunda	Aquila	Symmachus	LXX	Theodotion
זָכָר וּנְקֵבָה	ζαχαρ ουνκηβα	<ἄρσεν> <καὶ θῆλυ>	ἄρσεν καὶ θῆλυ	ἄρσεν καὶ θῆλυ	ἄρσεν καὶ θῆλυ

Figure 3: 'male and female' in the Hexapla

A similar example, cited earlier for a different purpose, occurs in *Contra Celsum* (1.34) when Origen is discussing the proper translation of the Hebrew word נְקִיָּה (Isa. 7:14):

And if a Jew, coming up with ingenious arguments, should say that 'Behold, the virgin' has not been written but instead of it, 'Behold, the young woman', we will say to him that the word *aalma*, which the seventy have translated as 'the virgin' but others as 'the young woman', is found, as they say, also in Deuteronomy referring to a virgin.²⁹

The word נְקִיָּה occurs in the Isaiah passage with the definite article (הַנְּקִיָּה). Like the previous example, the fact that Origen cites the word with the article (ἡ ἀλμά) may demonstrate once again that Origen copied the corresponding line of the second column in its totality³⁰ and was not working from his own Hebrew knowledge (see reconstruction below; based on FIELD [1875, 443]) (figure 4):

28. Aquila's translation is not attested in Field, but it is not likely that it would have differed.

29. Ἐὰν δὲ Ἰουδαῖος εὐρεσιλογῶν τὸ Ἰδοὺ ἡ παρθένος μὴ γεγράφθαι λέγει ἄλλ' ἀντ' αὐτοῦ Ἰδοὺ ἡ νεάνις, φήσομεν πρὸς αὐτὸν ὅτι ἡ μὲν λέξις ἡ ἀλμά, ἣν οἱ μὲν ἐβδομήκοντα μετελήφασιν εἰς τὴν παρθένον ἄλλοι δ' εἰς τὴν νεάνιν, κεῖται, ὥς φασι, καὶ ἐν τῷ Δευτερονομίῳ ἐπὶ παρθένου.

30. It is unlikely that the double αα at the beginning of the word signifies the guttural *ʿayin*. Such a representation would be unusual for the Secunda; further, the Ambrosiana palimpsest has αλωθ (46:1) in the plural construct without a double αα at the beginning of the word.

<i>Hebrew</i>	<i>Secunda</i>	<i>Aquila</i>	<i>Symmachus</i>	<i>LXX</i>	<i>Theodotion</i>
העלמה	ἁλμά	ἡ νεᾱνις	ἡ νεᾱνις	ἡ παρθένος	ἡ νεᾱνις

Figure 4: 'the virgin' in the Hexapla

On the other hand, because Origen is discussing how the word is translated in this context, one could argue that citing the word with the definite article is acceptable.³¹

2.2.1.4. Conclusions

Based on Origen's own testimony regarding his lack of expertise in Hebrew, his dependence on secondary sources for etymological meanings, and his heavy reliance on Greek translation and transcription instead of Hebrew, it is necessary to conclude that Origen lacked the requisite skill in Hebrew to compose the second column of the Hexapla himself. It is inconceivable that the same man who was able to vocalize the entire Hebrew Bible and devise a system of transcription for it could have made the sort of mistakes cited above. Even the idea that Origen merely transcribed what was dictated to him from an expert in Hebrew may be dismissed; the results of such a collaboration would be a much superior Hebrew knowledge than what is exemplified in Origen's writings and a much inferior system of transcription than what is exhibited in the Secunda.³² Therefore, barring new evidence that might come to light, it should be considered a fact that Origen did not compose the second column himself.³³

2.2.2. Nature and Extent of Origen's Hebrew Knowledge

The preceding section is sufficient to demonstrate that Origen was by no means an expert in Hebrew and could not have composed the second column himself. Nevertheless, it would not be correct to claim that he had no Hebrew knowledge at all. The present section will attempt

31. However, when Origen uses the same formula (ἡ λέξις ἡ + word) to discuss the Greek word ἐπιούσιον (in the phrase τὸν ἄρτον ἡμῶν τὸν ἐπιούσιον) in the Lord's prayer, he quotes the word without the article: ἡ λέξις ἡ ἐπιούσιον (*De oratione* 27.7.2).

32. Note that Jerome, who had a personal Hebrew teacher, exhibits a deep knowledge of Hebrew in numerous cases (GRAVES 2007). Also, the idea that someone unfamiliar with the language would transcribe it relatively consistently and sometimes even phonemically is unlikely on the basis of the principles of cross-language perception (see chapter 6).

33. This is the view of ELLIOTT (1877–1887, 855–59), KAHLE (1947), LIETZMANN (1950, 302), HANSON (1959, 167–75), and DE LANGE (1976, 21–23, 152–54).

to paint a picture of the nature and extent of Origen's Hebrew knowledge in terms of what he *did* know. A survey of the evidence demonstrates that Origen knew the Hebrew alphabet, knew many Hebrew words, had some grammatical knowledge of Hebrew, and used Hebrew text-critically.

2.2.2.1. Knowledge of the Alphabet

There are a number of pieces of evidence which suggest that Origen had learned the Hebrew alphabet (for the examples below, see ELLIOTT 1877–1887, 858; HANSON 1959, 170–71; DE LANGE 1976, 152–53). Although cited earlier to demonstrate that Origen relied on Greek translation and transcription, his comment that "*kaph* and *beth* maintain a great deal of similarity, such that they differ from each other in nothing but merely a small tittle"³⁴ (*Selecta in Psalmos*, 12.1068) points to familiarity with the alphabet. Also, in *Selecta in Psalmos* (12.1276.44–47), when discussing the phrase 'my savior' (σωτήρ μου) in the LXX (cf. 'my salvation' יְשׁוּעָה in the Hebrew), he states that "in this passage, in the Hebrew 'my savior', the name of our Savior Jesus Christ is written the way in which someone would write Jesus in Hebrew characters."³⁵ Origen seems to be connecting the root letters of יְשׁוּעָה with the same letters in the name of Jesus, spelled either ישוע or ישע during the Roman period.³⁶ Last, in *Fragmenta in Lucam* (221.1–4) and *Scholia in Lucam* (17.365.15–20), when discussing Jesus's famous saying about "one jot or tittle" (Matt. 5:18), he writes:

Not only among the Greeks is *iota* one tittle, but also among the Hebrews that which is called among them *ioth* [is one tittle]. And 'one *iota* or one tittle' may symbolically represent Jesus, since the beginning of his name, not only among the Greeks, but also among the Hebrews is written starting with *ioth*.³⁷

34. See footnote 22 for Greek text.

35. ἐν γὰρ τούτῳ τῷ Ἑβραϊκῷ τὸ σωτήρ μου, ὄνομα γέγραπται τοῦ Σωτῆρος ἡμῶν Ἰησοῦ Χριστοῦ. δι' ὧν ἅν τις τοῖς Ἑβραϊκοῖς χαρακτηῖσι γράψῃ τὸν Ἰησοῦν.

36. HANSON (1959, 171) wrongly argues that this passage reflects a mistake of Origen, assuming that the name of Jesus should be spelled ישעיה in Hebrew. However, HANSON seem to confuse the longer name ישעיה with its shorter variant ישוע common in the Second Temple Period. Moreover, in the Judaean Desert Texts, the short spelling of ישע for ישוע is common (MOR 2015, 79).

37. Μία κεραία οὐ παρ' Ἑλληνισι μόνον ἐστὶ τὸ ἰῶτα, ἀλλὰ καὶ παρ' Ἑβραίοις τὸ παρ' αὐτοῖς καλούμενον ἰῶθ. δύναται δὲ τὸ ἰῶτα ἐν ἡ μία κεραία συμβολικῶς λέγεσθαι ὁ Ἰησοῦς, ἐπεὶ περ ἡ ἀρχὴ τοῦ ὀνόματος αὐτοῦ οὐ παρ' Ἑλληνισι μόνον, ἀλλὰ καὶ παρ' Ἑβραίοις ἀπὸ τοῦ ἰῶθ γράφεται.

In *Selecta in Ezechielem* (13.800–01), when discussing why the Hebrew letter *taw* is to be put on the foreheads of those who are grieved by the sins of Jerusalem, he explains three Jewish interpretations, all of which are contingent on knowledge of the alphabet. First, because the *taw* is the last letter of the twenty-two letter Hebrew alphabet, it signifies the perfection of those who are grieved over the sins in the city. Second, it signifies those who have kept the law, because 'the law' (ὁ νόμος) is called 'Torah' (θωρα) in Hebrew, the first letter of which is *taw*. The third interpretation, which comes specifically from a Jewish Christian, states that in Paleo-Hebrew script (τὰ ἀρχαῖα στοιχεῖα) the *taw* resembles the form of the cross and is thus prophetic. It may seem far-fetched that a third-century CE Christian interpretation could depend on Paleo-Hebrew script, but Origen's comments on the *tetragrammaton* in his commentary on Psalms demonstrate that he was familiar with—or had at least heard about—Paleo-Hebrew script (*Selecta in Psalms*, 12.1104, see above).

Finally, in addition to the aforementioned examples, there are also a few places where Origen discusses the alphabet in relation to acrostic passages. In his opening remarks regarding Psalm 118/119, he points out that "it is written according to the letters of the Hebrews, so that the first verses of it are eight starting with *aleph*, which is the beginning of their alphabet, and the next eight start with *beth*, and thus in order" (*Selecta in Psalms*, 12.1585.38–42; *Fragmenta in Psalms 1–150*, 118p.1–8).³⁸ While it is true that even the Greek of the LXX indicates that Psalm 118/119 is a Hebrew acrostic, Origen comments on several other passages whose acrostic nature is not reflected in the Greek. In the same passage (*Selecta in Psalms*, 12.1585.49–53), when discussing the acrostic patterning in Psalms 111 and 112, Origen states that in those Psalms "the acrostic (στοιχείωσις) is not drawn out, but delivered

38. κατὰ Ἑβραίων στοιχεῖα γεγραμμένος, ὥστε τοὺς μὲν πρώτους αὐτοῦ στίχους εἶναι ὀκτὼ ἀπὸ τοῦ Ἄλεφ· ὃ ἐστὶν ἀρχὴ τῶν παρ' αὐτοῖς στοιχείων· τοὺς δὲ δευτέρους ὀκτὼ ἀπὸ Βῆθ, καὶ οὕτω καθ' ἑξῆς.

briefly."³⁹ Finally, in *Fragmenta in Lamentationes* (1.1–8), Origen provides a detailed description of the acrostic patterning of Lamentations.⁴⁰

In sum, while there is no doubt that Origen obtained some of his information about the alphabet (e.g., Paleo-Hebrew *taw*) from Jewish sources, the evidence suggests that Origen did indeed know the Hebrew letters. This does not necessarily mean that he could have read a Hebrew text, which would have required vocalization—in fact, there is evidence that such a task would have been difficult for him—but his recognition of Hebrew letters not conveyed in transcription (e.g., *ayin* in ע"י), his description of the shape of letters (e.g., *beth*, *kaf*, *yod*, *taw*), and his familiarity with the order of the alphabet (e.g., acrostics) seem to indicate that he had at least learned the alphabet.

2.2.2.2. Memorized Meanings and Etymologies

Beyond the alphabet, there is evidence that Origen knew the meaning of many Hebrew words and names (for the examples below, see ELLIOTT 1877–1887, 858; HANSON 1956; HANSON 1959, 166, 168, 170; DE LANGE 1976, 153). There are many instances in his writings where he will reference the Hebrew behind a Greek translation, such as Λευϊαθαν for δράκων (*Contra Celsum*, 6.25), Αζαζήλ for ἀποπομπᾶτος (*Contra Celsum*, 6.43), ις/ζαχαρ for ἀνὴρ/ἄρσεν (*Commentarium in evangelium Matthaei*, 14.16), and ἀνιη αρς for πρᾶεῖς τῆς γῆς (*Selecta in Psalmos*, 12.1060). It would be reasonable to assume that he used the text of the second column in such cases.⁴¹ There are also many instances in his writings where he will reference the

39. Ἐκεῖ μὲν οὖν ἡ στοιχειώσις οὐκ ἐκτέταται, ἀλλὰ διὰ βραχέων παραδέδοται.

40. Jeremiah ... laments, delineating several sections and distinct parts, which begin in the order of the Hebrew alphabet. And after completing the lamentation for every letter and on top of all of them the one beginning with *Taw*, which is the last letter of the Hebrews, he goes back to *aleph* and laments once again. This he does four times, proceeding through the twenty-two letters of the alphabet.

Ὁ Ἱερεμίας ... θρηνεῖ περικοπὰς τινὰς καὶ διαστολὰς περιγράφων ἀρχομένας ἐξῆς ἀπὸ τῶν παρ' Ἑβραίοις στοιχείων. καὶ μετὰ τὸ τελέσαι τὸν ἐφ' ἑκάστου στοιχείου Θρῆνον καὶ ἐπὶ πᾶσι τὸν ἀπὸ τοῦ Θαυ ἀρχόμενον, ὅπερ ἐστὶ τελευταῖον τῶν Ἑβραίων γράμμα, ἐπανέρχεται ἐπὶ τὸ Ἄλφ καὶ ἄλιν θρηνεῖ, καὶ τοῦτο ποιεῖ τετράκις τὰ εἴκοσι καὶ δύο στοιχεῖα ἐπεξιών.

41. HANSON argues that the sporadic instances of transcribed Hebrew in Origen's writings are his own creation (1959, 168). However, such transcriptions are generally consistent with the transcription system found in the Ambrosiana palimpsest. One possible exception could be the transcription βσαιμ ׀ψ׀ 'in the name of' in a quotation of Psalms 118:26 in Origen's commentary on Matthew (see below). The α/ε interchange common in contemporary Greek does not occur in the Ambrosiana palimpsest, where the word ׀ψ׀ 'name' is written with an

meaning of a Hebrew name, such as *transeuntes* 'those passing through' for *Hebraei* (*Homiliae in Librum Numerorum*, 19.4), θηρῶντες 'hunters' for Σιδων, ὁρῶν 'seeing one' for Ἀζαῦ (*Selecta in Genesim*, 12.117), and συνοχή 'distress' for Σόρ (*Commentarium in evangelium Matthaei*, 11.16) (for more, see HANSON 1956). HANSON has demonstrated that such etymological explanations derive from Jewish sources (1956). Finally, there are at least a couple instances where Origen provides a Greek explanation of a Hebrew word that is transcribed into Greek, even in the translation, such as γένοιτο for Ἀμήν (*Fragmenta in evangelium Joannis*, 120) and ἀντικείμενος for σατανᾶς (*Commentarium in evangelium Matthaei*, 12.21). It is possible that such instances reflect a slightly more internalized knowledge of Hebrew, gained neither through the text of the second column nor the etymological lists.

In sum, even though most of this material is likely derived from secondary textual sources, there is no doubt that someone with as brilliant a mind and as superb a memory as Origen (HANSON 1959, 182) would have been able to recall much of this information and apply it in different contexts. The process of consulting different textual and human sources for the amount of Hebrew material contained in Origen's writings would have been a process through which Origen learned a great deal.

2.2.2.3. Grammatical Understanding

While there is plenty of evidence that Origen knew the alphabet and meanings of words, only two passages point to a more sophisticated *grammatical* knowledge (for the examples below, see HANSON 1959, 167, 172). In *Homiliae in Librum Numerorum* (12.724.15–25), when discussing the presumably awkward use of the conjunction 'and' (καί) in the LXX translation of Numbers 24:21 ('and having seen the Kenite and having taken up his parable, he said' [καὶ ἰδὼν τὸν Καίναϊον καὶ ἀναλαβὼν τὴν παραβολὴν αὐτοῦ εἶπεν]), he writes:

It seems reasonable, according to the explanation which we delivered about the Kenite, that the conjunction 'and' disrupts the sense. But it should be known that it is natural for the Hebrew language to use the conjunction 'and'

epsilon (σεμ). On the other hand, Origen's transcription σελ (for סֵל) strongly supports the idea that he was quoting the second column (see footnote 56).

frequently, so that when it sometimes is excessive, and in those places in which it is not necessary, as it would seem in our language, it would seem thrust in: which should in any case be admitted with pardon. For each and every language has a particular characteristic, which would seem faulty in other languages. And in this place, then, the conjunction 'and' ought to be regarded as excessive and superfluous.⁴²

This passage does not necessarily demonstrate that Origen had a sophisticated understanding of the syntax of the conjunction *waw* in Hebrew, but merely that he was sensitive to the fact that the Hebrew use of the conjunction differed from that of Greek.

In *Philocalia* (14.1.6–32), Origen's comments regarding how different Greek translations render "nouns" (προσηγορία) and "predicates" (κατηγορήματα) in Genesis 1:16–17 may reflect a more sophisticated understanding of the language. His comments focus on the difference between the phrases לְמַשְׁלָת הַיּוֹם/הַלַּיְלָה 'for rule of the day/night' and לְמַשֵּׁל בַּיּוֹם 'to rule the day and the night'. He writes the following:

And it should be investigated if 'for rule of the day' is the same as 'and to rule the day' and 'for rule of the night' as ... 'and to rule the night'. For Aquila also preserved the parallel, having made it 'for authority' instead of 'for rule' and 'to exercise authority' instead of 'and to rule' ... Aquila, who was ambitious to translate most literally, has done no less than [distinguishing] the noun and the predicate [forms].⁴³

It is unclear from the passage if Origen actually understood the underlying Hebrew or if he was merely relying on translations. The fact that Origen regards Aquila to have "preserved the parallel" supports the idea that Origen was aware of this difference in the Hebrew text; this would reflect a somewhat sophisticated grammatical understanding of Hebrew. On the other hand, the belief that Aquila translated the Hebrew literally here does not necessarily mean that Origen was able to discern this grammatical feature in the Hebrew text himself. It

42. *Videtur sane secundum hanc expositionem quam de Cineo edidimus, et conjunctio inturbare sensum. Sed sciendum est, quod vernaculum est Hebraeae linguae et conjunctione frequenter uti, ita ut interdum abundet, et in non necessariis, ut in nostra apparet lingua, videatur inserta: quod utique cum venia accipiendum est. Habet enim unaquaeque lingua aliquid proprietatis, quod apud alias linguas vitiosum videatur. Et hic ergo, et conjunctio quasi abundans habenda est, et superflua.*

43. ζητητέον δὲ εἰ ταῦτόν ἐστι τό· εἰς ἀρχὰς τῆς ἡμέρας τῷ· καὶ ἄρχειν τῆς ἡμέρας· καὶ τό· εἰς ἀρχὰς τῆς νυκτός τῷ ... καὶ ἄρχειν τῆς νυκτός. καὶ ὁ Ἀκύλας γὰρ τὸ ἀνάλογον ἐτήρησε, ποιήσας ἀντὶ μὲν τοῦ εἰς ἀρχὰς, εἰς ἐξουσίαν· ἀντὶ δὲ τοῦ καὶ ἄρχειν, ἐξουσιάζειν ... ὁ κυριώτατα ἐρμηνεύειν φιλοτιμούμενος Ἀκύλας οὐκ ἄλλο πεποίηκε παρὰ τὴν προσηγορίαν καὶ τὸ κατηγορημα.

is quite possible that, due to his high esteem for Aquila and his reputation as the most literal translator, Origen simply assumed that such a conspicuous translation choice would not have been arbitrary.

In sum, Origen's discussion regarding the conjunction *waw* and the distinction between "nouns" and "predicates" in the Genesis passage would support the idea that Origen's knowledge of the language extended beyond the alphabet and etymologies into the realm of grammar. It is striking, though, that there are so few examples of Hebrew grammatical comments in Origen's writings. The relative paucity of such examples, in light of Origen's facility in discussing Greek grammar, points to a very limited knowledge of Hebrew grammar for Origen.

2.2.2.4. Comparing Greek Translations with Hebrew

There are a number of passages in which Origen appears to be able to intelligently compare the Greek translations to the Hebrew, sometimes correcting the Greek and sometimes merely citing the differences (for the examples below, see HANSON 1959, 164–66, 172–75).

In *Selecta in Psalmos* (12.1168.4–14), when discussing the phrase 'from the fruit of grain' (ἀπὸ καρποῦ σίτου) in the Greek translation of Psalms 4:8, Origen argues correctly that the Hebrew has 'from the time [of the grain]' (ἀπὸ καιροῦ) (cf. מִיָּמֵי תְעוּבָה).⁴⁴ In the same book (12.1116.44–48), when discussing the phrase 'from the *right* way' in the LXX translation of Psalms 2:12, he rightly claims that "[the word *right*] is not added to the noun, neither in the Hebrew nor in the other translations" and that perhaps "the manuscripts [of the LXX] have erred."⁴⁵ In *Commentarii in evangelium Joannis* (6.6.7–10), Origen argues that the phrase 'the Lord is just and has loved righteousness' (δίκαιος κύριος, καὶ δικαιοσύνας ἠγάπησεν) in the Greek translation of Psalms 11:7 is a justified reading because "[he] found it thus in the accu-

44. Aquila, Symmachus, and Theodotion all have ἀπὸ καιροῦ (FIELD 1875, 91).

45. οὔτε ἐν τῷ Ἑβραϊκῷ πρόσκειται, οὔτε ἐν ταῖς λοιπαῖς ἐρμηνείαις τὸ, δικαίας ... μήποτε ... τὰ ἀντίγραφα ἡμάρτηται. He also admits the possibility of the LXX translators making the change according to a "divine device" (κατ' οἰκονομίαν) (HANSON 1959, 164).

rate manuscripts, in the rest of the versions besides the Seventy, *and in the Hebrew*."⁴⁶ Elsewhere in the same book (10.40.282–83), when using the structure of the temple to make a spiritual application, he claims that the translators did not know the meaning of the word *dabir* (δαβειρ) and that others wrongly conflated it with the temple:

The two *cherubim* were in the *dabir* (δαβειρ), which those who translated the Hebrew into the Greek have not been able to interpret correctly. But through a misuse of language some have said that the thing which happens to be more precious than the temple (i.e., the *dabir*) is the temple itself.⁴⁷

In *Contra Celsum* (5.48.15–18), when discussing the phrase 'the blood of the circumcision of my child stayed' (ἔστη τὸ αἷμα τῆς περιτομῆς τοῦ παιδίου μου) in the LXX translation of Exodus 4:25, Origen writes that "according to the Hebrew itself" (κατὰ δὲ τὸ ἑβραϊκὸν αὐτό), the reading is 'you are a bridegroom of blood to me' (Νυμφίος αἱμάτων σύ μοι).⁴⁸

Even though Origen often cites "the Hebrew" as supporting evidence for a given reading (often against the reading of the LXX), it is possible that he is merely trusting that certain translators, known for their faithfulness to the Hebrew like Aquila, have accurately represented the Hebrew. This may be hinted at in a passage in *Commentarii in evangelium Joannis* (6.41.212), in which Origen discusses the mistakes in proper names in Greek manuscripts used by Christians:

And it is possible to see the same type of mistake in many places in the Law and the Prophets, as we have verified by learning from Hebrews and comparing our manuscripts to theirs, **which are witnessed by the never-yet-distorted versions of Aquila and Theodotion and Symmachus**.⁴⁹

46. οὕτω γὰρ ἐν τοῖς ἀκριβέσιν ἀντιγράφοις εὔρομεν καὶ ταῖς λοιπαῖς παρὰ τοὺς ἐβδομήκοντα ἐκδόσεσι καὶ τῷ Ἑβραϊκῷ.

47. Τὰ μέντοι δύο χερουβειμ ἐν τῷ δαβειρ ἦν, ὅπερ οὐ δεδύνηται ἐρμηνεῦσαι κυρίως οἱ μεταλαμβάνοντες εἰς Ἑλληνισμὸν τὰ Ἑβραίων. Καταχρηστικώτερον δέ τινες ναὸν αὐτὸν εἰρήκασιν τοῦ ναοῦ τιμιώτερον τυγχάνοντα.

48. It is difficult to determine if Origen's comment was based on an understanding of the Hebrew or on a particular translation. This verse is variously attested among the versions (FIELD 1875, 85–86): *Symmachus*: νυμφίος αἱμάτων σύ μοι. *Theodotion*: νυμφίος αἱμάτων σύ μοι. *Τὸ Ἑβραϊκόν*: νυμφίος αἵματος σύ μοι. *Aquila and Theodotion* (Syro-Hexapla): νυμφίον αἵματος ἔχω. *ὁ Ἑβραῖος*: ἐσφράγισε τὸ αἷμα τῆς περιτομῆς.

49. Τὸ δ' ὅμοιον περὶ τὰ ὀνόματα σφάλμα πολλαχού τοῦ νόμου καὶ τῶν προφητῶν ἔστιν ἰδεῖν, ὥς ἡκριβώσαμεν ἀπὸ Ἑβραίων μαθόντες, καὶ τοῖς ἀντιγράφοις αὐτῶν τὰ ἡμέτερα συγκρίναντες, μαρτυρηθεῖσιν ὑπὸ τῶν μηδέπω διαστραφειῶν ἐκδόσεων Ἀκύλου καὶ Θεοδοτίωνος καὶ Συμμάχου.

This passage may be interpreted to mean that Origen regarded the versions of Aquila, Theodotion, and Symmachus as accurately reflecting the Hebrew text of the Jews. Accordingly, it ought to be considered that, if the other versions represented a consensus, Origen might have regarded them as accurately reflecting the Hebrew without needing to check it himself.⁵⁰ After all, in *Epistula ad Africanum* (11.52.21–24), Origen says that Aquila "is believed by the Jews to have translated the Scripture most zealously, whom those who do not know the Hebrew language are especially accustomed to use, as he is more successful than all"⁵¹ (cf. HANSON 1959, 172).⁵² It is possible that this high esteem for Aquila may have even misled Origen at times.⁵³ In *Homiliae in Canticum Canticorum* (13.50.43–46), when comparing the translation of the LXX and Aquila for the word פְּיָיִךְ 'your calamity' in Proverbs 27:10, Origen argues that "instead of that which the Septuagint interprets as 'unfortunate' (*infelix*), Aquila, expressing the actual Hebrew, has placed 'rustic' (ἀγροικός)."⁵⁴ Unless Aquila and Origen were dealing with another Hebrew text, the LXX has the better translation here.⁵⁵

However, there is also evidence that Origen was indeed able to compare the Hebrew and Greek columns successfully. In *Commentarium in evangelium Matthaei* (16.19.72–86),

50. See Origen's statement in *In Jeremiam* (14.3.4–5): "for in most manuscripts ... but in the most accurate manuscripts and [those which] agree with the Hebrew ..." (HANSON 1959, 175).

51. φιλοτιμότερον πεπιστευμένους παρὰ Ἰουδαίοις ἡρμηνευκέναι τὴν Γραφήν· ὃ μάλιστα εἰώθασιν οἱ ἀγνοοῦντες τὴν Ἑβραίων διάλεκτον χρῆσθαι, ὡς πάντων μᾶλλον ἐπιτετευγμένον.

52. HANSON entirely misses the point of this statement by Origen, mistranslating the phrase 'those who do not know the Hebrew language' (οἱ ἀγνοοῦντες τὴν Ἑβραίων διάλεκτον) as 'those who know the Hebrew language' (1959, 172).

53. HANSON notes that Origen uses Aquila's translation to correct the Hebrew text and the translation of the LXX for Genesis 2:4 (1959, 172).

54. *Pro eo quod Septuaginta, infelix, interpretati sunt, Aquila Hebraeam exprimens veritatem ἀγροικός posuit.*

55. Another example of this is found in Origen's comments (*Selecta in Psalmos*, 12.1064.32–39) on the various renderings of the Hebrew superscription of Psalm 45 (עַל-שִׁלְשִׁימִים 'on the lilies'). Aquila has 'on the lilies' (ἐπὶ τοῖς κρίνοις) and Symmachus has 'about the flowers' (περὶ τῶν ἁνθεων). While Origen claims that the original Hebrew means either 'concerning the lilies' or 'concerning the flowers', he argues that the LXX translation fits with the others because the appearance of flowers changes quickly (HANSON 1959, 173). However, it is worth noting that the LXX rendering may be the result of the translator associating it with the root שָׁנָה 'to change'.

when discussing the reason why the quotation of Psalms 118:25–26 in Matthew 21:9 seems to skip over a line, Origen writes:

And it seems to me that the [phrase] that has been placed instead of, 'O Lord, please save', namely, 'Blessed is the one who comes in the name of the Lord', is referenced in Hebrew in the phrase, 'Hosanna to the son of David'. And so the Hebrew text also has, 'ANNA ADONAI, OSIANNA, ANNA ADONAI, ASLIANNA, BAROUCH ABBA BSAIM ADONAI'. It seems to me, then, that the gospels, being copied continually by the Greeks, who did not know the language, became commingled with respect to the placement of these [words quoted] from the aforementioned psalm.⁵⁶

Origen further supports his argument by appealing to Aquila's translation (16.19.86–91). Even though he was helped by Greek translations, this passage demonstrates that Origen was able to coordinate and compare the Greek translations with the Greek transcription of the second column in order to elucidate text-critical issues.

In sum, a survey of these texts demonstrates that Origen was capable of utilizing Hebrew in his text-critical discussions, even to the point of evaluating the accuracy of the Greek translations. However, these passages also show that his access to the Hebrew may have largely depended on his utilization of those translations that he regarded as particularly faithful to the original Hebrew.

2.2.3. Origen's Use of the Secunda and the Purpose of Including It in the Hexapla

Up to this point, it has been demonstrated that even though Origen lacked the Hebrew skill necessary to compose the Secunda himself, he did know Hebrew to some degree. Nevertheless, even though Origen did not compose the second column himself, it is clear that he interacted with it in his writings and study. It is fitting, then, to conclude this section on Origen's Hebrew knowledge with a couple examples that illustrate how Origen used the text of the second column.

56. δοκεῖ δέ μοι τὰ ἀντὶ τοῦ ὧ κύριε, σῶσον δὴ προτεταγμένα τοῦ εὐλογημένος ὁ ἐρχόμενος ἐν ὀνόματι κυρίου ἐβραϊκῶς ἐκκεῖσθαι ἐν τῷ ὡσαννὰ τῷ υἱῷ Δαυὶδ οὕτω δὲ καὶ εἶχεν ἡ ἐβραϊκὴ λέξις ANNA ΑΔΩΝΑΙ ΩΣΙΑΝΝΑ, ANNA ΑΔΩΝΑΙ ΑΣΛΙΑΝΝΑ, ΒΑΡΟΥΧ ΑΒΒΑ ΒΣΑΙΜ ΑΔΩΝΑΙ. εἴτα δοκεῖ μοι ὑπὸ Ἑλλήνων συνεχῶς γραφόμενα τὰ εὐαγγέλια μὴ εἰδόντων τὴν διάλεκτον, συγκεχύσθαι ἐν τοῖς κατὰ τὸν τόπον ἔχουσι ταῦτα ἀπὸ τοῦ προειρημένου Ψαλμοῦ.

For the first example, we may return to a passage examined above from *Epistula ad Africanum* (11.77), in which Origen's comments on the terms for 'man' and 'woman' seem to betray his *modus operandi* with the text of the second column:

The Hebrews say that the woman was called *essa* and that 'I took' is made clear from the word, as is evident from the [verse], '*Chos isouot essa*', which is translated as, 'I will take up the cup of salvation'. And the man is *is*, as is apparent from the [verse], '*Esre ais*', which is, 'Blessed is the man'.⁵⁷

In each example, Origen proves the meaning of a transcribed Hebrew word by citing an instance of that same transcription elsewhere in the Bible along with its translation into Greek. In the case of εσσα π̣שָׁא, this actually leads Origen to erroneously associate it with the verb λαμβάνω, which would have been on the same line as εσσα נ̣שָׂא in the Hexapla for Psalms 116:13. In the case of ις ψ̣א, Origen correctly associates it with the transcription ἄις ψ̣א, which would have been on the same line as ὁ ἀνὴρ in the Hexapla for Psalms 1:1. If these passages are representative of Origen's *modus operandi*, it seems that he learned the meaning of transcribed Hebrew words by comparing multiple instances of the same transcription with their various Greek translations in parallel lines of the Hexapla. It is worth noting that *Epistula ad Africanum* is likely dated after the completion of the Hexapla (HANSON 1954, 26).

The second example is even more telling than the first. In *Selecta in Psalmos* (12.1057.42–48), when discussing the phrase διάψαλμα in the Greek translation of the Psalms, Origen writes:

Having frequently searched for the reason that *diapsalma* was inscribed/subscribed between the psalms, **at last having made a close examination of the Hebrew (τῷ Ἑβραϊκῷ) and examining the Greek alongside it**, I found that where the Hebrew (τὸ Ἑβραϊστὶ) has *sel* (σέλ) and the Greek has *aei* or something equivalent to it, there the Seventy, Thedotion, and Symmachos assigned *diapsalma*.⁵⁸

57. Φασὶ δὲ οἱ Ἑβραῖοι ἐσσά μὲν καλεῖσθαι τὴν γυναῖκα· δηλοῦσθαι δὲ ἀπὸ τῆς λέξεως τὸ ἔλαβον, ὡς δῆλον ἐκ τοῦ· Χῶς ἰσουὼθ ἐσσά, ὅπερ ἐρμηνεύεται· ἵς δὲ τὸν ἄνδρα, ὡς φανερόν ἐκ τοῦ· Ἑσρὴ αἴς, ὅπερ ἐστὶ· Μακάριος ἀνὴρ.

58. Πολλάκις ζητήσας τὴν αἰτίαν τοῦ ἐπιγράφεσθαι μετὰ τῶν ψαλμῶν διάψαλμα, ὕστερον παρατηρήσας ἐν τῷ Ἑβραϊκῷ, καὶ συνεξετάζων αὐτῷ τὸ Ἑλληνικόν, εὔρον, ὅτι ὅπου τὸ Ἑβραϊστὶ σέλ, Ἑλληνιστὶ δὲ αἰ, ἢ τι τοῦτω ἰσοδυναμοῦν, ἐκεῖ οἱ Ἑβδομήκοντα, καὶ Θεοδοτίων, καὶ Σύμμαχος ἔταξαν τὸ διάψαλμα.

Origen then goes on to illustrate this point by citing the various correspondences of διάψαλμα and σελ in Psalms 75 and 76 (*Selecta in Psalmos*, 12.1057.48–12.1060.35).

This passage should remove any doubt as to whether or not Origen himself composed the Hexapla for a couple of reasons. First, the fact that Origen transcribes Hebrew הָלַל as σελ makes it clear that his reference to "the Hebrew" (τὸ Ἑβραϊκόν) in this passage refers to the text of the second column.⁵⁹ Second, this passage demonstrates that Origen was ignorant of the solution to his philological problem until he was able to examine "the Hebrew" (τὸ Ἑβραϊκόν). It is highly unlikely that someone who had transcribed the Hebrew of Psalms into Greek would have been unfamiliar with the word הָלַל, which appears 72 times in the book. Origen's need to examine the text demonstrates both that he did not compose it himself and that he was in possession of a text that could help him.

What emerges from this passage is a clear picture of how Origen used the various texts that were before him, whether they had yet been compiled into the form of the Hexapla at this time or not. Origen, who was most familiar with the LXX, noticed that the unusual word διάψαλμα, presumably innovated by the LXX translators, occasionally intervened in the text of the Psalms. As he was accustomed to do, he attempted to find some correlation between διάψαλμα and the parallel renderings in the other Greek translations. However, such a comparison was unsuccessful for a couple of reasons. First, while the alternative renderings of the other versions such as ἀεί 'evermore' and εἰς τ(ὸν) αἰῶνα 'forever' might be used to translate other words and phrases, διάψαλμα is only used to translate Hebrew הָלַל. Second, while the LXX always renders הָלַל as διάψαλμα (HATCH and REDPATH 1897, 316), the other versions are not as consistent. For example, while Aquila usually translates הָלַל as ἀεί (HATCH

59. Hebrew הָלַל is normally transcribed as σελ in the Ambrosiana palimpsest (Ps. 46:4, 8, 12; 49:14; 89:38, 46, 49) and only once as σελα (Ps. 32:7). The fact that a short form of הָלַל (i.e., σελ) is attested in no Hebrew text other than the second column makes it highly likely that Origen is referring to the text of the second column here. However, in Theodotion's translation of Psalm 89 as attested in the Ambrosiana palimpsest, הָלַל is regularly rendered as |ἀεί σελ| (Ps. 89:38, 47, 49). In the Quinta, הָלַל is transcribed as σελα in Habakkuk 3:3 (HATCH and REDPATH 1897, 1262).

and REDPATH 1897, 28), in Psalms 39:12 he translates it as ᾠσμα 'song' (FIELD 1875, 149). Therefore, had Origen relied solely on the Greek translations to elucidate the word διάψαλμα in the LXX, he would not have been able to find a consistent correspondence. Finding the Greek translations insufficient, Origen finally took recourse to the text of the second column, where he found that διάψαλμα in the LXX consistently corresponded with Hebrew σελ.

We may assume that Origen's *use* of the Secunda was consistent with his *motivations* and *purposes* for including it in the Hexapla. From a survey of how Origen uses the Hexapla in his writings, and especially in the examples cited here, emerge two primary purposes.

First, the second column served Origen as a concordance in his text-critical work in a way that neither the Greek versions nor the Hebrew consonantal text could. Origen was accustomed to compare the various Greek versions word-by-word when dealing with a passage textually, sometimes comparing other passages in which the same Greek word appears. That Origen did this without direct reference to the Hebrew is demonstrated by his text-critical use of the Greek versions in the early part of his commentary on Psalms, dated to his time in Alexandria (CLEMENTS 1997, 97–99). However, as the discussion regarding *selah* demonstrates, such a method had its limits. If Origen wanted to trace the occurrence of a particular word throughout the scriptures, he would only be successful if the translations were consistent. When they were not, seeking out a particular pattern would be a fruitless endeavor. For these sorts of issues, he needed to reference the original. His lack of facility in vocalizing Hebrew would have made the Hebrew consonantal text too difficult and ambiguous for such a purpose. The solution was found in the text of the second column. Rather than get lost in the potentially inconsistent renderings of the Greek versions, the second column functioned as a "key" for tracing certain words through the scriptures. By using the second column in this way, Origen was able to keep his primary focus on the Greek translations, where he was comfortable, but established a method by which his efforts would not lead to false assertions inconsistent with the Hebrew. For the sake of illustration, Origen's work with the Tetrapla in

Alexandria might be compared to one using four English translations of the Bible each with its own corresponding English concordance. Origen's work with the second column alongside the Greek versions in Caesarea might be compared to one using four English translations of the Bible, but with a keyed-to-Hebrew concordance for each of them. Clearly, the second circumstance would be far more helpful when comparing textual variants.

Second, the text of the Secunda provided Origen with one more source for increasing his Hebrew knowledge. By constantly comparing the transcribed words in the second column with their various translations in the Greek versions, Origen was able to add to his Hebrew vocabulary. Moreover, it seems that Origen was aware that some words could be translated in different ways and thus it was important to compare multiple passages before concluding that a particular (transcribed) Hebrew word could be matched with a corresponding Greek word (e.g., see the discussion regarding ἄνθρωπος 'man' and Ἐσθὴρ ἁγία 'blessed is the man').

2.2.4. Conclusions: A Portrait of Origen the Hebrew Scholar

Having thoroughly investigated the evidence for Origen's Hebrew knowledge, we may now paint a portrait of the early church father *qua* Hebrew scholar. To begin, it is necessary to see Origen as a lifelong *student* of Hebrew. He constantly built upon his limited knowledge of Hebrew in two ways. First, he made use of Jewish sources, interacting with both written texts and human interlocutors. Through such interaction, he encountered etymological name lists, heard exegetical nuggets on a variety of passages, and learned other tidbits regarding the Hebrew language. This resulted in a knowledge of Hebrew that was rather piecemeal, largely dependent on the information he received from those whom he readily accepted as more expert in the Hebrew language than himself. Second, Origen seems to have used the text of the second column and the other translations of the Hexapla as a study tool for growing in his knowledge of Hebrew. Origen interacted with the texts of the Hexapla, and especially the second column, as if he were building a keyed-to-Hebrew concordance in his head. There is

no doubt that his long hours working with the Hexapla would have, at the very least, helped him to build his Hebrew vocabulary and gain a sense of the usage of the language.

The actual objects of Origen's Hebrew knowledge may be described in a few parts. First, it seems that Origen had taken the time to learn the Hebrew alphabet, but did not go far enough with the language to be comfortable reading the unvocalized script without errors. Rather, he preferred to access the Hebrew through a comparison of the Greek translations (especially Aquila) and the transcribed Hebrew in the second column.⁶⁰ Second, through the information he gleaned from Jewish interlocutors, the etymological name lists, and the text of the second column, Origen knew many Hebrew words. While there is some evidence that Origen had some basic knowledge of Hebrew grammar, his knowledge of Hebrew was essentially a lexical one; that is, his knowledge of the language consisted primarily of knowing Greek-Hebrew correspondences in both directions. With the help of the Greek translations and the second column, Origen had enough of a working knowledge of the language and its grammar to engage Hebrew in his text-critical and commentary work, yet not without mistakes.

The passages examined above paint Origen as a very resourceful scholar with a phenomenal memory and a brilliant mind, but one who did not have the sort of familiarity with Hebrew to compose the second column himself. Rather, he utilized it as a tool for his textual and exegetical work. If one does not begin with the assumption that Origen knew Hebrew well (*contra* Eusebius and Jerome) and instead regards him as a theologian using various tools at his disposal to learn Hebrew, his achievements are impressive. He was a scholar who made excellent use of the resources he had, even using, it seems, the Greek transcription text of the second column to help him discover new aspects of the Hebrew language. Nevertheless, his significant relationship with the second column, though an important part of his writ-

60. In fact, as DE LANGE writes, "τὸ Ἑβραϊκόν frequently, if not always, refers to the second, not the first, column of the Hexapla" (1976, 153).

ings, cannot be conceived of as one of authorship. Origen did indeed labor long hours over the second column of the Hexapla—not as its author, but as its student.

2.3. THE SECUNDA AND THE COMPOSITIONAL HISTORY OF THE HEXAPLA

2.3.1. Origen and the Secunda in Caesarea

If Origen did not compose the text of the second column himself, he either commissioned others more expert in Hebrew than himself for the task (see section 4) or made use of an already existing text. In order to determine which of these two alternatives is more likely, it is first necessary to understand how the first two columns fit into the overall process of the composition of the Hexapla.

While there is scholarly consensus that Origen *completed* the Hexapla after he relocated from Alexandria to Caesarea in 233 CE (CROUZEL 1985; CLEMENTS 2000, 341; GRAFTON and WILLIAMS 2006, 17), there is debate about how and when the process of composition began. In order to spare a full review of scholarship on this issue, which is beyond the scope of the present work, it will suffice to say that the most convincing argument yet put forth is that of CLEMENTS (1997, 2000). According to her, Origen first compiled the Tetrapla (i.e., Aquila, Symmachus, LXX, and Theodotion in four parallel columns) in Alexandria. Later, after Origen relocated to Caesarea and came into contact with new Jewish sources, he added the two Hebrew columns to make the Hexapla. Some of Origen's assistants must have been skilled enough in Hebrew to correlate the Hebrew columns with the Greek translations when they were added (CLEMENTS 1997, 96–100).

Such an explanation facilitates a more persuasive argument regarding the columnar order of the Hexapla, which has proved difficult for many scholars who have attempted to explain it (e.g., ORLINSKY 1936). For CLEMENTS, when Origen refers to "our copies" and the "Hebrew copies" or "those of the Jews" in *Epistula ad Africanum*, he is actually distinguishing between the different Greek translations of the Tetrapla. The LXX and Theodotion, which exhibit textual similarity, were considered more "Christian" translations. Aquila and Sym-

machus, which were based on the Masoretic Text, were considered more "Jewish" versions. Having Aquila and Symmachus next to each other to the left of the LXX allowed Origen to treat them as a pair to determine the more "Jewish" reading to which the LXX might be compared. Having Theodotion to the right of the LXX allowed Origen to compare the LXX with the translation most closely related to it textually (CLEMENTS 1997, 93–94, 96–97).

CLEMENTS is correct to dismiss the claim of NAUTIN (1977, 333–43), who argues that Origen acquired the text of the second column as a liturgical text from the Greek-speaking Jews in Alexandria. This is unlikely for a couple reasons. First, unless the sages of Palestine exerted significant influence over the Alexandrian Jews and compelled them to read the scriptures in Hebrew, we may assume that the scriptures would have continued to be read in Greek in Alexandria. Second, in the wake of the rebellion in 117 CE, it is unlikely that a significant Jewish community had once again developed in Egypt by the beginning of the third century CE (CLEMENTS 1997, 95–96; GRAFTON and WILLIAMS 2006, 111).

On the other hand, there *are* good reasons for postulating that the addition of the Hebrew columns to the Hexapla took place during Origen's time in Caesarea. First, unlike Alexandria, Caesarea came to house a significant Jewish community by the end of the second century CE. Out of this Jewish community would emerge one of the most significant rabbinic schools of Palestine in the third century CE. Second, it is in Origen's writings dated to his time in Caesarea that references to discussions with Jewish interlocutors increase. The constant debates between Christians and Jews would have motivated both groups to examine and compare their scriptures more thoroughly (e.g., see *b⁶Avoda Zara* 4a). Third, and finally, given the Jewish scholarly presence there, it is more likely that a text like the Secunda would have developed in Caesarea than in Alexandria (MURRAY 2000; GRAFTON and WILLIAMS 2006, 111; see also section 3.4.4 on the "Rabbis of Caesarea").

2.3.2. Did Origen Commission the Second Column?

It is entirely possible that Origen commissioned Hebrew experts to compose the text of the second column during his time in Caesarea. The best argument in favor of this is the sheer extent of the Secunda. Although only a very small fraction of it has survived until modern times, it is assumed that at one point it constituted a Greek transcription of the entire Hebrew Bible.⁶¹ A text-critical endeavor focused on comparing every variant would naturally compel a comprehensive treatment of the material.⁶² Moreover, the fact that Origen tends to use the second column as a sort of working concordance, as shown above, further supports this idea.

On the other hand, it is more likely that Origen obtained a pre-existing text for the following reasons: First, the general consistency of the transcription conventions of the Secunda should not be taken for granted. It is by no means guaranteed that such a consistent transcription system should emerge out of a first attempt at transcribing the biblical text (cf. BRØNNO 1943, 7). Second, every other text found in the Hexapla was a pre-existing text that Origen had collected. Third, neither in Origen's writings nor in any of the ancient accounts about the composition of the Hexapla is there ever a mention of Origen composing the second column or commissioning others to do so. In fact, if anything, their descriptions of the work support the idea that he obtained the text from another source. These accounts will be examined in more detail in the following section.

2.3.3. Early Church Fathers on the Hexapla

References to Origen's text-critical work and composition of the Hexapla are found in a number of church fathers' writings. In addition to his own comments in *Epistula ad Africanum*,

61. Quotations of the Secunda in the church fathers include the following biblical books: Genesis, Exodus, Leviticus, Numbers, 1 Samuel, 1 Kings, 2 Kings, Isaiah, Jeremiah, Ezekiel, Hosea, Malachi, Psalms, Proverbs, Lamentations. Moreover, in the descriptions of the Hexapla in the early church fathers, who made a point to describe features peculiar to certain books (e.g., extra translations in Psalms), it is nowhere mentioned that the second column was incomplete.

62. CLEMENTS (1997, 95) argues that only the transliteration of "key terms" would be necessary if the second column was primarily to be a text-critical tool. However, such a position presumes the text-critical work has already been done. If Origen had difficulty accessing the Hebrew consonantal text, a transcription of the entire Hebrew Bible really would have been necessary for him to compare every textual variant.

descriptions of his work are found in Eusebius, Jerome, Epiphanius, and Rufinus. Because of the relevance of these ancient accounts for the present and upcoming discussion, the passages are quoted below (phrases related to compositional history in bold):⁶³

Origen: And I say these things not because I shrink from also investigating the Jewish scriptures, and **comparing all our scriptures with theirs**, and seeing the differences in them ... this we have already done to a high degree as far as possible, investigating the sense in all the versions and their variants ...⁶⁴

Eusebius: So great an exacting study of the divine words was introduced to Origen, that he thoroughly learned the Hebrew language, **and acquired as his own possession** the original scriptures held by the Jews in the very letters of the Hebrews. And he tracked down the versions of the others who had translated the Holy Scriptures besides the Seventy ... and **having gathered them all together** into the same [book], and **having divided them by phrase** and **having set them opposite each other** along with the Hebrew writing itself, left us with manuscripts of that which is called the Hexapla.⁶⁵

Jerome: It was our concern to correct all the books of the old law, **which the learned man Adamantius (i.e., Origen) had arranged (digesserat)**, copied from the library of Caesarea, from the original [copies] themselves, in which even the Hebrew words themselves are copied in their very own characters: and with Greek letters expressed in the nearby column. Aquila also, and Symmachus, the Septuagint as well as Theodotion, [each] hold their own order.⁶⁶

Epiphanius (Panarion): Ambrose provided [Origen], the shorthand writers, and his assistants with food, along with papyrus and the other costs. Origen, through sleepless nights and greatest deprivation completed the task of writing. First, **he was eager to carefully gather and set forth** the books of the six, Aquila, Symmachus, that

63. Except for the final text of Epiphanius, these texts are found in GRAFTON and WILLIAMS 2006, 89–95, 316–20. All translations are my own, but they are made in consultation with those of GRAFTON and WILLIAMS.

64. *Epistula ad Africanum* (11.60.9–15): Καὶ ταῦτα δὲ φημι οὐχὶ ὄκνη τοῦ ἐρευνᾶν καὶ τὰς κατὰ Ἰουδαίους Γραφάς, **καὶ πάσας τὰς ἡμετέρας ταῖς ἐκείνων συγκρίνειν**, καὶ ὁρᾶν τὰς ἐν αὐταῖς διαφοράς ... ἐπὶ πολὺ τοῦτο, ὅση δύναμις, πεποιήκαμεν, γυμνάζοντες αὐτῶν τὸν νοῦν ἐν πάσαις ταῖς ἐκδόσεσι καὶ ταῖς διαφοραῖς αὐτῶν. It is not clear if Origen is referring directly to the Hexapla here, but presumably he had completed the work of the Hexapla before writing this letter (HANSON 1954, 26).

65. *Historia ecclesiastica* (6.16.1, 6.16.4): Τοσαύτη δὲ εἰσήγετο τῷ Ὀριγέει τῶν θείων λόγων ἀπηκριβωμένη ἐξέτασις ὥς καὶ τὴν Ἑβραῖδα γλῶτταν ἐκμαθεῖν τὰς τε παρὰ τοῖς Ἰουδαίοις ἐμφορομένας πρωτοτύπους αὐτοῖς Ἑβραίων στοιχείοις Γραφάς **κτῆμα ἴδιον ποιήσασθαι**. ἀνιχνεύσαι τε τὰς τῶν ἐτέρων παρὰ τοὺς ἑβδομήκοντα τὰς ἱερὰς γραφὰς ἐρμηνευκῶτων ἐκδόσεις ... **ταύτας δὲ ἀπάσας ἐπὶ ταῦτὸν συναγαγὼν διελὼν τε πρὸς κῶλον καὶ ἀντιπαραθεῖς ἀλλήλαις** μετὰ καὶ αὐτῆς τῆς Ἑβραίων σημειώσεως. τὰ τῶν λεγομένων Ἑξαπλῶν ἡμῖν ἀντίγραφα καταλέλοιπεν.

66. *Commentarii in Epistolam ad Titum*, 3.9 (26.734–735): *Nobis curae fuit omnes veteris legis libros quos vir doctus Adamantius in Hexapla digesserat de Caesariensi bibliotheca descriptos ex ipsis authenticis emendare, in quibus et ipsa Hebraea propriis sunt characteribus verba descripta: et Graecis litteris tramite expressa vicino. Aquila etiam et Symmachus, Septuaginta quoque et Theodotio suum ordinem tenent.*

of the Seventy-Two and Theodotion, and the fifth and sixth versions.⁶⁷ **He set alongside them** every Hebrew word and the Hebrew letters themselves together with it. And opposite, in parallel, **making use of the second column for a composition** of Hebrew words through Greek letters, **has made yet another column of [this] composition**. So that these books are also called Hexapla, since in addition to the Greek translations **there were two juxtapositions together**, Hebrew naturally through Hebrew letters and Hebrew through Greek letters, so that [the result was] the entire Old Testament through that which is called Hexapla and through the two [columns] of the Hebrew words.⁶⁸

Epiphanius (Weights and Measures): At that time, **he placed together** both the Hexapla⁶⁹ and the two columns of Hebrew opposite in parallel, one translation facing the other, having named the books Hexapla, so he could examine upwards and across the width ... and these four columns, **having been joined to the two Hebrew columns** are called Hexapla. And if also the fifth and the sixth translation should be joined to these in order, they are called Octapla.⁷⁰ Now I am referring to the six translations and the other two, the one written with the very Hebrew letters and words, and the one written with Greek letters but Hebrew words.⁷¹

Epiphanius (Weights and Measures): **For having placed together** the six translations and the Hebrew writing in Hebrew letters and its own words in the first column, **another column he placed at its side**, [which was expressed] through Greek letters but Hebrew words, so that those who do not know Hebrew letters could apprehend to know, through the Greek letters, the power/meaning of the Hebrew oracles. And thus, by means of that which is called by him Hexapla or Octapla, **having placed the two Hebrew columns and the columns of the six translators opposite**

67. The fifth and sixth versions were additional Greek translations of the Psalms found by Origen.

68. *Panarion* (2.406–408): τοῦ μὲν Ἀμβροσίου τὰ πρὸς τροφὰς αὐτῷ τε καὶ τοῖς ὀξυγράφοις καὶ τοῖς ὑπηρετοῦσιν αὐτῷ ἐπαρκοῦντος, χάρτην τε καὶ τὰ ἄλλα τῶν ἀναλωμάτων, καὶ τοῦ Ὠριγένους ἐν τε ἀγρυπνίαις καὶ ἐν σχολῇ μεγίστη τὸν κάματον τὸν περὶ τῆς γραφῆς διανύοντος. ὅθεν τὸ πρῶτον αὐτοῦ **ἐπιμελῶς φιλοτιμησαμένου συναγαγεῖν** τῶν ἑξ ἑρμηνειῶν, Ἀκύλα Συμμάχου τῶν τε ἑβδομήκοντα δύο καὶ Θεοδοτίωνος, πέμπτης τε καὶ ἑκτῆς ἐκδόσεως τὰς βίβλους ἐξέδωκεν, **μετὰ παραθέσεως** ἐκάστης λέξεως Ἑβραϊκῆς καὶ αὐτῶν ὁμοῦ τῶν Ἑβραϊκῶν στοιχείων· ἐκ παραλλήλου δὲ ἄντικρυς, **δευτέρᾳ σελίδι χρώμενος κατὰ σύνθεσιν** Ἑβραϊκῆς μὲν τῆς λέξεως, δι' Ἑλληνικῶν δὲ τῶν γραμμάτων **ἐτέραν πάλιν πεποίηκε σύνθεσιν**· ὥς εἶναι μὲν ταῦτα καὶ καλεῖσθαι Ἑξαπλᾶ, ἐπὶ δὲ τὰς Ἑλληνικὰς ἑρμηνείας **γενέσθαι δύο ὁμοῦ παραθέσεις**, Ἑβραϊκῆς φύσει δι' Ἑβραϊκῶν στοιχείων καὶ Ἑβραϊκῆς δι' Ἑλληνικῶν στοιχείων, ὥστε εἶναι τὴν πᾶσαν παλαιὰν διαθήκην δι' Ἑξαπλῶν καλουμένων καὶ διὰ τῶν δύο τῶν Ἑβραϊκῶν ῥημάτων. Compare the translation of WILLIAMS (2013, 136).

69. "Tetrapla" would make more sense here. As it stands, the passage demonstrates confusion.

70. Octapla presumably refers to the six columns of the Hexapla plus the fifth and sixth versions of the Psalms.

71. *De mensuris et ponderibus* (516–518, 528–533): ὅτε καὶ τὰ ἑξαπλᾶ καὶ τὰς δύο τῶν Ἑβραϊκῶν σελίδας ἄντικρυ ἐκ παραλλήλου μᾶς ἑρμηνείας πρὸς τὴν ἐτέραν **συνέθηκεν** ἑξαπλᾶ τὰς βίβλους ὀνομάσας, καθ' ἅπερ ἄνω διὰ πλάτους εἴρηται ... τῶν τεσσάρων δὲ τούτων σελίδων **ταῖς δυσὶ ταῖς Ἑβραϊκαῖς συναφθεῖσων** ἑξαπλᾶ καλεῖται· ἐὰν δὲ καὶ ἡ πέμπτη καὶ ἡ ἑκτη ἑρμηνεία συναφθῶσιν ἀκολούθως τούτοις ὀκταπλᾶ καλεῖται· φημὶ δὴ ταῖς ἑξ ἑρμηνείαις καὶ ταῖς ἄλλαις δυσὶ τῇ μὲν Ἑβραϊκοῖς στοιχείοις καὶ ῥήμασιν αὐτοῖς γεγραμμένη, τῇ δὲ ἑλληνικοῖς μὲν στοιχείοις ῥήμασι δὲ Ἑβραϊκοῖς.

in parallel [with one another], he gave a great aid in knowledge for those who would desire such a noble purpose.⁷²

Rufinus: Then also those most famous codices [Origen] himself first composed, in which through narrow individual columns **he wrote down** (*descripsit*) the work of each and every translator separately, such that, first of all, **he placed** the Hebrew words themselves in Hebrew letters, **in the second place, in order, he wrote down** (*describeret*) the Hebrew words in Greek letters right next to it, third, **he joined** the edition of Aquila, fourth, that of Symmachus, fifth, that of the Seventy translators, which is ours, sixth, **he set in order** that of Theodotion. And because of the composition of this sort he named the exemplar Hexapla, that is, that which is written in a six-fold order.⁷³

Throughout these seven passages from five separate authors, the language used to describe Origen's work is that of collecting, compiling, joining, copying, placing, and arranging, but never composing or commissioning an original work. The statements referring specifically to the second column give no reason to assume that the general procedure of taking a pre-existing text and copying it into one of the columns of the Hexapla did not apply in the case of the text of the second column. This claim may be supported by Jerome's statement that Origen "arranged" (*digesserat*) the books of the old law, including the Hebrew words expressed by both Hebrew characters and Greek characters. Despite the difficult syntax, Epiphanius's statement in *Panarion* might be the most informative in this regard. He states that Origen, "making use of the second column for a composition of Hebrew words through Greek letters, has made yet another column of [this] composition."⁷⁴ Also, Rufinus uses the same word (*de-*

72. *De mensuris et ponderibus* (176-183): Τὰς γὰρ ἕξ ἑρμηνείας καὶ τὴν ἑβραϊκὴν γραφὴν ἑβραϊκοῖς στοιχείοις καὶ ῥήμασιν αὐτοῖς ἐν σελίδι μιᾷ **συντεθεικῶς, ἄλλην σελίδα ἀντιπαρέθετο** δι' ἑλληνικῶν μὲν γραμμάτων ἑβραϊκῶν δὲ λέξεων πρὸς κατάληψιν τῶν μὴ εἰδόντων ἑβραϊκὰ στοιχεῖα εἰς τὸ διὰ τῶν ἑλληνικῶν εἰδέναι τῶν ἑβραϊκῶν λογίων τὴν δύναμιν. Καὶ οὕτω τοῖς λεγομένοις ὑπ' αὐτοῦ ἑξαπλοῖς ἢ ὀκταπλοῖς τὰς μὲν δύο ἑβραϊκὰς σελίδας καὶ τὰς ἕξ τῶν ἑρμηνευτῶν **ἐκ παραλλήλου ἀντιπαραθεῖς** μεγάλην ὠφέλειαν γνώσεως ἔδωκε τοῖς φιλοκάλοις.

73. *Historia ecclesiastica* (6.16.4): Unde et illos famosissimos codices primus ipse composuit, in quibus per singulas columellas separatim opus interpretis uniuscuiusque **descripsit**, ita ut primo omnium ipsa Hebraea verba Hebraeicis litteris **poneret**, **secundo in loco per ordinem** Graecis litteris e regione Hebraea verba **describeret**, tertiam Aquilae editionem **subiungeret**, quartam Symmachi, quintam septuaginta interpretum, quae nostra est, sextam Theodotionis **conlocaret**, et propter huiuscemodi compositionem exemplaria ipsa nominavit *Exapla*, id est sextuplici ordine scripta.

74. The latter part of the line may also be interpreted as, "has made yet another composition." However, by using the word 'another' (ἐτέραν), it would imply that the second column was of the same nature as the first.

scribo) to refer to the writing down of the Greek translations as he does for the writing down of the second column.

While the statements of the early church fathers should not be accorded more weight than is due them, their testimony is not insignificant. Even though the early church fathers (e.g., Eusebius and Jerome) believed that Origen had superior Hebrew knowledge, none of them explicitly attributed the transcriptions of the second column to his pen. Moreover, if Origen had commissioned Jewish Hebrew scholars to transcribe the entire text of the Hebrew Bible, neither Origen nor the early church fathers mention it as part of the process of compiling the Hexapla.

Therefore, in light of the developed transcription system of the second column, the fact that the rest of the Hexapla was made up of pre-existing texts, and the testimony of the early church fathers, we may now make a ruling between the two alternatives put forth earlier. It seems more likely that Origen acquired the second column as a pre-existing text than that he commissioned Hebrew experts to transcribe the entire Hebrew Bible into Greek.

Nevertheless, it remains possible, though less likely, that he *did* commission the transcriptions of the second column. In this case, however, it would be better to argue that the second column is the result of a combination of factors. Origen might have come across portions of the Hebrew Bible transcribed into Greek and desired that such material be expanded to cover all of the scriptures. He then commissioned those familiar with Hebrew and the transcription technique to complete the task.⁷⁵ Such a theory would still be consistent with the developed transcription system of the *Secunda* and the fact that it is treated as a pre-existing text in the early church fathers' comments. Nevertheless, even if such is the case, it demands that the *Secunda*, or at least parts of it, had an original purpose and function separate and distinct from its inclusion in the Hexapla.

75. A similar suggestion is made by GORDON (1968, 289) and DE LANGE (1976, 58).

2.3.4. The Second Column as a Parallel Text

The most probable explanation of the evidence is that the Secunda existed in some form prior to the composition of the Hexapla. If the text of the second column was not originally composed for the Hexapla, it must be asked what it looked like in its original form. Did it stand alone, or was it originally composed to be read in parallel with the Hebrew text? While the evidence is inconclusive, the most likely explanation is that the Secunda was originally parallel to the Hebrew text, if not physically, at least functionally.

This claim is supported by a number of factors. First, following CLEMENTS's reconstruction outlined above, when Origen added the Hebrew to the Tetrapla, he added both columns together. Second, when the church fathers discuss the texts that make up the Hexapla, the Greek translations are often treated as a group and the two Hebrew columns are often treated as a group. Eusebius in particular only speaks of adjoining the Greek translations with "the Hebrew writing" (τῆς Ἑβραίων σημειώσεως), with no specific mention of the second column. Epiphanius refers to the added Hebrew columns as "two juxtapositions together" (δύο ὁμοῦ παραθέσεις). Although grouping the translations together and the Hebrew columns together would be intuitive, such a grouping may reflect something about the compositional history of the Hexapla. Third, much like a translation, the initial composition of the Secunda was necessarily based on the Hebrew text of the Bible. Fourth, if accurate pronunciation of the Hebrew text was important, the Greek transcriptions of the Secunda could only be a successful tool if used in conjunction with the Hebrew text or by one who already knew Hebrew (EMERTON 1956; see section 3.2). Fifth, and finally, the fact that two or three transcribed words are occasionally written on the same line (in the Ambrosiana palimpsest) is indicative of an originally columnar text (see section 3.4.1).⁷⁶

76. While it is typical for only one word to be written per line in the Secunda, a number of two- or three-word phrases, most of which would be connected by a *maqṣaf* or a conjunctive accent in the Tiberian tradition, are written on the same line in the Ambrosiana palimpsest (e.g., |αληκι| יְיָ־לֵךְ [Ps. 35:13], |χι·ανῶχιε'λωειμ| רַב־יְיָ־עֲלֵיךְ [Ps. 46:11], |αλ·μα·σαν| אֶל־יְיָ־הֵלֵךְ [Ps. 89:48]). A similar feature is present in bilingual columnar translations used to teach Latin literature to Greek speakers. While it is possible for only one word to be written per line in such texts, it is also common for the text to be broken up into phrases with multiple words per line

Therefore, in all probability, the Greek transcriptions of the Secunda were originally parallel with the Hebrew text of the Bible even before they were incorporated into the Hexapla.⁷⁷ This does not have to mean that they were formatted together on the same scroll, but that the Greek transcriptions *at least* would have been read alongside the Hebrew text of the Bible, not apart from it.

2.3.5. Conclusions

Any theory about the compositional history of the second column, due to the paucity of evidence, will necessarily be speculative. Nevertheless, we are now at a point where we may summarize a probable interpretation of the process. Sometime after his relocation to Caesarea in 233 CE, Origen encountered a Greek transcription text in use among the Jews alongside the traditional Hebrew text of the Bible. It is possible that this text was written on the same scroll as the Hebrew text of the Bible or that it was merely associated with it in its function. Moreover, while it is likely that the transcription text Origen encountered was comprehensive of the Hebrew Bible, it is also possible that only portions of the biblical text had a corresponding Greek transcription. In the case of the former, he would have required Jewish assistants to match the Hebrew columns with the Tetrapla. In the case of the latter, in addition to the task of correlating the columns, he would have required Jewish assistants to expand the Greek transcription text to cover the entire Bible.

Origen saw in the Greek transcriptions a potential tool which would help him more accurately compare the various translations and the LXX. The Greek transcriptions served him as a concordance in a way that neither the Hebrew consonantal text nor the other Greek

(see section 3.4.1). It should be noted that this principle is applied inconsistently in the Ambrosiana palimpsest. If such a feature had been the result of text-critical considerations in the composition of the Hexapla, one would expect more consistency in its implementation. It seems likely that such two- and three-word units could reflect an element of the original format of the Secunda before it was integrated into the Hexapla (see sections 3.4.1–4).

77. Some scholars (e.g., NAUTIN 1977, 333–39) even claim that the Jews had already made a synopsis of their own, attaching the Hebrew columns to the translations of Aquila and Symmachus. In light of CLEMENTS's reconstruction (1997, 97–100), GRAFTON and WILLIAMS point out that it is not necessary to posit such a pre-existing synopsis (2006, 113). Origen could have employed assistants knowledgeable in Hebrew to coordinate the Hebrew columns with the Greek columns.

translations could have. His interest in learning Hebrew and the potential of the transcriptions to aid in his Hebrew learning were also significant motivating factors for adding the second column to the Hexapla.

In conclusion, this section has analyzed and summarized Origen's relationship with the second column as far as the evidence allows. In this process, we have concluded that the Secunda most likely had a life of its own before Origen ever encountered it. With respect to its life before the Hexapla, the present discussion has only been able to affirm two likely facts. First, it was in use among the Jews of Caesarea. Second, it was originally parallel—at least functionally, if not physically—with the Hebrew text of the Bible. Questions regarding the original date and setting of the Secunda remain open. The following chapter will attempt to determine, in light of the evidence from the Hellenistic, Roman, and Byzantine Near East, both the original date and *Sitz im Leben* of the Secunda.

3. THE SECUNDA IN THE HELLENISTIC/ROMAN NEAR EAST

3.1. INTRODUCTION

In the previous section, it was argued that Origen could not have written the second column himself, but rather acquired the text from another source and incorporated it in the Hexapla. Accordingly, the issue of the original date and setting of the Secunda remains an open question. After a brief review of previous scholarship, this section will examine the relevant evidence in order to best determine the original date, context, and function of the Secunda. With regard to the date, it will be argued on the basis of linguistic evidence that the *terminus post quem* lies at the beginning of the second century CE. With regard to the original setting, parallel texts in the Hellenistic Near East, the linguistic situation in Roman Palestine, and the development of the Jewish education system all indicate that the second column was originally composed with a didactic or scholastic function in the wake of the decline of spoken Hebrew.

3.2. SURVEY OF SCHOLARSHIP

3.2.1. Previous Suggestions

The best summary of previous scholarship regarding the original background of the text of the Secunda is found in JANSSENS (1982, 13–20).⁷⁸ Rather than rehearsing the entire review

78. JANSSENS also discusses the views of those scholars who argue that Origen wrote the Secunda based on his knowledge of Hebrew (e.g., SPEISER 1925–26; ORLINSKY 1937–38; MERCATI 1947) or that a contemporary wrote or helped him write the Secunda (e.g., KAHLE 1921; MERCATI 1947).

here, a number of observations may be made. With respect to function, a number of scholars hold what might be termed the "liturgical" theory. That is, the Greek transcriptions were composed so Jews who did not know Hebrew could read the scriptures in the synagogue (e.g., HALÉVY 1901, 338, 341; BERTRAM, 1938, 73, 76, 77; JELICOE 1968, 106–111; DE LANGE 1976, 22, 57–58; MARTIN 2004; 2007). Other scholars, without explicitly mentioning liturgical use, argue that the transcriptions were intended for Jews who could not read Hebrew (e.g., BLAU 1894, 80–83; STAPLES 1939; JANSSENS 1982, 22–23). With respect to status, several scholars argue that the text had a canonical status among the Jews (e.g., HALÉVY 1901, 338, 341; KAHLE 1927, 7, 44; 1950, 184–85). With respect to origin, a number of scholars claim that Greek-Hebrew transcribed texts were around long before Origen (e.g., WUTZ 1925–1933; BERTRAM 1938, 73, 76, 77; BRØNNO 1943, 7; 1956, 242; KAHLE 1956, 150–51; 1959, 159, 161, 187; 1960, 385). With respect to provenance, it has been suggested that transcription texts like the *Secunda* developed in Egypt (e.g., HALÉVY 1901, 338, 341), Palestine (e.g., STAPLES 1939; JELICOE 1968, 106–111), or both (e.g., WUTZ 1925–1933). Dates are proposed from as early as the time of the LXX (e.g., WUTZ 1925–1933; BERTRAM 1938, 73, 76, 77) to the second or third century CE (e.g., KAHLE 1927, 7, 44; 1950, 184–85; BRØNNO 1943, 7; 1956, 242).

EMERTON disagrees with the "liturgical" view, arguing that any listeners who knew Hebrew would have found the reading of a transcribed text by someone who did not know Hebrew incomprehensible.⁷⁹ Anyone who had gone through sufficient training to be able to read Hebrew from a transliteration would have been able to read the Hebrew script itself. Alternatively, EMERTON claims that the transcribed text essentially functioned in the same role that *niqqud* would later fulfill. The two texts were used side-by-side, the transcribed text serving to elucidate the vocalization of the consonantal text when it was ambiguous or unknown. The

79. EMERTON states that "it is unlikely that devotion to the sacred tongue was of such a character that it led to the paradoxical result that a debased pronunciation was used which was nonsense to those proficient in Hebrew no less than to those who knew only Greek." Moreover, the inability of Greek script to distinguish the sibilants, the gutturals, the glides, and accentuation would have resulted in an incomprehensible pronunciation (1956, 80–81).

Greek representation of the consonants was not especially important, but its representation of the vowels was indispensable. The consonants merely served as a vehicle to convey the vocalization. He supports his conclusions with comparative evidence from the Hellenistic Near East, drawing on examples of transcription in Egyptian and Babylonian texts (1956, 79–82).

MARTIN agrees with the "liturgical" view, yet innovatively approaches the problem by emphasizing non-referential language theory. He claims that the public reading of Hebrew was regarded as having intrinsic value, whether or not the reader or the congregation understood it. He compares this to Egyptian and Mesopotamian texts from the same period that were transcribed into Greek because the mere utterance of them was regarded as powerful. Greek script was chosen to transcribe these *voces magicae* because, unlike the hieroglyphic, cuneiform, and Hebrew scripts, which demanded a prerequisite knowledge of the language for correct reading, the Greek script provided the phonetic information apart from contextual semantics. For MARTIN, the text of the second column does not have its origin among rabbinic circles, but was prepared by a "non-rabbinic" group of Jewish scholars so that those ignorant of Hebrew could carry out public reading of the Hebrew Bible in synagogue (2004; 2007).

3.2.2. Evaluation

The idea that there were other Greek-Hebrew transcription texts is based on three primary pieces of evidence. First, the theory that the LXX was originally translated from a Greek-Hebrew transcription text (e.g., WUTZ 1925–1933) demands the early existence of such texts. This theory is no longer taken seriously (MARCOS 2001, 61–62). Second, a number of rabbinic statements (*mMegilla* 1:8, *bShabbat* 115a, *bMegilla* 18a) have been cited as evidence for the existence of Greek transcriptions of biblical texts before Origen. PRICE and NAEH have demonstrated quite convincingly that the texts cited do not refer to the adaptation of the biblical text into other *scripts*, but into other *languages*; the rabbinic statements deal with *translation*—not transcription—into other languages (2009, 275–84). Third, the opening line of Melito of Sardis's (2nd CE) homily is also cited:

The scripture of the Hebrew Exodus has been read and the words of the mystery have been elucidated. How the lamb is slaughtered and how the people are rescued.⁸⁰

ZUNTZ has persuasively argued that the phrases, ἡ γραφή τῆς Ἑβραϊκῆς ἐξόδου 'the scripture of the Hebrew Exodus' and τὰ ῥήματα τοῦ μυστηρίου διασεσάφηται 'the words of the mystery have been elucidated' refer to a scripture lesson in Hebrew being followed by an explanation in Greek (1943). It has been assumed, perhaps too readily, that a Hebrew scriptural reading in a Christian community in Asia Minor must have been conducted from a Greek transcription text (KAHLE 1956, 151). However, as MARCOS points out, the most that can be ascertained from Meltio's homily is that the early Christians preserved the practice of reciting certain pericopes in Hebrew for special occasions (2001, 216). A Greek transcription of Hebrew is not mentioned in Melito's homily. Therefore, there is no direct evidence of or any reference to Greek-Hebrew transcription texts of significant length other than the Secunda.⁸¹

With respect to status, the idea that the text of the Secunda was an official text among the Jews seems to be entirely speculative. The lack of any explicit reference to transcription texts makes it impossible to conclude that such a text was held in high esteem among the Jewish communities of Egypt and Palestine. If anything, the lack of explicit reference argues *against* it being a highly regarded or official text. It is difficult to imagine how such an officially recognized text could be lost without leaving behind any allusions in other material.

With respect to the original function of the Secunda, EMERTON's objections to the "liturgical" view may be sustained (1956, 81–82). In addition to his objections, it might be added that in both Jewish and Greco-Roman education, the alphabet is always the initial step in learning the language (see section 3.4.3).

80. *De Pascha* (3–6): Ἡ μὲν γραφή τῆς Ἑβραϊκῆς ἐξόδου ἀνέγνωται, καὶ τὰ ῥήματα τοῦ μυστηρίου διασεσάφηται. πῶς τὸ πρόβατον θύεται καὶ πῶς ὁ λαὸς σφύζεται.

81. There are, of course, numerous examples of short Greek-Hebrew transcriptions on amulets, funerary inscriptions, etc. For these, see section 3.4.1.3.4.

MARTIN's appeal to non-referential language theory is worthy of more consideration. Non-referential language theory claims that language is regarded as intrinsically valuable for its own sake apart from any meaning (or understanding of meaning). Such a perspective regarding Hebrew in Origen's time would render irrelevant EMERTON's criticisms of the liturgical theory, namely, that recitation of Hebrew from Greek script would be unintelligible. Though important for the discussion, an emphasis on non-referential language theory overlooks the details of the specific cultural and historical context of ancient Palestinian Judaism.

First, since it was not obligatory to read the scriptures in Hebrew in ancient Palestine,⁸² it seems unlikely that the scriptures were necessarily read in Hebrew among the Greek-speaking Jewish communities. On the contrary, rabbinic literature seems to indicate that translation into Greek was acceptable and that sometimes the scriptures were read in Greek or other languages (EMERTON 1971, 17–19).⁸³ If the scriptures were read in Hebrew among Greek-speaking Jews, they would have been read by one who already knew the language without need of a transcribed text (PRICE and NAEH 2009, 277). Second, the references to transcription in rabbinic literature refer to other languages (biblical translations) being transcribed into the *Hebrew-Aramaic* script (PRICE and NAEH 2009, 279–84). Third, while *mMegilla* 2:1 proves that hearing Hebrew read without understanding could fulfill one's religious duty (MARTIN 2007, 267), the text nowhere implies that the reader was anything other than a skilled Hebrew reader reading the Hebrew consonantal text. In fact, script and language were intrinsically tied in the ideology of the rabbis (PRICE and NAEH 2009, 283). Fourth, a statement in Jerome implies that an inferior pronunciation of Hebrew based on transcriptions was regarded by the Jews to be literally ridiculous.⁸⁴ Therefore, while MARTIN's

82. See *mMegilla* 1:8, *bShabbat* 115a, *bMegilla* 18a and the explanation of PRICE and NAEH (2009, 275–84).

83. *mMegilla* 2:1 allows Esther to be read in Greek if the hearers do not know Hebrew (EMERTON 1971, 19).

84. When discussing Jews' reactions to Christians who pronounce Hebrew proper names incorrectly based on the transcriptions from the LXX, Jerome writes that "they are accustomed to mock us for our ignorance" (*Commentarium in Epistolam S. Pauli ad Titum*, 3:9) (BRØNNØ 1970, 205; HARVIAINEN 1977, 49–50).

claim that the Secunda was the product of "non-rabbinic" scholars may be impervious to objections based on the *Halakhah* and language ideology of the rabbis, it should be pointed out that his theory is merely speculative. The idea that the transcriptions were used for public reading in the synagogue by those who did not know Hebrew is unlikely.

In the following sections, I will argue that EMERTON's view that the Greek transcriptions functioned as a sort of *niqqud* or vocalization aid (1956; 1971) is to be preferred. It does not claim any official status and avoids the pitfalls of proposing a liturgical use for the transcriptions. Reasonably, it assumes that there were those who knew Hebrew but not well enough to read the entire Bible correctly. Nevertheless, EMERTON's theory remains somewhat vague. What was the specific context that gave rise to the transcriptions and how were they used? After a discussion regarding the date for the composition of the Secunda, the rest of the chapter will refine and expand on EMERTON's theory, drawing on evidence from the Hellenistic, Roman, and Byzantine Near East.

3.3. DATE OF THE SECUNDA: TERMINUS POST QUEM

3.3.1. Introduction

While a number of factors are relevant for determining the date of the original composition of the Secunda, a loose *terminus post quem* may be established on the basis of the representation of η and ς in transcription material. A survey of such material leads to the conclusion that the Secunda was composed at the beginning of the second century CE at the earliest.

3.3.2. Merger of / η /, / η / > / η / and / $\dot{\eta}$ /, / ς / > / ς /

The Hebrew graphemes η and ς , which in Tiberian Hebrew represent the pharyngeal voiced and voiceless fricatives / η / [h] and / ς / [ħ], respectively, originally represented two phonemes each. In addition to signifying / η /, η also served to signify the voiceless uvular fricative / χ / ([χ]). In addition to signifying / ς /, ς also served to signify the voiced uvular fricative / $\dot{\eta}$ / ([γ]). Although these phonemes eventually merged (/ η /, / η / > / η /; / ς /, / $\dot{\eta}$ / > / ς /), they remained distinct until a relatively late period in the history of Hebrew. Evidence of their distinct realization in the biblical reading tradition is exhibited in the Greek transcription of proper names found in

the LXX. For example, Hebrew בְּרָב ($\sqrt{r}hb$) is transcribed in Greek as Πααβ , but Hebrew זְרָז ($\sqrt{?}hz$) is transcribed as Αχαζ . Also, while Hebrew זְרָז/זְרָז ($\sqrt{?}zz$) is transcribed in Greek as Οζιας/Οζιου , Hebrew זְרָז ($\sqrt{g}zz$) is rendered as Γαζα (BLAU 2010, 75–76).

3.3.2.1. Diachrony of the Merger in the LXX, Josephus, Aquila, and 2 Esdras

The evidence for the polyphony of Hebrew ז and ז was laid out in BLAU (1982). On the basis of the distribution of the renderings $\text{Ø}/\chi$ for ז and $\text{Ø}/\gamma$ for ז in the LXX, BLAU demonstrated that there is general consistency between Ø and etymological $h/^\text{r}$, on one hand, and between χ/γ and etymological h/\dot{g} on the other (1982, 9–15, 43–48). However, in the transcriptions of proper names in 2 Esdras this consistency has diminished, with etymological $/h/$ and $/\dot{g}/$ often being represented by Ø and not χ/γ . BLAU understands this phenomenon to reflect the chronologically late nature of the LXX translation of 2 Esdras (1982, 37, 65–66).

More recently, STEINER (2005) has expanded on BLAU's work, examining the evidence for the merger in the Hebrew and Aramaic of Egypt and Palestine diachronically. He traces the representation of names with etymological $/h/$ and $/\dot{g}/$ through the LXX, Josephus, Aquila, and 2 Esdras in order to understand the mergers in the biblical reading traditions (246–49). What he finds is that etymological $/\dot{g}/$ is hardly represented at all in Josephus, Aquila, and 2 Esdras (246–47). The representation of etymological $/h/$ with χ decreases over time. In Josephus (37–93 CE), etymological $/h/$ is transcribed by Ø about one third of the time. In Aquila (ca. 125 CE), etymological $/h/$ is transcribed by Ø almost twice as much as in Josephus. Moreover, many of the names with χ in Aquila are likely imitations of the LXX form. It seems that the merger of $/h/$ and $/h/$ in the biblical reading tradition had already begun by the first century CE and was complete by the time of Aquila's translation (ca. 125 CE) (250–51). The fact that transcriptions with χ for etymological $/h/$ are more common than transcriptions with γ for etymological $/\dot{g}/$ in Josephus and Aquila supports BLAU's claim that $/\dot{g}/ > /^\text{r}/$ occurred before $/h/ > /h/$ in the history of Hebrew (246–50). Finally, the fact that etymological $/h/$ is realized as Ø

in 2 Esdras eight out of nine times leads STEINER to conclude that it was composed after Aquila, sometime in the middle or end of the second century CE (261–64).

STEINER goes on to argue that the biblical reading traditions, due to their more formal nature, likely maintained the distinction between the uvular and pharyngeal fricatives later than did the spoken languages (2005, 250). In order to determine the *terminus ante quem* for the merger of /ħ/ and /ħ/ in the vernacular, he examines epigraphic evidence from Jaffa, Masada, Jerusalem, and Gaza. On the basis of his analysis, he concludes that the merger of /ħ/ and /ħ/ must have occurred sometime between 100 BCE and 26 CE (253–57).

The distinction between the common vernacular, in which /ħ/ had merged with /ħ/ by Josephus's time (37–93 CE), and more formal reading traditions, in which /ħ/ had remained distinct, is further supported by the curious practice of Josephus in transcribing etymological /ħ/ in the names of postbiblical figures. When the postbiblical figure is a contemporary of Josephus, etymological /ħ/ is transcribed with Ø, but when the figure preceded his time, etymological /ħ/ is transcribed with χ (2005, 240, 243, 251).

STEINER suggests that the merger of /ħ/ and /ħ/ may have been the result of contact with Phoenician. Aramaic and Hebrew speakers of Upper Galilee, where Phoenician influence was quite strong, had probably merged /ħ/ and /ħ/ in their speech at an earlier period. The Hasmonean conquest at the end of the second century BCE, by connecting Judah with Galilee politically, provided ample opportunity for the merger to slowly begin to travel south over the coming century (2005, 259–61, 266).

3.3.2.2. Evidence of the Merger in the Secunda

STEINER's diachronic outline provides a method for dating the second column of Origen's Hexapla based on its conventions for transcribing etymological /ħ/ and /ġ/. The Secunda represents both etymological /ħ/ and /ġ/ only by means of Ø (or a hiatus between vowels) and never by χ or γ (STEINER 2005, 245). Examples of etymological /ħ/ include αἰλ ἡἵλ 'strength' (18:40), σεμα ἡἡἡ 'joy' (30:12), χαα ἡἡἡ 'like a brother' (35:14), σεωθῖ ἡἡἡ 'I bowed down'

(35:14), λαηριμ לְאַחֵרִים 'to others' (49:11), and μεεθθα הַחֶתָּה 'terror' (89:41). Examples of etymological /ġ/ include αων ἰν 'iniquity' (49:6), οσραμ ἔψῃ 'their wealth' (49:7), and αλουμαυ ἔλῳγῃ 'his youth' (89:46).⁸⁵

The lack of any transcriptions with χ or γ would seem to push the *terminus post quem* for the date of the composition of the Secunda after Josephus and probably after Aquila. The fact that transcriptions of proper names are the center of STEINER's analysis may call into question the validity of applying his conclusions to the text of the Secunda, which is a transcription of the language in general. Typically, proper names tend to be more resistant to linguistic change than the rest of the language. However, liturgical reading traditions are also more resistant to linguistic change than lower registers of the language. Therefore, on the basis of the complete merger of /h/ and /ħ/ in the Hebrew of the Secunda, we may reasonably operate under the assumption that the original composition of the second column of the Hexapla took place between the beginning of the second century CE and Origen's work on the Hexapla in Caesarea in the first part of the third century CE. In light of the earlier discussion regarding Origen's acquisition of the transcription text, a second- or third-century CE date further supports Palestine, rather than Egypt, as its original provenance (see 2.3.1).

3.3.2.3. Dialectal Variation

Before concluding, we should also consider the possibility that the lack of /h/ and /ġ/ in the Secunda may not necessarily reflect a later date but merely a different dialect. The relevance of dialectal variation for this issue is illustrated by KHAN, who describes a number of phenomena with respect to the historical development of *k*, *h*, *ġ*, and *ʕ* in various dialects of Northeastern Neo-Aramaic. While some dialects merge **k*, **h* > *x* (e.g., Qaraqosh), others merge **k*, **h* > *h* (e.g., Hertevin). However, sometimes the more archaic pronunciation may be maintained due to either phonetic or semantic factors. In many dialects that generally

85. But note the Secunda transcription βεγαβρωθ בְּעֶבְרֹת (Ps. 7:7). The variant in Chrysostom, however, has βεβαρωθ (FIELD 1875, 94).

merge **k*, **h* > *x*, the pharyngeal **h* is maintained in the environment of emphatic consonants. In the Qaraqosh dialect, **h* is maintained in some words of religious significance. Finally, sometimes the velars and pharyngeals exist side-by-side in free variation (KHAN 2005, 87–93). Moreover, inscriptional evidence indicates that the gutturals were lost in certain dialects of Hebrew (e.g., Beth Sheʿan, Tivʿon, Haifa) earlier than in others (MOR 2013, 163).

Accordingly, we should not be too comfortable using the lack of /h/ and /ġ/ in the Secunda as a measure for dating the text. Nevertheless, the data do seem to be consistent with assuming a general uniformity with respect to /h/ and /ġ/ in the Hebrew reading traditions in Palestine (see STEINER 2008, 245–46).⁸⁶ Therefore, until we find clear evidence to the contrary, such as a transcription reflecting either the lack of /h/ and /ġ/ at an early date or the retention of /h/ and /ġ/ at a late date, we may cautiously proceed under the assumption that the lack of /h/ and /ġ/ in the Secunda is *probably* indicative of a late date.

3.4. SITZ IM LEBEN OF THE SECUNDA

3.4.1. Comparative Material

3.4.1.1. Introduction

The text of the second column should be compared with other texts with a parallel format (or function) and other instances of transcription in the Hellenistic Near East. In the following survey, a distinction is made between parallel texts, which may include transcription, and instances of transcription that stand alone without any accompanying primary text.

3.4.1.2. Columnar, Parallel, and Interlinear Texts in the Hellenistic/Roman/Byzantine Near East

Whatever the original format of the text of the second column was, there can be little doubt that it was at least functionally, if not formally, parallel with the Hebrew consonantal text. This is suggested both by the discussion in chapter 2 and the evaluation of previous scholarship in the current chapter. Presumably, then, a survey of columnar, parallel, and interlinear

86. Note that the preservation or lack of /h/ and /ġ/ cannot be attributed to a general difference between Egypt and Palestine. The book of Maccabees (ca. 100 BCE) preserves the distinction between /h/ and /ħ/ in its transcribed names, even in names not found in the LXX: e.g., Χαλπι, Χαιδαῖοι, and Ονιας (STEINER 2005, 256). Moreover, there are no clear examples of /h/ preserved in a late text indicative of a more conservative dialect.

texts in the Hellenistic, Roman, and Byzantine Near East should shed some light on the original function of the text. Formally parallel texts that also happen to contain transcription will be treated in this section rather than in the subsequent section. As will be demonstrated, the nature of *parallel* transcription texts is quite different from *stand-alone* transcription texts.

3.4.1.2.1. Latin and Greek Tradition

3.4.1.2.1.1. Glossaries

In the Latin and Greek tradition, such formats are most commonly implemented for bilingual glossaries and translations. *P. Oxy.* LXXVIII.5162 (1st/2nd CE), for example, contains Greek words in the left column and Latin glosses transcribed into Greek in the right column:

Translation	Left Column	Right Column	(Latin Characters)
'ram'	κρειοc	αρ[ε]ηc	(= <i>aries</i>)
'bull'	ταυροc	ταυρουc	(= <i>taurus</i>)
'lion'	λεων	λεο	(= <i>leo</i>)

Figure 5: Greco-Latin Columnar Glossary (*P. Oxy.* LXXVIII.5162)

There are many other bilingual glossarial texts from the Roman period and early Byzantine period.⁸⁷ Such glossaries are usually organized around a particular theme or context,⁸⁸ presumably intended to grant its users with a practical vocabulary for a particular social situation. Additionally, this format is utilized for presenting grammatical information and paradigms.⁸⁹

There are also a number of Greco-Latin bilingual glossaries that express the Latin in Latin characters, rather than in Greek transcription.⁹⁰ If a glossary is made specifically for a

87. *P. Oxy.* LXXVIII.5163 (1st/2nd CE) and *P. Oxy.* XLIX.3452 (2nd CE) are similar to the text above.

88. *P. Mich. Inv.* 2458 is a list of Greek and Roman deities in two columns from the second or third century CE (KRAMER 1983, 79–80). *P. Strasb. Inv.* g 1173 is a third- or fourth-century CE glossary with merchandise and military terms (KRAMER 2001, 65–76). *P. Lund* I.5 (2nd CE) contains animal names (CAVENAILE 1958, 379). *P. Oxy.* XXXIII.2660a contains the names of vegetables and fishes. *P. Laur.* IV.147 (3rd CE) contains the names of various animals. *P. Fay.* 135v descr. (4th CE) is a list of month names (KRAMER 1983, 77–78). *P. Lond* II.481 (4th CE) contains a list of words organized according to professions (KRAMER 1977, 231–32; ADAMS 2003, 41–42).

89. *P. Strasb. inv.* G 1175 (3rd/4th CE) contains Greek verbal conjugations in the left column with the corresponding Latin conjugations in the right column transcribed into Greek (KRAMER 1983, 45–52). *P. Oxy.* LXXVIII.5161 (3rd/4th CE) contains a list of conjugated verbs in alphabetical order.

90. See *P. Oxy.* LXXVIII.5161 (3rd/4th CE), a grammatical text, and *P. Vindob. Inv.* L 27 (3rd/4th CE) and *C. Gloss. Biling.* 1 10 (4th CE), Greco-Latin columnar glossaries (KRAMER 1983, 73–76; KRAMER 2001, 53–56).

Latin literary text, the Latin is always represented in Latin characters. For example, *PSI VII 756* (4th/5th CE) contains a bilingual glossary for Vergil's *Aeneid* (CAVENAILE 1958, 15–18):

'they press/climb'	<i>nituntur</i>	εριδονται	'they set themselves'
'by/on steps'	<i>gradibus</i>	τοις βαδει[σμο]ις	'by/on the steps'
'with left (hands)'	<i>sinis[tr]is</i>	τεξ αριστε[ρ]ες	'with left (hands)'
'protected'	<i>protecti</i>	προβεβλημενοι	'having been thrown'
'they oppose'	<i>obiciunt</i>	αντιτιθεασιν	'they oppose'
'they press'	<i>praessant</i>	δρασσονται	'they press' (?)

Figure 6: Greco-Latin Columnar Glossary of Vergil's *Aeneid* (*PSI VII 756*)

The fact that this is a glossary and not a bilingual translation is evident from the full quotation of the lines (words from glossary in bold): *Nituntur gradibus clipeosque ad tela sinistris | Protecti obiciunt, praessant fastigia dextris* (*Aeneid* II.443–44). It seems that only certain key words needed a Greek gloss.⁹¹ Such texts, however, are not necessarily bilingual. *P.Oxy. XXIV.2405* (2nd/3rd CE) is an example of a Greek-Greek glossary for Homer's *Iliad*, with the more archaic Homeric Greek on the left and a more familiar Greek gloss on the right:⁹²

'until'	οφρα	οπως	'until'
'he completes'	τελεσση	τελειωση	'he completes'
'you will save'	σαωσις	σωσεις	'you will save'

Figure 7: Greek-Greek Glossary for Homer's *Iliad* (*P.Oxy. XXIV.2405*)

The full quotation shows that only those words that would be difficult for a Koine speaker are glossed: ὄφρα τελέσση δὲ σὺ φράσαι, εἴ σαώσεις με (*Iliad* I.82–83).⁹³ While Greco-Latin glossaries are typically in columnar form, other formats are also attested.⁹⁴

91. *P.Oxy. VIII.1099* (5th CE) represents the same sort of text.

92. DICKEY finds that glossaries of this format (word pair in same column) are the most common for Greek-Greek glossaries. Of the thirty-nine examples she found, thirty-four have this format (2015b, 819).

93. There are approximately eighteen word-lists for Homer's *Iliad* in the Egyptian papyri (GAEBEL 1970, 298).

94. *BKT IX 150* (1st BCE) is single-column Greco-Latin glossary with the transcribed Latin gloss indented one line below the Greek lemma (SCAPPATICCIO 2015, 464–66). *P.Sorb. inv. 2069* (3rd CE) alternates Greek and Latin on the same line. However, DICKEY argues that it was originally columnar (2010, 189, 206). Chester Beatty codex AC 14999 (4th CE), a glossary to the epistles of the Apostle Paul, separates the Greek lemma from its Latin gloss with double points (:), with a quotation-like symbol (") separating each entry. DICKEY suggests that such a text might have been rearranged from an originally columnar format (2015b, 818).

Although each text's specific purpose may have varied, from aids for practical communication to glossaries for a literary text, scholars generally agree that such glossaries were used by Greek speakers to learn Latin. In the earliest period, they were the most common material utilized for such a purpose. The topical, rather than alphabetical, arrangement facilitated practical use (DICKY 2012, 11–12). Grammatical information (e.g., *P.Oxy.* LXXVIII.5161) was not presented in a distinct format in bilingual material at an early period (DICKY 2012, 14). The outlier above, a word-list for Vergil's *Aeneid*, has been compared to the Greek word-lists for Homer's *Iliad*, the oldest attestation of which predates the *Aeneid* glossary by a few centuries. The purpose of both word-lists was to aid the Greek-speaking student in understanding the literary text before them (GAEBEL 1970, 298). Such a word-list, which only contains select words of the classical text, would have been read alongside another copy of the text. They may have been produced by teachers as aids for their students or by the students themselves, who looked up the words in lexica and copied them in order (DICKY 2012, 15).

3.4.1.2.1.2. Translations

P.Ryl. III.478, a fourth-century CE papyrus, contains a Greco-Latin columnar translation of Vergil's *Aeneid* (I.252–53) (CAVENAILE 1958, 8–9):

'and Italy'	<i>adque Italis</i>	και των [Ι]ταλιωνων
'far am I kept'	<i>longe disiungimur</i>	μακραν διαξευγνυμεθα
'is this, of piety, the reward?'	<i>hic pietatis ho[nos]</i>	αυτη της ευσεβιας τι[μη]

Figure 8: Greco-Latin Columnar Translation of Vergil's *Aeneid* (*P.Ryl.* III.478)

This columnar *translation* differs from the bilingual *glossaries* of Vergil cited above in that it translates almost every word, rather than just providing glosses for important words.⁹⁵ Columnar translation may also have more of a tendency to include two or three words per line instead of just one. Also, a comparison with the traditional word order of the Latin original shows that word-order changes, presumably for facilitating the learning of the text, were not uncommon in these columnar translations: ... *atque disiungimur longe oris Italis. Hic*

95. Other examples of Greco-Latin columnar translations of Vergil include *BKT* IX.39 (4th CE), *P.Fouad* 5 (4th/5th CE), *P.Oxy.* L.3553 (5th CE), and *P.Vindob. inv.* L 24 (5th CE).

honos pietatis? Sic reponis nos in scepra? (*Aeneid*, I.252–53). While the *Aeneid* is the most common columnar translation found, understandably, other texts also take this form,⁹⁶ such as the *Hermeneumata Pseudodositheana*, a group of bilingual pedagogical materials, which describe everyday life in the ancient world (2012, 3–4).⁹⁷ Finally, columnar translation is attested in exemplary epistles (e.g., *P.Bon.* 5 [3rd/4th CE]) (CAVENAILE 1958, 386–92; DICKEY 2015b, 816).

Greek translation of Latin literary texts is not always in columnar form. *Palimps. Ambros.* (4th/5th CE) contains a portion of the *Aeneid* (I:588–748) first written out in Latin and then translated into Greek, preserving the original form of the Latin (CAVENAILE 1958, 23–27):

<i>Restitit Aeneas claraque in luce refulsit</i> <i>Os umerosque deo similis; namque ipsa decoram</i> ... Ἀπέστη ὁ Αἰνείας καὶ ἐν καθαρῷ τῷ φωτὶ ἀντέλαμψεν Τὸ πρόσωπον καὶ τοὺς ὤμους θεῷ ὁμοῖο[ς] καὶ γὰρ αὐτὴ εὐπρεπῇ
--

Figure 9: Greco-Latin Same Column Translation of Vergil's *Aeneid* (*Palimps. Ambros.*)

Presenting the primary text and its translation in the same column is the case for a number of texts.⁹⁸ In some later biblical codices, Latin translations of the original Greek are set forth in a "facing-page" translation format (DICKEY 2015b, 817).⁹⁹

Bilingual translations are the most commonly attested form of ancient material for learning language. The teachers likely produced these texts to aid students in their reading. The degree of similarity between separately attested translations points to the use of lexica, written or memorized, in their production. Such texts could be read on their own or alongside

96. A palimpsest fragment (5th CE) contains a Greco-Latin columnar translation of Vergil's *Georgics* (HUSSELMAN 1957, 454–55). Cicero is found in Greco-Latin columnar translation in *P.Rain.Cent.* 163 (4th/5th CE) (CAVENAILE 1958, 71–74), *PSI Congr.XXI* 2 (4th/5th CE), *P.Ryl.* I.61 (5th CE), and *P.Vindob.* inv. L 127 (5th CE). Isocrates is translated in *BKT* IX.149 (4th CE). One of Aesop's fables is translated in *PSI* VII.848 (4th CE) (DICKEY 2015b, 816).

97. Ancient attestations of this genre are found in *P.Prag.* II. (4th/5th CE), which contains a scene from a school, and *P.Berol.* inv. 21860 (4th CE) (DICKEY and FERRI 2012, 129–31).

98. *P.Mich.* VII 457 (3rd CE) is one of Aesop's fables (CAVENAILE 1958, 23, 163; DICKEY 2015b, 818). *P.Amh.* II.26 (3rd/4th CE) is a Latin translation with the Greek text of *Babrius* (XI.1–5) (CAVENAILE 1958, 118–20).

99. Examples of this include *PSI* XIII.1306 (4th/5th CE), a fragment of Paul's letter to the Ephesians, and Codex Bezae (DICKEY 2015b, 817).

a different copy of the text. The colloquia served as conversation manuals by which a student could learn short dialogues and common phrases for certain situations (DICKY 2012, 14).

Finally, a couple observations can be made about the relationship between columnar glossaries and columnar translations. First, bilingual columnar translation, whose earliest attestations go back only to the fourth century CE, is attested later than bilingual glossaries. Columnar translation seems to have developed out of the tradition of columnar glossaries. DICKY explains the phenomenon as essentially "[treating] a continuous text like a glossary" (2015b, 814). Glossaries and word-lists that only contain key words of a classical literary work may reflect a transition period. Second, while Greek transcription of Latin is quite common in bilingual glossaries, it rarely appears in translation texts. DICKY argues that this is because in the earlier period the focus was more on oral proficiency, whereas in the later period the focus was more on literacy (2012, 10).

3.4.1.2.1.3. Transcription

Pure transcription is attested in abecedaries. O.Max. inv. 356 (1st/2nd CE), a bilingual abecedarium, contains the names of the Latin letters transcribed in Greek (FOURNET 2003, 445):

]	γ	η	+	ι	κ	α	ι	λ	•	μ	ε	ν	ω	π	η	κ	ο	υ	ρ	ε	ς	τ	η	ο	υ	ξ	η	
]	G	•	H	I	K	L	•	M	•	N	•	O	•	P	•	Q	•	R	•	S	•	T	•	U	•	X	Y	Z

Figure 10: Latin Abecedarium in Greek Transcription (O.Max. inv. 356)

There are a number of similar abecedaries attested in the papyri, one of which is accompanied by a line from Vergil.¹⁰⁰

Examples of Greek transcription were cited earlier in the context of columnar glossaries. In each case, the text of both columns is represented in Greek script. In other words, the transcription is not serving to help one read Latin characters elsewhere on the papyrus, but is merely the most appropriate vehicle for carrying the Latin text (for a Greek speaker). Presumably, if one could read Latin script at all, there would be no need for transcription to

100. *P.Antinoë* I fr. 1 (4th/5th CE) and *P.Oxy.* X.1315 (5th/6th CE) are additional examples of bilingual abecedaries (CAVENAILE 1958, 136–37; KRAMER 2001, 33–44; ADAMS 2003, 41–42).

help with pronunciation. This is because, unlike Semitic scripts, Latin script indicated both the consonants and the vowels. In the case of learning the alphabet, neither the phonetic values of the letters nor the names of the letters would be apparent to a language learner. Accordingly, the phonetic representation of their names in Greek would be appropriate.

Ancient students learned the Latin alphabet by copying the letters from a model text in their proper order and repeating their names (CRIBIORE 2005, 132; DICKEY 2012, 10–11). In order to practice the letters, a student might also copy out a line of verse (DICKEY 2012, 10–11). The names of the Latin letters being phonetically represented in Greek is consistent with the fact that an instructor would teach the names of the letters when teaching schoolboys the alphabet (ADAMS 2003, 41–42).

3.4.1.2.2. Egyptian Tradition

Similar to the Greco-Latin tradition, it is common to find Egyptian glossaries, translations, and transcription. The main difference between the former traditions and the latter is that most bilingual Demotic texts do not use the columnar format (DICKEY 2015b, 819–20).

3.4.1.2.2.1. Glossaries

There is only one attested example of a Greek-Demotic columnar glossary. P. Heid. Inv.-Nr. G 414 (3rd CE) presents a Greek-Demotic word pair on each line with no separation between the words. The Demotic is represented in Greek transcription (QUECKE 1997, 72–73):

ταλλαντον = 'talent'	Τ<Δ>ΛΛΑΝΤΟΝΚΩΡΙ	κωρι = 'talent'
αξινη = 'axe'	ΔΞΙΝΗΚΟΛΕΒΕΙΝ	κολεβειν = 'axe'
σιδηρος = 'iron'	ΣΙΔΗΡΟ<C>ΒΕΝΙΠΙ	βενιπι = 'iron'
μαχαира = 'sword'	ΜΑΧΑΙΡΑΧΦΙ	σηφι = 'sword'
υποποτιον = 'footstool'	[Υ]ΠΟΠΟΤΙΟΝΤΑΞ	ταξ = 'footstool'

Figure 11: Greek-Demotic Columnar Glossary (P. Heid. Inv.-Nr. G 414)

This format is also found in Greek-Coptic glossaries, with the exception that the Greek-Coptic glossaries divide the words with a double point (:) (DICKEY 2015b, 819).¹⁰¹ Word-lists for literary works, like the word lists for Vergil's literature, also exist in the Egyptian tradition.¹⁰²

P. Heid. Inv.-Nr. G 414 bears a resemblance to those Greco-Latin glossaries in which the Latin column was written in Greek characters. Its function was also parallel. The transcription of the Egyptian words into Greek and the columnar format seems to point to Greek-speakers learning how to pronounce certain Egyptian words (RICHTER 2009, 411). Coptic-Greek word lists presumably helped Coptic speakers to access the Greek text more fully.

3.4.1.2.2. Translations

P.Berol. inv. 10582 (5th/6th CE), a Latin-Greek-Coptic trilingual colloquium, presents Latin transcribed into Greek characters, Greek, and then Coptic on each line. Each word is separated by a double point (:): (DICKEY 2015a, 66):

(= <i>si omnes</i>)	σι:ομνης:ειπαντες:ΕCΧΕΝΤΟ	'If all'
(= <i>biberint</i>)	βιβεριντ:επιαν:ΔΥCΩ	'have drunk'
(= <i>terge</i>)	τεργε:καταμαξον:ΒΩΤΙ	'wipe'
(= <i>mensam</i>)	μενσαμ:τηντραπεζαν:	'the table'

Figure 12: Latin-Greek-Coptic Trilingual Colloquium (P.Berol. inv. 10582)

This text likely has roots similar to the colloquia of the *Hermeneumata Pseudodositheana* (DICKEY 2015a, 71). It is more common, however, for bilingual translation of Egyptian to occur all in the same column, with the translation following the original.¹⁰³ Other formats are also attested, such as each translation being on each side of one page, the facing-page format, and parallel columns without line-for-line correspondence (DICKEY 2015b, 820). The trilingual colloquium, according to DICKEY, was a mix between a dialogue and a phrasebook, designed for Coptic speakers to learn Latin, Greek, or both (2015a, 65, 73).

101. For example, see *P.Rain.UnterrichtKopt.* 257a (3rd/4th CE).

102. Chester Beatty Papyrus *VII* is a third century CE example of Coptic glosses written in Greek characters in parallel with a Greek translation of the book of Isaiah (KENYON and CRUM 1937; RICHTER 2009, 413).

103. This is common in biblical and Christian texts such as P. Osloensis 1661 (4th CE) and *P.Köln* IV.169 (5th CE).

3.4.1.2.2.3. Transcription

The Demotic magical papyrus of London, a third-century CE Demotic text containing incantations, invocations, instructions for divination, and other such *voces magicae* (GRIFFITH and THOMPSON 1904, I.1, I.10, I.14–18) sometimes utilizes Greek transcription above a Demotic word (EMERTON 1956, 86; GRIFFITH and THOMPSON 1904, II.16.8, see also II.23.28):

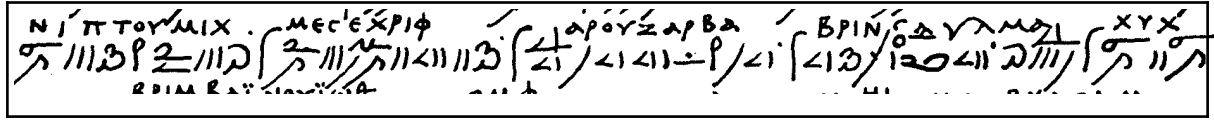


Figure 13: Supralinear Greek Transcription in the Demotic Magical Papyrus of London

THOMPSON and GRIFFITH's sketch shows the first word, Egyptian *nyptwmykh*, is glossed with the Greek transcription ΝΙΠΤΟΥΜΙΧ above it (EMERTON 1956, 86). Old-Coptic was also used to gloss rare words written in hieroglyphics in late Hieratic manuscripts (RICHTER 2009, 413).

EMERTON points out that the rare words given Greek transcription in this text are not actually Egyptian, but are almost all special terms invented by the magicians. Because the Demotic script was almost entirely consonantal, the Greek transcriptions provided a guide for pronunciation which was essential for the various invocations and spells to work (1956, 86).

3.4.1.2.3. Babylonian Tradition

The corpus of Graeco-Babyloniaca is comprised of around seventeen tablets from Mesopotamia written in cuneiform and Greek from the Hellenistic and Roman periods. WESTENHOLZ argues that the corpus should be dated between 50 BCE and 50 CE (2007, 274). Akkadian or Sumerian is written in cuneiform on the obverse and Greek transcription of that same cuneiform on the reverse. Rather than turn end-over-end like a typical cuneiform tablet, these tablets turn side-to-side (GELLER 1997, 47). This same practice was implemented when the text on the reverse contained a translation, rather than a continuation of the text on the obverse (GELLER 1983, 114). This is good evidence that the Greek transcription was conceived of as parallel to the cuneiform (GELLER 1997, 47). SOLLBERGER classifies much of the material as either lexical texts or literary texts (SOLLBERGER 1962, 63).

3.4.1.2.3.1. Transcription

BM 34797 is a Sumerian-Akkadian lexical text containing four columns. The obverse contains parallel columns of Sumerian and Akkadian written in cuneiform and the reverse contains parallel columns of the same text in Greek transcription (GELLER 1997, 68):

OBVERSE:

REVERSE:

<i>ṛe</i>	<i>i'-ki</i>	[ε]	ειχ
<i>pa₅</i>	<i>[p]al-gu</i>	[φα]	φαλαγ
<i>pa₅-ṛlal'</i>	<i>[a]-tap-pi</i>	φα λαṛλ'	[α]ṛθ'αφ
<i>ṛpa₅'-sig</i>	<i>[a-tap-pi]</i>	φα σεṛk'	αθṛα'φεṛι'

Figure 14: Sumerian-Akkadian Lexical Text with Greek Transcription (BM 34797)

Other lexical texts include BM 34781, BM 35727, and BM 34799 (SOLLBERGER 1962, 64–67).

There are also a number of examples of literary texts. Rm IV 327 (1st BCE), which contains a portion of the Šamaš Hymn, is expressed in cuneiform on the obverse and Greek transcription on the reverse (GELLER 1997, 78). The tablets also contain an Akkadian incantation (HSM 1137 [1st CE]) in cuneiform with Greek transcription and other literary texts (e.g., BM 34798, BM 34816, and VAT 412) (SOLLBERGER 1962, 67–71; GELLER 1983, 114–16).

Most scholars seem to agree that the Graeco-Babyloniaca tablets were the texts of ancient students of cuneiform (e.g., GELLER 1997, 47–48; WESTENHOLZ 2007, 262, 274). Even though only a small number of these texts have survived, the transcriptions bear the marks of a developed system and thus indicate that there were probably many such texts originally (274). Those trained in cuneiform during this time would most likely have been native Babylonians aspiring to work in astronomy or the liturgy of the cult (275).

Both GELLER (1997, 44) and WESTENHOLZ (2007, 276) set the Graeco-Babyloniaca texts against the backdrop of the demise of Akkadian as a spoken language. By the first century BCE, the last native speaker of Akkadian had passed away (WESTENHOLZ 2007, 276). Aramaic or Syriac would have taken the place of Akkadian in most contexts. The sort of cuneiform tablets that were still written contained temple-related texts, such as astronomical

diaries, incantations, and prayers (GELLER 1997, 64). Formal education would have been necessary for anyone wanting to learn Akkadian and the cuneiform script (276).

After students had learned some Akkadian, they would proceed to the traditional curriculum for the beginner scribe, which included such material as word lists and syllabaries. Eventually, they advanced to the classical Akkadian literary works. At this point, they were able to dismiss with the Greek transcriptions and function as true scribes (2007, 276–77). That the Greek transcriptions were meant to be an essential part of the learning process is demonstrated by the fact that they were written when the clay was not yet dry (WESTENHOLZ 2007, 277). Because contemporary pronunciation differed in significant ways from its representation in cuneiform (see WESTENHOLZ 2007, 283–91), the transcriptions were a helpful tool for the beginning scribe. The reason that the Greek alphabet was utilized over Aramaic script for such a pedagogical aid lay in its facility to express the precise vowel qualities and quantities (277). The Greek alphabet is also easier to learn than cuneiform. GELLER argues that the Greek transcription on the reverse was an aid for correct reading (likely aloud) (1997, 47).

In sum, the Graeco-Babyloniaca tablets represent an attempt of teachers to transmit the Babylonian culture, its language and literature included, to the next generation of students. Being able to read and write the cuneiform script was an essential part of this endeavor. The Greek transcriptions could never have substituted for the cuneiform script and were never intended to take the place of reading the Akkadian in its original representation. Rather, they were intended by the teachers who composed them to serve as a tool for training beginning scribes in cuneiform. Once a beginner had advanced far enough, the transcriptions had served their purpose and were no longer needed (WESTENHOLZ 2007, 280).

3.4.1.3. Stand-Alone Transcription in the Hellenistic/Roman/Byzantine Near East

3.4.1.3.1. Introduction

The first part of this section surveyed the comparative material that exhibited a columnar, parallel, or interlinear layout. A significant number of these texts also contained transcription. Most of these texts constituted material for learning another language. Because of the convic-

tion that transcription in columnar, parallel, or interlinear form generally has a different function than stand-alone transcriptional texts, the two types of transcription have been separated in our analysis. In the second part of this section, some of the more common instances of stand-alone transcriptional material will be surveyed by language or language group.

3.4.1.3.2. Latin and Greek Tradition

Transcription is attested in a number of legal or economic texts, perhaps due to common formulae being Latin-specific. SB III.I.6304 (2nd CE), a receipt of a slave trader from Miletus, originally penned in Italy but carried to Fayûm, constitutes Latin in Greek transcription (ADAMS 2003, 53–54, 63):

σκριψι μη ακκηπισσε α Τιτω Μεμμιω Μοντανω μιλιτε πεντηρω Αυγιστι
δηναριους σεσκεντους βιγεντι κινκυε πρετιουμ πουελλαι Μαρμαριαι βετρανε.¹⁰⁴

I wrote that I have received from Titus Memmius Montanus, soldier of the quinquireme "Augustus," 625 *denarii* as the price of a Marmarian girl, a "veteran."

Figure 15: Latin Receipt of Slave Trader in Greek Transcription (SB III.I.6304)

The reason transcription was used in this text is probably a combination of factors: the legal/economic formulae may have been Latin-specific, it may have been important for the author to write in his own hand, and the recipient may have only been able to read Greek script (ADAMS 2003, 55, 60, 62). Other examples of similar texts are attested in the papyri.¹⁰⁵ Transcription is also attested in Greco-Latin funerary inscriptions in the western empire. There, a Latin funerary inscription might have been expressed by means of Greek transcription due to the identity of the deceased (ADAMS 2003, 89–92).¹⁰⁶ Transcription is often used in magic and *defixiones* (curse tablets). The idea behind this is that the magical "spell" or "curse" should be obscured in some way; ADAMS calls this "obfuscation" (2003, 43–44, 47).¹⁰⁷

104. = *scripsi me accepisse a T. Memmio Montano milite pentero Augisti denariou sescentous viginti cinque pretium puellae Marmariae vetrane.*

105. *P.Oxy.* XXXVI.2772, a letter to a banker, contains Greek in Latin transcription (ADAMS 2003, 65–66).

106. For example, see *IG* XIV.698 (ADAMS 2003, 89–92).

107. An example of a Greek transcription of a Latin *defixio* is found at Hadrumetum (ADAMS 2003, 44).

3.4.1.3.3. Egyptian Tradition

Greek transcription of Egyptian is unique because Greek would later become the basis of the Coptic alphabet. An Egyptian dating formulary of Pharaoh Hor-Wenefer is transcribed into Greek script in a 202/201 BCE graffito from Abydos (LACAU 1934; RICHTER 2009, 411–412):

ΛΕ ΠΟΡΩ ΥΡΓΟΝΑΦΟΡ	(= <i>h</i> :.t-sp 5 Pr- ^ε : Hr-Wn-nfr)
MHI ΕΣΙ ΝΟΜ ΟΥΣΙΡΕ ΜΗΙΕ	(= <i>mrj</i> - ² Is.t nm Wsir <i>mrj</i> - ² I-)
ΜΟΥΝΑΑ ΣΟΝΘΡ ΠΙΝΟΤΩ	(= <i>mn</i> - R ^ε nswt - <i>ntr</i> .w p: <i>ntr</i> ^ε :)

Reg.-year 5 of Pharaoh Horwenefer, beloved by Isis and Osiris, beloved by Amun-Ra, king of gods, the great god

Figure 16: Egyptian Dating Formulary of Pharaoh Hor-Wenefer in Greek Transcription

Also, in a second-century BCE inscription on a stela, the various names of the Egyptian god Thot are transcribed into Greek (GIRGIS 1965; RICHTER 2009, 411–12).

"Old-Coptic" texts differ from the earlier attempts at transcription in that, while they are made up mostly of Greek letters, they add a number of Egyptian signs to supplement a number of Egyptian phonemes lacking in Greek (RICHTER 2009, 412–23).¹⁰⁸ For the sake of illustration, a portion of the Schmidt papyrus is quoted below (SATZINGER 1975, 39–40):

ΛΕ ΠΑΛΟΙΟ ΟΥΣΙΡΕ ΝΖΑΡΩ ΤΙΟΜΜΕ ΝΑΚ ΑΡΙ ΠΑΔΔΤ ΝΜ ΖΗΡ
--

My lord Osiris, (Lord) of Ḥasrō! I complain to you, do justice to me and Ḥōr

Figure 17: Old-Coptic in Greek Transcription (Schmidt Papyrus)

Most of the letters are Greek, but a number of Egyptian signs are utilized to represent those phonemes not present in Greek: Λ for *t/d*, Ζ for *h*, Δ for *h*, Ξ for *ō*, etc. (SATZINGER 1975, 38).

Egyptians utilized the Greek script in magical formulae, archaic language, and instances in which precise pronunciation was important (RAY 2007, 813). The "Old-Coptic" corpus is comprised largely of ritual texts. Transcription is used to make sure the text was pronounced with precision in a ritual context. From the perspective of non-referential lan-

108. See P.Lond. 98 (95 CE), a horoscope (CERNY, KAHLE, and PARKER 1957); BM 10808 (2nd CE), a spell (CRUM 1942; SEDERHOLM 2006); the Schmidt papyrus (ca. 100 CE), a petition (SATZINGER 1975; RICHTER 2002).

guage theory, one could accomplish the recitation of the archaic ritual texts from the Greek transcription even if one did not understand the original Demotic (MARTIN 2007, 257–59).

3.4.1.3.4. Hebrew Tradition

Transcription on funerary inscriptions is an identity-motivated choice (ADAMS 2003, 22–23). It is not uncommon for Jewish funerary inscriptions composed in Greek to have a Hebrew "tag," such as שלום 'peace' or שלום על ישראל 'peace upon Israel', at the beginning or end of the inscription.¹⁰⁹ Such tags are common in the Caesarea area (*CIIP* 2, 1517, 1549, 1602, 1662, 2098). Hebrew tags like שלום 'peace' could also be represented in Greek transcription (NOY 1993, no. 72; ADAMS 2003, 22–23, 66),¹¹⁰ as in the following funerary inscription from Beth She'arim (SCHWABE and LIFHISTZ 1974, no. 91, see also nos. 21, 25, 72):

Σαλλὸμ	'Farewell,
Ἄταν	Athan,
Δώρου	son of Doron.'

Figure 18: Beth She'arim Funerary Inscription (no. 91) with Transcribed Tag

ADAMS calls such a phenomenon "tag-switching" or "formula-switching," which was motivated by a sense of the (in this case Jewish) identity of the deceased (ADAMS 2003, 22–23).

A possible example of transcription in a *defixio* context is found on an ossuary from the Jerusalem area dated to the first century BCE or CE (*CIIP* I/I, 451). The name and identity of the deceased is written in both Hebrew and Greek script. However, the final line of the inscription, a typical warning against any who would disturb the grave, reads as follows: 'whoever moves these [bones], blindness will strike him!' τ ἀντικακινήσ(ας) | αὐτὰ παταξει αὐτο(ν) | οὐροῦν. According to RAHMANI (1994, no. 559), the word used for blindness (οὐροῦν) is apparently a transcription of the Hebrew עורין 'blindness' (*CIIP* I/I, 451).

109. For example, R. Samuel's (3rd–6th CE) epitaph in Jerusalem area: Παββὶ Σαμουήλ[ος] | ἀρχηγιστ[ή]ς[αγωγος --] ... | שלום על מישכבך 'Rabbi Samuel, synagogue ruler ... Peace on your resting place' (*CIIP* I/II, 1001).

110. For example: τάφος Ἄνα διὰ βίου σάλωμ (NOY 1993, no. 72).

The western part of the empire also contains a number of examples of religious or liturgical texts in Greek transcription.¹¹¹ The Hebrew *Shema* (Deut. 6:7) was found transcribed on an amulet buried with a child in what is modern day Austria dated to the second or third century CE (BAR-ASHER 2010). The use of Greek transcription for a Hebrew verse in such a context relates to the importance and power of the words themselves. If the author did not know Hebrew, transcription was preferred over translation to preserve the original. If the author did know Hebrew, transcription was chosen to ensure the words were pronounced correctly. If the amulet had a ritualistic use, Greek script may have been used for obfuscation.

3.4.1.3.5. Semitic Tradition

Transcription appears in a number of religious and liturgical contexts. At Dura-Europos, the following inscription is found on the wall of the pronaos of the temple (MILIK 1967, 289–90):

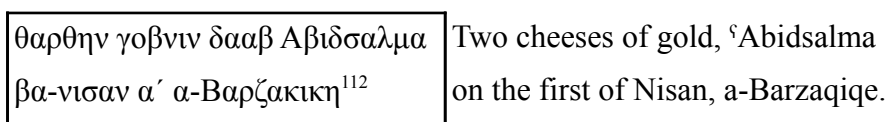


Figure 19: Aramaic in Greek Transcription (Dura-Europos Inscription)

This inscription was likely a votive offering of a shepherd, who offered two small gold models of cheese to thank the god for protecting his flocks. Having knowledge of the Greek script but not the language, he composed the inscription in his native Aramaic (MILIK 1967, 291). Greek transcription of Aramaic is also found in a pair of inscriptions from Naḥal Dimonah, which is regarded as a writing exercise (KIRK 1938; PRICE and NAEH 2009, 268–69).

P. Amherst 63 (2nd BCE), an Aramaic text of considerable length transcribed into Demotic script, constitutes the New Year's liturgy of a group of exiles from Mesopotamia. A linguistic analysis of the text has demonstrated that the scribe did not know Aramaic himself. Rather, he seems to have recorded an oral tradition (NIMS and STEINER 1983; STEINER 1997; PRICE and NAEH 2009, 263–64; STEINER and NIMS 2017). Since the use of Aramaic had greatly

111. A Greek transcription of Hebrew is found on an amulet from Sicily (NOY 1993, 159) and on a phylactery from Wales (ADAMS 2003, 272).

112. תרתין גבנין דהב עבדשלמא בניסאן 1 א-ברזקיקא =

diminished in Egypt by this time, the text was composed so that a priest, whose knowledge of Aramaic was poor, could still perform the ritual (STEINER and NIMS 1983, 272; 2017).

A neo-Punic inscription from El-Hofra is written in Greek letters (GORDON 1968, 289). Like the Aramaic example, it was probably also a votive offering. There are a number of other Greek transcriptions of Phoenician and Punic, which ADAMS connects to the eventual death of Punic. It is possible that the presence of deities' names or the cultic connection of certain inscriptions prompted the use of Punic in this text, even though the script was not used (2003, 240–45). There are also Punic inscriptions written in Latin from the third and fourth centuries CE from Tripolitania (KERR 2010). PRICE and NAEH argue that such texts arose in an environment where literacy in Punic had declined even though people still spoke the language (2009, 264–65).

Finally, like many Safaitic inscriptions, a Graeco-Arabic inscription from Jordan (3rd/4th CE) contains a simple record of a shepherd's activity (AL-JALLAD 2015b, 52). The use of Greek may reflect that the author was literate in Greek script, rather than the Safaitic script.

3.4.1.3.6. Summary

There is no singular thread of continuity that ties all these various uses of stand-alone transcription together, but a few trends are discernable. Transcription is used in legal or economic contexts, funerary inscriptions, *defixiones*, magical texts, ritual texts, and religious texts. Aside from the Greco-Latin tradition, transcription usually arises out of a circumstance in which the transcribed language is on the decline. Typically, an inscription would have been written in its "native" script unless the author was insufficiently skilled in that script or made a conscious choice to use a different script for another reason (PRICE and NAEH 2009, 274).

In some cases, the authors seems to be more (or only) proficient in Greek, but regard their text as inextricably linked to another language whose script they did not know. This seems to be the case in the legal or economic texts transcribed into Greek, in which the legal formulae are regarded as inherently Latin phrases. In the case of religious texts transcribed

into Greek, the names of deities and cultic elements in the inscriptions are difficult to separate from the language in which the people were accustomed to carry out their religious duties (e.g., Aramaic, Punic). In each of these instances, because of an inherent quality of the content of the inscription, transcription was regarded as more appropriate than translation. While the authors would have written the inscriptions in their "native" scripts if possible, they preserved the original languages even though they had to resort to writing them in another script.

In other cases, it seems that the author utilizes transcription as a conscious choice. In the case of funerary inscriptions, this is done for the sake of carving out an identity. In the case of *defixiones*, transcription is used for obfuscation. Finally, in the case of magical or ritual texts, the text was transcribed because the precise pronunciation of the words, which were regarded as inherently powerful, was important for the success of the utterance and the original script required that one know the language in order to read it correctly.

3.4.1.4. Synthesis

While numerous scholars have compared the different practices of transcription in the Near East with the Secunda (e.g., EMERTON 1956; MARTIN 2007; PRICE and NAEH 2009), none of these approaches have separated parallel transcription and stand-alone transcription in their analysis. Moreover, appreciating the Secunda as an originally parallel text has allowed us to expand the corpus of comparative material to include non-transcribed parallel texts. As a result of this multi-faceted analysis, a number of conclusions may be drawn about parallel texts and transcriptional texts in the Hellenistic, Roman, and Byzantine Near East.

First, it was consistently the case that columnar, parallel, and interlinear formats with or without transcription were implemented most for learning a foreign language or for learning classical literature. If transcription was found in a parallel context, it almost certainly indicates that the text was language-learning material. Second, transcription often arises when the transcribed language is dying. While use and knowledge of the script often fade first, the language continues to be spoken for some time. Transcription, in such cases, reflects an at-

tempt to preserve the language (e.g., Graeco-Babyloniaca, P. Amherst 63, Latino-Punic) and thus indicates its decline (PRICE and NAEH 2009, 262–266; see also ADAMS 2003, 66). Third, transcription may be the result of practical necessity or conscious choice. In the case of the former, the author is unskilled in the script of the target language but regards the text as inextricably linked to that language. In the case of the latter, the author may choose to implement transcription for the sake of identity, obfuscation, or ensuring the correct pronunciation of powerful and efficacious words. The final purpose, namely, ensuring correct pronunciation, is particularly common when a language is fading away.

In the case of the *Secunda*, the author must have known the Hebrew script and language quite well. Therefore, the utilization of transcription in the second column must have been the result of conscious choice and not practical necessity. It seems unlikely that a Jewish Hebrew expert would have utilized Greek script to emphasize his identity and less likely that he would desire to obfuscate the biblical text. Accordingly, we must rule that the purpose of transcription in the *Secunda* was to ensure the correct pronunciation of words regarded as efficacious or powerful.¹¹³ This motivation for transcription, in light of the evidence surveyed above, would also point to the fading away of the Hebrew language. Finally, the parallel nature of the *Secunda* would point to its use as material for learning language or literature.

In sum, the comparative material would suggest that the transcriptions of the second column should be viewed as Hebrew-learning material composed at a time when the language was fading away and it was becoming more and more important to ensure an accurate recitation of the powerful and efficacious words of the scriptures. Accordingly, the remaining sections of this chapter will examine the relevant evidence to determine if such a portrait fits for second- and third-century CE Palestine. First, a summary of the linguistic situation in

113. Although it was admitted earlier that the Greek transcriptions themselves would not have ensured correct pronunciation, the theory espoused below need not make such a claim. If used as a teaching tool, the transcriptions would have been used in conjunction with other means of Hebrew instruction (see 3.4.4).

Palestine will demonstrate that the date for the composition of the *Secunda* correlates with the fading away of Hebrew. Second, it will be shown that the composition of the *Secunda* also coincides with the rising importance of education in the recitation of the Hebrew scriptures and the development of schools. Finally, these conclusions will be synthesized to form a hypothesis regarding the original context for the composition of the *Secunda*.

3.4.2. The Linguistic Situation in Roman Palestine

3.4.2.1. Introduction

In Origen's *Epistula ad Africanum* (11.61), he describes his attempt to ascertain whether two plays on words found in the Greek *History of Susanna*—*πρῖνος* 'kermes-oak' and *πρῖσις* 'sawing', *σχῖνος* 'mastich' and *σχίσις* 'cleavage/parting'—would also be present in a hypothesized Hebrew original. He asks a number of Jews how they would translate the Greek words *πρῖνος/πρῖσις* and *σχῖνος/σχίσις* into Hebrew. They respond by saying that they do not know those Greek words, but request that Origen bring them pieces of the different trees. The account that follows provides insight into the linguistic situation in third-century CE Palestine:

And (for the truth is precious), I did not hesitate to place before them in their sight the [pieces of] the trees. One of them claimed that it was not possible to ascertain with certainty how something is said in Hebrew if it is not mentioned by name in the scriptures. And when at a loss, one is prone to use the Syriac word instead of the Hebrew [word]. He went on saying, "even among the wisest sometimes certain words are lacking." "If then," he said, "you can set forth the *schinos*, mentioned by name in some scripture, or the *prinos*, we are liable to find there that which is sought and its pair that provides the pun. But if it is nowhere mentioned by name, then such a word escapes us also."¹¹⁴

This conversation is quite instructive for inferring a number of facts about the linguistic situation in Palestine (or perhaps just Caesarea) during Origen's time. First, the conversation was presumably conducted in Greek, which demonstrates that it was not unusual for Palestinian Jews in the Caesarea area to converse in Greek. Second, the fact that Origen's Jewish infor-

114. Καὶ (φίλη γὰρ ἡ ἀλήθεια), οὐκ ἠπόρησα αὐτοῖς ὄψει παραστήσαι τὰ ξύλα. Ἄλλος δὲ ἔφασκε τὰ μὴ ὀνομασθέντα τῶν Γραφῶν ποὺ οὐκ ἔχειν διαβεβαιώσασθαι, ὅπως Ἑβραϊστὶ λέγεται· προπετὲς δὲ εἶναι, τὸν ἀπορήσαντα φωνῇ τῇ Συριακῇ χρήσασθαι ἀντὶ τῆς Ἑβραϊδος· καὶ ἔλεγε, καὶ παρὰ τοῖς πάνυ σοφοῖς ἐνίοτε λέξεις τινὰς ζητεῖσθαι. Εἰ μὲν οὖν, φησὶ, ἔχεις τι παραστήσαι τὴν σχῖνον ὅπως ποτὲ ὀνομασθεῖσαν ἐν τινὶ Γραφῇ, ἢ τὴν πρῖνον, ἐκεῖθεν ἂν εὗρομεν τὸ ζητούμενον, καὶ τὴν παρ' αὐτὰ παρωνυμίαν· εἰ δὲ μηδαμοῦ ὀνομάσθῃ, καὶ ἡμᾶς διαλανθάνει τὸ τοιοῦτον. Translation in consultation with CROMBIE in ROBERTS et al. (1885).

mants are confident that they can come up with the Hebrew name for the trees if Origen will just provide them with a specimen demonstrates that they were comfortable with Hebrew *on some level*. Finally, the fact that one would default to Syriac (i.e., Aramaic) when ignorant of a Hebrew term shows that Aramaic had overtaken Hebrew as the Jews' dominant language—or second language, if Greek was their primary language.

The subtleties of this passage, however, demand a more nuanced look at the status of Hebrew for Origen's Jewish informants. On one hand, his informants tell him that their Hebrew knowledge is essentially limited to that which is attested in scripture. This seems to indicate that Hebrew was no longer a vernacular language. On the other hand, the fact that his informants conceive of a situation where one might be at a loss (*ἀπορήσαντα*) for a Hebrew word and thus need to resort to the more familiar Aramaic term indicates that there existed a context in which Hebrew was the target of linguistic *production*. It is likely that such Hebrew usage was confined to religious discourse (biblical/*halakhic* discussions, instruction in schools, synagogue sermons, etc.) and liturgical use (prayers, songs, eventually *piyyuṭim*, etc.). Nevertheless, although Hebrew continued to be used in limited contexts, even the most knowledgeable among the Jews were ignorant of some of the rarer words.

3.4.2.2. Greek, Latin, Hebrew, and Aramaic

This passage is consistent with what is known about the linguistic situation in third-century CE Palestine. Greek was widely used in Palestine both during and before Origen's time. While scholars differ regarding the numbers and distribution of Greek-speaking Jews, there is consensus that Greek would be strongest among the upper classes, such as the rabbis and the educated, as well as among those dwelling in Hellenistic urban environments. Caesarea, especially, would have been a prime location for Jews with a strong grasp of Greek.¹¹⁵ In a city like Caesarea, the capital of the Roman province *Iudaea/Syria Palaestina*, Latin also would

115. For the use of Greek among Palestinian Jews, see MUSSIES (1976, 1056–59); HESZER (2001, 237–47); WISE (2015, 345). For the knowledge of Greek among the rabbis, see SPERBER (2012, 115–21, 129–31, 135–36, 158).

have played a significant, if limited, role. It would have been used among the administrative elite and enjoyed social prestige.¹¹⁶

For a long time, scholars wrongly assumed that Hebrew was no longer spoken in Palestine by the first century CE. However, advances in the field of Mishnaic Hebrew and new epigraphic discoveries over the course of the twentieth century have made it abundantly clear that both Hebrew and Aramaic were spoken by Palestinian Jews in the first two centuries CE. Rather than resembling the Hebrew of the Bible, however, the dialect of Hebrew that was spoken seems to be a form of Mishnaic Hebrew. This constituted the Hebrew vernacular. (Recently, it has been suggested that Mishnaic Hebrew is the product of a high degree of linguistic interference resulting from many native Aramaic speakers learning a form of Biblical Hebrew as a second language during the Hasmonean period.) There existed, at the same time, the standard literary register of Hebrew, which had to be learned. While it seems possible that Aramaic might have had a slight edge over Hebrew in the first century CE, they were both vernaculars of the Palestinian Jews. During the second century CE, probably largely due to the Bar Kokhba revolt in 135 CE, Aramaic began to replace Hebrew as the common vernacular in Palestine. By the end of the second century CE, Aramaic had become the vernacular of the Palestinian Jews, with Hebrew surviving only in religious and liturgical contexts. It is possible, however, that Hebrew continued to be a vernacular among some small pockets of Jews.¹¹⁷

3.4.2.3. Concluding Remarks

Origen's residence in Palestine comes at the tail end of the period in which Hebrew was still a vernacular for Palestinian Jews. It is unlikely that Origen encountered any native Hebrew

116. For the use of Latin in Caesarea, see LEHMANN and HOLM (2000); ECK (2009, 34–40); ISAAC (2009, 55–60).

117. For a history and critique of the "exclusive Aramaic" view, see BALTES (2014a). For a cogent argument regarding the prevalence of spoken Hebrew in the first two centuries CE, see FASSBERG (2012). For the relationship of spoken Hebrew and Aramaic to literary Hebrew and Aramaic and Hebrew *diglossia*, see WISE 2015 (7–12, 317, 330). For the epigraphic evidence for the use of Hebrew and Aramaic in the first two centuries CE, see NAVEH (1992a; 1992b); BALTES (2014b); TURNAGE (2014). For Judaeen Hebrew, see MOR (2015). For Jewish Palestinian Aramaic as the form of Aramaic spoken in Roman Palestine, see GZELLA (2015, 296–304). For Mishnaic Hebrew as the result of native Aramaic speakers learning Hebrew as a "non-hybrid conventionalized second language," see COOK (2016).

speakers, but it is entirely possible that he interacted with the grandsons and great-grandsons of Hebrew speakers. In third-century CE Caesarea, he was surrounded by (mainly) Greek and (some) Aramaic. Nevertheless, those Jews who had been to school would have been familiar with Biblical Hebrew and, if they advanced far enough in their schooling, Mishnaic Hebrew as well (see next section). Apparently, it was not too difficult for Origen to find such Jews familiar with Hebrew. This brings the discussion full circle back to the passage in Origen's *Epistula ad Africanum*. He conducted a conversation with Jewish informants in Greek, who seemed to exhibit a relative comfort with Biblical Hebrew, but were native Aramaic speakers.

It should be noted that, like the examples of transcription in the Near East surveyed above, the description of the linguistic situation in Palestine places the composition of the *Secunda* during the period when the use of Hebrew as a vernacular was fading away. This would have resulted in a situation in which the lack of competence in Hebrew, especially Biblical Hebrew, would have been especially felt.

3.4.3. Learning Hebrew in Tannaitic/Amoraic Palestine

3.4.3.1. Introduction

The Babylonian Talmud relates a curious story *in Aramaic* about sages learning the meaning of rare Hebrew words from the handmaid of Judah the Prince (2nd/3rd CE):

The rabbis did not know what [the meaning of] סִירוּגִין was. They heard the maidservant of Rabbi's house, when she saw the rabbis coming into the house in intervals, saying, "How long are you coming in סִירוּגִין סִירוּגִין?"¹¹⁸

...

The rabbis did not know what [the meaning of] וְטֹאטְאִיָּהּ בְּמִטְאֵטָא הַשְּׁמַד [Isa. 14:23] was. One day they heard the maidservant of Rabbi's house saying to her workmate, "Take a טֹאטְאִיָּהּ ['broom'] and טֹאטְאִי ['sweep!'] the house."¹¹⁹

This second- or third-century CE passage, in light of the discussion regarding the linguistic situation in ancient Palestine, demonstrates precisely the sort of issues that would have been rel-

118. *bRoš Hašana 26b*: לא הוו ידעי רבנן מאי סִירוּגִין שמעוה לאמתא דבי רבי דחזנתהו רבנן דהוו עיילי פסקי פסקי אמרה להו עד מתי אתם נכנסין סִירוּגִין סִירוּגִין. Translation in consultation with *William Davidson Talmud*.

119. *bRoš Hašana 26b*: לא הוו ידעי רבנן מאי (ישעיהו יד, כג) וְטֹאטְאִיָּהּ בְּמִטְאֵטָא הַשְּׁמַד יומא חד שמעוה לאמתא דבי רבי דהוות אמרה לחבירתה שקולי טֹאטְאִיָּהּ וטֹאטְאִי ביתא. Translation in consultation with *William Davidson Talmud*.

evant when the text of the second column was composed. The handmaid, a rare surviving native speaker of Hebrew, has a clear advantage in Hebrew over the rabbis, whose native language would have been Aramaic. Even though her dialect, resembling Tannaitic Hebrew, would have been markedly different from that of Biblical Hebrew, it meant that she knew "rare" words both in Mishnaic and Biblical Hebrew. However, whatever advantage native speakers of Hebrew might have had in reading the Hebrew Bible, the number of that group was diminishing throughout the second century CE. If the high literary Hebrew of the Bible had been difficult for native Hebrew speakers before (see WISE 2015), how much more difficult it would have been for native speakers of Aramaic or Greek.

Competence in reading and understanding the Hebrew Bible demanded formal education. The necessity of such learning becomes all the more poignant when one considers the fact that certain Hebrew words are said to escape even the knowledge of the sages, both in this passage from the Babylonian Talmud and in Origen's *Epistula ad Africanum*. Despite the challenge in learning it, the course of Jewish history demonstrates clearly that the rabbis learned and knew Hebrew very well, even when it was no longer their native tongue (ALEXANDER 1999, 71). The question, then, of how they learned Hebrew is quite relevant.

3.4.3.2. Torah Education and Jewish Elementary Schools

Scholars who have written on Jewish education in ancient Palestine have approached the topic in different ways. One approach takes the Amoraic statements about the existence of a Jewish elementary school system in the first few centuries CE at face value (e.g., SAFRAI 1976). Another approach questions whether rabbinic texts from the Amoraic period are reliable witnesses of the Tannaitic period (e.g., HEZSER 2001). When it comes to the actual methods of teaching Hebrew, different scholars draw on different sources to support their views. These various sources include rabbinic texts (e.g., SAFRAI 1976), parallels with other societies in the Graeco-Roman world (e.g., HEZSER 2001), and documentary evidence in ancient Palestine

(e.g., WISE 2015). A synthesis of the various perspectives on Hebrew learning and literacy in ancient Palestine may be summarized in terms of the method, context, and extent of learning.

With respect to the method, there is consensus that learning to read Hebrew began with learning the alphabet. The teacher would write out the letters for the students and repeat their names and sounds until the student learned to recognize them. It is possible that the students also learned to write the letters and continued to copy texts as part of their education. After learning the alphabet, the student would begin to read short texts from Leviticus (possibly also Numbers) and Genesis. Finally, the student would progress to read the Torah itself, which involved two main tasks. The first was memorizing the reading tradition of the Torah. This was accomplished by the teacher reciting verses and the students repeating them; a teacher who had learned to recite the reading tradition with precision was highly valued (e.g., *bGittin* 36a). The second was learning and understanding the meaning of the Torah. This was accomplished by the teacher's explanatory comments that accompanied the recitation of the Torah. Some scholars also think that a *phrase-by-phrase* translation, such as the Targumim and the Greek translations of Aquila and Symmachus were also used for such purposes (see 3.4.3.3). Familiarity with the reading tradition of the Torah and its translation was reinforced by hearing them read regularly in the synagogue. After learning the reading tradition of the Bible, students with the opportunity might advance to study *Halakha* in the *בֵּית מִדְרָשׁ*.¹²⁰

With respect to context, the responsibility to teach a boy to read the Torah originally fell on the shoulders of his father. Outside of the familial context, a potential teacher might be found in the local *הֹזֵן* or *סוֹפֵר*. Jewish education was not yet formalized at this point, but rather took shape based on the given needs and circumstances. At some point, however, Jewish elementary schools began to develop. Even then, rather than having their own designated build-

120. For a synthesis of the relevant rabbinic evidence on the methods of learning Hebrew, see SAFRAI (1976, 945–49, 951–53). For an approach based on epigraphic material, comparative material, and only rabbinic texts dated to the Tannaitic period, see HESZER (2001, 76–80, 83). For the use of parallel texts/translations in learning Hebrew, such as the Aramaic Targumim and Aquila's Greek translation, see ALEXANDER (1999, 79–84).

ings, lessons were conducted in the synagogue, in study houses, and even in the homes of teachers. Schools were present in many, but not all, Palestinian towns. The establishment of Jewish elementary schools happened no later than the third century CE, and possibly as early as the first century CE, though a date closer to the former should be favored. It may be accurate to view the time between these dates as a transition period of growth in systematic Torah education. It is perhaps no coincidence that this period was witness to the development of the Targumim, Aquila's translation, and Symmachus's translation, potential tools for learning the text of the Hebrew Bible and all prepared under the sponsorship of the rabbis (see 3.4.3).¹²¹

With respect to the extent of learning, it was the elite class who were able to avail themselves of the opportunity to learn to read. Under the assumption that the term "elite" is synonymous with the top quartile of society, about one in three elite males and one in fifteen adult males could read the Torah. While they would have grown up with the privilege of education, it also would have been possible to learn to read Hebrew as an adult like R. Aqiba.¹²²

3.4.3.3. The Place of the Targumim and Greek Translations in Learning Hebrew

While the Targumim are most commonly discussed for their role in the synagogue, both in rabbinic literature and in modern scholarship, they were also used in other settings. According to Targum scholars, the rabbis refer to three contexts for the use of the Targumim: in the synagogue, in schools, and in private study (e.g., ALEXANDER 1985, 21; FLESHER and CHILTON 2011, 285). For our purposes here, we may focus on the role of the Targumim in the *בֵּית סֵפֶר*.

In the Tosefta, a text regarding a list of passages not to be read in the synagogue service (*tMegillah* 3:31–38) concludes with the following statement: מעשה דוד ובת שבע לא נקרא: 'the story of David and Bathsheba is not to be read and is not to be translated, but the teacher (סופר) teaches as he is accustomed'. According to FLESHER and

121. For a synthesis of the relevant rabbinic evidence regarding the context of learning Hebrew, see SAFRAI (1976, 952–61). For an approach based on epigraphic material, comparative material, and only rabbinic texts dated to the Tannaitic period, see HESZER (2001, 40–69). See also ALEXANDER (1999, 71–78, 85–86).

122. For an analysis of the extent of literacy among first century CE Palestinian Jews, see WISE (2015, 53–60, 311, 345–555). For evidence of adults learning Hebrew in ancient Palestine, see HESZER (2001, 76).

CHILTON, the mention of the סופר in this passage not only indicates that the Targumim were used in the schools apart from the synagogue, but that they were used specifically in children's schools (2011, 321). There are also references to Targum in sequential descriptions of a study curriculum (e.g. *Sifré Deuteronomy*, 161) (ALEXANDER 1985, 22; FLESHER and CHILTON 2011, 319–320). Finally, there is a reference in the Jerusalem Talmud to a schoolmaster who owned a written Targum (*yMegillah* 74d) (ALEXANDER 1985; 22).

In light of such examples in rabbinic literature and comparative pedagogical material in the Roman world, ALEXANDER suggests that the Targumim may have originally developed in the בית ספר context (1999, 81). In fact, it is unlikely that the original *Sitz im Leben* of the Targumim, at least in their most primitive stage, was the synagogue.¹²³ Regardless of whether the Targums developed in the בית ספר, however, it is sufficient for our argument to affirm that they were used at the elementary level to teach Hebrew. Presumably, similar to the function of the columnar translations of Vergil, a student learned the meaning of a verse of the Bible by matching up the words of the Targum with the Hebrew original. In each case, a literal word-for-word translation facilitated learning (ALEXANDER 1999, 80–82). It should also be noted that such a hypothesis does not necessarily entail that a written Targum was in use in the בית ספר, but merely that the teacher regularly recited a phrase-by-phrase Aramaic translation after reciting the Hebrew text so that the students could learn to understand the Hebrew.

One might object to such a reconstruction on the grounds that the Targumim are not *verbum e verbo* translations but rather exemplify a much freer or even "midrashic" style. Such a characterization, however, is neither entirely accurate nor sufficiently nuanced. Although the Targumim often contain highly expansionist commentary, there is typically a "hyper-literal" core that is characteristic of a *verbum e verbo* style. FLESHER and CHILTON put it

123. According to Z. SAFRAI, the earliest clear references to the practice of antiphonal Aramaic translation in the synagogue date to the mid-second century CE. Moreover, a number of early references to synagogue meetings conspicuously omit any account of Aramaic translation following the Torah reading. At the same time, however, there are instances of Aramaic translation (e.g., the Job "Targum" at Qumran) and references to Targum (e.g., *bMegillah* 3a) dating to an earlier period (1992).

best by defining Targum as "a translation that combines a highly literal rendering of the original text with material added into the translation in a seamless manner." Because the additional commentary elucidated the meaning, the literal core did not necessarily have to convey the meaning in the clearest manner. Accordingly, it was often "hyper-literal" (2011, 19–37, 378–80). Whether first developed for the synagogue, for schools, or perhaps for both simultaneously, a hyper-literal word-for-word rendering followed by explanatory comments would be conducive to learning the original Hebrew, provided that it was recited phrase-by-phrase rather than verse-by-verse.¹²⁴ The fact that the Targumim stand alone among ancient translations in this respect (i.e., a hyper-literal rendering followed by extensive explanatory comments) (FLESHER and CHILTON 2011, 379–80) may be indicative of their distinct purpose, namely, that of helping the hearers learn the text in its original language (i.e. Hebrew).

Some scholars suggest that Aquila's Greek translation of the Old Testament (ca. 125 CE) was used in a similar way (e.g., VERMES 1966; ALEXANDER 1999, 83–84) (see discussion in MARCOS 2001, 110). This hypothesis is largely based on the "hyper-literal" and (excessively) word-for-word character of Aquila's translation technique. Particularly noteworthy are those instances in which he translates a phrase in Hebrew so literally that it no longer constitutes grammatically acceptable Greek. For example, when the Hebrew definite direct object marker **אֵת** is followed by the definite article **-הַ**, Aquila "translates" **אֵת** with Greek **σύν** 'with', as demonstrated by his rendering of Genesis 1:1: **ἐν κεφαλαίῳ ἔκτισεν ὁ θεὸς σὺν τὸν οὐρανὸν (καὶ) σὺν τὴν γῆν γῆν καὶ τὰ ὕδατα καὶ τὰ ζῷα καὶ τὰ πτερὰ καὶ τὰ ἑρπύσσωτα καὶ τὰ ἑρπύσσωτα καὶ τὰ ἑρπύσσωτα καὶ τὰ ἑρπύσσωτα**. MARCOS lists eleven such "hyper-literal" characteristics of Aquila's translation style (2001, 116–17). It is difficult to imagine that such a translation technique, which produced highly awkward or even ungrammatical Greek, was not intended to help its readers learn the Hebrew original. For a Greek-speaking Jew, it would have been highly conducive for learning Hebrew. Although not quite as literal as

124. There actually seem to be hints in rabbinic literature that disputes arose between schoolteachers who wanted the text divided into phrases and the rabbis who wanted the text divided into verses in the synagogue recitation (e.g., *yMegillah* 75b, *bMegillah* 22a) (see SAFRAI 1976, 951; ALEXANDER 1999, 81–82).

Aquila's translation, the Symmachus's translation could also be adequately matched up with the Hebrew word-for-word (ALEXANDER 1999, 84).

In sum, while there is insufficient evidence to determine if either the Targumim or Aquila's translation were *originally* developed in and/or for pedagogical purposes, a strong case can be made that they were used by some to learn Hebrew (ALEXANDER 1999, 80–84). These points will be picked up below, but it is worth emphasizing here that our overall argument about the original *Sitz im Leben* of the Secunda does not depend on assuming that the Targumim or Aquila's translation were originally developed for teaching Hebrew. They are merely cited as parallel examples of potential tools for learning the Bible. It should also be noted that, at least in some Jewish communities in ancient Palestine, there may not have been a sharp categorical distinction between studying the Torah and studying (Biblical) Hebrew.

3.4.3.4. Concluding Remarks

Before proceeding to our final section, a few observations about the ancient Jewish education system and its relevance for understanding the Secunda are in order. First, the Jewish education system was centered around transmitting a correct *pronunciation* and *understanding* of the Hebrew Bible. Second, a good argument can be made that parallel "texts" such as the Targumim and Aquila's translation were sometimes utilized as means for achieving the latter goal (ALEXANDER 1999). Third, while there is debate about when elementary schools were established, they were certainly around during Origen's time and possibly began to develop in the preceding century.

3.4.4. Conclusions: The Original Context of the Secunda

3.4.4.1. Introduction

When discussing the possibility of nullifying a vow in order to fulfill a *mitzvah*, the Babylonian Talmud cites the following example (SAFRAI 1976, 950):

For it is [like the case of] a teacher of children upon whom Rav Aḥa imposed a vow, based on the consensus of public opinion [to depose the teacher], since he had acted wrongly towards the children [i.e., using severe discipline with

them]. And Ravina [Rav Aḥa] restored him [to his post] since no one was found who was as precise as he.¹²⁵

This passage highlights precisely the sort of need that could have given rise to the transcriptions of the Secunda. Although Rav Aḥa (4th CE) had dismissed this Hebrew teacher because of his harshness, he eventually reinstated him because there was no one else who was as skilled and precise in reciting the reading tradition as he was (SAFRAI 1976, 950). The word used to describe the Hebrew teacher, דייק 'precise', often refers to being exact or precise in an argument (JASTROW 1926, 287–88). In the case of a Hebrew teacher, it probably refers to precision in vocalization.¹²⁶ This passage, in addition to other rabbinic statements,¹²⁷ demonstrates just how much value was placed on transmitting an accurate and exact reading of Hebrew. It also calls attention to the fact that expert teachers were not found in abundance. It is in just such a context that the original composition of the Secunda makes sense.

In the final section of this chapter, it will be argued that the text of the Secunda was originally composed to meet a didactic need in the Jewish community. This didactic need should be set against the backdrop of the decline of spoken Hebrew during the second century CE, on one hand, and the growing prevalence of education from the Tannaitic period to the Amoraic period on the other. Such a hypothesis is consistent with the trends of transcribed texts in the Hellenistic Near East, the linguistic and social context in the Jewish community, the methods of learning Hebrew, the specific scholastic context in Caesarea, and Jewish views of the biblical text in second- and third-century CE Palestine.

125. *bGittin* 36a: כי ההוא מקרי דרדקי דאדריה רב אחא על דעת רבים דהוה פשע בינוקי ואהדריה רבינא דלא אישתכח דייק. כוותיה. Translation in consultation with *William Davidson Talmud*.

126. These meanings may overlap in a talmudic passage regarding utterances effecting divorce (*bGittin* 65b):

R. Natan says: [If he says] *patruha*, [then] his words stand. [If he says] *pitruha*, he has said nothing. Rava said: R. Natan, who is Babylonian, made a distinction (דייק) between *pitruha* and *patruha* (רבי נתן אומר פטרוה דבריי). קיימין פיטרוה לא אמר כלום אמר רבא רבי נתן דבבלאה הוא ודייק בין פיטרוה לפטרוה (translation in consultation with *William Davidson Talmud*).

127. *mBerakhot* 2:3: One who has read the *Shema* ... [if] he recited [it] but was not exact (דיקדק) in [pronunciation of] the letters, R. Yose says, "He has discharged [his duty]," but R. Yehudah says, "He has not discharged [his duty]." (הקורא את שְׁמַע ... קָרָא וְלֹא דִיקְדַּק בְּאִתּוֹתֶיהָ ר' יוֹסֵה אָמַר יָצָא ר' יְהוּדָה אָמַר לֹא יָצָא).

3.4.4.2. Consistent with Function of Transcriptions in Hellenistic Near East

Positing an originally didactic function among the Jewish community for the transcriptions of the Secunda is supported by the comparative parallel and transcriptional material in the Hellenistic Near East. The parallel format reflects language-learning material and the use of transcription reflects an emphasis on the powerful or efficacious words of the text.

First, parallel and columnar texts, with or without transcription, are generally used as material to learn language or literature. While parallel transcription is more often associated with learning a language (e.g., Greco-Latin glossaries), parallel translation is more often associated with learning classical literature (e.g., columnar translations of Vergil's *Aeneid*). In other words, *transcription* is more common in non-continuous glossarial texts and *translation* in continuous literary texts.

One might object that the Secunda, which makes use of transcription for a continuous literary text, does not actually conform to these data. In other words, we are unjustified in taking principles that are valid for *translations*, and applying them to a *transcription* text. Such an objection may be answered by framing our understanding of these parallel texts both in terms of *the need* they address and *the method* by which they address that need. In the case of the Greek-Greek word lists for Homer, an unfamiliar Homeric word is set in parallel with a more familiar synonym from Koine. In the case of a Greco-Latin columnar translation of Vergil, a Greek gloss (written in Greek script) is placed in parallel to an unfamiliar Latin word (written in Latin script). In each case, *the need* was to have the *meaning* of the word explained. Accordingly, a corresponding (contemporary) Greek gloss was supplied. There was no need, however, to aid the reader in pronunciation, since the Latin and Greek scripts conveyed both consonants and vowels. Had the Greek (in the case of Homer) or Latin (in the case of Vergil) scripts been insufficient to communicate the necessary phonetic information to pronounce the text correctly, parallel transcription likely would have developed as well.

In the case of the Hebrew text of the Bible, on the other hand, *the need* of the learner lay in both elucidation of the meaning *and* instruction in the vocalization. While translation, such as that exemplified in the Targumim, might have served to alleviate the first need, Greek transcription, even of a continuous literary text, could have been a possible method of dealing with the second. This seems to be the case with Akkadian in the Graeco-Babyloniaca tablets and Aramaic in P. Amherst 63, both of whose scripts required knowledge of the language for correct pronunciation. Therefore, as long as we are sensitive to *the need* a particular text or tool is intended to address and *the method* by which it addresses it, we are justified in applying the same sorts of principles to parallel transcription texts that we find to be valid for parallel translation texts.

Second, a survey of the function of transcription in the Hellenistic Near East also demonstrated that it was used to ensure the correct pronunciation of words regarded as powerful or efficacious. This is consistent with the extremely high value that the rabbis placed on a correct and exact pronunciation of the Hebrew reading tradition of the Bible. This is demonstrated by the passage quoted at the beginning of this section as well as R. Yehudah's opinion that one who recites the *Shema* without being exact in their pronunciation of the letters has not fulfilled their religious duty (*mBerakhot* 2:3).

3.4.4.3. Linguistic and Social Context

An originally didactic function is also consistent with the linguistic and social context in which it was first composed, namely, the decline of spoken Hebrew during the second century CE and growing interest in Hebrew education from the Tannaitic to Amoraic period.

Even before the decline of Hebrew as a spoken language in the second century CE, there would have obtained a situation of *diglossia*. While a dialect akin to Mishnaic Hebrew would have been spoken in everyday life, Standard Biblical Hebrew (SBH) would have been routinely heard in religious contexts as well. Although learning SBH would have been difficult even at this point in time, native Hebrew speakers would have had a significant advan-

tage in learning the language, especially considering the fact that they heard it recited regularly and already possessed internalized grammatical categories for much of what they heard. However, as the number of native Hebrew speakers began to wane in the second century CE, it was far more difficult to achieve familiarity with SBH in a passive manner. The only way to attain any kind of proficiency in SBH was to receive formal education.

It seems no coincidence that the establishment of Jewish elementary schools coincides with the period when Hebrew ceased to be a vernacular of the Jews. Even though scholars disagree on when exactly the establishment of Jewish schools should be dated, the best synthesis of their views points to a gradually increasing emphasis on education and study of the Torah beginning after the revolt of 70 CE and reaching its height sometime in the third century CE; during this century, in which the existence of schools is uncontested, the rabbis began to encourage an even deeper study of the Torah (see HEZSER 2001, 68–69). It is this period (70 CE–3rd CE) of increased emphasis on the study of the Torah and establishment of schools that produces a number of potential tools for learning Hebrew, such as the Targumim and Aquila's translation. That a Greek transcriptional text of the Hebrew Bible might also be a product of this period of increased emphasis on learning the Hebrew Bible is entirely conceivable.

3.4.4.4. Methods of Learning Hebrew

That the development of these Hebrew learning tools is consistent with the methods of learning Hebrew described earlier also supports the proposed didactic function of the *Secunda*. After learning the alphabet, students proceeded to learn the *vocalization* of the Torah by repeating the recitation of the teacher and the *meaning* of the Torah by both listening to his explanatory comments and learning a translation of the scriptures into the vernacular, such as the Targumim. One who wanted to learn Hebrew, yet was more familiar with Greek than Aramaic, *might* have found more adequate help from a Greek translation such as Aquila or Symmachus (see 3.4.3.3). Prepared under the patronage of the rabbis, Aquila in Palestine at the beginning of the second century CE and Symmachus in *Caesarea* just before Origen's arrival

there (beginning of 3rd CE), places them in a social, geographical, and chronological context consistent with their use as tools for learning the Hebrew Bible (ALEXANDER 1999, 83–84).¹²⁸

It is worth noting, however, that suggesting that such texts might have been used to learn Hebrew by no means implies that each student interacted with a written copy. ALEXANDER compares these "hyper-literal" translations with the Greco-Latin language-learning material from Egypt (see 3.4.1.2.1), which he does not regard as mere student exercises. Rather, he considers the Greco-Latin texts scholarly in nature and classifies them as "school-masters' textbooks," emphasizing their surprising consistency across the papyri (1999, 82–83).

Presumably, then, it is conceivable that the Greek *transcription* text was originally developed as an aid for students learning the vocalization of Biblical Hebrew. Like the translations mentioned above, it was never meant to replace the Hebrew text; rather, it was meant to serve as a "crutch," eventually enabling the student to deal with the Hebrew text on its own (cf. ALEXANDER 1999, 82). It would be a mistake to suggest that the ability to use such a tool would require extensive training in Greek literacy. Because it is merely a transcription, one would only need the most basic level of reading ability to utilize the transcription as a parallel tool for learning the vocalization. It is also possible that the transcription text was not used by the students themselves, but essentially served as a reference or manual for the teachers. The quote from the beginning of this section (*bGittin* 36a) shows that there were clearly teachers of varying levels, and some surely needed help in vocalizing at least some parts of the Bible.

That the transcriptions were originally developed in the context of the בֵּית סֵפֶר is not so far-fetched a claim. SAFRAI, for example, accepts the view that "written vocalization was first practised by the teachers of young children as a teaching aid" (1976, 950–51; cf. BACHER 1904), though he does not mention the second column. We may also compare the idea that

128. Recall the statement of R. Yehudah HaNasi (2nd/3rd century CE): "In the land of Israel, why [should one speak] in the Syriac language? Rather, [one should speak] either in the holy language or the Greek language" (בארץ ישראל לשון סורסי למה, אלא אי לשון הקודש אי לשון יוונית) (*bSota* 49b).

biblical accentuation traces its origins to the segmentation of the Hebrew text for pedagogical purposes in the *בֵּית סֵפֶר* (ALEXANDER 1999, 82). In fact, a number of features of the biblical text may have developed originally in a didactic setting.

3.4.4.5. Scholastic Context in Caesarea

A number of factors also suggest that the Greek transcriptions of the Secunda might have been a product of the Jewish scholastic community in Caesarea. Origen himself refers to the presence of schools in Caesarea, the city was known to be home to prominent rabbis and scholars, and a Jewish community in the midst of a Hellenized city would have made a text like the Secunda linguistically appropriate for the community.

In *Commentarii in Romanos* (2.14), when discussing Paul's statement that the Jews were entrusted with the oracles of God (Rom. 3:2), Origen writes, "For we see many Jews from infancy until old age ever learning but never attaining the knowledge of the truth"¹²⁹ (DE LANGE 1976, 59–60, 181–82; translation from SCHECK 2001, 167). In *Commentarii in Canticum Canticorum* (1.1), when discussing the particular scriptural passages to be studied last, he writes that "there is another practice too that we have received from them—namely, that all the Scriptures should be delivered to boys by teachers and wise men, while at the same time the four that they call *deuterōseis* ... should be reserved for study till the last"¹³⁰ (DE LANGE 1976, 60, 182; translation from LAWSON 1957, 23).¹³¹ Origen certainly seems to have been in contact with Jews who valued teachers accurately transmitting the scriptures to children. Although Origen does not explicitly mention Caesarea, it seems likely that the majority of Origen's experiences of Jewish life came from his time in that city.

129. *Videmus enim plurimos Iudaeorum ab infantia usque ad senectutem semper discentes, & nunquam ad scientiam veritatis pervenientes.*

130. *Sed et illud ab iis accepimus custodiri, quandoquidem moris est apud eos, omnes scripturas a doctoribus et a sapientibus tradi pueris, simul et eas, quas δευτερώσεις appellant, ad ultimum quatuor ista observari.*

131. The four *deuterōseis* mentioned are the beginning of Genesis, the beginning of Ezekiel, the end of Ezekiel, and Song of Songs.

While little is known about the Jewish community in Caesarea during the second century CE, it would grow to have a notable scholarly and rabbinic presence in the third century CE. Nevertheless, the sparse evidence from the second century CE does point to some Jewish presence in the city. That some Jewish scholars resided in Caesarea during this period may be concluded from the fact that Rabbi Eliezer b. Hyrcanus came to the city for *Sukkoth* and stayed in the house of Yohanan b. Ilai (*bSukkoth* 27b) (MURRAY 2000).¹³² Moreover, after Jews were banned from Jerusalem in the wake of the Bar Kokhba revolt (135 CE), many fled to the north and settled in Caesarea. A number of rabbinic rulings favoring Caesarea further encouraged its settlement so that by the end of the second century CE, it likely had a sizeable Jewish community again—though this community was still a minority among a mostly pagan population. This Jewish minority in Caesarea and the rabbis who delineated *Halakhah* that would apply to them would always be navigating the line between preserving peace for their community and preserving their Jewish identity in the midst of a Hellenistic urban environment (MURRAY 2000).

It is in the third century CE that the references to the famous "rabbis of Caesarea" (רבני דקסרין) begin in the Talmud (MURRAY 2000). LEVINE calls this group "one of the most highly developed associations within the Palestinian rabbinate" (1975, 97). Constant debates between the (Jewish) Christians and the rabbis made the rabbis of Caesarea especially invested and precise in their handling of the scriptures (MURRAY 2000). For example, when a number of Christians are appalled at the lack of scriptural knowledge possessed by a Babylonian rabbi, Rabbi Abbahu (c. 250–320 CE), the leading figure of the Caesarean rabbis, replies, "We, who are present in your midst, set ourselves to study [these things] thoroughly. One not [in your midst] [i.e., the Babylonian rabbi], does not study [as thoroughly]."¹³³ (*b'Avoda Zara* 4a)

132. There are a number of other rabbinic references to Jewish residents of Caesarea during the second century CE (LEVINE 1975, 44; MURRAY 2000).

133. אבן דשכחינן גביכון רמינן אנפשינן ומעיינן אינהו לא מעייני. Translation in consultation with EPSTEIN (1935–1948).

(MURRAY 2000). The renown and significance of this group is also demonstrated by the fact that, in the latter part of the third century CE, Caesarea is marked by the continual presence of prominent Tiberian rabbis. LEVINE explains that the Tiberian rabbis were likely attracted to Caesarea due its rabbinic academy. The same may be said about some of the Babylonian sages found in Caesarea during this same period (1975, 90–91).

Even though the Jewish community was one of three minority groups (Christians, Jews, Samaritans) living in an overwhelmingly Greek pagan city (MURRAY 2000), there is evidence that they maintained some knowledge of Hebrew down into the fourth and fifth centuries CE. Of the nine inscriptions found in connection with the Byzantine synagogue in Caesarea, six of them are in Greek and three are in Hebrew, including a large inscription containing the twenty-four priestly courses (1 Chr. 24:7–18) dated to the fourth or fifth century CE (CIIP 2, 1145–47). At the same time, there is good evidence that much of the Jewish community in Caesarea was Greek-speaking, some knowing only Greek. Rabbi Abbahu was quite knowledgeable in Greek and permitted other Jews to teach Greek to their daughters. Also, Rabbi Bar Haita is said to have gone to Caesarea and heard the *Shema* recited in Greek against the stipulation that it should only be recited in Hebrew (*ySotā* 29a:3) (CIIP 2, 29–30).

This city of Caesarea, then, which housed some of the most prominent Jewish scholars and rabbis of the period as well as those who could only recite the *Shema* in Greek, was likely the location for the original composition of the Greek transcriptions behind the *Secunda*. There are a couple of different perspectives regarding how a transcription text might have originally functioned in such a community.

First, as suggested earlier, the transcription text may have been developed as a teaching aid in the *בֵּית סֵפֶר* (see 3.4.4.4). In a city like Caesarea, Greek transcription could have served as a helpful aid to bridge the gap for Greek-speaking Jews approaching the Bible.

Second, it may have been developed in a scholarly context. In this case, the transcriptions would have functioned in the context of deeper and more detailed study of the Hebrew

scriptures. In fact, ALEXANDER suggests that the *בֵּית תַּלְמוּד* might have simply been a more advanced study and commentary on the Bible (1999, 85). Because commentary, interpretation, and *Halakhah* all depend on the reading of the biblical text, establishing the most precise details of a vocalization tradition would be inextricably linked to the exposition of the text and its *halakhic* implications (see NAEH 1992a; 1993; 3.4.4.6 below). The Greek transcriptions underlying the Secunda, then, would be the product of the rabbinic school of Caesarea solidifying a vocalization tradition upon which to base their exegesis, interpretation, and *Halakhah*.¹³⁴ In fact, it was the study of Hebrew grammar that grew out of the discipline of biblical interpretation and not the other way around.

Whether the Greek transcriptions originally developed as a teaching aid for the *בֵּית סֵפֶר* or as a solidified tradition for biblical interpretation in a more scholarly context, the rabbinic community of Caesarea was certainly capable of carrying out such a project. Note, for example, that the translation of Symmachus was probably carried out at Caesarea under the sponsorship of the rabbis at the turn of the third century CE (SALVESEN 1991; ALEXANDER 1999, 84; MARCOS 2001, 123–26). A clear prerequisite for such a translation project would be a thorough knowledge of the Hebrew reading tradition and an extensive knowledge of Greek, both of which were present among the rabbinic community of Caesarea.

3.4.4.6. Transcriptions and Jewish Views of the Biblical Text in Palestine

The idea that a Greek transcription text was originally composed to fulfill a didactic or scholastic function in the Jewish community of Caesarea can be related to the development of Jewish views regarding the authority of the biblical text and its vocalization.

According to NAEH, there are essentially two ways in which the rabbis might relate to the text of the Torah from an exegetical perspective: First, the consonantal text may be regarded as a *transcription of divine speech*. In this case, the standard accepted vocalization tra-

134. One might compare the motivation behind Aquila's translation style. A number of scholars regard his style as serving the hermeneutical principles of Rabbi Aqiba or some other school (see MARCOS 2001, 110).

dition (the *qere*) constitutes the one correct realization of this divine speech. Various readings are only possible because the consonantal text is ambiguous; thus, other readings exist but are not considered valid. Second, the consonantal text may be regarded as a *divine text* in itself. Such a divine consonantal text (the *ketiv*) validates an array of possible vocalizations and, on the basis of various potential vocalizations, a multiplicity of interpretations. Moreover, such an approach gives greater weight to various elements of the consonantal text such as the shape of the letters (1992a, 402).

A clear example of an interpretation based on the second approach is found in the commentary on Genesis 3:8 (וַיִּשְׁמְעוּ אֶת־קוֹל יְהוָה אֱלֹהִים מְתַהַלֵּךְ בְּגֶן עֵדֶן לְרוּחַ הַיּוֹם) 'and they heard the voice of YHWH God walking about in the garden at the cool of the day') in *Bereshit Rabbah* (19:8) from the Amoraic period. R. Berekhyah suggests that וַיִּשְׁמְעוּ אֶת־קוֹל 'and they heard the voice ... ' should be read as וַיִּשְׁמְעוּ אֶת־קוֹל 'and the [the trees] caused [their] voice to be heard ... ' and R. Levi suggests that מְתַהַלֵּךְ 'walking about' may be read as מֵת הֹלֵךְ/מֵת הֹלֵךְ לוֹ 'a dead man is going/has gone his way', applying the words to Adam.¹³⁵ These readings are clearly *revocalizations* of the consonantal text—not a distinct inherited vocalization tradition. What NAEH argues it that this sort of interpretation, which is based on regarding the consonantal text itself as divine, is never the grounds for *halakhic* exegesis until the Amoraic period. In the Tannaitic period, while elements of the written text might be utilized to elucidate an *aggadic* interpretation, *halakhic* exegesis always depended on a fixed vocalization tradition (1992a, 402, 443–45).

The Greek transcription text of the Secunda is best understood against the backdrop of the first approach, characteristic of the Tannaitic period, namely, that it was the *qere* that was divine. Even if the transcription text was meant to be used in conjunction with the Hebrew *ketiv*, as suggested, its likely functions proposed in this section support the idea that it was re-

135. For an English translation of the passage, see FREEDMAN and SIMON (1961, 154).

garded as an accepted vocalization reflecting the correct reading of the Bible. If it was used as a didactic aid for learning Hebrew in the *בֵּית סֵפֶר*, then it represented the standard form of the Torah that students learned. If it was used in a more scholastic setting, it would constitute a standardized and accepted vocalization tradition on which to base *halakhic* exegesis, in line with the Tannaitic approach outlined in NAEH. Accordingly, we may conclude that it is more likely that the Greek transcription text of the Secunda grew out of an approach that regarded the *qere* as more authoritative than the *ketiv*, rather than the other way around.¹³⁶

3.4.4.7. Summary

At the beginning of this chapter it was argued on linguistic grounds that the Greek transcriptions underlying the Secunda must have been composed no earlier than the beginning of the first century CE. Following this, comparative parallel and transcriptional material from the Hellenistic, Roman, and Byzantine Near East was examined. The relevant conclusions emerging from this analysis were that a parallel transcription text would be associated with both the fading away of the transcribed language and the learning of a language or literature whose words were regarded as especially powerful. These conclusions were then applied to Palestine. It was demonstrated that during the chronological window for the composition of the Secunda, spoken Hebrew was fading away, there was a gradual move toward the establishment of Jewish schools, and the correct recitation of the Hebrew words of scripture was regarded as very important. All of this led to the likely hypothesis that the Greek transcriptions underlying the Secunda were originally developed and used in a didactic and/or scholar-

136. At the same time, there is evidence that Origen interacted with Jewish interpretations and exegesis that rested on the *ketiv*, rather than the *qere*. For example, he cites three separate interpretations of Ezekiel 9:4–6 that depend on the shape of the letter *taw* in the Jewish script (*Selecta in Ezechielem*, 13.800–801; see also 2.2.2.1). However, this does not contradict what has been suggested for a few reasons. First, such an interpretation does not constitute a *revocalization* but merely an explanation based on the "material data" (NAEH 1992a, 444–45) of the Bible. Second, the text in Ezekiel itself contains the word *תָּו* 'sign', which seems to be understood by Origen's Jewish interlocutors as a reference to the letter *taw*. Third, the explanations cited by Origen are better regarded as *aggadic* interpretations, rather than *halakhic* interpretations. Therefore, such examples in Origen's writings pose no contradiction to the idea that the Secunda fits within the Tannaitic interpretive context and perspective.

ly context in the schools of Caesarea Maritima toward the end of the second century CE or beginning of the third century CE.

While similar to the view expounded by EMERTON (1956; 1971), this chapter has built upon, expanded, and gone deeper than his original articles. The composition of the *Secunda* has been better established in the wider context of the Hellenistic Near East and the more specific context of the linguistic and social world of Palestine and, more specifically, Caesarea. Such a theory is to be preferred over hypothesizing an originally liturgical function for the *Secunda* (see section 3.2.2).

4. PRONUNCIATION OF GREEK IN ROMAN PALESTINE

4.1. INTRODUCTION

In the preceding two chapters, it was argued that the original text of the *Secunda* was composed in Palestine at some point during the second or third century CE. Therefore, understanding the relationship between the orthography and phonology of the Greek of this period will elucidate the orthography of the *Secunda*. The focus of the present chapter is a comprehensive analysis of the phonology of Palestinian Koine Greek from the Hellenistic period to the Byzantine period. First, methodology will be outlined (4.2), including a summary of a preliminary phonemic system (4.3), second, in order to provide proper background, previous research on Egyptian Koine phonology will be summarized (4.4), third, the data for the pronunciation of Palestinian Koine will be presented (4.5), finally, in order to help lay the foundation for understanding the phonology of the *Secunda*, the chapter will conclude by outlining the correspondences between the Greek phones and the various Greek graphemes used to represent them at the time of the composition of the *Secunda* (4.5.4).

4.2. METHODOLOGY

Unlike modern languages, whose phonology can be analyzed through real speech, ancient languages are only preserved by means of written texts. Apart from ancient grammatical treatises in which phonology is described explicitly, the actual pronunciation of an ancient lan-

guage can only be discerned through occasional spelling interchanges. For example, a misspelling of English *perceive* as *percieve*** indicates that *ei* and *ie* are equivalent in the writing system, both representing the phoneme /i/ (GIGNAC 1976, 57). In the same way, the common "misspelling" of κῑτε for κείται 'lies' in Greek funerary inscriptions of the Byzantine period (e.g., variation 33.15) indicates that the pair ι/εῖ represented one phoneme (/i/) and the pair ε/αι represented one phoneme (/ε/) in contemporary pronunciation. This method, which is typically implemented in studies of Koine Greek phonology (e.g., GIGNAC 1976; TEODORSSON 1977), will be adopted here for the analysis of Palestinian Koine phonology.

The corpus for the study of Palestinian Greek phonology in this chapter is comprised of the *Corpus Inscriptionum Iudaeae Palaestinae* (CIIP) (2010–2014)¹³⁷ and the electronic database of the *Greek Judean Desert Manuscripts* (G-JUDEAN-T) (2015).¹³⁸ At the time of writing (May 2017), the former includes two volumes on Jerusalem (2010, 2012), a volume on Caesarea and the Middle Coast (2011), and a volume on the South Coast (2014).¹³⁹ The latter includes all the non-biblical non-Qumran Greek documents provenanced to the Judaean Desert. These two sources account for approximately 28,000 Greek words attested in about 2,000 Greek inscriptions and texts. Approximately 1,400 spelling interchanges have been collected from these sources.

Although such numbers may seem high, they are only sufficient for a *near* comprehensive reconstruction of the phonology of the language. Accordingly, we may utilize the Egyptian material, which could fill more than 100 volumes (GIGNAC 1976, 50), to fill in some of the Palestinian material. The work of TEODORSSON (1977), who covers Egyptian Koine in

137. The goal of this six-volume series is to document every inscription in Palestine from Hellenism to the Islamic conquest.

138. The electronic database (G-JUDEAN-T) is the source of the non-biblical non-Qumran Greek section of *The Dead Sea Scrolls Concordance* (2015).

139. Volumes on Judaea/Idumea, Galilee, and the Negev are expected to be published by 2020. It is my intention to update the present work as the coming volumes are published.

the Ptolemaic period (332 BCE–31 BCE), and the work of GIGNAC (1976), who covers Egyptian Koine in the Roman and Byzantine periods (30 BCE–735 CE), will serve as our sources for the phonology of Greek in Egypt. Because the findings of these scholars are valuable not only for filling in gaps but also for comparison, their work will be summarized briefly before we proceed to treat the Palestinian material.

4.3. PRELIMINARY PHONEMIC SYSTEM

Because the endeavor of determining ancient phonology depends on spelling interchanges, it is necessary to have a standard system of correspondences between graphemes (e.g., α, ε, η, γ, δ, etc.) and phonemes (e.g., /a/, /e/, /ε:/, /g/, /d/, etc.) by which spelling interchanges in the Koine period will be measured. TEODORSSON calls this a tentative phonemic system (1977, 43–47). The basic state of affairs that obtained in Attic Greek around 350 BCE, out of which the Koine developed (TEODORSSON 1977, 25–35, 44), will function in this way and serve as our point of departure.

The Attic Greek vocalic system essentially consisted of eight different qualities: /i/, /y/, /e/, /ε/, /a/, /ɔ/, /o/, /u/. Three of these were always long: /ε:/, /ɔ:/, /u:/. The other five qualities could be long or short: /i(:)/, /y(:)/, /e(:)/, /a(:)/, /o(:)/. In addition to simple vowels, the vowels /y/, /e/, /o/, and /a/ could be combined with /i/ and /u/ to produce diphthongs. The resulting vocalic system and its graphemic representation are as follows (TEODORSSON 1977, 44–46; PETROUNIAS 2007b; JOSEPH 2014; HORROCKS 2014, 164):

Short Vowels		Long Vowels		Short Diphthongs		Long Diphthongs	
/i/	ι	/i:/	ι				
/y/	υ	/y:/	υ	/y ⁱ /	υι		
/e/	ε	/e:/	ει	/e ^u /	ευ	/ε: ^u /	ηυ
		/ε:/	η	/e ⁱ / > /e:/	ει	/ε: ⁱ /	ηι
/a/	α	/a:/	α	/a ^u /	αυ		
		/ɔ:/	ω	/a ⁱ /	αι	/a: ⁱ /	αι
/o/	ο	/o:/	ου	/o ⁱ /	οι	/ɔ: ⁱ /	ωι
		/u:/	ου	/o ^u / > /o:/	ου		

Chart 1: Preliminary Vocalic Phonemes: Attic Greek Vowels

The Attic Greek consonantal system is made up of fifteen distinct phonemes, including three voiceless stops (/p/, /t/, /k/), three voiced stops (/b/, /d/, /g/), three voiceless aspirated stops (/p^h/, /t^h/, /k^h/), two fricatives (/s/, /h/), two liquids (/l/, /r/), and two nasals (/m/, /n/). The following consonants could be doubled: γγ = /ng/, κκ = /k:/, λλ = /l:/, μμ = /m:/, νν = /n:/, ππ = /p:/, σσ = /s:/, ττ = /t:/. Additionally, a few graphemes (ζ, ψ, ξ) represented a combination of two consonantal phonemes (/zd/, /ps/, /ks/) (TEODORSSON 1977, 43–47; PETROUNIAS 2007b, 568–69):

<i>Voiceless unaspirated stops:</i>	/p/ = π, /t/ = τ, /k/ = κ
<i>Voiced unaspirated stops:</i>	/b/ = β, /d/ = δ, /g/ = γ
<i>Voiceless aspirated stops:</i>	/p ^h / = φ, /t ^h / = θ, /k ^h / = χ
<i>Fricatives:</i>	/s/ ([z]) ¹⁴⁰ = σ, /h/ = ς
<i>Liquid resonants:</i>	/l/ = λ, /r/ = ρ
<i>Nasal resonants:</i>	/m/ = μ, /n/ = ν
<i>Combinations:</i>	/dz/ /zd/ = ζ, /ps/ = ψ, /ks/ = ξ

Chart 2: Preliminary Consonantal Phonemes: Attic Greek Consonants

4.4. EGYPTIAN KOINE GREEK

4.4.1. Vowels

4.4.1.1. Ptolemaic Period

TEODORSSON divides the developments of Ptolemaic Egyptian Koine into four periods. The first phonological stage, which Teodorsson sets in the mid-third century BCE, is marked by four sound changes. On the front vowel axis, the diphthong /ε:i/ = ηι monophthongizes to /i:/, as demonstrated by spelling interchanges such as κελεύσις (for κελεύσηις) (1977, 122). The long vowel /e:/ = ει shifts to /i:/, except before a vowel, where it remains /e:/. This is demonstrated by spelling interchanges such as χαίριν (for χαίρειν), but σκαφήα (for σκαφεῖα) (62, 114). The vowel /ε:/ = η is raised to /e:/, as demonstrated by interchanges such as ὑγιές (for ὑγιής) and ὤδη (for ὤδε) (103, 109). On the back axis, the long vowel /ɔ:/ is raised to /o:/,¹⁴¹

140. Preceding a voiced consonant such as /m/, /s/ = [z] (e.g., κόσμος [kozmos]).

141. It should be noted that TEODORSSON assumes that /o:/ = ου shifted to /u:/ = ου already before this period.

as demonstrated by interchanges such as ἔχο (for ἔχω) and τόπους (for τόπους) (152, 156).

The resulting vocalic system and its graphemic representation are as follows (changes in bold):

Short Vowels		Long Vowels		Short Diphthongs		Long Diphthongs	
/i/	ι	/i:/	ι, ει, ηι				
/y/	υ	/y:/	υ	/y ⁱ /	υι		
/e/	ε	/e:/	ει, η	/e ^u /	ευ	/e: ^u /	ηυ
/a/	α	/a:/	α	/a ^u /	αυ		
				/a ⁱ /	αι	/a: ⁱ /	αι
/o/	ο	/o:/	ω	/o ⁱ /	οι	/ɔ: ⁱ /	ωι
		/u:/	ου				

The second phonological stage, which Teodorsson sets at the beginning of the second century BCE, is marked by a number of sound changes. On the front vowel axis, /aⁱ/ shifts to /æ:/, as demonstrated by interchanges such as καὶ οὔτε (for καὶ οὔτε) and παλαιοῦ (for παλαιουῦ) (127, 130), and /e/ lowers to /ε/ (254–55). The diphthong /a:ⁱ/ shifts to /a:/, as demonstrated by interchanges such as χώρα (for χώραι) and ἀπὸ βορρᾶι (for ἀπὸ βορρᾶ) (124, 126). The diphthong /ɔ:ⁱ/ monophthongizes to /ɔ:/, as demonstrated by interchanges such as ἐτοίμω (for ἐτοίμωι) (161). The diphthong /oⁱ/ monophthongizes to /ø:/, as demonstrated by interchanges such as οἰκίαν (for οἰκίαν) and ἀνύγω (for ἀνοίγω) (137, 140). The resulting vocalic system and its graphemic representation are as follows:

Short Vowels		Long Vowels		Short Diphthongs		Long Diphthongs	
/i/	ι	/i:/	ι, ει, ηι				
/y/	υ	/y:/	υ	/y ⁱ /	υι		
		/ø:/	οι				
/ε/	ε	/e:/	ει, η	/ε ^u /	ευ	/e: ^u /	ηυ
/æ:/	αι	/a:/	α, αι	/a ^u /	αυ		
/a/	α	/ɔ:/	ωι				
/o/	ο	/o:/	ω				
		/u:/	ου				

The third phonological stage, which Teodorsson sets in the mid-second century BCE, is marked by a number of sound changes accompanied by the neutralization of length. On the front axis, the vowel /æ:/ merged with /ε/ into the vowel /ε/, as demonstrated by the increased frequency of interchanges such as δέομέ σου (for δέομαί σου) and παρακαλεῖται (for

παρακαλεῖτε) (130–31). On the back axis, the vowel /ɔ:/ closed so as to merge with /o:/, as demonstrated by interchanges such as ἐν οἴκο (for ἐν οἴκῳ) and ὁμοίως (for ὁμοίῳ) (168–69). With respect to the diphthongs, the second element of /aʷ/ and /eʷ/ had fricativized to create the pair [aΦ]/[aβ] and [eΦ]/[eβ], or the pair [aw] and [ew]. The shift of /aʷ/ to [aΦ]/[aβ]/[aw] is demonstrated by interchanges such as ἀτοῦ (for αὐτοῦ), καθάπερ (for καθάπερ), and ῥάβδους (for ῥάβδους). The shift of /eʷ/ to [eΦ]/[eβ]/[ew] is demonstrated by interchanges such as κελέουσι (for κελεύουσι), κεύει (for κεύει), εφ εἴη (for εὐ εἴη), and συνευδοκῶ (for συνευδοκῶ) (142–43). Interpreting such interchanges as reflecting [aΦ]/[aβ]/[aw] and [eΦ]/[eβ]/[ew] is grounded in two principles. First, the fact that α and ε may function as spelling equivalents of αυ and ευ (and vice versa) indicates that the second element of the diphthongs, originally represented by υ, had ceased to be vocalic. Second, the fact that the second element of the graphemes αυ and ευ may interchange with β, φ, and ου indicates that the vowel [u] had not merely elided but came to be realized as a consonant, which was occasionally approximated by β, φ, and ου. The resulting vocalic system and its graphemic representation are as follows (changes in bold):

Vowels (Qualitative)		Diphthongs (Qualitative)	
/i/	ι, ει, ηι		
/y/	υ	/y ⁱ /	υι
/e/	ει, η	/εw/ = [εw], [εΦ], [εβ]	ευ
/ε/	ε, αι	/ew/ = [ew], [eΦ], [eβ]	ηυ
/ø/	οι	/aw/ = [aw], [aΦ], [aβ]	αυ
/a/	α, αι		
/o/	ο, ω, ωι		
/u/	ου		

The only other change to occur before the end of the period was the merger of /ø/ and /y/ to /y/, as demonstrated by the decreased frequency in the first century BCE of interchanges such as ποῶν (for ποιῶν) and the increased frequency of interchanges such as σοὶ δέδωκας (for σὺ δέδωκας) and ἀνύγω (for ἀνοίγω) (137, 140).

4.4.1.2. Roman and Byzantine Periods

GIGNAC has assembled a wealth of data on Egyptian Koine in the Roman and Byzantine periods along with helpful analyses, but his work lacks the diachronic precision of TEODORSSON. Accordingly, the data from Gignac's work will be summarized phoneme-by-phoneme, with only the Roman and Byzantine periods serving as the main diachronic division.¹⁴²

4.4.1.2.1. Front Axis

The phoneme /i/ remained essentially unchanged, typically being represented by ι and ει, as demonstrated by interchanges such as ἵκοσι (for εἴκοσι) and μικρός (μικρός) (189–90). However, it had an allophonic variant of [ε] before liquid consonants, as demonstrated by interchanges such as χιρός, χερός, χηρός (for χειρός) and καμίλων, καμείλων, καμέλων (for καμήλων) (261–62). **The phoneme /y/** remained essentially unchanged, typically being represented by υ and οι, as demonstrated by interchanges such as μυ (for μοι), ἥμισοι (for ἥμισυ), and πυῶ (for ποιῶ) (197–200). Interchanges of υ and υι, such as υός (for υίος) and ἔγγυοι (for ἔγγυοι), also indicate that the diphthong /yi/ was simplified to /y/ (202–203, 207). Expanded orthographies such as υείος (for υίος) and υειοῦ (for υίοῦ) seem to indicate that υι, which always precedes a vowel in Greek words, indicated the vowel /y/ followed by a glide [j] before the following vowel (202–203). **The phoneme /e/** was unstable during the period. By the Byzantine period it had certainly shifted to /i/, as demonstrated by interchanges such as ἄχρης (for ἄχρις) and ὑμῆν (for ὑμῖν) (238). GIGNAC places the *terminus ante quem* for the /e/ > /i/ shift by the second century CE, but admits that /e/ > /i/ might not have been universal during the Roman period. When the phoneme /e/ was represented, it was typically represented by η/ηι, rather than ει (191, 330). Like the phoneme /i/, it had an allophone [ε] before liquid consonants, where it could be represented with η, ει, ι, or ε, as demonstrated by the examples above. **The phoneme /ε/** remained essentially unchanged, typically being represented by ε and αι, as demonstrated by interchanges such as χέρειν (for χαίρειν) and ὑπαίρ (for ὑπέρ)

142. The interchanges which Gignac attributes to the bilingual interference of Coptic are ignored in the following summary.

(192). However, it had an allophonic variant of [i] before back vowels, nasals, and /s/, as demonstrated by interchanges such as ἐκθίσται (for ἐκθέσθαι) and ἔνεκιν (for ἔνεκεν) (250). Like the phonemes /i/ and /e/, it had a lowered allophone ([a]) occurring especially before /r/, as demonstrated by interchanges such as ὑπάρ (for ὑπέρ) and ἐτάρις (for ἐτέροις) (284).

4.4.1.2.2. Back Axis

The phoneme /a/ remained essentially unchanged, typically being represented by α, occasionally by αι, and rarely by αυ. The latter correspondences are demonstrated by interchanges such as κατὰι (for κατὰ) and καθάυπερ (for καθάπερ) (194, 229). In unstressed syllables, especially before /s/ and /n/, /a/ had a tendency to shift to [ə], which was represented by ε. This is demonstrated by interchanges such as πάντε (for πάντα), συνεγομένους (for συναγομένους), and ἀκουσίως (for ἐκουσίως) (279, 283). This reflects the reduction and centralization of unstressed vowels to [ə] (285). **The phoneme /o/** remained essentially unchanged, typically being represented by ο, ω, or ωι. The fact that there was no longer a distinction in length is demonstrated by interchanges such as ἔχο (for ἔχω), λόγο (for λόγω), and αὐτώς (for αὐτός) (276–77). Like the phoneme /a/, in unstressed syllables and especially before /s/, /o/ had a tendency to shift to [ə], which was represented by ε. This is demonstrated by interchanges such as τέλες (for τέλος), ἕκαστες (for ἕκαστος), and ὀβδομήκοντα (for ἐβδομήκοντα) (289, 291). As with the /a/ > [ə] shift above, this reflects the reduction and centralization of unstressed vowels to [ə] (291–92).¹⁴³ **The phoneme /u/** remained essentially unchanged, typically being represented by ου. While interchanges such as παρὰ σῶ (for παρὰ σοῦ) and ἐν τῷ νομοῦ (for ἐν τῷ νομῷ) demonstrate that ου represented a simple vowel and not a diphthong, the relative infrequency of interchanges with ω and the possibility of bilingual interference lead to the conclusion that the value of ου was simply /u/ (208, 213–14).

143. It is possible that bilingual interference played factor in the shifts, since Coptic had no /o/ vowel (GIGNAC 1976, 291–92). Nevertheless, even if bilingual interference was a factor, it is significant that in each instance the reduced centralized vowel is represented with ε.

4.4.1.2.3. Diphthongs

The diphthong /yⁱ/ had simplified to /y/ during the period, as demonstrated by interchanges such as υοί (for υιοί) and ἀλληλεγγύης (for ἀλληλεγγύης) (202–203, 207). Expanded orthographies, such as υειός (for υιός) and υειοῦ (for υιοῦ), indicate that pre-vocalic υι represented a combination of the vowel /y/ and the glide [j] before the following vowel (202–203). There is not much evidence regarding the pronunciation of the diphthong /e^u/ in the papyri from the Roman and Byzantine periods. However, interchanges such as ηὐ- or εὐχρήστησεν (for ηὐ- or εὐχρήστησεν) and κουρηούς (for κουρεύς) may indicate that the diphthong was maintained, eventually shifting to [ew], then [eβ], and presumably [iβ] after the /e/ > /i/ shift (188–89). The diphthongs /ε^u/ and /α^u/ are often represented simply with ε or α, as in δετέρου (for δευτέρου) and ατοῦ (for αὐτοῦ). While the above interchanges seem to indicate that the final element of the diphthong had simply been elided, spellings such as ἐρμηνεούς (for ἐρμηνεύς), δευουδέρου (for δευτέρου), αουτοῦ (for αὐτοῦ), and αυουτῶν (for αὐτῶν) demonstrate that the second element of the diphthong was retained. Together, these data point to the fact that the final υ of the graphemes ευ/αυ had shifted to a sound not typically represented in the spelling system. During the Byzantine period, the interchanges with ε(υ)ου and α(υ)ου almost totally disappear, being replaced by interchanges with εβ and αβ, such as προσαγορεῖβσε (for προσαγορεῦσαι) and ναύιαν (for ναύβιον). This diachronic progression seems to indicate that the second element of the diphthong was gradually closing, progressing from /u/ > /w/ > /β/. Because the spellings εβ/αβ are mostly from the Byzantine period and the spellings ε(υ)ου and α(υ)ου are mostly prior to it, it would be reasonable to assume the following diachrony: The graphemes ευ and αυ represented /ε^u/ and /α^u/ until about the mid-second century BCE, when they shifted to /εw/ and /aw/. From that point on the second element became gradually more and more closed until, finally, the Byzantine period serving as the *terminus ante quem*, they became /εβ/ and /αβ/ (with likely allophones of [εΦ] and [αΦ] before voiceless consonants) (GIGNAC 1976, 68–70, 226–34; TEODORSSON 1977, 142–43).

4.4.1.2.4. Summary

Because few sound changes distinguish the vocalic system of the Byzantine period from that of the Roman period, they are represented together in the chart below. Changes from the Roman to the Byzantine period are marked with an arrow (>) and bolded text:¹⁴⁴

Vowels (Qualitative)		Diphthongs (Qualitative)	
/i/	ι, ει, > ι, ει, η, ηι		
/y/	υ, υι, οι	/y ⁱ / > /y/	υι
/e/ > /i/	η > η, ει	/ew/ = [eΦ]/[eβ] > [if]/[iv]	ηυ
/ε/	ε, αι, ει / _l,r	/εw/ = [εΦ]/[εβ] > [ef]/[ev]	ευ
/a/	α, αι	/aw/ = [aΦ]/[aβ] > [af]/[av]	αυ
/o/	ο, ω, ωι		
/u/	ου		
/ə/	ε (ο, α)		

4.4.1.3. Summary

A summary of the correspondences between each grapheme and the phonemes it represents is presented in chart form below. A second chart is added displaying the orthographic interchanges which serve as evidence for the phonological developments (changes are marked with >, every successive change adding an additional >) (charts 3 and 4):

	<i>Cl. Attic</i>	<i>250 BCE</i>	<i>200 BCE</i>	<i>150 BCE</i>	<i>50 BCE</i>	<i>30 B.–395 C.</i>	<i>395 C.–735 C.</i>
<i>Graphs</i>							
ι	/i(:)/	/i(:)/	/i(:)/	> /i/	/i/	/i/	/i/
υ	/y(:)/	/y(:)/	/y(:)/	> /y/	/y/	/y/	/y/
η	/ε:/	> /e:/	/e:/	>> /e/	/e/	/e/	>>> /i/
ε	/e/	/e/	/ε/	/ε/	/ε/	> /ε/, [ə]	/ε/, [ə]
α	/a(:)/	/a(:)/	/a(:)/	> /a/	/a/	/a/	/a/
ο	/o/	/o/	/o/	/o/	/o/	/o/	/o/
ω	/ɔ:/	> /o:/	/o:/	>> /o/	/o/	/o/	/o/
<i>Digraphs</i>							
ου	/o:/, /u:/	> /u:/	/u:/	>> /u/	/u/	/u/	/u/
υι	/y ⁱ /	/y ⁱ /	/y ⁱ /	/y ⁱ /	/y ⁱ /	> /y/	/y/
ηι	/ε: ⁱ /	> /i:/	/i:/	>> /i/	/i/	(?) /e/	(?) /i/
ει	/e:/	> /e:/, [i:]	/e:/, [i:]	>> /e/, [i]	/e/, [i]	>>> /i/	/i/
αι	/a(:) ⁱ /	/a(:) ⁱ /	> /æ:/, /a:/	>> /ε/, /a/	/ε/, /a/	/ε/, /a/	/ε/, /a/
οι	/o ⁱ /	/o ⁱ /	> /ø:/	>> /ø/	>>> /y/	/y/	/y/

144. The changes marked with arrows began in the Roman period and were completed by the Byzantine period.

ωι	/ɔː ⁱ /	/ɔː ⁱ /	> /ɔː/	>> /o/	/o/	/o/	/o/
ηυ	/ɛː ^u /	> /ɛː ^u /	/ɛː ^u /	>> [ɛw],[ɛΦ],[ɛβ]	[ɛw],[ɛΦ],[ɛβ]	[ɛw],[ɛΦ],[ɛβ]	>>> /iΦ/,iβ/
ευ	/ɛ ^u /	/ɛ ^u /	/ɛ ^u /	> [ɛw],[ɛΦ],[ɛβ]	[ɛw],[ɛΦ],[ɛβ]	[ɛw],[ɛΦ],[ɛβ]	>> /ɛΦ/,εβ/
αυ	/a ^u /	/a ^u /	/a ^u /	> [aw],[aΦ],[aβ]	[aw],[aΦ],[aβ]	[aw],[aΦ],[aβ]	>> /aΦ/,aβ/

Chart 3: Egyptian Koine Greek Vowels: Grapheme-Phoneme Correspondences by Period

(xv = decreased frequency, x^ = increased frequency, black text indicates a new feature for the period)

250 BCE	200 BCE	150 BCE	50 BCE	30 BCE – 395 CE	395 CE – 735 CE
ι = ηι	ι = ηι	ι = ηι	ι = ηι	ι = ηι	ι = ηι
ι = ει	ι = ει	ι = ει	ι = ει	ι = ει	ι = ει
η = ε	η = ε	η = ε	η = ε	η = ε	η = ε
ω = ο	ω = ο	ω = ο	ω = ο	ω = ο	ω = ο
αι = α	αι = α	αι = α	αι = α	αι = α	αι = α
αι = ε	αι = ε (x^)	αι = ε	αι = ε	αι = ε	αι = ε
ωι = ω	ωι = ω	ωι = ω	ωι = ω	ωι = ω	ωι = ω
οι = ο	οι = ο	οι = ο (xv)	οι = ο	οι = ο	οι = ο
οι = υ	οι = υ	οι = υ (x^)	οι = υ	οι = υ	οι = υ
	ωι = ο	ωι = ο	ωι = ο	ωι = ο	ωι = ο
	αυ = α	αυ = α	αυ = α	αυ = α	αυ = α
	αυ = αβ	αυ = αβ	αυ = αβ	αυ = αβ	αυ = αβ (x^)
	ευ = ε	ευ = ε	ευ = ε	ευ = ε	ευ = ε
	ευ = εφ	ευ = εφ	ευ = εφ	ευ = εφ	ευ = εφ
	ευ = εου	ευ = εου	ευ = ε(υ)ου	ευ = ε(υ)ου (xv)	ευ = ε(υ)ου (xv)
			αυ = α(υ)ου	αυ = α(υ)ου (xv)	αυ = α(υ)ου (xv)
			ευ = εβ	ευ = εβ (x^)	ευ = εβ (x^)
			οι/υ = υι	οι/υ = υι	οι/υ = υι
			ι = η	ι = η (x^)	ι = η (x^)
			ε = ο = α	ε = ο = α	ε = ο = α

Chart 4: Egyptian Koine Greek Vowels: Orthographic/Spelling Interchanges by Period

4.4.2. Consonants

4.4.2.1. Ptolemaic Period

Only two consonants changed substantially during the Ptolemaic period. First, ζ = /dz/ /zd/ simplified to /z:/ and eventually to /z/. This is demonstrated by interchanges such as διαλογίσεσθαι (for διαλογίζεσθαι), κεκόμizμαι (for κεκόμισμαι), δεσζμοῦ (for δεσμοῦ), and ἀνασζητήσας (for ἀναζητήσας) (TEODORSSON 1976, 190–91). Second, the voiced velar stop γ = /g/ shifted to a fricative with two allophonic realizations: [j] / $_V_{[+front]}$ and [ɣ]. This is demonstrated by interchanges such as ὀλίον (for ὀλίγον), ὑποτεταμένοις (for ὑποτεταγμένοις), ἀρχιγερέυς (for ἀρχιερέυς), ἱγεροῦ (for ἱεροῦ), and ὑγιαίνει (for ὑγιαίνει). The former shift (/zd/ > /z:/ > /z/) had obtained by the mid-third century BCE, and the latter shift (/g/ > [ɣ], [j] / $_V_{[+front]}$) by the mid-second century BCE (TEODORSSON 1976, 184–87; HORROCKS 2014, 171).

4.4.2.2. Roman and Byzantine Periods

A number of additional consonantal changes occur during the Roman and Byzantine periods. First, β = /b/ comes to represent a bilabial fricative [β]. This is demonstrated by the fact that β is used to transcribe Latin *v*¹⁴⁵ and the fact that β occasionally interchanges with the second element of the diphthongs αυ/ευ. Examples of the former are βιάτικον (for *viaticum*), Σιλβανός (for *Silvanus*), and Σεβήρου (for *Severus*). Examples of the latter are προσαγορεύσε (for προσαγορεύσαι) and ἐυδόμη (for ἐβδόμη) (GIGNAC 1976, 68–70). Second, the voiced stop δ = /d/ shifted to a fricative [ð] before [j] during the 1st–3rd centuries CE, and was generalized as /ð/ from the fourth century CE onwards. This is demonstrated by interchanges such as δά (for διά), καρύζα (for καρύδια), ζειαβαλεῖν (for διαβαλεῖν), and ὑβρίδι (for ὑβρίζει) (GIGNAC 1976, 75–76). However, HORROCKS argues that there is no reason to suppose an earlier change of /d/ > [ð] before [j] in the 1st–3rd centuries CE (2014, 170). It should be noted that even after the fricativization of γ, β, and δ, they maintained their stop realizations after nasals

145. Latin *v* [w] began to be pronounced as [β] from the first century CE (ALLEN 1978, 40–42).

(e.g., ἀναβαίνω = /anaβeno/, but συμβίος = /symbios/) (GIGNAC 1976, 70). Third, final ν and final ζ have a tendency to be omitted, as demonstrated by interchanges such as τὴν ... συνήθεα (for τὴν συνήθειαν) and τῆς θυγατρὸς μου (for τῆς θυγατρὸς μου). This indicates that final /n/ and final /s/ had dropped in the speech of some of the writers (111–14, 124–31). Fourth, aspiration (i.e., the phoneme /h/) had disappeared from speech, as demonstrated by phrases such as μετ' ὄρκου (for μεθ' ὄρκου) and ἐπ' οἷς (for ἐφ' οἷς) (133–38).

Finally, it should be mentioned that GIGNAC finds little evidence for the fricativization of the aspirated stops ($p^h > f$, $k^h > \chi$, $t^h > \theta$) in the corpus (1976, 75–76). He bases this claim on the frequency of interchanges with the unaspirated stops, such as πόβον (for φόβον), χαταβένω (for καταβαίνω), and θιμήν (for τιμήν) (86–98). However, there are a few instances from the fifth century CE and later in which φ is transcribed as *f*, as in *egrafe* ἐγράφη, *Foibammonos* Φοιβάμμων, and *Epifaniu* Ἐπιφάνιος. GIGNAC is careful to point out that there is far more evidence for the continued plosive pronunciation of the stops in Greek (1976, 99–100). While GIGNAC does not find evidence for the fricativization of φ, χ, and θ in the Roman or Byzantine periods, they eventually were fricativized. HORROCKS, based on evidence from Laconia (σιός for θεός in the 5th CE), Asia Minor (/k^h/ > /χ/ in 2nd BCE, /p^h/ > /f/ in 2nd CE), and Attic inscriptions (Ἐφρονίς for Εὐφρονίς in 2nd CE), suggests that fricativization began in the Hellenistic period outside of Egypt and was fairly widespread by the fourth century CE (2014, 170–71). This conclusion should be held loosely.

4.4.2.3. Summary

In sum, the consonants ζ, γ, β, δ, ν, and ζ (and the aspirated stops φ, χ, θ) all underwent phonological changes from the Hellenistic period to the Byzantine period in Egyptian Koine.

The changes of these consonants are summarized in the following chart (chart 5):

<i>Classical Period</i>	<i>Hellenistic Period</i>	<i>Roman Period</i>	<i>Byzantine Period</i>
ζ = /zd/	> /zz/ > /z/		
γ = /g/	> [γ]/[j]		
β = /b/		> [β]	
δ = /d/		(> [ð] / _[j])	>> [ð]

$v\# = /n/$	$> \emptyset$	
$\varsigma\# = /s/$	$> \emptyset$	
$\varphi, \chi, \theta = /p^h/, /k^h/, /t^h/$		$> [f], [\chi], [\theta]$

Chart 5: Egyptian Koine Greek Consonants (Classical to Byzantine Period)

4.5. PALESTINIAN KOINE GREEK

4.5.1. Introductory Remarks

The format for the analysis of the Palestinian material follows that of TEODORSSON (1977, 209–56). First, spelling interchanges are tabulated and presented (see appendix A). Second, the data from the list of spelling interchanges are analyzed phonetically. The interchanges are treated several at a time, being grouped according to the sound change to which they attest. Third, based on the phonetic analysis, the phonology of Palestinian Koine will be outlined.

4.5.2. Orthographic Data

See appendix A.

4.5.3. Analysis

4.5.3.1. Graphemic Interchanges

4.5.3.1.1. <EI> ~ <I> (Variations 1–2)

The interchange of $\epsilon\iota$ and ι is by far the most common one in the corpus, occurring 354 times and approximately 12.45 times per 1000 words. It appears regularly in all regions and times:

	$\leq 1^{\text{st}}$ CE	2^{nd} CE– 3^{rd} CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 1: $\epsilon\iota > \iota$	0/2510	3/4850	44/6626	121/14438	168/28424
Var. 2: $\iota > \epsilon\iota$	25/2510	30/4850	17/6626	114/14438	186/28424
<i>Total per 1K</i>	<i>9.96</i>	<i>6.80</i>	<i>9.21</i>	<i>16.28</i>	<i>12.45</i>

This interchange indicates that in the Roman and Byzantine periods in Palestine both ι and $\epsilon\iota$ represented [i] (see GIGNAC 1976, 189–91; TEODORSSON 1977, 212–14). This conclusion is further supported by the interchanges of $\iota\epsilon\iota/\epsilon\iota$ and $\iota/\iota\epsilon$ (variations 3–4; see TEODORSSON 1977, 214–15).

4.5.3.1.2. <Y> ~ <I>, <Y> ~ <YI> (Variations 39–40, 43–44)

These interchanges occur a total of 10 times and approximately 0.35 times per 1000 words:

	$\leq 1^{\text{st}}$ CE	2^{nd} CE– 3^{rd} CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 39: $\upsilon > \iota$	0	0	0	3	3

Var. 40: ι > υ	0	0	0	1	1
Var. 43: υ > υι	0	0	0	2	2
Var. 44: υι > υ	2	0	2	0	4
<i>Total per 1K</i>	<i>0.80</i>	<i>0.00</i>	<i>0.30</i>	<i>0.42</i>	<i>0.35</i>

These interchanges, in light of the interchange of υ and οι (variations 53–54), indicate both that υ was pronounced as /y/ and that the diphthong /yⁱ/ had been simplified to /y/ (see GIGNAC 1976, 202–208, 267–73; TEODORSSON 1977, 227).

4.5.3.1.3. <OI> ~ <Y>, <OI> ~ <I>, <OI> ~ <EI> (Variations 53–54, 58–60)

The interchange of οι and υ occurs 19 times and approximately 0.67 times per 1000 words:

	≤ 1 st CE	2 nd CE–3 rd CE	≥ 4 th CE	Undated	Total
Var. 53: οι > υ	2	0	8	8	18
Var. 54: υ > οι	0	0	1	0	1
<i>Total per 1K</i>	<i>0.80</i>	<i>0.00</i>	<i>1.36</i>	<i>0.55</i>	<i>0.67</i>

This interchange (variations 53–54) indicates that οι represented a similar or identical quality to υ = /y/, either [ø] or [y]. The realization of [y] is supported by the 4 instances of the interchange of οι and ι (variation 59–60) and οι and ει (variation 58) (see GIGNAC 1976, 197–202, 262–75; TEODORSSON 1977, 225–29).

4.5.3.1.4. <OI> ~ <O>, <OI> ~ <Ω>, <OI> ~ <OY>, <OI> ~ <AI>, <OI> ~ <E>, <OI> ~ <H>, <OI> ~ <OOI> (Variations 48–52, 55–57, 61)

On the other hand, οι also interchanges with ο (variation 48), ω (variations 51–52), ου (variations 49–50), αι (variation 55), ε (variation 56), η (variation 57), and οοι (variation 61). These combine for a total of 16 times and 0.56 times per 1000 words. While the interchanges between οι and ι occur mostly in the Byzantine period, the interchanges between οι and ο/ω/ου/αι/ε/η/οοι occur mostly in the Roman period and mostly in the Judaeen Desert. It is possible, then, that the diphthong οι was not quite realized purely as [y] until the late Roman or Byzantine period, being realized as something like [ø] during the early Roman period (see GIGNAC 1976, 199–202, 215–16; TEODORSSON 1977, 227–29, 234–35, 253–55).

4.5.3.1.5. <H> ~ <I> (Variations 25–26)

The interchange of η and ι is one of the most significant ones covered in this study, occurring 101 times and approximately 3.55 times per 1000 words. As noted above, GIGNAC suggests that the /e/ > /i/ (= η) shift had occurred in Egypt by the second century CE, but may not have been universal during the Roman period (1976, 191, 330). In Palestine, on the other hand, the overwhelming majority of the occurrences are from the Byzantine period. Moreover, it is unlikely that any of the undated inscriptions would impact the distribution. In fact, most, if not all, of the undated examples are probably from the Byzantine period:

	$\leq 1^{\text{st}}$ CE	2 nd CE–3 rd CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 25: $\eta > \iota$	1	0	31	35	67
Var. 26: $\iota > \eta$	2	1	22	9	34
<i>Total per 1K</i>	<i>1.20</i>	<i>0.21</i>	<i>8.00</i>	<i>3.05</i>	<i>3.55</i>

This interchange indicates that in the Byzantine period in Palestine both η and ι represented [i], reflecting the /e/ > /i/ (= η) shift (see GIGNAC 1976, 235–242; TEODORSSON 1977, 219–20). It is unlikely that this shift had occurred in the Roman period. All four attestations of the η/ι interchange from the Roman period occur in phonetic environments prone to vowel raising.¹⁴⁶ Moreover, prior to the Byzantine period, the ϵ/ι interchange is about 15 times more common than the η/ι interchange. Therefore, it is probably the case that the general shift of /e/ > /i/ (= η) was not complete in Palestine until sometime in the Byzantine period. However, /e/ = η was prone to raising in certain phonetic environments. It is also noteworthy that the interchange of υ and η (variations 41–42) is not attested prior to the Byzantine period.

4.5.3.1.6. <H> ~ <EI> (Variations 23–24)

The interchange of η and $\epsilon\iota$ is rare, occurring 18 times and approximately 0.63 times per 1000 words. Most of the undated examples should be dated to the Byzantine period:

146. It occurs between a nasal and a liquid in Νατανιλου (255, 1st CE, Jerusalem); it occurs between two nasals in Βενιαμιν (523, 1st BCE–1st CE, Jerusalem); it occurs between a sibilant and a nasal in Σημων (210, 1st BCE–1st CE, Jerusalem); it occurs before a sibilant in Γησχαδαν[--] (Mur92, 100–135 CE, Judaean Desert). See also variations 28–29.

	$\leq 1^{\text{st}}$ CE	2^{nd} CE– 3^{rd} CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 23: $\eta > \varepsilon$	1	1	2	2	6
Var. 24: $\varepsilon > \eta$	1	0	3	8	12
<i>Total per 1K</i>	<i>0.80</i>	<i>0.21</i>	<i>0.75</i>	<i>0.69</i>	<i>0.63</i>

This interchange indicates that in the Byzantine period both η and ε represented [i] (see GIGNAC 1976, 235–242; TEODORSSON 1977, 218–19). Similar to the previous interchange, its few attestations in the Roman period occur in particular phonetic conditions.¹⁴⁷

In sum, the /e/ > /i/ shift occurred in particular contexts during the Roman period (environment of sibilants/nasals and before vowels) but was widespread in the Byzantine period.

4.5.3.1.7. <H> ~ <E> (Variations 21–22)

The interchange of η and ε is relatively common, occurring 75 times and approximately 2.64 times per 1000 words. It occurs relatively frequently in all periods and regions:

	$\leq 1^{\text{st}}$ CE	2^{nd} CE– 3^{rd} CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 21: $\eta > \varepsilon$	6	1	15	19	41
Var. 22: $\varepsilon > \eta$	2	2	12	18	34
<i>Total per 1K</i>	<i>3.19</i>	<i>0.62</i>	<i>4.07</i>	<i>2.56</i>	<i>2.64</i>

In the earlier periods, in which the η/ι interchange is extremely rare, the η/ε interchange indicates that $\eta = /e/$ had not yet merged with /i/ (see GIGNAC 1976, 242–49; TEODORSSON 1977, 216–28). If the interchange of η and α (variations 31–32) were added to this list, it would increase the frequency in the earlier period. The fact that the η/ε interchange persists after the fourth century CE indicates that the pronunciation of η as /e/ persisted well into the Byzantine period. In fact, there is evidence elsewhere that η persisted as /e/ all the way into the 7th century CE in the Near East (AL-JALLAD 2015, 13).¹⁴⁸ On the other hand, it is possible that η was pronounced as /e/ in certain phonetic environments during the Byzantine period even though

147. It occurs between a nasal and a sibilant in [Τε]μεισειωνο[ς] (497, 1st BCE–1st CE, Jerusalem) and before a vowel in Ηδ̄ηα (243, 1st CE, Jerusalem).

148. AL-JALLAD claims that the interchange of η/ε in Greek renderings of Semitic onomastica such as Ταννε (PAES III.a 628) for Ταννη prove this point (2015, 13).

it had shifted to /i/ generally. In the environment of sibilants and nasals (e.g., *μενι, ημοι*), the η/ε interchange may be regarded as reflecting a raised allophone ([e] or [i]) of ε = /ε/. Before a liquid (e.g., *σωτεριας, επερωτημενης*), it is likely that the η/ε interchange reflects a lowered allophone ([ɛ]) of η = /ε/.

4.5.3.1.8. <E> ~ <I> (Variations 17–18)

The interchange of ε and ι is infrequent, occurring 27 times and approximately 0.95 times per 1000 words. Aside from the Judaeen Desert, in which the interchange is rare, it occurs relatively consistently in all regions and periods:

	≤ 1 st CE	2 nd CE–3 rd CE	≥ 4 th CE	Undated	Total
Var. 17: ε > ι	2	0	7	3	12
Var. 18: ι > ε	3	1	3	8	15
<i>Total per 1K</i>	<i>1.99</i>	<i>0.21</i>	<i>1.51</i>	<i>0.76</i>	<i>2.64</i>

This interchange, which occurs almost exclusively in the environment of nasals, sibilants, or before vowels, points to a raised realization ([e] or [i]) of ε = /ε/ in certain phonetic environments (see GIGNAC 1976, 249–62; TEDORSSON 1977, 215–16). This is further supported by the interchange of αι and ι (variations 35–36).

4.5.3.1.9. <E> ~ <EI> (Variations 19–20)

The interchange of ε and ει occurs 13 times and approximately 0.42 times per 1000 words:

	≤ 1 st CE	2 nd CE–3 rd CE	≥ 4 th CE	Undated	Total
Var. 17: ε > ι	1	0	1	2	4
Var. 18: ι > ε	1	0	1	6	8
<i>Total per 1K</i>	<i>0.80</i>	<i>0.00</i>	<i>0.30</i>	<i>0.55</i>	<i>0.42</i>

This interchange, which is found in phonetic environments similar to those of the ε/ι interchange, indicates a raised realization ([e] or [i]) of ε = /ε/. It may be assumed that ει > ε before the liquid ρ (e.g., *χερος* for *χειρός*) indicates rather a lowered realization ([ɛ]) of ει (GIGNAC 1976, 261–62; TEDORSSON 1977, 215–16).

4.5.3.1.10. <AI> ~ <E> (Variations 33–34)

The interchange of α and ε is one of the most common interchanges in the corpus, occurring 103 times and approximately 3.62 times per 1000 words. While it is common in the Byzantine period, it is only meagerly attested in the Roman period. However, it is likely that a significant number of the undated inscriptions are from the Roman period.¹⁴⁹ Accordingly, the actual number of occurrences per 1000 words for the earlier period should be higher:

	$\leq 1^{\text{st}}$ CE	2 nd CE–3 rd CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 33: $\alpha > \varepsilon$	0	3	48	44	95
Var. 34: $\varepsilon > \alpha$	0	0	1	8	8
<i>Total per 1K</i>	<i>0.00</i>	<i>0.62</i>	<i>7.40</i>	<i>3.60</i>	<i>3.66</i>

This interchange reflects that in the Roman and Byzantine periods in Palestine both α and ε represented [e] (see GIGNAC 1976, 192–94; TEODORSSON 1977, 224).

It should be noted, however, that historical $\alpha\tilde{i}$ = /aⁱ/ with *trema* (¨) on *iota* was not subject to this sound change. This is clear from variations 37–38, in which we find τροπαιικον (for τροπαϊκον) and Ιηννᾱη (for Semitic /Yannay/).

4.5.3.1.11. <Ω> ~ <O> (Variations 81–83)

The interchange of ω and o is quite common, occurring 162 times and approximately 6.05 times per 1000 words. It is attested regularly in all regions and periods:

	$\leq 1^{\text{st}}$ CE	2 nd CE–3 rd CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 81: $\omega > o$	10	5	50	46	111
Var. 82: $o > \omega$	1	2	25	33	61
<i>Total per 1K</i>	<i>4.38</i>	<i>1.44</i>	<i>11.32</i>	<i>5.47</i>	<i>6.05</i>

This interchange indicates that ω and o both represented the quality [o] in all periods and that vowel length had been neutralized (see GIGNAC 1976, 275–78; TEODORSSON 1977, 233–34). This is also reflected in the $\omega o/\omega$ interchange in the word $\upsilon\pi\epsilon\rho\omega\nu$ (Xhev/Se64, ?, Judean Desert) for $\upsilon\pi\epsilon\rho\acute{\omega}\nu$ (variation 83).

149. A significant portion of the undated examples occur in the Judean Desert texts.

4.5.3.1.12. <E> ~ <A> (Variations 87–88)

The interchange of ε and α occurs 15 times and approximately 0.53 times per 1000 words:

	$\leq 1^{\text{st}}$ CE	2^{nd} CE– 3^{rd} CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 87: $\varepsilon > \alpha$	1	0	1	5	7
Var. 88: $\alpha > \varepsilon$	3	0	2	3	8
<i>Total per 1K</i>	<i>1.59</i>	<i>0.00</i>	<i>0.45</i>	<i>0.55</i>	<i>0.53</i>

This interchange indicates the tendency for vowels to be reduced or centralized away from the stress, in addition to the raising and lowering of vowels in certain phonetic environments.

The reduction of vowels is further supported by the interchange of $o > \varepsilon$ (variation 90). The interchange of o and α in the environment of ρ , if it does not reflect reduction or centralization, may reflect the lowering of $/o/$ in the environment of a liquid (variations 91–92) (see GIGNAC 1976, 278–93).

4.5.3.1.13. <EY> ~ <E>, <Y>, <EOY>, <EO> (Variations 62–64, 66)

The interchange of $\varepsilon\upsilon$ and one of these other variations occurs only 6 times and approximately 0.21 times per 1000 words. It is attested in the earliest and latest periods:

	$\leq 1^{\text{st}}$ CE	2^{nd} CE– 3^{rd} CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 62: $\varepsilon\upsilon > \varepsilon$	1	0	1	0	2
Var. 63: $\upsilon > \varepsilon\upsilon$	0	0	1	0	1
Var. 64: $\varepsilon\upsilon > \varepsilon\upsilon\upsilon$	0	0	1	0	1
Var. 66: $\varepsilon\upsilon > \varepsilon\upsilon$	1	0	0	0	1
<i>Total per 1K</i>	<i>0.80</i>	<i>0.00</i>	<i>0.45</i>	<i>0.07</i>	<i>0.21</i>

The omission of the υ in variations 62–63 indicate that the second element of the diphthong had either ceased to be pronounced or that it had shifted to a sound not represented in the writing system. The interchanges with $\varepsilon\upsilon\upsilon$ and $\varepsilon\upsilon$ (variations 64 and 66), however, demonstrate that the second element was still pronounced. It is typical to understand the development of the diphthongs in Koine as follows: #1 $/\varepsilon^u/ > \#2 / \varepsilon w/ > \#3 / \varepsilon \beta/, / \varepsilon \Phi/ > \#4 / \varepsilon v/, / \varepsilon f/$. Variations 62 and 66 indicate that Palestinian Koine had progressed at least to stage 2 by the first century CE (see GIGNAC 1976, 226–34; TEODORSSON 1977, 229–30; HORROCKS 2014, 169).

4.5.3.1.14. <AY> ~ <A>, <AOY>, <AYOY>, <Ω>, <O> (Variations 67–69, 71–72)

The interchanges of αυ and one of these other variations occurs only 7 times and approximately 0.25 times per 1000 words. It is attested in all regions and periods:

	≤ 1 st CE	2 nd CE–3 rd CE	≥ 4 th CE	Undated	Total
Var. 67: αυ > α	1	1	0	1	3
Var. 68: αυ > αου	0	0	1	0	1
Var. 69: αυ > αουου	0	0	1	0	1
Var. 71: αυ > ω	1	0	0	0	1
Var. 72: αυ > ο	0	0	0	1	1
<i>Total per 1K</i>	<i>0.80</i>	<i>0.21</i>	<i>0.30</i>	<i>0.14</i>	<i>0.25</i>

Like variations 62–66, the interchanges with αου and αουου (variations 68–69) demonstrate that the second element of the diphthong /a^u/ had become consonantal. Variation 67 seems to indicate that the /a^u/ diphthong in Palestinian Koine had shifted to /aw/ by the first century CE. Variation 71 likely reflects the /a^u/ > /o:/ shift in Latin (see GIGNAC 1976, 226–34; TEODORSSON 1977, 230–31; HORROCKS 2014, 169):

4.5.3.1.15. Latin <EV/AV> ~ <EOY/AOY>, <EYOY/AYOY>, <EY/AY>, <EB/AB>, <E/A>

The rendering of Latin *v* in proper names and Latin loanwords can shed some light on the diachrony of the /a^u/ > [aw] > [aβ]/[aΦ] > [av]/[af] change in Palestinian Greek. While comprehensive statistics have not been collected on these interchanges, a number of general trends are apparent from the data.

First, ου is the regular rendering of Latin *v*. It may be regarded as the "default" spelling, attested in all regions and periods: Οκταουιου *Octavius* (XHev/Se65, 131 CE, Judaeen Desert), Γαουιου *Gavius* (XHev/Se63, 127 CE, Judaeen Desert), Νερουα *Nervae* (XHev/Se63, 127 CE, Judaeen Desert), Σαλουειδιηνου *Salvidienus* (Judaeen Desert–1st/2nd CE), Σεο[υ]ηρου *Severus* (Mur114, 171 CE, Judaeen Desert), Σιλουανον (2122, ?, Caesarea), Σιλουανου *Silvanus* (2535, ≥ 4th CE, South Coast), and Σιλουανου *Silvanus* (809, 7th CE, Jerusalem). Second, the occasional variant ουου is attested in early periods: Φλαουουιου *Flaviius* (5/6Heb21–23, ?, Judaeen Desert). Third, there are a number of forms with υ from differ-

ent regions and time periods: Φλαυοιου *Flavius* (5/6Hev20, ?, Judaeen Desert), Σευηριναν *Severina* (764, Late Roman, Jerusalem), Σευηρου *Severus* (1266, 500 CE, Caesarea), and Σευ[ηρου] *Severus* (1528, 4th CE–7th CE, Caesarea). Fourth, there are a number of forms from early and late periods that signify Latin *v* by means of hiatus: Γα<ου>ιου *Gavius* (XHev/Se62, 127 CE, Judaeen Desert), Νοενβριων *November* (Mur115, 124 CE, Judaeen Desert), Φλα<ου>ιου *Flavius* (XHev/Se69, 130 CE, Judaeen Desert), Φλαια *Flavia* (2446, 528–530 CE, South Coast). Fifth, in the Byzantine period, interchanges with β are common in multiple regions: Σεβηρα *Severus* (1548, 3rd CE–6th CE, Caesarea), Φλαβιανον *Flavianus* (842.67, 4th CE–6th CE, Jerusalem), Ιουβεναλιου *Iuvenalis* (962, ≥ 6th CE, Jerusalem), and Σηλβανου *Silvanus* (1150, Byzantine?, Caesarea). There is, however, an attestation of Latin *v* rendered with β prior to the Byzantine period: Βερουταριου *Verutarius* (221–22, 1st BCE–1st CE, Jerusalem).

The fact that renderings with β are virtually absent until the Byzantine period is significant. There is evidence that Latin *v* had at least begun to shift from /w/ > [β] or [v] by the first century CE (ALLEN 1978, 40–42).¹⁵⁰ Accordingly, at the very least, the increased use of Greek εβ/αβ to render Latin *ev/av* in the Byzantine period in Palestinian Koine seems to indicate that Greek β had shifted from /b/ to [β] and perhaps also [v] (see GIGNAC 1976, 68–71). The fact that the same sequences in similar names may be spelled either with εβ or εϐ in the Byzantine period (e.g., Σευηρου [1266, 500 CE, Caesarea] || Σεβηρα [1548, 3rd–6th CE, Caesarea]) probably indicates that their phonetic values were relatively close, if not equivalent. In sum, the Greek diphthongs εϐ and αϐ were pronounced as [εw] and [aw] by the first century CE in Palestine and as [εβ]/[εv] and [αβ]/[av] in the Byzantine period (see 4.5.3.1.14; GIGNAC 1976, 68–71, 226–34; TEODORSSON 1977, 229–31; HORROCKS 2014, 169).

150. In first century CE inscriptions, Latin *v* occasionally interchanges with Latin *b* [β] (< *[b]). In the second century CE, Velius Longus says that *v* is pronounced *cum aliqua adspiratione* 'with some aspiration'. While the reflex of this sound is /v/ in all the Romance languages, the pronunciation [w] was still around even in the fifth century CE (ALLEN 1978, 41). For more, see chapter 5 on the transcription of Latin into Greek.

4.5.3.1.16. <OY> ~ <Y> (Variations 73–74)

The interchange of *ou* and *u* occurs 15 times and approximately 0.53 times per 1000 words:

	≤ 1 st CE	2 nd CE–3 rd CE	≥ 4 th CE	Undated	Total
Var. 73: <i>ou</i> > <i>u</i>	3	1	3	4	11
Var. 74: <i>u</i> > <i>ou</i>	0	0	3	1	4
<i>Total per 1K</i>	<i>1.20</i>	<i>0.21</i>	<i>0.91</i>	<i>0.35</i>	<i>0.53</i>

This change is especially common in the environment of the liquids *λ* and *ρ*. It may then reflect regressive assimilation and the fronting of the vowel /*u*/ > [y] in these environments.

The same would apply for the interchanges of *o*/*u* and *ω* > *u* (variations 75–76, 86) (cf. GIGNAC 1976, 293–94; TEODORSSON 1977, 231–32)

4.5.3.1.17. <OY> ~ <O> (Variations 78–79)

The interchange of *ou* and *o* is infrequent, occurring 22 times and approximately 0.77 times per 1000 words. It is most frequent in the earlier period:

	≤ 1 st CE	2 nd CE–3 rd CE	≥ 4 th CE	Undated	Total
Var. 78: <i>ou</i> > <i>o</i>	8	0	4	6	18
Var. 79: <i>o</i> > <i>ou</i>	1	0	1	2	4
<i>Total per 1K</i>	<i>3.59</i>	<i>0.00</i>	<i>0.75</i>	<i>0.55</i>	<i>0.77</i>

This interchange may be viewed in conjunction with the interchange of *ou* and *ω* (variations 84–85). As in Egypt, this interchange reflects the monophthongization of the diphthong *ou* to a simple vowel /*u*/ and the neutralization of length (see GIGNAC 1976, 208–214; TEODORSSON 1977, 232–34). A significant portion of these interchanges occur in the environment of the liquids *λ* and *ρ*, which may indicate the lowering of /*u*/ > [o] in this environment.

4.5.3.1.18. <IO> ~ <I>, <EI> (Variations 6–10)

The interchange of *io* with *ι* and *ει* is fairly common, occurring 32 times and approximately 1.13 times per 1000 words. It occurs most frequently in Jerusalem and the South Coast, less frequently in the Judaeen Desert, and never in Caesarea. It is attested in all periods:

	≤ 1 st CE	2 nd CE–3 rd CE	≥ 4 th CE	Undated	Total
Var. 7: <i>io</i> > <i>ει</i>	2	0	0	0	2
Var. 8: <i>io</i> > <i>ι</i>	1	4	9	16	30

<i>Total per 1K</i>	<i>1.20</i>	<i>0.82</i>	<i>1.36</i>	<i>1.11</i>	<i>1.13</i>
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Variations 6 ($\iota\omicron > \varepsilon$) and 9 ($\iota\omicron > \eta$) are relevant here as well. This interchange reflects the monophthongization of the vowel sequence /io/ to /i/. It is not attested word-medially, but rather only in the endings $-\iota\omicron\varsigma > -\iota\varsigma$ and $-\iota\omicron\nu > -\iota\nu$. It has been recognized as a feature particular of Jewish texts (ROSEN 1963, 66). It may be that speakers of Semitic languages (Hebrew and/or Aramaic), whose phonotactics did not permit two consecutive vocalic phonemes, naturally simplified these sequences in their Greek. The fact that this interchange also occurs with the vowel α in the interchange $\iota\alpha > \iota$ (variation 10) seems to support this point.

4.5.3.1.19. <IO> ~ <O>; <IΩ> ~ <Ω>; <IA> ~ <A> (Variations 11–16)

The interchanges of $\iota\omicron > \omicron$ and $\iota\omega > \omega$ occur 10 times and approximately 0.42 times per 1000 words. While most of the attestations are late, some of the undated attestations are probably from earlier periods:

	$\leq 1^{\text{st}}$ CE	2^{nd} CE– 3^{rd} CE	$\geq 4^{\text{th}}$ CE	Undated	Total
Var. 11: $\iota\omicron > \omicron$	2	0	2	4	8
Var. 12: $\iota\omega > \omega$	0	0	1	3	4
Var. 14 $\iota\alpha > \alpha$	0	0	0	2	2
<i>Total per 1K</i>	<i>0.80</i>	<i>0.00</i>	<i>0.45</i>	<i>0.62</i>	<i>0.49</i>

This interchange most likely reflects the shift of /i/ > [j] after liquids and before another vowel (see GIGNAC 1976, 207, 302–306; HORROCKS 2014, 169). If the multiple instances of $\kappa\rho\iota\alpha$ (e.g., 1548, 2086, 2544) attested in Palestinian epigraphy do not represent a lemma distinct from $\kappa\rho\iota\alpha$, then they may also reflect this phenomenon. The interchanges $\varepsilon\omega > \omega$ ($\alpha\nu\tau\iota\lambda\eta\psi\omega\varsigma$), $\iota\alpha > \iota\epsilon\alpha$ (Μαριεαμη), and $\iota > \alpha\epsilon$ (Μαρκαεος) in variations 13, 15, and 16 may reflect an attempt to represent the glide [j] in a script with no sufficient character for [j]. The consonantal realization of ι in such contexts is also supported by variations 43–47.

4.5.3.1.20. Vowel Deletion (Variations 95–100)

Because formulaic words are regularly abbreviated in inscriptions, it is difficult to ascertain when the omission of a vowel in a given word reflects pronunciation. However, there are at least a few instances in which vowel deletion seems likely. It occurs in foreign words and

names: Βαβθα (for Βαβαθα), Παββαθμωβοις (for Παββαθμωαβοις), [-- ο]υετρανος (for ουετρανος). It occurs word-initially before a consonant cluster beginning with a sibilant: σχιων (for ισχίων). It most frequently occurs in the environment of liquids and nasals: θεμντος (for θευμνατος), αιωνς (for αιωνας), θεωφιλστατου (θεοφιλεστατου), μνμα (for μνημα), Κορνλιας (for Κορνηλιας), σωττριας (for σωτηριας), ορφαντροφιω (for ορφαντροφιω), πολποτων (for πολυβοτων), and ευδαιμοσνης (for ευδαιμοσυνης) (see GIGNAC 1976, 302–310).

4.5.3.1.21. Epenthetic Vowels (Variations 93–94)

An anaptyctic vowel is occasionally inserted between consonants: Χαθουσιωνος (for Χθουσιωνος), Δυστερου (for Δυστρου), and Απερος (for Απρος) (see GIGNAC 1976, 310–312).

4.5.3.1.22. Vowel Length

It is clear that vowel length has been neutralized in Palestinian Koine from the following interchanges: ι/ει (variations 1–2), ε/ε (variations 19–20), η/ε (variations 21–22), ι/η (variations 25–26), α/ε (variations 33–34), ο/ο (variation 48), οι/ε (variation 56), ο/ου (variations 78–79), ω/ο (variations 81–82), and ωο/ο (variation 83) (see GIGNAC 1976, 325; TEODORSSON 1977, 237–38).

4.5.3.1.23. Gemination and Simplification (Variations 104–105, 108, 112–13, 123–24, 129–30, 132, 135–36, 138–39, 148, 150–51, 153, 156, 159–60, 166–67, 171)

Gemination of single consonants occurs with π > ππ (αππαν[τα] for απαντα) (variation 105), μ > μμ ([α]ν[ο]ιωγμμενον for ανεωγμένον) (variation 112), ν > νν (Βεννιαμιν for Βενιαμιν) (variation 123), τ > ττ (σωττριας for σωτηριας) (variation 129), δ > δδ (Αινγαδδων for Ενγαδων/Εγγαδων) (variation 136), σ > σσ (εξεσσω for εξεστω) (variation 139), ζ > ζζ (τευχιζζει for τευχιζει) (variation 148), κ > κκ (Ιακκωβου for Ιακωβου) (variation 150), χ > κκ (Ζακκαριας for Ζαχαριας) (variation 156), γ > γγ (ζυγγ[ων] for ζυγων) (variation 159), λ > λλ (δεσδεκαλλου for διδασκαλου) (variation 167), and ρ > ρρ ([Θεο]δορρω for Θεοδωρω) (variation 171) (see GIGNAC 1976, 154–65; TEODORSSON 1977, 244–45).

Simplification of double consonants occurs with $\pi\pi > \pi$ (παπος for παππος) (variation 104), $\beta\beta > \beta$ (Ραβι for Ραββι) (variation 108), $\mu\mu > \mu$ (Αμια for Αμμια) (variation 113), $\nu\nu > \nu$ (δεκαενεα for δεκαεννεα) (variation 124), $\tau\tau > \tau$ (πιτακιου for πιττακιου) (variation 130), $\theta\theta > \theta$ (Μαθεθ<ος> for Μαθθεθος) (variation 132), $\delta\delta > \delta$ (Θαδαιος for Θαδδαιος) (variation 135), $\sigma\sigma > \sigma$ (τεσερεσκαιδεκατου for τεσσαρεσκαιδεκατου) (variation 138), $\kappa\kappa > \kappa$ (εκκλησια for εκκλησια) (variation 151), $\chi\chi > \chi$ (Ζαχαι for Ζαχχαι) (variation 153), $\gamma\gamma > \gamma$ (Λογινος for Λογγινος) (variation 160), and $\lambda\lambda > \lambda$ (Εληνεστι for Ελληνιστι) (variation 166) (see GIGNAC 1976, 154–65; TEODORSSON 1977, 244–45).

Taken together, these interchanges are proof that, like vocalic length, consonantal length (i.e., gemination) was no longer phonemic in Palestinian Koine (see GIGNAC 1976, 154–55; TEODORSSON 1977, 244–45).

4.5.3.1.24. <Φ> ~ <Π> (Variations 101–103)

The interchange of ϕ and π occurs in the names Σαπιρα (for Σαφιρα) and, unless it is a short form of Ιωσηπος, Ιωσηπ (for Ιωσηφ) (variation 102). The word $\pi\theta\omicron\nu\epsilon$ (for $\phi\theta\omicron\nu\epsilon$) demonstrates that ϕ lost is aspiration before θ ($[p^h] > [p] / _ [t^h]$) (variation 103). Because fricatives would not be expected after a nasal, the unusual spelling of $\epsilon\nu\phi$ (for $\epsilon\phi'$) may reflect a continued plosive pronunciation of ϕ into the Byzantine period (variation 101) (see GIGNAC 1976, 98–100; TEODORSSON 1977, 238–39, 244–45). The relatively low frequency of interchanges between ϕ and π and the lack of interchanges between ϕ and β/ν support the pronunciation of $\pi = [p]$ and $\phi = [p^h]$ (see GIGNAC 1976, 93–96; TEODORSSON 1977, 238–39).

4.5.3.1.25. <Β> ~ <Π> (Variations 106–107)

An interchange of β and π occurs in the words πολποτων (for πολυβοτων), βουργος (for πυργος), and Υβερβερετεου (for Υπερβερεταιου) (variations 106–107) (see GIGNAC 1976, 83–86; TEODORSSON 1977, 238–39). The utilization of Greek β to render Latin ν points to a fricativized realization of β (i.e., $/b/ > [\beta]$) by the Byzantine period (see 4.5.3.1.15).

4.5.3.1.26. <MB> ~ , <MΠ> ~ <Π>, <MΣ> ~ <Σ>, <NT> ~ <T>, <NΘ> ~ <Θ>, <N#> ~ <Θ>, <M> ~ <Θ> (Variations 109–111, 120–22, 126)

It is common for nasals to be omitted word-medially, as in *Λαπαδιου* (for *Λαμπαδιου*), *διαφεροτα* (for *διαφεροντα*), *προ[σ]ηνεγκοτος* (for *προσηνεγκοντος*), and *Μαναηου* (for *Μαναημου*) (variations 109–111, 120–22). It is also quite common for *v* to be omitted word-finally, as in *αυτο* (for *αυτον*), *Μενιαμι* (for *Μενιαμιν/Βενιαμιν*), and *βοηθω* (for *βοηθων*). The omission of nasals may reflect the fact that they were no longer pronounced in speech. Their elision may have resulted in the nasalization of the preceding vowel. On the other hand, it is also possible that the nasal assimilated to the following consonant, voicing it in the case of stops. For example, *διαφεροντα* would be realized as [diap^heronda] > [diap^herodda] (see GIGNAC 1976, 111–14, 116–19, 165–72).

4.5.3.1.27. <M> ~ <N> (Variations 114, 125)

In several cases, the nasals *μ* and *ν* interchange, as in *μνηοριων* (for *μημοριον*), *Ναρκελ[λα]* (for *Μαρκελλα*), and *διακομου* (for *διακονου*). This interchange may also attest to the loss (or weakening) of nasals in pronunciation (see GIGNAC 1976, 111–14, 116–19).

4.5.3.1.28. <MB> ~ <NB>, <MB> ~ <NMB>, <MΠ> ~ <NΠ> (Variations 115–17)

There is a frequent interchange of *ν* and *μ* before stops, as in *συνβιον* (for *συμβιον*) and *συνπαροντος* (for *συμπαροντος*). Because nasals are expected to have assimilated, spellings with *ν* in these instances probably reflect an orthographic phenomenon. That is, the word was conceived of in its etymological parts and spelled accordingly (see GIGNAC 1976, 165–72).

4.5.3.1.29. <MΨ> ~ <MΣ>, <MΠΤ> ~ <MT> (Variations 118–19, 174–76)

When a consonant cluster beginning with a stop follows *μ*, there is a tendency for the stop to be omitted, as in *πεμτου* (for *πεμπτου*) and *επεμσα* (for *επεμψα*) (see GIGNAC 1976, 64–65). It should be noted that the *μ* in the interchange of *ψ* and *μψ* in variation 174 is probably a lexical phenomenon connected to the *μ* in the word *λαμβάνω*.

4.5.3.1.30. <T> ~ <Θ> (Variations 127–28, 133–34)

The interchange of *τ* and *θ* occurs in the words *θαφος* (for *ταφος*), *Βερουτος* (for *Βερουθος*), and *Νατανιλου* (for *Ναθαναηλ*). It also occurs after *σ* and *ν*, as in *ευφραινεστε* (for

ευφραίνεσθε), μνιστιτη (for μνησθητι), and επληθυντησαν (for επληθυνθησαν). This indicates that θ lost its aspiration after ν and σ, probably demonstrating that it was also voiced after ν. The offers no evidence that θ [tʰ] had shifted to [θ] (see GIGNAC 1976, 87; TEODORSSON 1977, 239–40).

4.5.3.1.31. <T> ~ <Δ> (Variation 137)

There is only one attestation of an interchange of τ and δ (τρυφακτου for δρυφακτου) (variation 137), perhaps indicating voicing in the environment of the liquid (see GIGNAC 1976, 80–85; TEODORSSON 1977, 239–40)

4.5.3.1.32. <T> ~ <Θ> (Variations 131, 143)

The voiceless stop /t/ may be omitted following σ (Χρισος for Χριστος) and before ρ (Κλευπαρος for Κλεοπατρος) (variations 131, 143). The former indicates that the consonant cluster /st/ was occasionally simplified to /s/ and the latter may indicate that τ and ρ had similar places of articulation (see GIGNAC 1976, 66–68).

4.5.3.1.33. <Σ> ~ <Θ>, <Σ#> ~ <Θ> (Variations 141–42, 144–45, 157)

It is common for σ to be omitted both word-medially and word-finally. Word-medially, this occurs before τ (e.g., ωτε for ωστε), θ ([μν]ηθητ[ι] for μνησθητι), and before a vowel ([ε]λεηον for ελεησον) (variations 141–42, 145). It is also erroneously added before κ (Προβατισκις for Προβατικις) (variation 157). Most commonly, it is omitted at the end of words, as in αυτη (for αυτης), υω (for υως), and αδερφο (for αδελφος). This may indicate that final /s/ was elided and medial consonant clusters with /s/ were simplified (see GIGNAC 1976, 124–31; TEODORSSON 1977, 245–48).

4.5.3.1.34. <Σ> ~ <Ζ> (Variations 146–47)

The sibilants σ and ζ occasionally interchange, as in πρεζβευτου (for πρεσβευτου), αγοραζματος (for αγορασματος), and Εσκιας (for Εζκιας) (variations 146–47). This indicates both that /s/ was realized as /z/ before a voiced consonant and that /dz/ had simplified to /z/ (see GIGNAC 1976, 120–24; TEODORSSON 1977, 243–44).

4.5.3.1.35. <X> ~ <K> (Variations 154–55)

The interchange of χ and κ occurs in Μικαηλ (for Μιχαηλ) and Αντειχουον (for *antiquum*). There is no evidence in the material for the shift of [k^h] > [χ] (see GIGNAC 1976, 86, 95; TEODORSSON 240–41).

4.5.3.1.36. <K> ~ <Γ> (Variation 158)

The interchange of κ and γ occurs frequently in the preposition εκ before a voiced consonant, as in εγ μερους (for εκ μερους) and εγ διαταγματος (for εκ διατάγματος), and in the prefix εκ attached to a verb beginning with a voiced consonant, as in εγδικησωμεν (for εκδικήσωμεν) and εγδω (for εκδῶ). This reflects assimilation of /k/ to the following voiced consonant (GIGNAC 1976, 77–80; TEODORSSON 1977, 241–43).

4.5.3.1.37. <ΓΙ> ~ <Γ> (Variation 165)

It is possible that the omission of ι following γ in αγω (for άγίω) indicates the shift of γ = [g] > [γ]/[j], but it is inconclusive (see GIGNAC 1976, 71–75; TEODORSSON 1977, 241–43).

4.5.3.1.38. <ΓΙ> ~ <ΝΙ>, <ΓΚ> ~ <ΝΚ>, <ΓΧ> ~ <ΝΧ> (Variations 162–64)

The interchanges of γγ > νγ, γκ > νκ, and γχ > νχ are quite common, occurring a combined 67 times between the three of them, as in παρανγέλλω (for παραγγέλλω), ενκληματι (for έγκλήματι), and εντυνχανω (for έντυγγάνω) (variations 162–64). These interchanges indicate that the first element of these consonant clusters was realized as /n/ (cf. GIGNAC 1976, 116).

4.5.3.1.39. <P> ~ <Λ>, <Λ> ~ <Θ>, <P> ~ <Θ> (Variations 168–70, 172–73)

The liquids λ and ρ occasionally interchange, as in Γληγοριας (for Γρηγοριας), λιβλαριος (for λιβραριος), θεοφιρος (for θεοφιλος), and αδερφο (for αδερφος) (variations 168–69). There are also a few attestations in which they are omitted (e.g., αδεφου [for αδελφου] and πρεσβευτηο [for πρεσβυτηρου]) (variations 170, 172–73). It would seem that λ and ρ had similar points of articulation. In Modern Greek, λ > ρ before a consonant is general and dissimilation between liquids is common (GIGNAC 1976, 102–108).

4.5.4. Summary

4.5.4.1. Introductory Remarks

The spelling interchanges in the Palestinian material indicate that the significant changes in the phonological system occurred between the Roman and Byzantine periods. Accordingly, two phonological systems will be described. The first will outline the sound changes that had become complete by or during the Roman period and the second the changes that had become complete by or during the Byzantine period. It should be noted, however, that the sound changes would have occurred gradually and not all at once.

4.5.4.2. Vowels

The main distinctives of the vocalic system against the Attic system are explained on the basis of the neutralization of length (quantity) and a series of mergers (quality). With regard to quantity, numerous spelling interchanges attest to the neutralization of phonemic length in the vocalic system (4.5.3.1.20). With regard to quality, the most important identifications are the following: $\epsilon\iota > [i] = \iota$ (4.5.3.1.1), $\eta > [i] = \iota$ (Byz.) (4.5.3.1.5–6), $\omicron\iota (> [\emptyset] \text{ in Early Rom.}) > [y] = \upsilon$ (Byz.) (4.5.3.1.3), $\alpha\iota > [\epsilon] = \epsilon$ (4.5.3.1.10), and $\omega > [o] = o$ (4.5.3.1.11).

A few additional observations should be made. First, the distribution of the interchanges of η and $\epsilon/\alpha\iota$ (4.5.3.1.7, 4.5.3.1.10) demonstrate that the pronunciation of η as $[e]$ may have persisted well into the Byzantine period. Second, reduced or centralized vowels may be represented as ϵ , α , and perhaps o (4.5.3.1.12). Third, a number of interchanges point to a tendency for sibilants and nasals to raise vowels, on one hand, and for liquids to lower vowels, on the other (e.g., 4.5.3.1.7–9). Fourth, consecutive vowel sequences have a tendency to monophthongize, as in $-\iota\omicron\varsigma > -\iota\varsigma$ and $-\iota\omicron\nu > -\iota\nu$ (4.5.3.1.17). Fifth, there are a number of contexts in which the vowel $\iota [i]$ seems to shift to the glide $[j]$ (4.5.3.1.19). Sixth, vowel syncope may occur, usually in the environment of liquids and nasals (4.5.3.1.20). Seventh, and finally, epenthetic vowels may sometimes be inserted between consonants (4.4.3.1.21).

The relationship between the orthography and phonology of the vocalic system of Palestinian Koine Greek during the Roman period may be summarized as follows (cf. PETROUNIAS 2007c, 602–605):¹⁵¹

	front		central/reduced	back	
	unrounded	rounded		unrounded	rounded
high (close)	i	y			u
mid-close	e	(ø)			
mid			([ə])		o
mid-open	ɛ ¹⁵²				
low (open)				a	

Chart 6: Palestinian Koine Greek Vowels (Roman Period)

Sounds	Script
[i]	ι, ει, (η in Byz.)
[y]	υ, υι, οι
[e]	η
([ø])	(οι in Early Roman?)
[ɛ]	ε, αι ¹⁵³
[a]	α
[o]	ο, ω
[u]	ου
[ə]	ε (α, ο)

Chart 7: Palestinian Koine Greek Vocalic Orthography in (Roman Period)

4.5.4.3. Diphthongs

The second element of the diphthongs αω [a^u] and ευ [ɛ^u] had become consonantal (i.e., the semi-vowel [w]) during the Roman period: /ɛ^u/ > [ɛw], /a^u/ > [aw] (4.5.3.1.13–14). By the Byzantine period, the second element of the diphthongs had likely become [β]/[Φ] and then eventually [v]/[f]: /ɛw/ > [ɛβ]/[ɛΦ] > [ɛv]/[ɛf], /aw/ > [aβ]/[aΦ] > [av]/[af] (4.5.3.1.15). This

151. My charts are modeled after those of PETROUNIAS (2007c, 602–605).

152. It should be noted that this vocalic quality may not have been a mid-open vowel, but rather a true mid vowel [ɛ] (see PETROUNIAS 2007c, 604; HORROCKS 2014, 165–70).

153. But note that αι = [ai] (see 4.5.3.1.10).

is demonstrated by the rendering of Latin *ev/av* [eβ]/[aβ] (or [ev]/[av]) with Greek εβ/αβ [εβ]/[αβ] alongside Greek ευ instead of the typical εου/αου of earlier periods. The data are insufficient to determine when precisely this change happened. While the evidence for the change is essentially confined to the Byzantine period, it is possible that it occurred earlier as well. The development of the diphthongs up to, during, and after the Roman period may be summarized as follows:

Roman Period			Byzantine Period
[ε ^u] > [εw]	[εw]	[εw] > [εβ]/[εΦ] > [εv]/[εf]	[εv]/[εf]
[a ^u] > [aw]	[aw]	[aw] > [aβ]/[aΦ] > [av]/[af]	[av]/[af]

Chart 8: Palestinian Koine Greek Diphthongs (Roman and Byzantine Periods)

Sounds	Script
[ε ^u]	ευ
[a ^u]	αυ
[εw]	ευ, ε, εου,
[aw]	αυ, α, αου, αυου, ο
[εβ]/[εΦ]	ευ, εου, εβ ?
[aβ]/[aΦ]	αυ, (αου), αβ ?
[εv]/[εf]	ευ, εου, εβ ?
[av]/[af]	αυ, (αου), αβ ?

Chart 9: Palestinian Koine Greek Diphthongal Orthography (Roman/Byzantine Periods)

4.5.4.4. Consonants

There are essentially five types of consonantal changes that occur from Attic Greek to the Late Byzantine period in Koine Greek in general (4.4.2): the simplification of geminated consonants (/C:/ > /C/), the simplification of ζ (/zd/ > [zz] > [z]), the fricativization of the voiced stops γ (/g/ > [γ]/[j]), β (/b/ > [β]), and δ (/d/ > [ð]), the weakening of the nasals and σ, especially in final position, the fricativization of the aspirated stops φ (/p^h/ > [φ]), χ (/k^h/ > [χ]), and θ (/t^h/ > [θ]), and the loss of aspiration (/h/ > Ø).

There is evidence in the Palestinian material that the simplification of geminated consonants (4.5.3.1.23), the simplification of ζ (4.5.3.1.23, 4.5.3.1.34), and the fricativization of

the voiced stops (4.5.3.1.26, 4.5.3.1.33) had occurred in Palestinian Koine. With respect to the fricativization of the voiced stops (β , γ , δ), there is only evidence for the fricativization of β ($/b/ > [\beta]$) (4.5.3.1.15). Because it is assumed that the fricativization of γ occurred before that of β (HORROCKS 2014, 170), we may also assume that $/g/ > [\gamma]/[j]$ had taken place in Palestinian Koine as well, for which there may be evidence (variation 165). The shift of $/d/ > [\delta]$, on the other hand, must remain an open question for our period.

There is no evidence for the fricativization of the aspirated stops (ϕ , χ , θ) in the Palestinian material. While GIGNAC finds only meager evidence for the fricativization of the aspirated stops in the Roman and Byzantine periods in Egyptian Koine (1976, 98–101), HORROCKS assumes that Egypt reflects a more conservative phonology (2014, 170–71). However, there are reasons to believe that the Near East in general preserved a more conservative phonology as well (see 4.6). In fact, the rendering of both Arabic $/t/$ $[\theta]$ and $/t/$ $[t^h]$ with Greek θ and the occasional rendering of Arabic $/t/$ $[\theta]$ with Greek τ point to a lack of fricativization of the aspirated stops in the east (AL-JALLAD 2015, 13–14, 18–19).¹⁵⁴ Therefore, while speculative, it seems reasonable to posit an aspirated realization of ϕ , χ , and θ until some point in the Byzantine period.

I found no evidence in the Palestinian material regarding the loss of aspiration. However, while *spiritus asper* (') in Greek loanwords in Hebrew is rendered sometimes as \aleph , sometimes as η , and sometimes as π , *spiritus lenis* is always rendered as \aleph (HEIJMANS 2013, 279–81). Accordingly, it may be that aspiration, though weakened, was still preserved to some degree during the Roman period.

154. For example, Arabic $/gaw\theta/$ is rendered into Greek both as $\Gamma\alpha\upsilon\theta\omicron\varsigma$ and $\Gamma\alpha\upsilon\tau\omicron\varsigma$ (334–35 CE) and the Nabatean name $/ḥareṭah/$ is rendered into Greek as Αρετας . If Greek θ represented $[\theta]$ rather than $[t^h]$, the alternative representation of Arabic $/t/$ $[\theta]$ with Greek τ $[t]$ would not make any sense. However, if Greek θ still represented $[t^h]$, then both the general convention and the exceptions make perfect sense. Arabic $/t/$ $[\theta]$ and $/t/$ $[t^h]$ were both generally rendered by Greek aspirated θ $[t^h]$ because it most closely approximated both consonants, but the occasional use of Greek τ $[t]$ to render Arabic $/t/$ $[\theta]$ demonstrates that the Arabic interdental fricative did not perfectly correspond with either Greek θ $[t^h]$ or τ $[t]$ (AL-JALLAD 2015, 13–14, 18–19).

The relationship between the orthography and phonology of the consonantal system (excluding the diphthongs) of Palestinian Koine Greek during the Roman period may be summarized as follows (cf. GIGNAC 1976, 178–79; PETROUNIAS 2007c, 606–609) (charts 10 and 11).¹⁵⁵

	Bilabial	Dental	Alveolar	Palatal	Velar	Glottal
Plosive	p p ^h ([b])		t t ^h ([d])		k k ^h ([g])	
Nasal	m		n			
Fricative	β	(ð?)	s z		γ	(h?)
Trill			r			
Approximant			l	([j])		

Chart 10: Palestinian Koine Greek Consonants (Roman Period)

Sounds	Script (Normal)
[p]	π
[t]	τ
[k]	κ
[p ^h]	φ
[t ^h]	θ
[k ^h]	χ
([b])	(v/μ)β, (v/μ)π
[d]	δ, (v)τ
([g])	(γ)γ, (γ)κ, κ(δ)
[m]	μ
[n]	ν, γ(γ,κ,χ)
[β]	β
([ð])	δ
[s]	σ, ζ(θ)
[z]	ζ, σ(δ)
[γ]	γ
([h])	·
[r]	ρ
[l]	λ

155. Note that (δ) = voiced consonant and (θ) = unvoiced consonant in the entire for ([g]), [s], [z] below.

[j]	γ, ι, Ø
[ks] or [k ^h s] ¹⁵⁶	ξ
[ps] or [p ^h s] ¹⁵⁷	ψ

Chart 11: Palestinian Koine Greek Consonantal Orthography (Roman Period)

4.6. CONCLUSION

In sum, our survey of the epigraphic and documentary evidence from the Hellenistic, Roman, and Byzantine periods has resulted in a picture of Palestinian Koine not drastically different from that of Egyptian Koine. Unfortunately, it was necessary to fill some gaps in the Palestinian Koine system with evidence from Egypt. This was especially true for the consonantal developments.¹⁵⁸ However, the similarity between the two systems in those areas in which evidence is sufficient should be encouraging. It should be noted that a number of features of Palestinian Koine, such as the late pronunciation of η as /e/ and the continued aspirated realization of the stops φ, χ, θ, reflect a relatively conservative Greek phonology relative to the developments in Greece. This is consistent with other data from the Near East (e.g., AL-JALLAD 2015).

This chapter has thus provided a foundation for understanding the orthography and phonology of the Secunda. The Greek pronunciation and writing conventions of the Roman period summarized here are what the author(s) of the Secunda would have been familiar with at the time of the composition of the Secunda. In the following chapter, we will examine general Greek practices of transcription of other languages from roughly the same time period.

156. For the aspiration of the first element of ξ and ψ in Greek loanwords in Mishnaic Hebrew, see 5.4.1.3.6.

157. See previous note.

158. This, of course, would be expected. Because the phonological changes in the consonantal system are primarily rephonologizations—the realization of the phoneme changes without merging with another phoneme—spelling interchanges are less common (see TEODORSSON 1977, 36–51).

5. GREEK TRANSCRIPTION CONVENTIONS IN THE HELLENISTIC/ROMAN/ BYZANTINE NEAR EAST

5.1. INTRODUCTION

In chapter two, a number of instances of transcription in the Hellenistic, Roman, and Byzantine Near East were analyzed from a historical and social perspective. The present chapter will examine these same transcription texts from a linguistic and orthographic perspective, analyzing the transcription conventions utilized when rendering other languages into Greek. The preceding chapter, in which the historical phonology of Koine Greek in Palestine (and Egypt) was described, will serve as a foundation for understanding the nature of the transcription conventions implemented in these texts. Taken together, these two chapters (4 and 5) will serve as a foundation for understanding the phonology and orthography of the Secunda.

The first part of this chapter outlines methodology; the second part constitutes a linguistic and orthographic analysis of the transcription texts by language; the third part summarizes relevant research regarding the realization of Greek loanwords in Tannaitic Hebrew.

5.2. METHODOLOGY

For each language analyzed, the corpus of texts and/or inscriptions is outlined. In general, priority is given to transcription of common words rather than proper names. The phonological inventory of the language is briefly summarized. Following this, the Greek transcription

conventions are analyzed in terms of vowels, semi-vowels and diphthongs, and consonants. The languages chosen for this survey are Latin, Akkadian, Arabic, Aramaic, and Phoenician-Punic. Latin was chosen because its phonology is the best understood of contemporary languages attested in Greek transcription.¹⁵⁹ The remaining languages were chosen by virtue of them being Semitic languages in Greek transcription from a roughly contemporary period. Finally, in order to better understand the cross-linguistic perceptual relationship with respect to Greek and Hebrew transcription, the evidence regarding how Greek loanwords are realized in Mishnaic Hebrew will be summarized.

In the case of Latin and Akkadian, I conduct original research based on a comprehensive statistical analysis of a corpus of published editions of Greek transcription texts for the relevant period. In the case of Arabic, I summarize the work of AL-JALLAD et al. (AL-JALLAD, DANIEL, and GHUL 2013; AL-JALLAD 2015; AL-JALLAD and AL-MANASER 2015). In the case of Phoenician and Aramaic, I make general conclusions on the basis of a small number of representative continuous-text inscriptions and, in the case of Phoenician, supplement the data with transcriptional material found in the grammars (e.g., FRIEDRICH and RÖLLIG 1999; KRAHMALKOV 2001; HACKETT 2008). In the case of Greek loanwords in Hebrew, I summarize the work of HEIJMANS (2013) on Greek loanwords in the Mishnah.

5.3. LINGUISTIC AND ORTHOGRAPHIC ANALYSIS: GREEK TRANSCRIPTION

5.3.1. Latin

The corpus for Latin transcribed into Greek includes the following papyri from Egypt: P.Berol.21246 (1st CE), *P.Oxy.* XXXIII.XXXIII.2660 (1st–2nd CE), *P.Oxy.* XLVI.3315 (1st–2nd CE), *P. Oxy.* LXXVIII.5162 (1st–2nd CE), *P.Oxy.* LXXVIII.5163 (1st–2nd CE), Pap.Laur.Inv.Nr.III–418 (2nd CE), *P.Lund* I.5 (2nd CE), *P.Oxy.* XLIX 3452 (2nd CE), SB III.I.6304 (2nd CE), *P.Mich.Inv.* 2458 (2nd–3rd CE), *P.Oxy.* XXXIII.XXXIII.2660a (3rd CE),

159. This is because it is very well attested in inscriptional evidence and there are numerous contemporary grammatical treatises explicitly describing the phonology of Latin.

P.Strasb.Inv. G 1175 (3rd–4th CE), P.Strasb.Inv. g 1173 (3rd–4th CE), *P.Fay.* 135 verso (4th CE), *P.Lond.* II 481 (4th CE), and P.Berol.Inv.Nr. 10582 (5th–6th CE), P. Vindob. L 91 (6th CE). Most, but not all (see SB III.I.6304 and P. Vindob. L 91), constitute bilingual Greco-Latin glossaries. Uncertain readings in the papyri have also generally been excluded.

5.3.1.1. Vowels

The Latin vocalic system is essentially comprised of two systems, a system of short vowels (*a, e, i, o, u*) and a system of long vowels (*ā, ē, ī, ō, ū*). As is common cross-linguistically, the long vowels are located more on the periphery of the vowel trapezium and the short vowels nearer to the center. That is, the long vowels have more tense pronunciations while the short vowels have more lax pronunciations. With the exception of long */ā/* and short */ă/*, which seem to have had essentially the same quality, the long vowels had a significantly more close quality than that of the corresponding short vowels. Thus, the resulting vocalic system was as follows: */ī/* = [i:], */ĩ/* = [ɪ], */ē/* = [e:], */ě/* = [ɛ], */ā/* = [a:], */ă/* = [a], */ō/* = [o:], */ǫ/* = [ɔ], */ū/* = [u:], */ũ/* = [ʊ]. It is important to note that the qualities of */ĩ/* and */ũ/* were closer to those of */ē/* and */ō/*, respectively, than to those of their long counterparts, */ī/* and */ū/*¹⁶⁰ (ALLEN 1978, 47–50). At some point in the history of Latin, the quantitative and qualitative oppositions gave way to only qualitative oppositions (i.e., the neutralization of phonemic length). Latinists date this change to around the second century CE (MARTÍNEZ 1989, 106).

5.3.1.1.1. a-Vowels

The short vowel */ă/* [a] is represented almost exclusively (161/162x or 99.38%) with α:

<i>Greek Transcription</i>	<i>Latin Word</i>	<i>Manuscript</i>	<i>Date</i>
αντε	<i>ăntě</i>	<i>P.Oxy.</i> XLIX.3452	2 nd CE
αρκουc	<i>ărcūs</i>	<i>P.Oxy.</i> LXXVIII.5162	1 st –2 nd CE

160. The similar quality of */ĩ/* and */ē/* is demonstrated by inscriptions in which *e* is substituted for short *i* (*trebibus* for *tribibus*) and *i* for long *ē* (*minsīs* for *mensis*). The similar quality of */ũ/* and */ō/* is demonstrated by inscriptions in which *o* is substituted for short *u* (*sob* for *sub*) and short *u* is substituted for long *ō* (*pūnere* for *pōnere*). Nevertheless, there were certainly differences between *ĩ/i* and *ě/e*. There was greater palatal contact of the tongue in the case of *ĩ/i*. Likewise, *ũ/u* differed from *ō/o* in that the lip-rounding was especially close in the case of *ũ/u* (ALLEN 1978, 47–50).

δεβιττα	<i>dēbīṭā</i>	P. Vindob. L 91	6 th CE
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The long vowel /ā/ [a:] is always (90/90x) represented with α:

ακηταρια	<i>ācētāriā</i>	<i>P.Oxy.</i> XXXIII.2660	1 st –2 nd CE
ουοκαβουλωρουμ	<i>vōcābūlōrūm</i>	<i>P.Oxy.</i> XLIX.3452	2 nd CE

5.3.1.1.2. e-Vowels

The short vowel /ĕ/ [ɛ] is represented most frequently by ε (206/220x or 93.64%), and rarely by αι (4/220x or 1.82%), η (3/220x or 1.36%), ι (4/220x or 1.82%), α (2/220x or 0.91%), or Ø (1/220x or 0.45%):

ρεδδε	<i>rēddē</i>	P.Berol. 21246	1 st CE
γενιους	<i>gēnīūs</i>	<i>P.Mich.Inv.</i> 2458	2 nd –3 rd CE
αικους	<i>ēcūs</i>	P. Lund 5	2 nd CE

In the environment of *r*, short /ĕ/ may be represented with η: ηρκουλανεους *Hērcūlānēūs* (1st–2nd CE, *P.Oxy.* XXXIII.2660), κονστηρνατους *cōnstērnātūs* (5th–6th CE, P.Berol.Inv.Nr. 10582), [πε]ρηγρινη *pērēgrīnī* (5th–6th CE, P.Berol.Inv.Nr. 10582).

The long vowel /ē/ [e:] is usually represented by η (75/103x or 72.82%), less frequently by ε (25/103x or 24.27%), and a few times with ι (3/103x or 2.91%):

κλασσης	<i>clāssēs</i>	SB III.I. 6304	2 nd CE
ομνης	<i>ōmnēs</i>	P.Berol.Inv.Nr. 10582	5 th –6 th CE
ρεγαλιτερ	<i>rēgālītēr</i>	P.Berol.Inv.Nr. 10582	5 th –6 th CE

There is significant disparity in the representation of Latin /ē/ from the fourth century CE:

<i>Latin ē</i>	≤ 1 st –2 nd CE	2 nd –3 rd /4 th CE	≥ 4 th CE	Total
as η	26 (96.30%)	28 (80.00%)	21 (51.22%)	75 (72.82%)
as ε	1 (3.70%)	7 (20.00%)	17 (41.46%)	25 (24.27%)

The distribution clearly demonstrates that chronology was a significant factor in the representation of Latin /ē/. Presumably, after the neutralization of quantitative distinctions in Latin, *e* was more prone to be represented by Greek ε. At the same time, the fact that Latin *e* and

Greek ε were paleographically similar may account for a portion of the instances in which

Latin /ē/ is rendered by Greek ε.

5.3.1.1.3. i-Vowels

The short vowel /i/ [i] is represented most frequently by ι (217/236x or 91.95%), rarely by ει (9/236x or 3.81%), and a number of times by ε (6/236x or 2.54%):

ινετ	<i>innēt</i>	P.Berol. 21246	1 st CE
κωγιτατ	<i>cōgītāt</i>	P.Strasb.Inv. g 1173	3 rd –4 th CE
ιουσσειστι	<i>jūssistī</i>	P.Berol.Inv.Nr. 10582	5 th –6 th CE

The long vowel /ī/ [i:] is usually represented by ι (60/91x or 65.93%), less frequently by ει (26/91x or 28.57%), and a few times with ε (4/91x or 4.40%):

φορμικα	<i>fōrmīcā</i>	P.Oxy. LXXVIII.5163	1 st –2 nd CE
ρηγινα	<i>rēgīnā</i>	P.Mich.Inv. 2458	2 nd –3 rd CE
ουεντεις	<i>vēntīs</i>	P.Oxy. XLVI.3315	1 st –2 nd CE

While ει is used to represent long /ī/ only slightly less than one third of the time, the grapheme ει is far more likely to represent long /ī/ than it is short /i/:

	/i/	/ī/
ει	7/29 (24.14%)	22/29 (75.87%)

There are also two instances in which ει represents two distinct vowels, rather than the vowel quality [i]: πουλειουμ *pūlēiūm* (1st–2nd CE, P.Oxy. XXXIII.2660) and ει *ēī* (SB III.I. 6304, 2nd CE).

5.3.1.1.4. o-Vowels

The short vowel /ō/ [ɔ] is usually represented with ο (65/69x or 94.20%) and rarely with ου (2/69x or 2.90%) or ω (2/69x or 2.90%):

οσπιτ[εμ]	<i>hōspītēm</i>	P.Berol. 21246	1 st CE
μορς	<i>mōrs</i>	P.Mich.Inv. 2458	2 nd –3 rd CE
νωεμ[β]ερ	<i>Nōvēmbēr</i>	P.Fay. 135 verso	4 th CE

The long vowel /ō/ [o:] is usually represented by ω (85/107x or 79.44%)¹⁶¹ and less frequently by o (22/107x or 20.56%):

ρουβελλιωνης	<i>rŭbĕllĭōnēs</i>	<i>P.Oxy. XXXIII.2660</i>	1 st –2 nd CE
νωμινα	<i>nōmĭnă</i>	<i>P.Mich.Inv. 2458</i>	2 nd –3 rd CE
βος	<i>vōs</i>	<i>P.Lond. II 481</i>	4 th CE

The representation of Latin /ō/ with o is more common after the fourth century CE:

<i>Latin ō</i>	≤ 1 st –2 nd CE	2 nd –3 rd /4 th CE	≥ 4 th CE	Total
as ω	16 (72.73%)	51 (96.23%)	18 (56.25%)	85 (79.44%)
as o	6 (27.27%)	2 (3.77%)	14 (43.75%)	22 (20.56%)

Presumably, after the neutralization of quantitative distinctions in Latin, *ō* was more prone to be represented by Greek o. At the same time, the fact that Latin *o* and Greek o were paleographically similar may account for a portion of the instances in which Latin /ō/ is rendered by Greek o.

5.3.1.1.5. u-Vowels

The short vowel /ŭ/ [ʊ] is most frequently represented by ου (169/188x or 89.89%) and occasionally by o (18/188x or 9.57%):

ινσουλσους	<i>īnsŭlsŭs</i>	<i>P.Berol. 21246</i>	1 st CE
τουσσιτ	<i>tŭssĭt</i>	<i>P.Strasb.Inv. G 1175</i>	3 rd –4 th CE
αρμαριομ	<i>ărmārĭŭm</i>	<i>P.Lond. II 481</i>	4 th CE

The instances in which /ŭ/ is represented by Greek o seem to be in specific phonetic environments: in the environment of *m* (e.g., ινγενιομ, *īngĕnĭŭm*; αρμαριομ, *ărmārĭŭm*; μορμορω [*mŭrmŭrō*]), in the environment of *r* (ορσαμ, *ŭrsăm*), and before *v* [w] (πλοουεζ, *plŭ[v]ĭs*). Generally, instances in which Latin final nominative *-us* is represented as Greek -ος have been excluded from this analysis, due to the fact that it may be a morphological equivalency natural for a Greek speaker rather than a reflection of pronunciation.

161. The word *prīmō*, which is transcribed as πριμωι, has been counted in this tabulation.

The long vowel /ū/ [u:] is always represented with Greek ου (41/41x):

λακτουκα	<i>lăctŭcǎ</i>	<i>P.Oxy. XXXIII.2660</i>	1 st –2 nd CE
σαλουτατ	<i>sălŭtăt</i>	<i>P.Strasb.Inv. G 1175</i>	3 rd –4 th CE

5.3.1.2. Diphthongs and Semi-Vowels

The two most common Latin diphthongs, *ae* and *au*, originally represented the sounds [ai] and [aw]. While *ae* was originally written as *ai*, by the second century BCE it began to be represented by *ae*. This may reflect that the diphthong was narrowed and the vowel quality of the second element had approached that of its beginning point in [a]. In rural dialects, *ae* shifted to a mid-open front vowel /ĕ/ and *au* shifted to a mid-open back vowel /ō/. During the imperial period, *au* shifted to *a* when the following syllable contained an /u/ vowel (e.g., *Agustus* for *Augustus*). In Late Latin the monophthongization of *ae* became universal, but *au* maintained its diphthongal realization in some regions (ALLEN 1978, 60–62).

The semi-vowels *j* (or *i*) and *v* (or *u*) were originally pronounced as [j] and [w], respectively. Whenever *i* was written intervocalically, it represented a geminated consonant [j:] (e.g., *māiōr* [maj:or]). Such a realization obtained throughout the ancient period. Beginning in the first century CE, *v* [w] begins to interchange with *b* in inscriptional evidence, which likely reflects a bilabial fricative [β] realization of consonantal *u*.¹⁶² Velius Longus describes a fricative pronunciation already in the second century CE. This sound change was essentially universal by the fifth century CE, though there is some evidence that the pronunciation of [w] remained in some pockets. It should also be noted that the *u* in the "digraph" *qu*, which represented a single labio-velar phoneme [k^w], did not become [β] as consonantal *u* did elsewhere. While not as clear, a parallel situation probably obtained with respect to *gu* [g^w] (ALLEN 1978, 16–20, 25, 37–42).

162. Note how a similar phenomenon occurs in Jewish Palestinian Aramaic (see KHAN 1997, 105), roughly contemporary Hebrew, and roughly contemporary Greek (see 4.5.3.1.13–15; 6.3.1.1; 6.3.7.1).

5.3.1.2.1. Diphthong ae

The diphthong *ae* [ai]/[ae] is usually represented by αι (14/20x or 70.00%), but occasionally, presumably reflecting the aforementioned shift, represented by η (6/20 or 30.00%) or ε (1/20x or 10.00%):

τερραι	<i>těrrae</i>	P.Berol. 21246	1 st CE
πραιτωριαι	<i>praetōriāe</i>	SB III.I.6304	2 nd CE
[κ]ηνα	<i>cēnǎ</i> (< <i>caenǎ</i>)	P.Berol. 21246	1 st CE
κηλως	<i>cēlōs</i> (< <i>caelōs</i>)	<i>P.Lond.</i> II 481	4 th CE
<π>ρε<φ>εκτους	<i>praefectūs</i>	P.Strasb.Inv. g 1173	3 rd –4 th CE

5.3.1.2.2. Diphthong au

The diphthong *au* [aw] is almost exclusively represented by αυ (11/12x or 91.67%) and once, presumably reflecting the *au* > *a* / *_Cu* shift mentioned above, by α (1/12 or 8.33%):

ταυρουc	<i>taurūs</i>	<i>P.Oxy.</i> LXXVIII.5163	1 st –2 nd CE
αυτεμ	<i>autēm</i>	P.Berol.Inv.Nr. 10582	5 th –6 th CE
αγουστος	<i>Augūstūs</i>	P.Fay. 135 verso	4 th CE

5.3.1.2.3. Semi-Vowel j

Consonantal *i* (*j*) [j] is always represented by ι (12/12x):

μαιορ	<i>mājōr</i>	P.Berol. 21246	1 st CE
α[δ]ιο[v]τω	<i>adjūtō</i>	P.Strasb.Inv. G 1175	3 rd –4 th CE
ιαμ	<i>jām</i>	<i>P.Lond.</i> II 481	4 th CE

5.3.1.2.4. Semi-Vowel v

Consonantal *u* (*v*) [w] is represented about half the time by ου (28/57x or 49.12%), slightly less than half the time by β (25/57x or 43.86%), and a few times by Ø (4/57x or 7.02%):

ουεντους	<i>vētūs</i>	<i>P.Oxy.</i> XLVI.3315	1 st –2 nd CE
φουωνιους	<i>fāvōnīūs</i>	<i>P.Oxy.</i> XLVI.3315	1 st –2 nd CE
ουιδες	<i>vidēs</i>	P.Strasb.Inv. G 1175	3 rd –4 th CE
βιλα	<i>villā</i>	<i>P.Lond.</i> II 481	4 th CE
ναβες	<i>nāvīs</i>	<i>P.Lond.</i> II 481	4 th CE

βιδεω	<i>vīdēō</i>	P.Berol.Inv.Nr. 10582	5 th –6 th CE
νωεμ[β]ερ	<i>Nōvēmbēr</i>	P.Fay. 135 verso	4 th CE

It may be assumed that Greek ου represents Latin *v* = [w] and Greek β represents Latin *v* = [β]. Although the statistical quantities of the representation of Latin *v* are almost evenly split between ου and β, the distribution may be entirely explained on the basis of diachronic distribution and distribution according to genre:

<i>Latin v</i>	≤ 1 st –2 nd CE	2 nd –3 rd /4 th CE	≥ 4 th CE	Total
as ου	23 (95.83%)	14 (82.35%)	0 (0.00%)	37 (56.06%)
as β	0 (0.00%)	3 (17.65%)	22 (88.00%)	25 (37.88%)
as Ø	1 (4.17%)	0 (0.00%)	3 (12.00%)	4 (6.06%)

Latin *v* is almost exclusively represented by ου up until the fourth century CE, after which time Greek β, and not ου, is used to represent Latin *v*. At first glance, this may seem problematic. This is because the Latin sound change *v* [w] > [β] had already begun in the first century CE and was widespread enough to be mentioned in a grammatical treatise by the second century CE. Moreover, Latin loanwords in Egyptian Koine Greek reflect this change already in the first and second centuries CE: *πρεβέτοις prīvātūs* (1st CE), *κερβικάριον cērvicāle* (early 2nd CE), and *βιάτικον vīātīcūm* (2nd CE) (GIGNAC 1976, 68–69).

The solution to this problem is to be found in the nature of the text that contains the only occurrences of Greek β for Latin *v* prior to the fourth century CE. SB III.I. 6304, a second-century CE receipt for the sale of a slave, was originally penned in Italy and subsequently taken to Egypt. It contains all three examples of Greek β for Latin *v* prior to the fourth century CE: *βιγεντι vīgēntī*, *βετρανε vēt(ē)rānē*, and *βενδιδτ vēndīdīt*. This text differs from the glossarial texts, of which most of the corpus is comprised, in two ways. First, we know that it was originally penned in Italy. Accordingly, we could suggest that it reflects a different pronunciation. Even if this is the case, it is inadequate as an explanation since there is evidence for the *v* [w] > [β] change in Egypt at an earlier period as well. Second, it differs from the

glossarial texts in genre. Its original function was to record and ratify an everyday sale. There is no reason why it should reflect anything other than everyday pronunciation. Glossarial texts, on the other hand, were used *to teach* someone how to speak Latin. Accordingly, it would not be surprising if these bilingual glossaries reflected a more standard archaic pronunciation, in which *v* was still pronounced as [w]. In fact, this is a common phenomenon in formal language instruction. A modern English teacher would read the phrase *going to* as ['gʊɪŋ tu] when teaching their students, even though they themselves would pronounce it as ['gʌnə] (i.e., "gonna") among friends. The preservation of the pronunciation [w] in the glossarial texts well after the sound had shifted in colloquial pronunciation strengthens the claim mentioned in chapter 3 that such texts were actually created by the teachers themselves.

If we assume that this was the case, the diachronic distribution is entirely explained. Even though Latin *v* was pronounced as [β] already from the first or second century CE in Egypt, glossarial and grammatical texts used for language instruction maintained the old pronunciation [w] up until the fourth century CE. During this period, language-learning texts represented Latin *v* with *ov*, reflecting an archaic or standard pronunciation, and non-didactic texts represented Latin *v* with *β* (e.g., SB III.I. 6304), reflecting everyday colloquial pronunciation. After the fourth century CE, it seems that the pronunciation of Latin *v* as [β] had become so universal that even in grammatical texts Latin *v* was represented with *β*.

Finally, it should be noted that the labio-velar phoneme *qu* [kʷ] was represented in a variety of ways. It was most frequently represented by *kov* (11/20x or 55.00%), but also by *κο* (4/20x or 20.00%), *κοι* (3/20x or 15.00%), and *κυ* (2/20x or 10.00%) each attempting to approximate the atypical Latin phoneme [kʷ]. Its realization is fairly constant in all periods:¹⁶³

ακουαριους	<i>āquārīūs</i>	P.Oxy. XLVI.3315	1 st –2 nd CE
εκουειτης	<i>ēquītēs</i>	P.Strasb.Inv. g 1173	3 rd –4 th CE

163. The variant *κωτ[ι]θιδιανουμ* in P.Vindob. L 91 (6th CE) probably reflects the shift of [kwo] > [ko].

κοις	<i>quīs</i>	P.Berol.Inv.Nr. 10582	5 th –6 th CE
κουδ	<i>quīd</i>	P.Berol.Inv.Nr. 10582	5 th –6 th CE
κινκυε	<i>cīnquē</i>	SB III.I.6304	2 nd CE

There is only one instance of *gu* [g^w] in the corpus, represented by γου: συνγουεντουμ *ūnguēntūm* (P.Berol.Inv.Nr. 10582, 5th–6th CE).

5.3.1.3. Consonants

The Classical Latin consonantal system is made up of eighteen distinct phonemes,¹⁶⁴ including three voiceless stops (/p/, /t/, /k/), three voiced stops (/b/, /d/, /g/), two labio-velars (/k^w/, /g^w/), two liquids (/l/, /r/), three nasals (/m/, /n/, /ŋ/), three fricatives (/f/, /s/, /h/), and two semi-vowels (/w/, /y/). Latin consonants could be doubled, in which case the consonant was held for a greater duration. The grapheme *x* represented the combination of /k/ = *c* and /s/ = *s* (ALLEN 1978, 11–46):

<i>Voiceless stops:</i>	/p/ = <i>p</i> , /t/ = <i>t</i> , /k/ = <i>c</i>
<i>Voiced stops:</i>	/b/ = <i>b</i> , /d/ = <i>d</i> , /g/ = <i>g/c</i>
<i>Labio-velars:</i>	/k ^w / = <i>qu</i> , /g ^w / = <i>gu</i>
<i>Liquids:</i>	/l/ = <i>l</i> , /r/ = <i>r</i>
<i>Nasals:</i>	/m/ = <i>m</i> , /n/ = <i>n</i> , /ŋ/ = <i>g(n)</i>
<i>Fricatives:</i>	/f/ = <i>f</i> , /s/ = <i>s</i> , /h/ = <i>h</i>
<i>Semi-Vowels:</i>	/j/ = <i>i/j</i> , /w/ = <i>u/v</i>
<i>Combination:</i>	/ks/ = <i>x</i>

5.3.1.3.1. Voiceless Stops

The voiceless stops *p*, *t*, and *c* are represented by their unaspirated Greek counterparts π, τ, and κ: e.g., πισκης *pīscēs* (P.Oxy. 3315, 1st/2nd CE), τινγω *tīngō* (P.Strasb.Inv. g 1175, 3rd/4th CE), and κανις *cānīs* (P.Oxy. LXXVIII.5162, 1st/2nd CE). In the case of τ, it is twice represented with δ: e.g., ακκεντιδε *āccēndītē*. It is once represented with θ: κωτ[ι]θιδιανουμ¹⁶⁵

164. The aspirated stops (/p^h/, /t^h/, /k^h/) and the voiced dental fricative (/z/), which enter the language through Greek loanwords, have been omitted.

165. The sequence τ[ι]θι is probably a form of haplography.

quōtīdīānūm (P.Vindob. L 91, 6th CE). It is once omitted: ε δεμεττε *ēt dīmīttē* (P.Vindob. L 91, 6th CE). In the case of *c*, it is twice represented by γ: e.g., γονγερ *cōngēr* (P.Oxy. XXXIII.2660, 1st/2nd CE):

<i>Latin p</i>		<i>Latin t</i>		<i>Latin c</i>	
as π	93	as τ	228	as κ	132
		as δ	2	as γ	2
		as θ	1		
		as Ø	1		

Their representation with the Greek unaspirated series indicates that the Latin voiceless stops were also unaspirated in their pronunciation.

5.3.1.3.2. Voiced Stops

The voiced stops *b*, *d*, and *g* are represented by their voiced Greek counterparts β, δ, and γ: e.g., βλιτουμ *blītūm* (P.Oxy. XXXIII.2660, 1st/2nd CE), δη *dē* (P.Oxy. 3315, 1st/2nd CE), and γενιους *gēnīūs* (P.Mich.Inv. 2458, 2nd/3rd CE). In the case of *b*, it is twice represented by π: e.g., δεκεμπερ *Dēcēmbēr* (P.Fay. 135 verso, 4th CE), in which the π was probably pronounced as [b] after the nasal *m*. When preceding *s*, the combination is represented by ψ: οψιγναν[ς] *ōbsīg-nāns* (P.Berol.21246, 1st CE). In the case of *d*, it is twice represented by τ when following Greek ν, as would be natural in contemporary Greek orthography: e.g., ουντε *ūndē* (P.Lond. II. 481, 4th CE). It is once also represented by the combination νδ: μενδιουμ *mēdīūm* (P.Berol.Inv.Nr.10582):

<i>Latin b</i>		<i>Latin d</i>		<i>Latin g</i>	
as β	53	as δ	228	as γ	46
as π	2	as (ν)τ	2		
as ψ / _s	1	as νδ	1		

5.3.1.3.3. Labio-Velars

See 5.3.1.2.4.

5.3.1.3.4. Liquids

The liquids *l* and *r* are represented by their Greek counterparts λ and ρ, respectively: e.g., λεπους *lēpūs* (*P.Lund* 5, 2nd CE) and ρηγίνα *rēgīnā* (*P.Mich.Inv.* 2458, 2nd/3rd CE). In the case of *r*, it is once represented by ν: κοντιναι *cōrtīnae* (*P.Oxy.* LXXVIII.5163, 1st/2nd CE):

<i>Latin l</i>		<i>Latin r</i>	
as λ	102	as ρ	204
		as ν	1

The nasals *m* and *n* are represented by their Greek counterparts μ and ν, respectively:¹⁶⁶ e.g., μηνκα *mēnsā* (*P.Oxy.* LXXVIII.5163, 1st/2nd CE). In the case of *m*, it is transcribed by ν three times: e.g., κολουνβος *cōlūmbūs* (*P.Lond.* II 481, 4th CE), possibly due to the fact that regressive assimilation can be assumed for the Greek orthography -νβ- = /mb/ (< */nb/). In the case of *n*, it is once transcribed by γν after κ: φακ γνοβες *fāc nōbīs* (*P.Lond.* II 481, 4th CE), possibly reflecting the voicing of /k/ as the speaker transitions into the following word. It is also once transcribed by ι: νοῦτιας *nūntiās* (*P.Berol.Inv.Nr.*10582, 5th/6th CE), possibly reflecting the the weakening of the nasal (KRAMER 1983):

<i>Latin m</i>		<i>Latin n</i>	
as μ	148	as ν	198
as ν	3	as γν / k_	1
		as ι	1

5.3.1.3.5. Fricatives

The fricative *f* is transcribed as φ: e.g., φορμικα *fōrmīcā* (*P.Oxy.* LXXVIII.5163, 1st/2nd CE).

The fricative *s* is transcribed as σ: e.g., σπονδαι *spōndae* (*P.Oxy.* LXXVIII.5163, 1st/2nd CE).

Latin *h* is never represented in the transcription: e.g., ομο *hōmō* (*P.Berol.*21246, 1st CE). In the

case of *s*, it is once transcribed as νσ: αρ[ε]ι'ηνς *ārīēs* (*P.Oxy.* LXXVIII.5162, 1st/2nd CE):

166. The first element of the Latin sequence *gn* is not treated separately in this analysis. In all 7 instances of the sequence *gn* in Latin, Latin *gn* is transcribed as γν in Greek. The *gn* sequence in Latin either represented [ηη] as in English *hangnail* or [gn] as a regular "spelling pronunciation" (see ALLEN 1978, 22–25).

<i>Latin f</i>		<i>Latin s</i>		<i>Latin h</i>	
as φ	31	as σ	290	as Ø	12
		as υσ	1		

5.3.1.3.6. Semi-Vowels

See 5.3.1.2.3–4.

5.3.1.3.7. Combination x

The Latin consonant *x* [ks] is represented by ξ: e.g., εξ ἔχ (SB III.I.6304, 2nd CE). It is once represented by ξσ: σεξστουμ *sěxtũm* (SB III.I.6304, 2nd CE). The sequence *nx*, which occurs once, is represented by ξ: φαλαξ *fălănx* (P.Strasb.Inv. g 1173, 3rd/4th CE):

<i>Latin x</i>		<i>Latin nx</i>	
as ξ	13	as ξ	1
as ξσ	1		

5.3.1.3.8. Consonant Gemination

Consonantal gemination [C:] is usually represented in the transcription (41/49x or 83.67%): e.g., ακκηπισσε *ăccēpīssē* (SB III.I.6304, 2nd CE), σουπελλεξ *sŭpěllēx* (P.Oxy. LXXVIII.5163, 1st/2nd CE), and σαγιτταριους *săgittārīūs* (P.Oxy. XLVI.3315, 1st/2nd CE). However, it is not always indicated (8/49x or 16.33%): e.g., στηλας *stěllās* (P.Lond. II 481, 4th CE) and πασαρες *păssērēs* (P.Lond. II 481, 4th CE):

	<i>cc</i>	<i>dd</i>	<i>ll</i>	<i>mm</i>	<i>nn</i>	<i>rr</i>	<i>ss</i>	<i>tt</i>	<i>Total</i>
CC	7	5	8	1	0	4	9	7	41
C	0	0	3	0	1	1	1	2	8

There is also one instance in which single *t* is falsely geminated in the transcription as ττ: δεβιττα *dēbīta* (P.Vindob. L 91, 6th CE).

5.3.1.4. Summary

The most common representation of each Latin phoneme is summarized in the charts below. If a second grapheme is used more than 20.00% of the time, it is included in parentheses (chart 12):

Vowels

<i>Latin:</i>	ā [a]	ā [a:]	ě [ɛ]	ē [e:]	ĩ [i]	ī [i:]	ǫ [ɔ]	ō [o:]	ŭ [ʊ]	ū [u:]
<i>Greek:</i>	α	α	ε	η (ε)	ι	ι (ει)	ο	ω (ο)	ου	ου

Diphthongs

Semi-Vowels

<i>Latin:</i>	au [aw]	ae [ai]/[ae]	ei [ei]/[ɛi]	j [j]	v [w]	v [β]
<i>Greek:</i>	αυ	αι	ει	ι	ου	β

Voiceless Stops

Voiced Stops

Labio-Velars

<i>Latin:</i>	p [p]	t [t]	k [k]	b [b]	d [d]	g [g]	qu [k ^w]	gu [g ^w]
<i>Greek:</i>	π	τ	κ	β	δ	γ	κου (κο)	γου

Liquids

Nasals

Fricatives

Combination

<i>Latin:</i>	l [l]	r [r]	m [m]	n [n]	f [f]	s [s]	h [h]	x [ks]	b + s [bs]
<i>Greek:</i>	λ	ρ	μ	ν	φ	σ	Ø	ξ	ψ

Chart 12: Summary of Latin in Greek Transcription: Correspondences

5.3.2. Akkadian

The corpus for Greek transcription of Akkadian is comprised of the Graeco-Babyloniaca tablets (GELLER 1997): BM 34797 (undated), BM 35727 (1st BCE), BM 34799 (1st BCE), BM 35726 (undated), BM 48863 (1st CE), BM 34781 (undated), BM 77229 (1st CE), HSM 1137 (1st CE), BM 34816 (1st CE), BM 33769 (1st BCE), VAT 412 (1st CE), BM 38461 (1st/2nd CE), St. Petersburg tablet (undated) and BM 34798 (1st CE). With GELLER, Ash. Mus. 1937.993 (2nd BCE), also known as the Ashmolean Incantation, is omitted from the analysis (1997, 83–85). Uncertain readings in the tablets have also generally been excluded.

5.3.2.1. Vowels

Akkadian has four short vowels (/a/, /e/, /i/, /u/) and four corresponding long vowels (/ā/, /ē/, /ī/, /ū/). The four long vowels, when represented with a circumflex (i.e., /â/, /ê/, /î/, /û/), are

the result of the contraction of consecutive vocalic phonemes. The difference between the short and long vowels is essentially duration (HUEHNERGARD 2011, 1).

5.3.2.1.1. a-Vowels

The short vowel /ă/ is always represented by Greek α (91/91x):

<i>Greek Transcription</i>	<i>Akkadian Word</i>	<i>Manuscript</i>	<i>Date</i>
αγαμ	<i>agam(m)</i> (< * <i>agammu</i>)	BM 34781	undated
ναφφας	<i>nappaš</i> (< * <i>nappašu</i>)	HSM 1137	1 st CE
ραφασθ	<i>rapašt</i> (< * <i>rapaštu</i>)	St. Petersburg Tablet	undated

The long vowel /ā/ (distinct from â) is likewise always represented by Greek α (42/42x):

βαβιλ	<i>Bābil</i> (< * <i>Bābilu</i>)	BM 34798	1 st CE
μαρ	<i>mār</i> (< * <i>māri</i>)	HSM 1137	1 st CE
ταβ	<i>tāb</i> (< * <i>tābu</i>)	BM 34816	1 st CE

Both instances of /â/ (distinct from /ā/), which result from the contraction of adjacent vowels, are represented by α: μαρατ *mahrât* (BM 34798, 1st CE) and [v]ακ *nâq* (BM 77229, 1st CE).

5.3.2.1.2. e-Vowels

The short vowel /ĕ/ is most frequently represented by ε (4/9x or 44.44%) or η (4/9x or 44.44%), and once by ει (1/9x or 11.11%):

ελισ	<i>eliš</i>	BM 35727	1 st BCE
λεμν	<i>lemn</i> (< * <i>lemnū</i>)	BM 34816	1 st CE
μηλω	<i>meluhhû</i>	BM 34799	1 st BCE
λα θηροβ	<i>lā terrub</i>	HSM 1137	1 st CE
ιχλειθ	<i>iklet</i> (< * <i>ikleti</i>)	HSM 1137	1 st CE

According to WESTENHOLZ, the instances in which short /e/ is rendered by Greek η point to Aramaic influence. The forms μηλω *meluh(h)* and ημυκ *emūq* are the result of pretonic lengthening in an open unstressed syllable, since a short vowel was not tolerated in such a position according to the phonotactics of Aramaic. He further argues that the form θηροβ *tērub* (< **terrub*), in which *lā* + preterite is used instead of *lā* + durative, is the result of morpholog-

ical influence of Aramaic (2007, 288). It is curious, however, that in each of these instances the unexpected η is adjacent to a liquid or a nasal, the same sort of environment which gives rise to the η/ε spelling interchange in contemporary Greek orthography. Moreover, the word *meluḥḥû* is not even an originally Akkadian word. Accordingly, these forms may simply reflect typical conventions of Greek orthography and not necessarily Aramaic influence. The lack of gemination of ρ is not a difficulty (see 5.3.2.3.8).

The long vowel /ē/ (distinct from /ê/) is rendered both by η (4/8x or 50.00%) and ει (4/8x or 50.00%):¹⁶⁷

βηλ	<i>bēl</i>	VAT 412	1 st CE
βη[λ]σον	<i>Bēlšun</i> (< * <i>Bēlšunu</i>)	St. Petersburg Tablet	undated
ζεip	<i>zēr</i> (< * <i>zēri</i>)	BM 38461	1 st /2 nd CE
ειπισ	<i>ēpiš</i>	St. Petersburg Tablet	undated

In all but one occurrence the /ē/ vowel is in the environment of a liquid or a nasal. The one exception is *ēpiš*, in which ει is used to represent long /ē/.

The long vowel /ê/ (distinct from /ē/), which is the result of the contraction of adjacent vowels, is also represented by both η (3/4x or 75.00%) and ει (1/4x or 25.00%):¹⁶⁸

σauη (2x)	<i>šawê</i> (< * <i>šamê</i>)	BM 34798	1 st CE
[πετ]ει	<i>petê</i>	BM 38461	1 st /2 nd CE

5.3.2.1.3. i-Vowels

The short vowel /i/ is usually represented by ι (40/53x or 75.47%) and less frequently by ε (7/53x or 13.21%) or ει (6/53x or 11.32%):

ραβις	<i>rābiš</i> (< * <i>rābišu</i>)	BM 34799	1 st BCE
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167. Note also the two renderings of the name *Nabû Rēmāni*, in which it is once rendered as ι and once as η: ναβο[υ]ριuαν (St. Petersburg tablet, undated) and <ναβου>ρη<αν> (St. Petersburg tablet, undated). These renderings have been omitted from the statistics.

168. GELLER reads λιβει *libbê* in BM 38461 (1st/2nd CE). However, the reading on the tablet is by no means clear. Moreover, the supposed form *libbê* does not exist. Accordingly, the suffix ει has been omitted from my analysis.

ιθθι	<i>itti</i>	HSM 1137	1 st CE
εξερ	<i>iḥir</i> (< * <i>iḥr</i> < * <i>iḥri</i>)	BM 34797	undated
ιθεικ	<i>ītiq</i>	BM 34799	1 st BCE

Long /ī/ (distinct from /î/) is represented by ι (7/14x or 50.00%) and ει (7/14x or 50.00%):

ιφοσ	<i>īpuš</i>	BM 34797	undated
λλι[θ]	<i>lilīt</i> (< * <i>lilītu</i>)	BM 34816	1 st CE
νιβειθ	<i>nibīt</i>	BM 34798	1 st CE
ρεισαθ	<i>rīšāt</i> (< * <i>rīšāti</i>)	BM 34798	1 st CE

Additionally, a final etymological short /i/ vowel is represented with ι in the word *apti* αφθι (HSM 1137, 1st CE). According to GELLER, the apparent retention of a short final case vowel /i/ in the form αφθι is "peculiar." The final ι in the comparable form ιθθι may represent a "fixed vowel" after the -CC sequence (1983, 117). It is more likely, though, that the final /i/ is a bound form marker. However, because final short vowels had elided, it is unclear whether this was a long or short vowel.

5.3.2.1.4. u-Vowels

The short vowel /ū/ is almost always rendered by Greek ο (28/29x or 96.55%), but is rendered once by ου (1/29x or 3.45%):

φολοξθ	<i>puluḥt</i> (< * <i>puluḥta</i>)	BM 33769	1 st BCE
ιφοσ	<i>īpuš</i>	BM 34797	undated
οζον	<i>uzun</i> (< * <i>uzn</i>)	St. Petersburg tablet	undated
μορσ	<i>murš</i> (< * <i>muršu</i>)	BM 34816	1 st CE
σ[ο]υβα[θ]	<i>šubāt</i> (< * <i>šubātu</i>)	BM 48863	1 st CE

Long /ū/ (distinct from û) is represented by ου (5/10x or 50.00%) and ω (5/10x or 50.00%):

τουβ	<i>tūb</i>	BM 38461	1 st /2 nd CE
[δο]φσαρουθ	<i>tupšarrūt</i> (< * <i>tupšarrūti</i>)	St. Petersburg tablet	undated
νωρ	<i>nūr</i>	St. Petersburg tablet	undated

All of the instances of ω for / \bar{u} / are either the result of lowering in the environment of /r/ or the result of assimilation to the semi-vowel /w/. Accordingly, ου should be assumed as the regular Greek transcription of Akkadian / \bar{u} /.

The long vowel / \hat{u} / (distinct from / \bar{u} /), which is the result of the contraction of adjacent vowels, is also represented by both ου (3/8x or 37.50%) and ω (5/8x or 57.14%):

ναβο[v]ρωαν	<i>Nabû-Rîmanni</i>	St. Petersburg tablet	undated
[μα]λου	<i>malû</i>	BM 33769	1 st BCE
ναδου	<i>nadû</i>	BM 48863	1 st CE
μαλαλω	<i>malallû</i>	BM 34797	undated
βιλλοτω[...]	<i>pilludûšu</i>	BM 34798	1 st CE
ασανω	<i>asnû</i>	BM 34799	1 st BCE
μαχανω	<i>makkanû</i>	BM 34799	1 st BCE
μηλω ¹⁶⁹	? (< $*meluhû$)	BM 34799	1 st BCE

It is conventional for the long *u*-vowel in all of these forms to be normalized as \hat{u} . However, it is likely that there was actually an / \hat{o} / phoneme in Akkadian. Evidence for such a phoneme is suggested by the correlation between \hat{u} that results from the contraction of [ǣ] + [ũ] and the U and U₄ signs, on one hand, and the correlation between \hat{u} that results from the contraction of other vowels (e.g., [i] + [u], [u] + [u]) and the Ú sign, on the other. The Greek material generally supports this distinction. For example, the vowel \hat{u} in *pilludûšu* (< $*pilluda-\bar{u}-šu$) is represented with an ω in Greek, whereas the vowel \hat{u} in *malû* (< $*mali+u$) is represented with an ου. The transcription ναδου *nadû* (< $*nadā+u$), assuming it is the infinitive form, constitutes an exception to this rule (WESTENHOLZ 1991; HUEHNERGARD and WOODS 2004, 233). Notwithstanding the one exception, these examples, then, do not actually reflect ω for [u:] but

169. It is not clear whether the Greek μηλω is representing *meluhû*, with retention of the uvular fricative, or *melu(hh)+û* > *melû*, with the elision of the fricative.

ω for /û/ [o:] (or /ô/ [o:]). Accordingly, ou as the regular representation of /û/ is still supported.

5.3.2.1.5. Epenthetic Vowels

There are a number of instances (5x) in which apparent epenthetic vowels, not indicated in the cuneiform, appear in the transcription in non-final consonant clusters:

ασανω	<i>asnû</i>	BM 34799	1 st BCE
σαφαλις (2x)	<i>šapliš</i>	BM 35727	1 st BCE
ιχλειθ	<i>iklet</i> (< * <i>iklet</i>)	HSM 1137	1 st CE
οζοει	<i>uznī</i> (< * <i>uznīya</i>)	BM 38461	1 st /2 nd CE

These forms are best explained according to the Syllable Contact Law (SCL), according to which a fall in sonority is preferred in the transition from the end of one syllable to the beginning of the next. In each instance above ($s > n$, $p > l$, $k > l$, $z > n$), there is a rise in sonority. The quality of the epenthetic vowel inserted is identical to the vowel that precedes it.

In the case of original final consonant clusters, epenthesis is common (5x):¹⁷⁰

εξξερ	<i>iḥir</i> (< * <i>iḥr</i> < * <i>iḥri</i>)	BM 34797	undated
φαλαγ	<i>palag</i> (< * <i>palg</i> < * <i>palgu</i>)	BM 34797	undated
εξξερ	<i>iḥir</i> (< * <i>iḥr</i> < * <i>iḥri</i>)	BM 34797	undated
χαβαρ	<i>qabar</i> (< * <i>qabr</i> < * <i>qabri</i>)	HSM 1137	1 st CE
οζον	<i>uzun</i> (< * <i>uzn</i> < * <i>uznu</i>)	St. Petersburg tablet	undated

Like epenthetic vowels in word-medial clusters, the epenthetic vowel is identical in quality to that of the preceding vowel. However, it is just as common (6x), for a final consonant cluster to go unresolved:

μιτερθ	<i>miṭirt</i> (< * <i>miṭirtu</i>)	BM 34797	undated
ιβωρθ (2x)	<i>i(b)būrt</i> (< * <i>ina būrti</i>)	HSM 1137	1 st CE

170. Because of the regularity of this rule, each short epenthetic vowel has been tabulated with its corresponding vowel elsewhere.

μoρσ	<i>murs</i> (< * <i>mursu</i>)	BM 34816	1 st CE
θηροφσ	<i>terrubš</i> (< * <i>terrubšu</i>)	BM 34816	1 st CE
ραφασθ (2x)	<i>rapašt</i> (< * <i>rapaštu</i>)	BM 33769/St. Petersburg tablet	1 st BCE/undated
φολοξθ	<i>puluḫt</i> (< * <i>puluḫta</i>)	BM 33769	1 st BCE

There are a couple of non-phonetic factors to be considered with respect to these two distinct treatments of final *-CC#* clusters. First, the first group is comprised entirely of monosyllabic forms and the second group is comprised *almost* entirely of bisyllabic forms (with the exception of μoρσ). Second, all of the forms in the first group actually had an old bisyllabic allomorph with epenthesis as its bound form. Beyond the non-phonetic factors, it is worth noting that the presence or lack of an epenthetic vowel to resolve a consonant cluster may be related to relative sonority. Generally speaking, with the exception of φαλαγ, clusters remain when there is falling sonority and are resolved by an epenthetic when there is rising sonority. This may be regarded as an instantiation of the Sonority Sequencing Principle (SSP), according to which final clusters should exhibit a fall in sonority.

The SSP may also explain the final /i/ vowel in the transcription *apti/aptī* αφθι (HSM 1137, 1st CE). We might expect a transcription such as αφθ (or αφαθ), but the lack of falling sonority and the plosive nature in both elements of the cluster might have made neither of those realizations tenable. Thus, the final ι might have been preserved as a sort of paragodic epenthetic vowel.¹⁷¹

5.3.2.2. Semi-Vowels

The Akkadian semi-vowel /j/ is only attested twice in the prohibitive particle *ajj*: αι ιθικ *ajj ītiq* (BM 34799, 1st BCE) and αι ειθ[ικ] *ajj ītiq* (St. Petersburg tablet, undated). The Akkadian

171. Compare, for example, the relationship between sonority and the resolution of final consonant clusters in Tiberian Hebrew. While final consonant clusters ending in a sonorous consonant were resolved with a word-internal epenthetic (e.g., **wayyibn* > **wayyiben* > וַיִּבֶן [vaj'ji:ven]), final consonant clusters ending in a consonant at the bottom of the sonority scale were allowed to remain (e.g., **wayyibk* > וַיִּבֶּק [vaj'je:vk]). While most grammarians preserved the final consonant cluster in words like the latter, it was the opinion of some grammarians that a final consonant cluster like וַיִּבֶּק may actually be resolved by adding an epenthetic short vowel to the end of the word, rather than between the consonants (i.e., וַיִּבֶּק [vaj'jēvka]) (KHAN 2013b, 669).

semi-vowel [w], which in most cases results from the shift of intervocalic [m] > [w], is represented by υ (6/11x or 54.55%), Ø (5/11x or 45.45%), and perhaps ου:¹⁷²

σωνη (3x)	<i>šawê</i> (< * <i>šamê</i>)	BM 34798	1 st CE
σαναc	<i>šawaš</i> (< * <i>šamaš</i>)	HSM 1137	1 st CE
ναναp	<i>nawār</i> (< * <i>namāri</i>)	HSM 1137	1 st CE
ηουκ	<i>ewūq</i> (< * <i>emūq</i>)	BM 34798	1 st CE
ωει	<i>ūwī</i> (< * <i>ūmī</i>)	St. Petersburg tablet	undated

There is also a very curious transcription in BM 34816 (1st CE). The Greek transcription [θ]αλαμ[ις] presumably reflects a normalized Akkadian *talammiš(u)* from the verb *lawûm* 'to surround'. Although the middle radical of this word is *w*, due to the shift of intervocalic *m* to *w* by this late period, it was common for intervocalic *w* to be written with *m*, even though it was still pronounced as *w* (e.g., *amīlu* 'man'). (HUEHNERGARD 2011, 260). Accordingly, even though the word might be spelled *ta-lam-mi-šú*, it would still have been pronounced as /ta-lawwīš(u)/, for which we would expect the following transcription: θαλαυις. The fact that the Greek transcribes the *m* [w] with a μ is difficult to explain. It may be the result of treating each sign in isolation, rather than in connection with the wider context of the entire word (i.e., transliteration and *not* transcription). Alternatively, because there are no other clear examples of such a phenomenon, it is possible that the Akkadian word *talammiš(u)* was actually pronounced by the scribe of this tablet with an [m] as it is transcribed.

5.3.2.3. Consonants

The Akkadian consonantal system is made up of twenty distinct phonemes, including three voiceless stops (/p/, /t/, /k/), three voiced stops (/b/, /d/, /g/), three emphatic/glottalic consonants (/tʔ/, /kʔ/, /sʔ/), a glottal stop (/ʔ/), a uvular fricative (/ħ/), two liquids (/l/, /r/), two nasals

172. In BM 34816 (1st CE), GELLER reads the Greek transcription of *lem-nu* as λεμν (1997, 76–77), whereas WESTENHOLZ suggests [λ]εουν for the same word (2007, 269–270). It is unclear from the picture of the tablet what the correct reading is, though GELLER's reading is unlikely.

(/m/, /n/), three plain sibilants (/s/, /š/, /z/), and two semi-vowels (/w/, /y/) (HUEHNERGARD 2011, 1–3, 586–591).

5.3.2.3.1. Voiceless Stops

The voiceless stops /p/, /t/, and /k/ are represented by the aspirated Greek stops φ, θ, and χ, indicating that the Akkadian stops were aspirated: e.g., φολοξθ *puluht* (BM 33769, 1st BCE), θαλ *tāl* (BM 35726, undated), and χο[μβολ] *kumbul* (BM 34781, undated). There may be one instance of voicing of /p/ in the transcription βιλλοτω[...] *pilludûšu* (BM 34798, 1st CE), but it may simply be a variant form. In one instance /t/ is voiced: [φω]δ *pût* (BM 35727, 1st BCE). In one instance it is realized as τ: μαρατ *mahrāt* (BM 34798, 1st CE):

Akkadian /p/		Akkadian /t/		Akkadian /k/	
as φ	19	as θ	30	as χ	7
as β	1	as δ	1		
		as τ	1		

5.3.2.3.2. Voiced Stops

The voiced stops /b/, /d/, and /g/ are represented by β, δ, and γ, respectively: e.g., βαβιλ *Bābil* (BM 34798, 1st CE), δοσ[ω] *duššû* (BM 34781, undated), and αγαμ (BM 34781, undated). Progressive assimilation results in the devoicing of /b/ in the transcription θηροφσ *terrubš* (BM 34816, 1st CE). Devoicing may also occur in the transcription βιλλοτω[...] *pilludûšu* (BM 34798, 1st CE). Finally, v appears in the transcription [εσ]ανγι<λ> *Esagil/Ésangil* (VAT 412, 1st CE), reflecting the original phonology inherited from Sumerian:

Akkadian /b/		Akkadian /d/		Akkadian /g/	
as β	38	as δ	7	as γ	3
as φ	1	as τ	1	as vγ	1

5.3.2.3.3. Emphatic/Glottalic Consonants

The emphatic (or glottalic) consonants /tʔ/, /kʔ/, and /sʔ/ are represented by τ, κ, and σ, respectively: e.g., ταβ *tāb* (BM 34816, 1st CE), κ[ε]ιμ *qēm* (BM 48863, 1st CE), and σ[ο]υβα[θ] *šubāt* (BM 48863, 1st CE). Akkadian /tʔ/ is once represented by δ: δοφ *tup(p)* (St. Petersburg tablet,

undated). Akkadian /k^ʔ/ is once represented by χ: χαβαρ *qabar* (HSM 1137, 1st CE). Akkadian /s^ʔ/ is once represented by ζ: ζα[ραρ] *šarār* (BM 34781, undated).

Akkadian /t ^ʔ /		Akkadian /k ^ʔ /		Akkadian /s ^ʔ /	
as τ	6	as κ	7	as σ	4
as δ	1	as χ	1	as ζ	1

The representation of the emphatic stops with τ and κ demonstrates that it was the unaspirated nature of the glottalic consonant that identified them with the Greek unaspirated series.

5.3.2.3.4. Gutturals

There is one attestation of the glottal stop /ʔ/ in the corpus: ιβα *iba^ʔ(?)* (BM 33769, 1st BCE).¹⁷³

The uvular fricative /ħ/ [χ] is represented by Ø (4/8x or 50.00%), ξ (3/8x or 37.50%), and once as ξξ (1/8x or 12.50%):

μαρατ	<i>mahrât</i> (< * <i>mahrâti</i>)	BM 34798	1 st CE
σοοσ [2x]	<i>suħuš(š)</i> (< * <i>suħušši</i>)	BM 34799	1 st BCE
[v]αφα[ρ]	<i>naphar</i> (< * <i>napharu</i>)	BM 48863	1 st CE
φολοξθ	<i>puluħt</i> (< * <i>puluħta</i>)	BM 33769	1 st BCE
σιξ[ιθ]	<i>šihit</i> (< * <i>šihit</i> < * <i>šihitu</i>)	BM 34781	undated
εξερ	<i>ihir</i> (< * <i>iħr</i> < * <i>iħri</i>)	BM 34797	undated
εξξερ	<i>ihir</i> (< * <i>iħr</i> < * <i>iħri</i>)	BM 34797	undated

In Greek loanwords in Hebrew, ξ is represented with ם, indicating some aspiration of the first element: i.e., [k^hs]. Accordingly, it seems that the decision of the Akkadian scribes to use ξ to represent /ħ/ [χ] may be explained by the combination of two factors: The first element of ξ, namely [k^h], would have been the nearest consonant to Akkadian /ħ/ [χ] in terms of place of articulation. The second element of ξ, namely [s], would have combined the previous sound with a fricative element, thus approximating the fricative nature of the Akkadian sound.

173. GELLER reads this word as ιβα^ʔυ^ʔ[ω] (1997, 78) and WESTENHOLZ (2007, 273) reads this word as ιβα followed by a blank space and then the remains of a few letters. It seems to me that there is a blank space followed by an υ. In any case, the most likely reading for the word under discussion is ιβα. This is presumably the subjunctive form of *bâ^ʔum* after final short vowels have elided: **iba^ʔu* > *iba^ʔ(?)*.

5.3.2.3.5. Liquids

The liquids /l/ and /r/ are represented by λ and ρ , respectively: e.g., $\lambda\alpha$ *lā* (HSM 1137, 1st CE) and $\rho\alpha\tau$ *rāt* (BM 34797, undated). In a couple instances, λ is omitted or assimilated: α $\rho\epsilon\iota\sigma\alpha[\theta]$ *āl rīšāt* (BM 34798, 1st CE) and α $\sigma\alpha$ $\varphi\alpha\rho[\dots]$ *āl ša parṣūš* (BM 34798, 1st CE). In one instance, ρ is realized as σ : $\mu\alpha\sigma\theta$ *mārt* (VAT 412, 1st CE). This may reflect a shift of $r > š / _t$ (VON SODEN 1995, 44):

<i>Akkadian /l/</i>		<i>Akkadian /r/</i>	
as λ	49	as ρ	32
as \emptyset	2	as $\sigma / _ \theta$	1

The nasals /m/ and /n/ are represented by μ and ν , respectively: e.g., $\mu\alpha\rho$ *mār* (HSM 1137, 1st CE) and $\nu\alpha\rho$ *nār* (BM 48863, 1st CE). Akkadian /m/ is once represented with \imath : $\Theta\imath\lambda\imath\omicron\nu[\omega]$ *tilmunnu* (BM 34799, 1st BCE). It is once omitted in representation: $\omicron\epsilon\imath\rho$ *mušir(r)* (HSM 1137, 1st CE).

<i>Akkadian /m/</i>		<i>Akkadian /n/</i>	
as μ	12	as ν	26
as \imath	1		
as \emptyset	1		

5.3.2.3.6. Sibilants

The sibilants /s/ and /š/ are both represented by σ : e.g., $\sigma\omicron\sigma\sigma$ *suhuš(š)* (BM 34799, 1st BCE) and $\sigma\epsilon\imath\rho$ *šēr* (BM 34816, 1st CE). The fricative /z/ is represented by ζ : e.g., $\zeta\epsilon\imath\rho$ *zēr* (BM 38461 (1st/2nd CE)). There is one instance in which /s/ is rendered as θ : $\mu\alpha\rho\chi\alpha\theta$ *markas* (BM 34798, 1st CE):

<i>Akkadian /s/</i>		<i>Akkadian /š/</i>		<i>Akkadian /z/</i>	
as σ	5	as σ	40	as ζ	5
as θ	1				

5.3.2.3.7. Semi-Vowels

See 5.3.2.2.

5.3.2.3.8. Consonant Gemination

Consonantal gemination [C:] is sometimes represented in the transcription (5/18x or 27.78%): e.g., ναφφας *nappaš* (HSM 1137, 1st CE) and ορριχ *urrik* (St. Petersburg tablet, undated). More frequently, however, a geminated consonant in Akkadian is represented by only one Greek consonant (13/18x or 72.22%): e.g., αθαφει *atappī* (BM 34797, undated) μαχανω *makkanû* (BM 34799, 1st BCE), and λιβει *libbê* (BM 38461, 1st/2nd CE).¹⁷⁴

	<i>pp</i>	<i>tt</i>	<i>kk</i>	<i>bb</i>	<i>ll</i>	<i>rr</i>	<i>nn</i>	<i>ss</i>	<i>šš</i>	<i>Total</i>
CC	1	1	0	0	1	1	0	1	0	5
C	2	1	1	2	2	3	1	0	1	13

There is one instance in which *ḥ* is falsely geminated in the transcription: εἰἰερ *iḥir* (BM 34797, undated). Etymological final gemination is never represented: e.g., ασαχ *ašak(k)* (BM 34816, 1st CE), βερ *bir(r)* (HSM 1137, 1st CE), and αγαμ *agam(m)* (BM 34781, undated):

	<i>p(p)#</i>	<i>t(t)#</i>	<i>k(k)#</i>	<i>b(b)#</i>	<i>d(d)#</i>	<i>ḥ(h)#</i>	<i>r(r)#</i>	<i>m(m)#</i>	<i>n(n)#</i>	<i>š(š)#</i>	<i>Total</i>
C#	2	2	1	2	1	1	2	1	2	2	16

5.3.2.4. Summary

The most common representation of each Akkadian phoneme is summarized in the charts below. If an additional grapheme is used more than 20.00% of the time, it is included in parentheses (chart 13):

<i>Vowels</i>										
<i>Akkadian:</i>	<i>a</i>	<i>ā/â</i>	<i>e</i>	<i>ē/ê</i>	<i>i</i>	<i>ī/î</i>	<i>u</i>	<i>ū</i>	<i>û</i>	[i]+[u] <i>û/ô</i> [ǣ]+[ũ]
<i>Greek:</i>	α	α	ε (η)	η, ει	ι ¹⁷⁵	ι, ει ¹⁷⁶	ο	ου	ου	ω

Diphthongs and Semi-Vowels

174. Final gemination C(:)#, which is always represented with a single consonant, has been excluded from the analysis because it is not clear if final gemination had been simplified or not.

175. It is also represented by ε (7/53x or 13.21%) and ει (6/53x or 11.32%).

176. The vowel /î/ only occurs twice, once represented by ι and once by η (two variants of the same word).

Akkadian: (a)j [(a)j] w [w]

Greek: (α)ι υ, Ø

Voiceless Stops

Voiced Stops

Akkadian: p [p^h] t [t^h] k [k^h] b [b] d [d] g [g]

Greek: φ θ χ β δ γ (γγ)

Emphatic/Glottalic Consonants

Gutturals

Akkadian: ʔ [tʔ] q [kʔ] ʕ [sʔ] ḫ [χ] ʕ [ʔ]

Greek: τ κ σ (ζ) ξ, Ø -

Liquids

Nasals

Sibilants

Akkadian: l [l] r [r] m [m] n [n] s [s] š [ʃ] z [z]

Greek: λ ρ μ ν σ σ ζ

Chart 13: Summary of Akkadian in Greek Transcription: Correspondences

5.3.3. Arabic

The relevant material for Greek transcription of ancient Arabic has been analyzed by AL-JALLAD in three separate articles (AL-JALLAD, DANIEL, and GHUL 2013; AL-JALLAD 2015; AL-JALLAD and AL-MANASER 2015). While most of the transcription material is comprised of proper names rendered into Greek, a third or fourth century CE inscription from north-eastern Jordan provides an example of a continuous transcription text. The corpora examined are the epigraphic and papyrological evidence from the Roman and Byzantine Near East, specifically in southern Syria, central and southern Jordan, and Israel. Because the material has already been analyzed, we will forego a comprehensive statistical analysis and merely summarize the findings of AL-JALLAD.

5.3.3.1. Vowels

The Arabic vocalic system is made up of three short vowels (/a/, /i/, /u/) and three corresponding long vowels (/ā/, /ī/, /ū/). In addition to these vowels, the contraction of the diphthong /ay/ may result in a monophthongs of the *e*-vowel class.

5.3.3.1.1. a-Vowels

Arabic short /a/ is transcribed with Greek α: e.g., Αλαβδος /al-ʕabd/ (208 CE) and Αλαχβαρ /al-ʔakbar/ (505–520 CE). Arabic long /ā/ is likewise transcribed with Greek α: e.g., Μοσαλεμου /mosālem/ (179–180 CE) and Μαλ /māl/ (505–537 CE). When short /a/ is raised pretonically it is transcribed with ε: e.g., Σεουαδος /sewād/ (< */sawād/) (undated). When short /a/ is rounded before a labial, it is transcribed with ο: e.g., Ασλομου /ʔaslom/ (< */ʔaslam/) (434 CE) (AL-JALLAD 2015, 31–33).

5.3.3.1.2. i-Vowels

Arabic short /i/ is transcribed most commonly with Greek ε: e.g., Αλεσου /ḥāleṣ/ (179–80 CE) and Κεσεβ /qeṣeb/ (505–537 CE). Less commonly, /i/ is transcribed by η: e.g., Νασηρος /nāṣir/ (IGLS XXI 59). Transcribing etymological /i/ with η is common in the environment of liquids and nasals.¹⁷⁷ In very rare cases it is transcribed by ι in stressed closed syllables: e.g., Σιθρο /sitrō/ (undated) and Ιννου /ḥinn/ (undated). AL-JALLAD regards these occurrences as too rare to be meaningful. Arabic long /ī/ is transcribed almost always with ι: e.g., Αβδαλμιθαβου /ʕabd al-mīṭab/ (434 CE) and Μοκιμος /moqīm/ (undated). Less frequently, long /ī/ may be transcribed with Greek ει: e.g., Μοκειμος /moqīm/ (undated) and Ουασειχαθος /waṣīkat-/ (undated) (2015a, 32, 34). Short /i/ is rendered as ι in the continuous text from north-eastern Jordan (3rd/4th CE): e.g., βι-Χανου[v] /bi-kānūn/ (AL-JALLAD 2015, 32, 34; AL-JALLAD and AL-MANASER 2015, 52–53).

177. I would like to thank Ahmad Al-Jallad for providing me with this example and observation.

5.3.3.1.3. u-Vowels

Arabic short /u/ is most commonly transcribed with Greek ο: e.g., Οσνη /ħosn/ (318 CE), and Μοσλεμος /moslem/ (undated). In stressed closed syllables, short /u/ is sometimes transcribed with ου: e.g., Αλσουφλη /al-sufley/ (505–537 CE) and Ουββος /ħubb/ (undated). Unstressed short /u/ is transcribed as ου only twice: Αλουλαιφ /al-ħulayf/ (undated) and Νοουμερος /Numeyr/ (undated). Arabic long /ū/ is regularly transcribed with Greek ου: e.g., Αλουφαθη /ħalūfat-/ (5th CE) and Αβου /ʔabū/ (565 CE). In the rare instance that long /ū/ is lowered by a following /r/ it is transcribed by ω: e.g., Μεφωρ /meħfōr/, reflecting the lowering of $\bar{u} > \bar{o}$ before r (AL-JALLAD 2015, 32–34).

5.3.3.2. Diphthongs and Semi-Vowels

Arabic has two diphthongs, namely, /aw/ and /ay/. It is common in the dialects for the diphthong /ay/ to monophthongize to /e/. The semi-vowels /w/ and /y/ are fairly stable in Arabic.

5.3.3.2.1. Diphthong /aw/

The diphthong /aw/ is regularly represented by αυ: e.g., Αυσαλλας /ʔaws/ (157 CE), Αυμου /ʔawm/ (213 CE), and Ζαυανου /zawʕān/ (6th CE). In one instance, where /aw/ has been raised to /ew/, the diphthong is represented as εου: Σεουδα /sewdā/ (411 CE) (AL-JALLAD 2015, 31, 35). A few examples are also found in the continuous text from north-eastern Jordan (3rd/4th CE): Αυσος /ʔAws/, α-δauρα /ʔad-dawra/, and ειραυ /yirʕaw/ (AL-JALLAD and AL-MANASER 2015, 52–53).

5.3.3.2.2. Diphthong /ay/

The diphthong /ay/ is represented in two ways. First, it is represented with an *e*-class vowel, namely, ε or η: e.g., Οβεδου /ʕobeyd/ (undated) and Ονηνος /ħoneyn/ (undated). Second, it is represented with the digraph αι, and less frequently ει: e.g., Χαιρου /ħayr/ (164 CE), Βαιθ /bayt/ (505–537 CE), and Ζονειννος /ʕonayn/ (undated). AL-JALLAD argues that even though contemporary Greek pronunciation rendered αι as [ε], the distribution of the spellings indicate that the Arabic diphthong persisted as [ai], represented by αι, with a raised allophone of [ei], represented by ε, η, and ει (2015, 35–36).

5.3.3.2.3. Semi-Vowel /w/

Arabic /w/ is typically represented by ου: e.g., Ραουαου /rawāḥ/ (233 CE) and Ουαελος /wāʿel/ (293/4 CE). It may also be represented by Ø (i.e., a hiatus between two vowels): e.g., Ποεος /ro(w)eyḥ/ (undated) and Ζοεδαθος /zo(w)eydat/ (undated) (AL-JALLAD 2015, 29–30). In the continuous text from north-eastern Jordan, the representation of /w/ is inconsistent: αθαοα /ʔatawa/, ζαθαοε /ʕatāw/, ωα /wa/, and αουα /wa/ (AL-JALLAD and AL-MANASER 2015, 52–53).

5.3.3.2.4. Semi-Vowel /y/

Arabic /y/ is typically represented by ι: e.g., Τοβαιαθη /ṭobayyat/ (undated) and Αλαγιαθ /al-ḥag(i)yāt/ (undated). It may also be represented by Ø: e.g., Μοεαρος /moḡe(yy)ar/ (undated) (AL-JALLAD 2015a, 29–30). In the continuous text from north-eastern Jordan, word-initial /yi/ is represented with the digraph ει (3rd/4th CE): ειραυ /yirʕaw/ (AL-JALLAD and AL-MANASER 2015, 52–53).

5.3.3.3. Consonants

The reconstructed proto-Arabic consonantal system is made up of twenty-eight distinct phonemes, including three voiceless stops (/p/, /t/, /k/), three voiced stops (/b/, /d/, /g/), two interdental (/ḏ/, /ṭ/), two uvular fricatives (/ħ/, /ʕ/), two pharyngeal fricatives (/ħ/, /ʕ/), a glottal fricative (/h/), a glottal stop (/ʔ/), two liquids (/l/, /r/), two nasals (/m/, /n/), five emphatic (or glottalic) consonants (/ṭ/, /ṭ/, /ṣ/, /ṣ/, /q/), three plain sibilants (/s¹/, /s²/, /z/), and two semi-vowels (/w/, /y/) (AL-JALLAD 2015).

5.3.3.3.1. Voiceless Stops

Arabic etymological /p/, which may or may not have shifted to /f/ during the period of the transcriptions, is represented with φ:¹⁷⁸ e.g., Φοσεα /foṣeyyah/ (505–537 CE) and Ασ αφιρ /ʕaṣāfir/ (505–537 CE). Arabic /t/ is regularly represented by Greek θ: e.g., θιμου /tiyim/ (330 CE) and Γανναθ- (505–537 CE). Arabic /k/ is regularly transcribed by χ: e.g., Χασετος

178. Loanwords such as *fars* (<*pars) and *firdaws* (<*paradeisos) suggest that these loanwords were borrowed into Arabic when /f/ was pronounced as /p/. It is unclear if this realization was so during the period of the inscriptions. Al-Jallad acknowledges that the transcription of the Nabatean name חליפ as Χαλιπος might point to an attempt at transcribing /f/, just as τ sometimes attempts to represent /ṭ/. However, representations of /p/ (or /f/) with π are far more rare than those of /ṭ/ with τ.

/kāset/ (undated) and Αλαχβαρ /al-ʔakbar/ (505–520 CE). The fact that Arabic /k/ is transcribed with χ and not κ, seems to indicate that χ was still representing /k^h/ and not /χ/ in eastern Greek at the time of the material (AL-JALLAD 2015, 11–14, 19–20–23, 28, 31–32, 48).

5.3.3.3.2. Voiced Stops

Arabic /b/ is consistently transcribed with Greek β: e.g., Αλαβδος /al-ʕabd/ (208 CE). Arabic /d/ is regularly represented by δ: e.g., Ζειδος /zeyeyd/ (315 CE). Arabic /g/ (likely not [d̪])¹⁷⁹ is regularly transcribed as γ: e.g., Αβγαρ /abgar/ (108/109 CE) (AL-JALLAD 2015, 29, 31, 50).

5.3.3.3.3. Interdentals

The interdental voiced fricative /ɖ/ [ð] is represented by δ, as in Δουσαρεος /dū-šarey/ (164 CE) and Αουιδου /ʕawīd/ (569 CE). The voiceless interdental fricative /t̪/ [θ] is transcribed by θ: e.g., Αυθου /ḡawθ/ (380 CE) and Αυιθου /ḡawīθ/ (undated). However, Arabic /t̪/ may be transcribed by τ as well: e.g., Γαυτος /ḡawθ/ (334–335 CE) and Αουιτος /ḡawīθ/ (undated). The occasional representation of Arabic /t̪/ [θ] with τ is evidence for the continued realization of Greek θ as [t^h] at the time of the Graeco-Arabica material (2015, 18–19, 24, 38).¹⁸⁰

5.3.3.3.4. Gutturals

Arabic /ħ/ ([x] or [χ]) may be transcribed as χ: e.g., Χαιρου /ḡayr/ (164 CE) and Χαμσα /ḡam-sah/ (undated). It may also be represented by Ø: e.g., Ηρανου /ḡeyrān/ (327 CE) and Αλδου /ḡald[ē]/ (undated). It is more common for /ħ/ not to be represented in the transcription, on account of which AL-JALLAD argues that Greek χ was still /k^h/ in the east even at the time of the Graeco-Arabica material (AL-JALLAD 2015, 14–18).¹⁸¹

179. In the Islamic period there are Greek transcriptions such as Νεσζιδ *neḡīd/ and Γιαφαρ *ḡaʕfar/ to approximate the Arabic [d̪]. The absence of such representations in the corpus suggest that etymological /g/ was realized as [g] (AL-JALLAD 2015, 20–21).

180. Greek τ is used for emphatic /t̪/ is because they both share the lack of aspiration. On the other hand, because aspiration by itself is not phonemic, but the opposition between stop and fricative is, the author would have been more likely to prioritize that distinction. Therefore, if θ had already become [θ] in Greek of the time, then it would have made more sense for the transcriptions to align τ with Arabic /t/ and θ with Arabic /t̪/. The fact that this does not occur seems to indicate that θ represented /t^h/ in the Greek of the time and region. Moreover, the fact that Arabic interdental /t̪/ [θ] is occasionally transcribed as τ, rather than with what would have been an obvious transcription if θ had represented [θ], further supports the theory that Greek θ [t^h] had not yet shifted to [θ] (AL-JALLAD 2015, 11–14, 18–19).

181. He provides an example where neither Safaitic /h/ or /ħ/ are represented in the Greek (Αλιζου for ḡlḡ and Αδδιδανου for ḡddn) in the same text, even though there is no evidence for a merger in Safaitic. He concludes

Arabic /ġ/ ([ɣ] or [ʁ])¹⁸² may be transcribed by Greek γ: e.g., Μογεαιρος /moġeyyir/ (386 CE) and Αλγεβ /al-ġebb/ (undated). It may also be transcribed by Ø: Μοεαρος /moġe(yy)ar/ (372 CE) and Αυθου /ġawt/ (380 CE) (AL-JALLAD 2015, 14–18).

The remaining gutturals (/ħ/, /ʕ/, /ʔ/, /h/) are represented by hiatuses between vowels or Ø: e.g., {B}εακκος /be-ħaqq[oh]/ (undated), Χααμμος /ka-ʕamm-[oh]/ (undated), Ουαβαλας /wahb-(ʔ)al(l)āh/ (undated), and Ουαελος /wāʕel/ (233 CE) (AL-JALLAD 2015, 30, 44).

5.3.3.3.5. Sonorants

The Arabic liquids /l/ and /r/ are transcribed by Greek λ and ρ: e.g., Ζαγλος /zagl/ (315 CE) and Ραουαου /rawāh/ (223 CE). The nasals /m/ and /n/ are represented by μ and ν: e.g., Θιεμου /tiyeim/ (330 CE) and Οσνη /ħosn/ (318 CE) (AL-JALLAD 2015, 21, 29, 32–33).

5.3.3.3.6. Emphatic/Glottalic Consonants

The emphatic stops /t/ and /q/ are transcribed by Greek unaspirated τ and κ: e.g., Χασετος /kāset/ (undated) and Ζαιδοκιμα[ς] /zaydo-qīma/ (517 CE). Etymological /q/ is transcribed once by χ in Χαυμος /qawm/ (undated). AL-JALLAD is unsure if the glottalic realization of the emphatic stops had fronted to pharyngealization in Arabic by the time of the transcriptions. However, it was the lack of aspiration common to both the Arabic "emphatics" and the Greek unaspirated stops that led to the association between the two (2015, 11–13, 21–22, 27–28).¹⁸³

Arabic /ʃ/ is transcribed by Greek σ: e.g., as in Φοσεα /foʃeyyah/ (505–537 CE), and Ασαφιρ /ʕaʃāfir/ (505–537 CE). AL-JALLAD is undecided as to whether or not etymological /ʃ/ was realized as [ʃʰ], [ʃʰ], or [ʃʰ] during the period. Arabic /t/ is usually transcribed by τ: e.g., Ναταμος /naṭam/ (undated). However, in the Nessana papyri it is transcribed by ζ: e.g.,

that the author simply did not regard Greek χ as a suitable representation of the phoneme /ħ/. He reminds us that even though we typically think of /ħ/ as representing the uvular fricative [χ], numerous dialects have a velar fricative [x]. Similarly, it is a possibility that /ħ/ was actually a front velar fricative (or even a palatal fricative) in the dialects of the material. He suggests that either a front velar fricative [x̠] or a palatal fricative [ç] would be regarded closer to the Greek *spiritus asper* than the velar stop χ [kʰ] (AL-JALLAD 2015, 14–18).

182. AL-JALLAD suggests that the representation of */ġ/ with Ø may indicate that in Old Arabic */ġ/ was realized as a velar approximant [ʁ] rather than a velar or uvular fricative (2015, 17).

183. It is also worth noting, however, that there are some Arabic dialects in which both non-emphatic /t/ and emphatic /t/ exhibit at least some aspiration (BELLEM 2007, 60–63, 203–204).

Ζαννος /ẓann/ (undated). This likely reflects an emphatic lateral fricative [ḵʕ]. Arabic /š/, which reflects an emphatic lateral [ḵʕ], is transcribed with σ: e.g., Ρασαουαθος /rašāwat/ (undated). In the Nessana papyri, where it is assumed to have merged with /ẓ/, it is represented with ζ: e.g., Μαζεκα /maẓēqah/ < */maṣīqah/ (undated) (2015, 22–27).

5.3.3.3.7. Plain Sibilants

Arabic /s/ is regularly transcribed by Greek σ: e.g., Σεουδα /sewdā/ (411 CE) and Αλσουλλαμ /al-sullam/ (505–538 CE). Arabic /š/ (<*/ḵ/, Modern Arabic /š/), similarly, is regularly transcribed by σ: e.g., Σαιαθη /šayʕat/ (316–396 CE) and Αλσαρκια /al-šarqiyyah/ (6th CE). Because Safaitic s¹ is used to transcribe Aramaic [ʃ], /š/ had probably not yet shifted to [ʃ] and was still realized as the lateral [ḵ]. Arabic /z/ is regularly transcribed by Greek ζ: e.g., Ζειεδος /zeyeyd/ (315 CE) and Αλλουζα /al-lowzah/ (505–537 CE) (AL-JALLAD 2015, 28–29).

5.3.3.3.8. Semi-Vowels

See 5.3.3.2.

5.3.3.3.9. Consonant Gemination

Consonantal gemination [C:] is usually indicated: e.g., Ουαβαλλας /wahb-(ʔ)allāh/. However, it may also be omitted: e.g., Ουαβαλας /wahb-(ʔ)al(l)āh/. Gemination of the glides /y/ ʔ/Ø and /w/ ou/Ø is never indicated: e.g., Αουαθω /ġawwātō/, Ουμανατ /ʔum(m)-ġawwaθ/ and Τοβαιαθη /tōbayyat/. Final gemination is not represented: e.g., Αλγεβ /al-ġebb/ (AL-JALLAD 2015, 6, 16, 24, 29, 33, 54).

5.3.3.4. Summary

The most common representation of each Arabic phoneme is summarized in the charts below.

Secondary graphemes are listed in parentheses (chart 14):

<i>Vowels</i>							
<i>Arabic:</i>	<i>a</i>	<i>ā</i>	<i>i</i>	<i>ī</i>	<i>u</i>	<i>ū</i>	<i>e</i>
<i>Greek:</i>	α	α	ε (η)	ι (ει)	ο (ου)	ου	ε, η

Diphthongs

Semi-Vowels

<i>Arabic:</i>	ay [aj]	aw [aw]	y [j]	w [w]
<i>Greek:</i>	αι, ε, η	αυ	ι, Ø (#yi- = ει)	ου, Ø (αοα, αοε, ωα)

Voiceless Stops

Voiced Stops

<i>Arabic:</i>	*p [p ^h] > f [f]	t [t ^h]	k [k ^h]	b [b]	d [d]	g [g]
<i>Greek:</i>	φ	θ	χ	β	δ	γ (vγ)

Interdentals

<i>Arabic:</i>	ḏ [ð]	ṭ [θ]
<i>Greek:</i>	δ	θ (τ)

Emphatic Stops

Emphatic Sibilants/Fricatives

<i>Arabic:</i>	ṭ [kʔ]	q [kʔ]	ṣ [sʔ] or [ʔsʔ]	ṣ' [ʔʔ]	ṭ' [kʔʔ]
<i>Greek:</i>	τ	κ	σ	σ	ζ

Gutturals

<i>Arabic:</i>	ḥ [χ] or [x]	ġ [γ]	ḥ [h]	ʿ [ʕ]	h [h]	ʔ [ʔ]
<i>Greek:</i>	χ, Ø	γ, Ø	Ø	Ø	Ø	Ø

Liquids

Nasals

Plain Sibilants

<i>Arabic:</i>	l [l]	r [r]	m [m]	n [n]	s [s]	š [ʃ]	z [z]
<i>Greek:</i>	λ	ρ	μ	ν	σ	σ	ζ

Chart 14: Summary of Arabic in Greek Transcription: Correspondences

5.3.4. Aramaic

While a comprehensive treatment of Aramaic in Greek transcription lies beyond the scope of this chapter,¹⁸⁴ a general description will be carried out based on the limited corpus of the Naḥal Dimona inscription and the Dura-Europos inscription (see 3.4.1.3.5).

5.3.4.1. Vowels

The Aramaic vocalic system varies over time, space, and dialect. However, in Jewish Palestinian Aramaic, which is probably relevant at least for the Naḥal Dimona inscription,¹⁸⁵ the vocalic phonemic inventory consisted of /a/, /e/, /i/, /o/, /u/, and "shewa" (KHAN 1997, 107–111; SOKOLOFF 2011, 613). In our limited corpus, /a/ is transcribed with Greek α: e.g., θαρθην *tarten*, σιμαθα *sim^ata*, and καιαμα *qayyama*. Aramaic /e/ is represented by η or ε: e.g., σαβη *ṣaḇe*, θαρθην *tarten*, δαελαα *d^aelaha*, ιαεβ *yaheḇ*. Aramaic /i/ is transcribed with ι: e.g., νισαν *nisan*, σιμαθα *sim^ata*, γοβνιν *goḇnin*, and Αβιδσαλμα *ʿAbidšalma*. Aramaic /o/ (< */u/) is transcribed with ο: e.g., γοβνιν *goḇnin*. Aramaic /u/ is transcribed as ου: e.g., ου *hu*. A "shewa" vowel seems to be realized with the quality of [a], since it is transcribed by Greek α: e.g., λαμαν *l^aman*, βα-νισαν *b^anisan*, δαελαα *d^aelaha*, and δααβ *d^ahab*.

5.3.4.2. Semi-Vowels

The Aramaic semi-vowel /j/ is transcribed as ι: e.g., καιαμα *qayyama* and ιαεβ *yaheḇ*.

5.3.4.3. Consonants

The Aramaic consonantal inventory is made up of twenty-two consonants, including three voiced stops with fricative post-vocalic allophones (/b/ > [v], /g/ > [ɣ] or [ɣ], /d/ > [ð]), three voiceless stops with fricative post-vocalic allophones (/p/ > [f], /k/ > [χ], /t/ > [θ]), three emphatic consonants (/t/, /k/, /ṣ/), a glottal stop (/ʔ/), a glottal fricative (/h/), two pharyngeal fricatives (/ħ/, /ʕ/), two liquids (/l/, /r/), two nasals (/m/, /n/), three sibilants (/s/, /š/, /z/), and two semi-vowels (/w/, /j/) (KHAN 1997, 104–107; SOKOLOFF 2011, 612–13).

184. Most of the rest of the material for Aramaic transcription is comprised of proper names.

185. For a transcription of the Naḥal Dimona inscription, see PRICE and NAEH (2009, 269).

The voiceless stops (/p/, /t/, /k/) are not distinguished from their fricative allophones ([f], [θ], [χ]) in transcription. Aramaic /t/ [t] and /t̥/ [θ] are transcribed by θ: e.g., θαρθην *tarten* and σιμαθα *sim^ata*. The voiced stops (/b/, /d/, /g/) are not distinguished from their fricative allophones ([v], [ð], [ɣ] or [ɣ]) in transcription. Aramaic /b/ [b] and /b̥/ [v] are transcribed by β: e.g., βα-νισαν *b^anisan* and σαβη *šabē*. Aramaic /d/ [d] and /d̥/ [ð] are transcribed by δ: e.g., δααβ *d^ahab* and Αβιδσαλμα *ʿAbidšalma*. Aramaic /g/ is transcribed by γ: e.g., γοβνιν *gobnin*. The emphatic stop /q/ is represented by Greek unaspirated κ: e.g., καιαμα *qayyama*. Emphatic /š/ is represented by σ: e.g., σαβη *šabē*. The attested gutturals are represented by a hiatus between vowels: /ʔ/ in δαελαα *d^aelaha* and /h/ in δααβ *d^ahab*. The sonorants (/l/, /m/, /n/, /r/) are represented as expected: /l/ with λ in λαμαν *l^aman*, /m/ with μ in καιαμα *qayyama*, /n/ with ν in γοβνιν *gobnin*, and /r/ with ρ in Βαρζακιη *barzaqiye*. The voiceless sibilants /s/ and /š/ are both represented with σ: e.g., βα-νισαν *b^anisan* and Αβιδσαλμα *ʿAbidšalma*. The voiced sibilant /z/ is represented with ζ: e.g., Βαρζακιη *barzaqiye*.

5.3.4.4. Summary

Although the corpus is limited and the attestation of the phonological inventory is incomplete, the correspondences in the Naḥal Dimona inscription and the Dura-Europos inscription may be summarized as follows:

<i>Vowels and Semivowels</i>															
<i>Aramaic:</i>	<i>a</i>	<i>e</i>	<i>i</i>	<i>o</i>	<i>u</i>	"ə"	<i>j</i>								
<i>Greek:</i>	α	ε, η	ι	ο	ου	α	ι								

<i>Consonants</i>															
<i>Aramaic:</i>	<i>b</i>	<i>b̥</i> [v]	<i>d</i>	<i>d̥</i> [ð]	<i>g</i>	<i>l</i>	<i>m</i>	<i>n</i>	<i>q</i>	<i>s</i>	<i>š</i>	<i>š̥</i>	<i>t</i>	<i>t̥</i> [θ]	<i>z</i>
<i>Greek:</i>	β	β	δ	δ	γ	λ	μ	ν	κ	σ	σ	σ	θ	θ	ζ

Chart 15: Summary of Aramaic in Greek Transcription: Correspondences

5.3.5. Phoenician-Punic

The Phoenician data is primarily taken from the instances of Greek transcription cited in FRIEDRICH and RÖLLIG's *Phönizisch-Punische Grammatik* (1999).

5.3.5.1. Vowels

The Standard Phoenician vocalic systems was originally made up of three short vowels (/a/, /i/, /u/) and five long vowels (/ā/, /ē/, /ī/, /ō/, /ū/). As early as the seventh century BCE, original stressed short /a/ shifted to /o/, which is known as the "Phoenician Shift." This change probably proceeded as follows: *á* > *ā*, *ā* > *ɔ*, *ɔ* > *o*. When the result of the Phoenician shift was still /ɔ/, the /o/ vowel resulting from the Canaanite shift (/ā/ > /o/) shifted to /u/. The result of this /o/ > /u/ shift did not merge with original /u/, which instead was pushed forward to /ü/. At the period of the transcriptions, the vowels /a/, /e/, /i/, /o/, /u/ and /ü/ are present. It is not clear if length was still phonemic during this period, but there does seem to be a phonetic lengthening of stressed vowels (FOX 1996; FRIEDRICH and RÖLLIG 1999, 36; HACKETT 2008, 87–89).

5.3.5.1.1. a-Vowels

Phoenician short /a/, preserved in doubly-closed syllables, is transcribed by Greek α: e.g., λασουναλφ /lašun-ʔalp/, βαλ /baʕl/, and Καδος /kad(d)/. Occasionally, short /a/ in these positions is represented by either ε or η, likely reflecting a raised allophone of [æ]: e.g., Ημουνος /hamōn/ and Μερβαλος /maharbaʕl/ (cf. Μαρβαλ). Unstressed /a/ in an open syllable is also transcribed by α: e.g., Σαμημ /šamēm/ and σαδε /šadē/. In the environment of emphatics, /a/ can have a rounded articulation (perhaps [ɔ]?) represented by ο: e.g., Σοφωνιβας /šapan-baʕl/ (FRIEDRICH and RÖLLIG 1999, 38–40).

5.3.5.1.2. o-Vowels

The result of the Phoenician shift, probably /o/ but perhaps still /ɔ/ (< */ā/), is represented by ο or ω, ο presumably reflecting the quality and ω representing the quality and phonetic lengthening under the stress: e.g., λαβον /labón/, ναδωρ /nadór/, σαμω /šamós/, and Χουσωρ /kušár/. The result of the Canaanite shift, when realized as /ō/, is represented by ω or ο: e.g., Αβδαλωνυμος /ʕabd-ʔlōnīm/, Οζερβαλος /ʕōzer-baʕl/, and Ειρωμος /(?ahī)-rōm/. Long /ō/

resulting from original */aw/ > /ō/ or */ahu/ > */au/ > /ō/ can be transcribed as ω: e.g., Μωθ (< */mawt/) and Ιωμilkου (< */yahū-milk/) (FRIEDRICH and RÖLLIG 1999, 40–41, 44–45).

5.3.5.1.3. u-Vowels

When the /ō/ resulting from the Canaanite shift has further developed to /u/, it is represented by ου: e.g., αδουν /ʔadun/, λασουν /lašun/, κουλω /qulo/,¹⁸⁶ and σαφουν /šapun/. Long /ū/ resulting from the original */aw/ > */ō/ > /ū/ is represented by ου: e.g., κουλω /qulo/ and μουθ (< */mawt/). The vowel /ū/ is presumably reflected in Greek transcriptions by υ: e.g., ρυβαθων /rūbbaton/ (< */rabbaton/) and βυν /būn/ (FRIEDRICH and RÖLLIG 1999, 41, 45–46).

5.3.5.1.4. i-Vowels

Original /i/ in a doubly-closed syllable or an unstressed closed syllable is usually represented by ι: e.g., Μιλκιατων /milk-yaton/, -μιλχαρ /-milqar/, and Βαλσιλληχ /baʃl-šillek/. Occasionally, it is represented by ε: e.g., Μελκαθρος (read Μελκαρθος) and Εσυμσελημου /ešmūn-šillem/. Originally long /ī/ is represented with ι or ει: e.g., Αβιβαλος /ʔabī-baʃl/ and Ειρωμος /ī-rōm/ (< */(ʔa)hī-rōm/), and Αβδηλιμος /ʔabd-ʔilīm/ (FRIEDRICH and RÖLLIG 1999, 43–44).

5.3.5.1.5. e-Vowels

In a stressed syllable, etymological */i/ is realized as /e/, represented by η (reflecting phonetic lengthening) or ε: e.g., σιλληχ /šillek/, σελημου /šillem/, and Οζερβαλος /ʔōzer-baʃl/. Long /ē/ resulting from the original diphthong */ay/ is represented with η: e.g., Σαμημ /šamēm/ (FRIEDRICH and RÖLLIG 1999, 43–44).

5.3.5.1.6. Shewa and Epenthetic Vowels

There are a few different realizations of a potential parallel to Hebrew *shewa*, namely, a short or reduced vowel in an open syllable away from the stress. Historical /a/ may be preserved as α: e.g., Φανη/Φανε /panē/ and λασουναλφ /lašun-ʔalp/. It may also be reduced and represented by ε: e.g., Φενη. There seems to be some evidence that *shewa* was in some instances (or at some stage) realized as /ū/ and represented by υ: λυ βαλ /l-baʃl/ (FRIEDRICH and RÖLLIG 1999, 45). A variable quality of "*shewa*" may also be demonstrated by the transcription σιθιλ (< */

186. Note that the original pattern is actually probably *qāl (HUEHNERGARD 2015, 32).

satīl/) (KRAHMALKOV 2001, 35). An epenthetic to resolve final -CC# may assimilate to the quality of the preceding vowel: e.g., Συδουκ and Σεδεκ (< */šidq/). On the other hand, the epenthetic may be of a more neutral quality: e.g., Συδεκ (< */šidq/) (FRIEDRICH and RÖLLIG 1999, 53). Finally, an epenthetic may assimilate to an adjacent pharyngeal /ʕ/: e.g., Βααλ /baʕl/ and ζερα /zerʕ/ (FRIEDRICH and RÖLLIG 1999, 53; KRAHMALKOV 2001, 31).

5.3.5.1.7. Semi-Vowels /w/ and /y/ and Diphthongs

It is only in the conjunction /w-/ that we have a possible attestation of a transcription of consonantal /w/: ου λω ρυβαθων /w-l-rübbaton/. However, it is not clear if ου is intended to represent vocalic [u] or consonantal [w] in this instance. The semi-vowel /y/ is represented by Greek ι: e.g., Μιλκιατων /milk-yaton/. It also seems that the sequence of *vowel* + /y/ may be represented by ι: e.g., βινιω /biniyō/. The diphthong /ay/ seems to be maintained in the word Βαιτυλος (< */bayt-ʔil/) (FRIEDRICH and RÖLLIG 1999, 33, 41, 169, 185).

5.3.5.2. Consonants

The Standard Phoenician consonantal system is made up of twenty-two distinct phonemes, including three voiceless stops (/p/, /t/, /k/), three voiced stops (/b/, /d/, /g/), three emphatic consonants (/t/, /k/, /ʕ/), a glottal stop (/ʔ/), a glottal fricative (/h/), two pharyngeal fricatives (/ħ/, /ʕ/), two liquids (/l/, /r/), two nasals (/m/, /n/), two affricates (/ʔz/, /ʔs/), one sibilant (/š/ [s]), and two semi-vowels (/w/, /j/) (HACKETT 2008, 86–87).

5.3.5.2.1. Voiceless Stops

At an early period, /p/, /t/, /k/ are represented by the Greek unaspirated series: Σαραπτα (for צרפת), Βαλιτων /baʕl-yaton/, and Αβδιμικων (for עבדמלך). After the second century BCE, they are represented with the Greek aspirated series φ, θ, χ: e.g., Φανε/Φανη /panē/, Σαρε/αφθα (for צרפת), and σιλληχ /šillek/. It is not clear if φ, θ, χ also represented fricative allophones in this late period, but Punic /p/ is transcribed by *f* in Latin (FRIEDRICH and RÖLLIG 1999, 18–24).

5.3.5.2.2. Voiced Stops

The voiced stops were typically represented by Greek β, δ, γ: e.g., Βαλ /baʕl/, ναδωρ /nador/, and λαδουν /l-ʔadun/. It is not clear if β, δ, γ also represented fricative allophones in this late

period, but there are instances of post-vocalic Punic /b/ represented by Greek φ: e.g., Αφεσαφουν (for עבדצפון?) and αφδε (for עבדי) (FRIEDRICH and RÖLLIG 1999, 18–24, 40; KRAHMALKOV 2001, 21).

5.3.5.2.3. Gutturals

The guttural consonants (/ʔ/, /h/, /ʕ/, /ħ/), which are never represented directly in transcription, are either inferred or implied by a hiatus between vowels: e.g., Μερβαλος/Μααρβαλος /mahr-baʕl/, σαμω /šamoʕ/, and βαλ Αμουν /baʕl-hamun/. Elision of /ʔ/ may be indicated by the transcription λαδουν (< */l-ʔadun/) (FRIEDRICH and RÖLLIG 1999, 12, 16–18).

5.3.5.2.4. Sonorants

The sonorants /r/, /l/, /m/, /n/ are represented by ρ, λ, μ, ν: e.g., ναδωρ /nador/, κουλω /qulo/, σαμω /šamoʕ/, and πανε /panē/ (KAI 175). In the name גרסכן, /r/ is prone to be elided: e.g., Γισκων/Γεσκων. A velar allophone of /n/ [ŋ] is also represented by ν: e.g., Βωνχαρ (cf. *Bomcar* in Latin script) (FRIEDRICH and RÖLLIG 1999, 28–31).

5.3.5.2.5. Emphatic/Glottal Consonants

The emphatic stops /t/ and /k/ are represented by the Greek unaspirated series τ and κ: e.g., Μοτυη (for (א)מטו) and κουλω /qulo/. Emphatic /s/, probably realized as an affricate [tʃ], is usually transcribed as σ: e.g., Σιδων (for צידן), Συδεκ/Συδυκ/Σεδεκ (for צדק), and ασιρ (for חצר). It may also be transcribed as στ, τ, and perhaps ζ (in one instance): e.g., ατιρ/ασιρ (for חצר) and Ζωφασημιν (cf. Hebrew צִפְיִי שְׁמִי) (FRIEDRICH and RÖLLIG 1999, 20–21, 26).

5.3.5.2.6. Affricates and Plain Sibilants

Both original /ts/ ([tʃ] > [s]) and original /š/ ([ʃ]) are represented by σ: e.g., Γισκων (for גרסכן), υς (for שא), σαμω /šamoʕ/, and σαδε (for שד). A voiced allophone may be represented by ζ: e.g., Αβδύζμουνος (for עבדאשמנ). Original /dz/ is usually represented by ζ: e.g., Οζερβαλος (for עזרבעל) and ζερα (for זרע). Before /r/, it may also be transcribed as σ or σδ: e.g., Ασρουβας/Ασδρουβας (for עזרבעל) (FRIEDRICH and RÖLLIG 1999, 24–28).

5.3.5.2.7. Semi-Vowels

See 5.3.5.1.7.

5.3.5.2.8. Consonant Gemination

Consonantal gemination [C:] is not represented consistently: e.g., ρυβαθων (< */rabbaton/), Θεωνειθ/Θινιθ (for תנית), Εσυμσελημου /ʔešmūn-šillem/, Βασιλληχ /baʃl-šillek/, and Σαδυκος (< */šaddīq/) (FRIEDRICH and RÖLLIG 1999, 20–21, 54–55).

5.3.5.3. Summary

The most common representation of each Punic phoneme is summarized in the charts below.

Secondary graphemes are listed in parentheses:

	Vowels						Semivowels	Diphthongs		
<i>Punic:</i>	<i>a</i>	<i>e</i>	<i>i</i>	<i>o</i> (< *ʔ)	<i>u</i>	<i>ü</i>	"ə"	<i>w</i> [w]	<i>y</i> [j]	<i>ay</i> [aj]
<i>Greek:</i>	α	η, ε	ι, ε	ο/ω	ου	υ	α, ε, υ	(ου)	ι	αι

	<i>Voiceless Stops</i>			<i>Voiced Stops</i>		
<i>Punic:</i>	* <i>p</i> [p ^h] (> [tʰ]?)	<i>t</i> [t ^h] (> [θ]?)	<i>k</i> [k ^h] (> [χ]?)	<i>b</i> [b] (> [v]?)	<i>d</i> [d] (> [ð]?)	<i>g</i> [g] (> [ɣ]?)
<i>Greek:</i>	φ	θ	χ	β (φ)	δ	γ

	<i>Emphatic Stops</i>		<i>Emphatic Affricate</i>	<i>Plain Sibilants</i>	
<i>Punic:</i>	<i>t</i> [tʔ]	<i>q</i> [kʔ]	<i>ʃ</i> [tsʔ]	<i>ś, š</i> [ʃ]	<i>z</i> ([ɬ] or [z])
<i>Greek:</i>	τ	κ	σ (στ, τ)	σ	ζ

	<i>Sonorants</i>		<i>Nasals</i>		<i>Gutturals</i>			
<i>Punic:</i>	<i>l</i> [l]	<i>r</i> [r]	<i>m</i> [m]	<i>n</i> [n]	<i>ħ</i> [ħ]	<i>ʕ</i> [ʕ]	<i>h</i> [h]	<i>ʔ</i> [ʔ]
<i>Greek:</i>	λ	ρ	μ	ν	Ø	Ø	Ø	Ø

Chart 16: Summary of Phoenician-Punic in Greek Transcription: Correspondences

5.3.6. Summary

The various Greek transcription conventions during the Hellenistic, Roman, and Byzantine periods in the ancient Near East are summarized in the following chart (chart 17):

Vowels

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
<i>ā</i>	α	α	α	α	α
<i>ā</i>	α	α	α		-
<i>ē</i>	ε	ε (η)	(ε, η)	η, ε	-
<i>ē</i>	η (ε)	η, ελ	(ε, η)		η, ε
<i>ī</i>	ι	ι	ε (η)	ι	ι, ε
<i>ī</i>	ι (ελ)	ι, ελ	ι (ελ)		ι
<i>ū</i>	-	-	-	-	υ
<i>ū</i>	ου	ο	ο (ου)	ου	-
<i>ū</i>	ου	ου	ου		ου
<i>ō</i>	ο	-	-	ο	-
<i>ō</i>	ω (ο)	ω	(ω)		ο/ω
<i>ə</i>	-	-	-	α	α, ε, υ

Diphthongs and Semi-Vowels

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
<i>ai/ae/aj</i>	αι	αι	αι, ε, η	-	αι
<i>au/aw</i>	αυ	-	αυ	-	-
<i>j</i>	ι	(α)ι	ι, Ø	ι	ι
<i>w</i>	ου	υ, Ø	ου, Ø	-	ου

Voiceless Stops

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
<i>p</i>	π [p]	φ [p ^h]	φ [p ^h]	-	φ
<i>t</i>	τ [t]	θ [t ^h]	θ [t ^h]	θ	θ
<i>k</i>	κ [k]	χ [k ^h]	χ [k ^h]	-	χ

Voiced Stops

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
<i>b</i>	β [b]	β [b]	β [b]	β	β
<i>d</i>	δ [d]	δ [d]	δ [d]	δ	δ
<i>g</i>	γ [g]	γ [g]	γ [g]	γ	γ

Sonorants (Liquids and Nasals)

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
<i>l</i>	λ [l]	λ [l]	λ [l]	λ	λ
<i>m</i>	μ [m]	μ [m]	μ [m]	μ	μ
<i>n</i>	ν [n]	ν [n]	ν [n]	ν	ν
<i>r</i>	ρ [r]	ρ [r]	ρ [r]	ρ	ρ

Fricatives

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
<i>f</i>	φ	-	φ	-	(φ?)
<i>v</i>	β ([β] or [v])	-	-	β	(β, φ?)
<i>t</i>	-	-	θ (τ)	θ	(θ)
<i>d</i>	-	-	δ	δ	(δ)
<i>s</i>	σ	σ	σ	σ	σ
<i>z</i>	-	ζ	ζ	ζ	ζ
<i>š</i>	-	σ	σ	σ	-

Emphatic/Glottalic Consonants

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
<i>t</i>	-	τ	τ	-	τ
<i>k</i>	-	κ	κ	κ	κ

ς	-	σ (ζ)	σ	σ	σ, (στ, τ)
ς̣	-	-	σ [tʰ]	-	-
τ̣	-	-	ζ [bʰ]	-	-

Gutturals (Liquids and Nasals)

	<i>Latin</i>	<i>Akkadian</i>	<i>Arabic</i>	<i>Aramaic</i>	<i>Phoenician</i>
ħ	-	ξ, Ø	χ, Ø	-	-
ġ	-	-	γ, Ø	-	-
ḥ	-	-	Ø	-	Ø
ʕ	-	-	Ø	Ø	Ø
h	Ø	-	Ø	Ø	Ø
ʔ	-	-	Ø	-	Ø

Chart 17: Summary of Latin and Semitic in Greek Transcription: Correspondences

5.4. LINGUISTIC AND ORTHOGRAPHIC ANALYSIS: GREEK IN HEBREW

The primary evidence for Hebrew transcription of Greek from the Roman period is attested in the various vocalized manuscripts of the Mishnah, especially Kaufmann and Parma A, as analyzed by HEIJMANS in his work on Greek and Latin loanwords in the Mishnah (2013). A number of relevant epigraphic examples are also cited below.

5.4.1. Greek Loanwords in the Mishnah

5.4.1.1. Vowels

5.4.1.1.1. α

Greek α is represented with Hebrew *pataḥ* or *qamaṣ*. The distribution of *pataḥ/qamaṣ* is according to the Tiberian Hebrew rules, with *pataḥ* in a closed unstressed syllable and *qamaṣ* in an open unstressed syllable or a closed stressed syllable. Far from the stress, a *ḥataf pataḥ* may be used. Examples from the Kaufmann manuscript include ἀήρ אֵר, γάμμα גָּמָה, σάνδαλον סַנְדָּל, κάμπτρα קַמְטְרָה, and ἄσημον אֶשִּׁימוֹן. In Palestinian-pointed manuscripts, there is no consistency in the distribution of /a/ vowel signs. Some words exhibit an /a/ > /i/ shift

(e.g., ἄσσάριον אֶסְרִי), but these are regarded by HEIJMANS as reflecting a later internal Hebrew development (i.e., attenuation). In the environment of sonorants (λ, μ, ν, ρ) or κ, Greek α may be rendered as /o/ or /u/: e.g., πάλλιον פּוֹלִיּוֹן and κάψα אֶפְסָא (HEIJMANS 2013, 259–61).

5.4.1.1.2. ε/αι

Greek ε is mostly rendered with Hebrew /a/ vowels, usually *patah*. Perhaps due to nothing more than statistical coincidence, almost all the instances of Hebrew /a/ for Greek ε occur in closed syllables.¹⁸⁷ About half of these occur word-initially, transcribed with an initial א: e.g., ἐμβατή אֶמְבַּטִּי, ἐνθήκη אֶנְתִּיכִי, σπεκλάριον לְרִיכָא אֶפִּיטְרוֹפּוֹס, and κεφαλωτόν הֶקְפִּלוֹטוֹן. HEIJMANS concludes that rendering Greek ε with Hebrew /a/ is due to an open pronunciation of Greek ε in contrast with Hebrew /e/, at least in closed syllables, during the period when the word was borrowed. In a minority of instances Greek ε is rendered as /e/, /i/, or /o/. Due to the paucity of data, no conclusions may be drawn regarding such apparent shifts. The grapheme αι, which interchanged frequently with ε in the Roman period, is transcribed with *šere* in the word αἶψος קִירוֹס in the most reliable manuscripts (2013, 262–63, 275).¹⁸⁸

5.4.1.1.3. η

Unlike ε, Greek η is usually rendered with Hebrew /e/ vowels, usually *šere*: e.g., ἡγήρ אֶהִיר, ἀσθενής אֶסְתָּנִישׁ, and διαθήκη דִּי־תִיקִי. Greek η is occasionally rendered with Hebrew *hiriq*. However, HEIJMANS makes a distinction between cases which are only attested in some manuscripts and thus reflect a later tradition, and those which are *hiriq* across the manuscript tradition and thus reflect the pronunciation at the time when Mishnaic Hebrew was spoken. To the former class belong words such as βῆμα בֵּימָא (but cf. בִּימָה, בִּימָה) and δηνάριον דִּינָר (but cf. דִּינָר). To the latter class belong words such as ἄσημον אֶסְיִמון and σημεῖον סִימְיוֹנוֹת (HEIJMANS

187. The one example which does not reflect a closed syllable in Hebrew is ἐπίτροπος אֶפִּיטְרוֹפּוֹס (assuming the *dagesh* in the *peh* only reflects a stop pronunciation).

188. There is also an instance in which Greek αι is rendered by Hebrew /a/ in πραιτώριον פְּלִטוֹרִין, a development consistent with the omission of the second element of the diphthong that occurs in the papyri. This may also be reflected by the transcription κυαίστωρ קֶסְטוֹר in Parma A.

2013, 264–66).¹⁸⁹ The fact that Greek η is usually rendered with Hebrew /e/ is evidence that even the vocalization of the Mishnah reflects pre-Byzantine Greek pronunciation.

5.4.1.1.4. *ι/ει*

Greek ι is usually rendered with Hebrew *hiriq*: e.g., ὀμφάκινον אֲנִפְקִינוֹן, λίτρα לִיטְרָא, and κινάρα קִינְרָא. In closed unaccented syllables, Greek ι may also be rendered by Hebrew /e/ vowels: e.g., ἰδιώτης יְדִיאוֹתִי, ἐμπίλια אֲנִפִּילִיא, and μίνθα מִינְתָּה. In open unaccented syllables, Greek ι may be rendered as /e/. This reflects the reduction of the vowel and thus the representation of vocal *shewa* with Hebrew *šere* or *seghol*.¹⁹⁰ As would be expected, Greek ει is transcribed by Hebrew *hiriq*: e.g., χεῖρ כַּי and δεῖγμα דַּיְגָמָא. However, in Yemenite manuscripts there is one example in which the /e/ pronunciation of ει before a vowel is preserved, namely, φορειαφόροι פִּרְיִפְרִין. Finally, ι in the sequence ια can be rendered consonantly in Hebrew: e.g., σπεκλάριον לְרִיחַ סֶפֶק and ἐμπίλια אֲנִפִּילִיא (HEIJMANS 2013, 262, 267–68, 275–76).

5.4.1.1.5. *ο/ω*

Greek ο is usually rendered by Hebrew *holam-waw*: e.g., ὄρυζη אֲוִרִז, νοταρικόν נוֹטָרִיקוֹן, and κισσός קִיסוֹס. In a number of words with the Greek suffixes -ος and -ον, the ο of the suffix is rendered as Hebrew /a/: e.g., ἄμυλον אֲמִילֹן, βωμός בֹּמָס, and λευκόν לְוֹקֹן. This reflects the reduction and centralization of the suffixes to /əs/ and /ən/.¹⁹¹ This is supported by epigraphic evidence, in which Greek names ending in -ος have various representations: e.g., θεόφιλος תִּפִּילִס, Ἀντίοχος אַנְטִיכֹס/אֲנִיכֹס/אֲנִיכֹסִים, and Ἡλιόδωρος הִלִּידוֹרוֹס/הִלִּידוֹרוֹסִים. Only a few words render Greek ο with *shuruq*: e.g., ὀλεάριος אֲוִלֵּיִרִין and ἐμπορία אֲנִפּוֹרִיא. Greek ω is rendered by Hebrew /o/ in the majority of instances: e.g., ἐξώστρα אֲסוֹסְטְרָא, δράκων דְּרָקוֹן, and χαράκωμα פְּרָקוֹם. There are a few instances in the environment of labial consonants /m/ and

189. The only instance of ηι in a Greek loanword, ληστής לִיסְטִיס/לִיסְטִים, is rendered in Hebrew by /e/ or /i/. The former represents the earlier pronunciation and the latter rendering represents the Byzantine pronunciation.

190. Additionally, there are a number of words in which ι is rendered with *šere* even in closed stressed syllables (but not necessarily closed in Greek) (e.g., σμίλη אֲמִילָה). In a few instances, ι is rendered with /a/ before a liquid consonant (e.g., ἄσγλα אֲסָלָה). Finally, ι is rendered by /o/ or /u/ a number of times in the environment of labials and κ (e.g., μιλιάριον מִלִּיִּר, κίστη קִיסְתָּה).

191. Variants of the same word in the same manuscript support this (e.g., γύψος גִּיפְסִיס/גִּיפְסִים, φανός פָּנֹס/פָּנִים).

/p/, in which Greek ω is rendered by Hebrew /u/: e.g., μονοπώλης מִנְפּוֹלִי and πήλωμα פִּילּוֹמָא (HEIJMANS 2013, 269–74).¹⁹²

5.4.1.1.6. υ/οι

Greek υ is rendered by Hebrew *hiriq* about half the time and by Hebrew /o/ or /u/ about half the time: e.g., *hiriq* for υ in γύψος גִּיפְסִיס, λάγνος לִגְנִין, and σύμφωνον סִימְפּוֹנוֹן; /o/ or /u/ for υ include βυρσεύς בּוֹרְסֵי, γρύτης גְּרִיטִי, and χρυστουμῖνος קְרוֹסְטִימִילִים. The distribution points to Greek υ being realized as /y/ during the period.¹⁹³ Similarly, the diphthong οι is rendered in Hebrew with *hiriq*: e.g., κοινωνία קִינּוֹנִיָּא and κοιλία קִילִיָּא (HEIJMANS 2013, 272–73, 276).

5.4.1.1.7. ου

Greek ου is rendered in Hebrew both by /u/ and /o/: e.g., βούργος בּוֹרְגָן/בּוֹרְגִין, φούνδα פּוֹנְדָּה, κουκούμιον קוֹמְקוֹם/קוֹמְקוֹם/קוֹמְקוֹם, and βούλιμος בּוֹלִימוֹס/בּוֹלִימוֹס.¹⁹⁴ HEIJMANS admits that there is no simple explanation for such interchanges. Similar interchanges occur in the Papyri from Egypt and in Jewish Palestinian Aramaic. There could be any number of factors reflected in this interchange, including transmission history. However, HEIJMANS does maintain that at least some of the interchanges reflect an old pronunciation (2013, 277–78).

5.4.1.2. Diphthongs

5.4.1.2.1. ευ/αυ

Only two or three words, which are certain to have been borrowed from Greek and not Latin,¹⁹⁵ attest to the rendering of the Greek diphthongs ευ/αυ: εὐθέως אִיוֹתִיָּאֻס, λευκόν לְוִיקוֹן, and possibly Νικόλαος נִקְלָאֻס (if we assume /nikolaos/ > /nikolaus/ > /nikolavs/). The orthography with double *waw* וו reflects the pronunciation of the Byzantine period ([εῦ],[αῦ]),

192. There are also instances of /o-o/ dissimilating to /i-o/: e.g., κωνωπεῖον קִינּוֹן and βωμός בִּימוֹס. Finally, there are a few instances in which Greek ω is rendered by /e/ (e.g., πραιτώριον פְּרִיטוֹרִין) or /a/ (e.g., καταφερέης קַטְפֶּרֶיִס).

193. Additionally, there are four instances in which υ is rendered by Hebrew /e/: ζῦθος זִיטוֹס, ἄμυλον אִמְלִין, συνέδριον סִנְדִּיקִין, ζωμάριον סוּמָרִין, and ὄρυζα אִוְרִיז. This corresponds with a similar interchange of υ/ε in Greek papyri, reflecting that υ was sometimes realized as /e/. HEIJMANS suggests that such may be the case in the famous transcription συμα for Hebrew שִׁמְעָא. There are also a number of examples in which υ is rendered by Hebrew /a/ (e.g., ὑποθήκη אִפּוֹתִיקָא).

194. The same interchange is attested in the transcription of Latin *crustuminus* קְרוֹסְטִימִילִין.

195. The word *claustrum* קְלוֹסְטִרִי, *caulis* קוֹלִיסִי, and *paragauda* פֶּרְגֹּדִי seem to attest to the contraction /au/ > /o/ characteristic of Latin, but not Greek.

which is supported by the spellings אביתוס and לבקן (HEIJMANS 2013, 276–77). While it is correct that spellings with וּ and ב indicate the Byzantine pronunciation, they do not therefore determine that this was not already the realization of εϋ/αϋ in the Roman period (276–77). A Jerusalem inscription from the first century BCE/CE renders the Greek name Εὐπτόλεμος as אפּטלמוס (CIIP I/1, no. 407), representing the second element of the diphthong with פּ.

5.4.1.3. Consonants

5.4.1.3.1. π, τ, κ

The unaspirated voiceless stops π, τ, κ are rendered in Hebrew by ק, ט, פ: e.g., βασιλική בַּסִּילִקִי, σπλήνιον סְפִלְיִן, and ισάτις טַטִּיץ. While Greek π could only be represented by פ, the choice to represent unaspirated τ and κ with ט and ק indicates that it is likely that the "emphatic" consonants in Hebrew also lacked aspiration. A shift of /p/ > /b/ occurs in a number of instances: e.g., σπάθη אַצְבַּתִּי and πάρδαλις בַּרְדֵּלִס¹⁹⁶ (HEIJMANS 2013, 235–40).

5.4.1.3.2. β, δ, γ

The voiced stops β, δ, γ are rendered in Hebrew by ג, ד, ב: e.g., βιβάριον הַבִּיבָרִין, μαργαρίτης מַרְגָּלִיתָה, μάλαγμα מַלְגָּמָה, δηνάριον דִּינָר, and γράδος וְגִרְדֹּן. The *dagesh* seems to operate according to Tiberian rules: e.g., γενέσια גִּנְיָסִיָּה and τράγος טַרְגֹּס. It is also worth noting that when voiceless alternatives of γ and δ occur, they are rendered as the emphatics ק and ט in Hebrew: e.g., γλωσσόκομον מְקַלְסֹקוֹמֹן and Καλένδαι קַלְנֵטַי. This indicates that the Hebrew voiced stops were probably unaspirated (HEIJMANS 2013, 241–44).

5.4.1.3.3. φ, χ, θ

The aspirated voiceless stops φ, θ, χ are rendered in Hebrew by כ, ת, פ: e.g., δίφορος דִּיפֹרִס, κοχλιάριον כּוֹכְלִיָּרִי, and θήκη תִּיקָה. Representing aspirated θ and χ with ת and כ indicates that the Hebrew non-emphatic voiceless stops were aspirated. The *dagesh* seems to operate according to Tiberian rules: e.g., μέλαθρον מֵלֶתְרִיוֹן and καθέδρα קַתְדֵּרָה (HEIJMANS 2013, 245–48). A

196. In addition to these changes, Hebrew כ renders the first part of the sequence κτ in Greek, reflecting a κτ > χθ shift in the Koine pronunciation. Also, primarily in oriental manuscripts, there are attestations of ט representing τ, an attempt at reflecting the lack of aspiration.

Jerusalem inscription from the first century BCE/CE renders Greek βοηθός as בוטון, representing Greek θ with ט (*CIIP* I/1, no. 119–20).

5.4.1.3.4. λ, μ, ν, ρ

The sonorants λ, μ, ν, ρ are usually represented with Hebrew ל, מ, נ, ר: e.g., ἄλφα אֵלֶפֶת, μηχανή מְכֻנָּה, νόμος נִימוֹס, and ῥοζα אֹרֶז. Just as in Koine, λ and ρ may interchange: e.g., ὀλεάριος אורירין and πραιτώριον פֶּלְטוֹרִין. Interchange of μ and ν is less common, limited to the environment of preceding labial stops, as in ἔμβολον עֲנָבּוֹל. The initial aspirated *rho* ρ is reflected in the word ῥοδοδάφνη הָרֹדֶד־פָּנִי (HEIJMANS 2013, 248–52).

5.4.1.3.5. σ, ζ

Greek σ is usually realized as Hebrew ס: e.g., σέλλα סֵלָה and σῆμα סִמָּן. Before voiced consonants, it undergoes voicing and is represented with צ: e.g., προσβολή פְּרוֹבֹל. Before τρ, Greek σ becomes emphatic (or glottalic) in Hebrew: e.g., γάστρα גִּטְרָא. However, this phenomenon is more common in Babylonian manuscripts. Greek ζ is realized as Hebrew ז: e.g., ζεύγος זֵוֹ (HEIJMANS 2013, 253–56).

5.4.1.3.6. ξ, ψ

Greek ξ is represented by Hebrew כס: e.g., ἐξέδρα אֶסְדָּרָה and ξένος אֶכְנִיִּים.¹⁹⁷ Greek ψ is represented by Hebrew פס: e.g., ὁψώνιον אֶפְסִיִּין and ψῆφος פְּסִפִּין. This indicates that the first element of each must have been aspirated: [k^hs] and [p^hs] (HEIJMANS 2013, 257–58).

5.4.1.4. Summary

The most common realization of each phoneme in Greek loanwords in Mishnaic Hebrew is summarized in the chart below (chart 18):

	<i>Vowels</i>							<i>Diphthongs</i>	
<i>Greek:</i>	α	ε/αι	η	ι/ει	ο/ω	υ/οι	ου	ευ	αυ
<i>Hebrew:</i>	א, ב	ב (בֵּי)	בֶּ	בֵּי	בּוּ	בֵּי, בּוּ/בּוֹ	בּוּ/בּוֹ	אֵי, אִי (אב)	אָב

197. Word-finally, Greek ξ is represented by either קס or סכ: e.g., πίναξ פִּנְקָס and πάλλαξ פִּלְלָס. This is best explained as an internal-Greek development (πίναξ > πίνακος).

	<i>Voiceless Stops</i>			<i>Voiced Stops</i>			<i>Aspirated Stops</i>		
<i>Greek:</i>	π	τ	κ	β	δ	γ	φ	θ	χ
<i>Hebrew:</i>	פ	ט	ק	ב	ד	ג	פ	ת	כ

	<i>Sonorants</i>			<i>Sibilants</i>			<i>Combination</i>		
<i>Greek:</i>	λ	μ	ν	ρ	σ	ζ	ξ	ψ	
<i>Hebrew:</i>	ל (ר)	מ (נ)	נ (מ)	ר (ל, קר)	ס (ז, צ, טר)	ז	כס (קס, גס)	פס	

Chart 18: Summary of Greek Loanwords in Mishnaic Hebrew: Correspondences

5.5. CONCLUDING REMARKS

The preceding chapter outlined the correspondences between the phonology and orthography of the local Greek during the Roman period. The present chapter has surveyed and tabulated the Greek orthographic conventions utilized in transcribing Latin, Akkadian, Arabic, Aramaic, and Punic as well as summarizing how Greek loanwords are realized in Hebrew. Taken together, the findings of these two chapters provide a foundation for understanding the phonology and orthography of the Secunda. First, the work on Greek pronunciation provides an expectation of what the most natural phonemic value for any particular Greek grapheme might be at the time of the composition of the Secunda. Second, the work on Greek transcription conventions provides an expectation of how the Greek script might be used to represent various foreign phonemic values with an imperfect overlap. Third, the representation of Greek loanwords in Hebrew aids our understanding of how the two phonological systems corresponded to one another. To avoid redundancy, the data presented in this and the previous chapter will be referred to repeatedly in the discussion of the phonology and orthography of the Secunda in the following chapter rather than in a concluding synthesis here. Generalizations about transcription practices will be made in passing as the data are applied to the transcriptions of the second column.

6. THE PHONOLOGY AND ORTHOGRAPHY OF THE SECUNDA

6.1. INTRODUCTION

Chapters 4 and 5 investigated Greek pronunciation in Roman Palestine and Greek transcription conventions in the Roman Near East. The present chapter applies the findings of the previous two chapters to the phonology and orthography of the Secunda. The ultimate objective is to arrive at a phonemic and phonetic transcription of the Hebrew reflected in the Secunda.

6.2. METHODOLOGY

Current research on historical Hebrew linguistics will serve as a point of departure for discussing the phonemes and phonemic features of Secunda Hebrew. We will operate under the assumption that each phoneme or phonemic feature (e.g., quantity, gemination, vowel quality) generally falls on some point of the spectrum between its (reconstructed) realization in Proto-Northwest Semitic and its realization in one of the later reading traditions of Hebrew (e.g., Tiberian, Babylonian, Palestinian, Samaritan). Each phoneme will be addressed from the perspective of Greek historical phonology and orthography, Greek transcription conventions, and Hebrew dialectology. Analysis will be informed by modern linguistic studies in the fields of phonetics and phonology with a special emphasis on (cross-language) perception studies, since we are dealing with transcriptions into another language's script (for a summary of our methodology as it relates to cross-language perception studies, see 1.3.3).

In light of all these data, each transcription will be assigned a phonemic and phonetic transcription. The *phonetic* transcription, though informed by the evidence, is not necessarily intended to be understood as indisputable. Rather, though quite tentative, it is included as an educated approximation to better elucidate the nature of the Secunda transcriptions.

6.3. CONSONANTS

Consonants are fairly stable throughout the history of Hebrew, in the various reading traditions of Hebrew, and in the consonantal text of the Hebrew Bible. In most cases, it is merely the reflex of a particular consonant that is under discussion.

6.3.1. Stops (/b/, /p/, /d/, /t/, /g/, /k/)

In the earliest stages of Hebrew, the stops were probably unaspirated, as is demonstrated by the fact that the Greek alphabet adopted the Semitic voiceless stops to represent the Greek unaspirated series (e.g., כּ = ταν, פּ = καπα, שׁ = π). Relatively early in the history of Hebrew, the *voiceless* stops acquired aspiration: /k/ > [k^h], /p/ > [p^h], /t/ > [t^h]. Eventually, probably as a result of Aramaic influence, each stop developed a spirantized *post-vocalic* allophone (i.e., /b/ > [v], /g/ > [ɣ]/[ʁ], /d/ > [ð], /k^h/ > [x]/[χ], /p^h/ > [f], /t^h/ > [θ]) (KUTSCHER 1965; STEINER 2007, 54; YUDITSKY 2017, 21).

There is no consensus regarding the precise timing of spirantization in Aramaic and Hebrew, but there is good reason to believe that not all the stops were affected at once, but shifted in stages. Though spirantization is attested at a relatively early stage (ca. 7th BCE) in Aramaic in Mesopotamia, it did not reach the west until later. STEINER has argued compellingly that while the labials (/b/, /p/) and the dentals (/d/, /t/) underwent spirantization prior to the loss of */ħ/ (ca. 1st BCE/CE), only after the loss of */ħ/ did the velar stop /k/ develop a spirantized allophone, because, prior to such a loss, the spirantized allophone of /k/ ([x] or [χ]) could have been confused with */ħ/ ([χ]). That the velar stops developed spirantization at a later stage is further supported by the lack of a spirantized /k/ in the Egyptian Aramaic of P.

Amherst 63 (ca. 4th/3rd BCE) and the fact that the velar stops /k/ and /g/ never acquired spirantized allophones in Samaritan Hebrew (2007, 56, 64–65).¹⁹⁸

In light of STEINER's argument that spirantization of the labials and dentals occurred prior to the loss of the uvular fricatives (**/ħ/* and **/ġ/*), it is likely that at the time of the composition of the Secunda (2nd/3rd CE) the labial and dental stops had spirantized post-vocalic allophones: /b/ > [v], /g/ > [ɣ], /d/ > [ð], /t/ > [θ] (see 3.3.2.2). It is unclear whether or not spirantized allophones of the velar stops /k/ and /g/ had yet developed before the Secunda.

6.3.1.1. Voiced Labial Stop: /b/ = β

In the Secunda, both syllable-initial and post-vocalic /b/ are represented with β:

<i>Greek</i>	<i>Phonemic Representation</i>	<i>Phonetic Representation</i>	<i>Gloss</i>	<i>Verse</i>
καρβαμ	/qerbam(m)/	[kʰarbã(m)]	'within them'	Ps. 49:12
βαναν	/bɔ̃naw/	[bɔ̃:naw]	'his sons'	Ps. 89:31
αβδω	/ʕabdō/	[ʕabdō:]	'his servant'	Ps. 35:27
αβι	/ʔɔ̃bī/	[ʔɔ̃:βi:]	'my father'	Ps. 89:27

There is epigraphic evidence that already by the first century CE, Greek β in Palestinian Koine represented a bilabial fricative [β] and not the bilabial stop [b] (4.5.3.1.15).¹⁹⁹ It was only after a nasal that β represented the historical plosive pronunciation (e.g., φόβος [pʰoβos], but λαμβάνω [lambano]; 4.5.3.1.26). In fact, the rare utilization of μβ to transcribe /b/ in the LXX in names such as Ζαμβίνα זְבִינָה (Ezra 10:43) and Αμβακουμ הַבְּקוּיָם (Hab. 1:1) may reflect an attempt to represent a plosive pronunciation of /b/ ([b]) (see ROSÉN 1963, 68). This convention (μβ), however, is by no means the normal mode of transcribing a plosive [b] into Greek. Both Latin /b/ and Semitic /b/ are regularly transcribed into Greek as β (5.3.6). Presumably, the bilabial fricative [β] was the nearest Greek consonant to the bilabial plosive [b], differing only in manner of articulation (fricative vs. plosive).

198. Samaritan Hebrew grammarians discuss the allophones of בּפדו"ת and not כּפ"ד (STEINER 2007, 54).

199. At some point during the Byzantine period, the bilabial fricative [β] shifted to a labio-dental fricative [v].

If we assume that there was a post-vocalic fricative allophone of /b/ ([β] or [v]), as the history of Hebrew would suggest, it is no surprise that it was also transcribed by β. This is precisely what happens in Greek transcriptions of Latin when attempting to represent the newer fricative pronunciation of consonantal *v*, namely, [β] or [v] (< *[w]) (5.3.1.2.4). Aramaic syllable-initial and post-consonantal /b/ are also both transcribed by β (5.3.4.3).

There are also alternative ways of representing a bilabial fricative [β] or labio-dental fricative [v] in Greek orthography and transcription. In the sequence αυ and ευ, the second element came to represent [β]/[ϕ] by the Byzantine period, during which it ultimately shifted to [v]/[f] (4.5.3.1.13–14). Latin consonantal *v* in proper names is occasionally represented in this way in Palestinian Koine (4.5.3.1.15). In fact, Hebrew ב is used in a few instances to render the second element of the diphthongs αυ/ευ in loanwords from Greek in the Mishnah (5.4.1.2.1). In transcriptions of Phoenician-Punic, there is one instance in which post-vocalic /b/, perhaps reflecting a fricativized allophone, is represented with ϕ (αφδε /ʕabde/) (5.3.5.3).

In light of these last few points, it is worth mentioning a few examples of interest in external witnesses to the Secunda. First, in scholia on Genesis 34:2, Hebrew וַיִּשְׁכַּב 'and he lay down' is transcribed as ουσχαυ (Cod. 127). If the reading is original, the rendering of post-vocalic /b/ by υ would indicate a fricative pronunciation ([β] or [v]). However, it is likely that the reading of Cod. 344, which has ουσχαβ, is more reliable.²⁰⁰ Second, the feminine imperative of לָבַשׁ is transcribed as λαφσι לְבָשִׁי (Isa. 51:9) (see YUDITSKY 2017, 81). Because the Hebrew voiced stops were probably unaspirated (5.4.1.3.1–2), an unvoiced allophone of a plosive /b/ should be represented with π instead of ϕ.²⁰¹ The fact that an unvoiced allophone is represented with Greek aspirated ϕ probably points to a post-vocalic fricative realization of /b/.²⁰² Third, a similar example may be found in the transcription (α)ζαφθανει עֲזַבְתָּנִי 'you have

200. I would like to thank Peter Gentry for discussing with me the attestations of this word in the manuscripts.

201. For this principle in the transcriptions of the LXX, see KNOBLOCH (1995, 175).

202. Note that devoicing of /b/ before an unvoiced consonant also occurs in Greek transcriptions of Akkadian

forsaken me' (Ps. 22:2) in Codex Bezae's (folio 99v) reading of Matthew 27:46, which is likely to be a quotation of Psalm 22:2 from the Secunda (or another transcription tradition).²⁰³

Relatively contemporary Hebrew evidence also supports a post-vocalic fricative realization of /b/. Interchanges of ב/ב are attested in Mishnaic Hebrew (BREUER 2013, 111; BAR-ASHER 2015, 61–62) and at Qumran (REYMOND 2014, 70–71). Interchanges of פ/ב are also attested in Mishnaic Hebrew (BREUER 2013, 111; BAR-ASHER 2015, 61–62) and in the Judean Desert texts (MOR 2015, 121–22).

Contemporary Greek and Hebrew evidence is consistent with positing a syllable-initial realization of /b/ as a plosive [b] and a post-vocalic realization as a fricative [β] or [v] in the Secunda. It should be noted that the process of spirantization in Hebrew and Aramaic, at least in the case of the bilabial stops, involves a change both in the manner of articulation (plosive > fricative) and in the place of articulation (bilabial > labio-dental). However, it is more sensible linguistically if /b/ was first fricativized and only later realized as a labio-dental: [b] > [β] > [v]. This is precisely what happens in the development of Greek β ([b] > [β] > [v]) and is attested cross-linguistically (e.g., spirantized /b/ in Spanish is [β] and not [v]). Neo-Aramaic dialects also commonly realize post-vocalic /b/ phonetically as [β].²⁰⁴

(e.g., $\theta\eta\rho\phi\sigma$ *terrubs* [5.3.2.3.2]).

203. The entire line in Codex Bezae reads: $\text{HAEIHAEI\AA MAZA\phi\Theta ANEI}$ = $\eta\lambda\epsilon\iota\ \eta\lambda\epsilon\iota\ \lambda\alpha\mu\alpha\ \zeta\alpha\phi\theta\alpha\nu\epsilon\iota$. The reading $\zeta\alpha\phi\theta\alpha\nu\epsilon\iota$ is clearly secondary; most manuscripts have $\sigma\alpha\beta\alpha\chi\theta\alpha\nu\iota$, reflecting Mishnaic Hebrew or Aramaic שבקתני (BUTH 2014, 395–96). Because $\zeta\alpha\phi\theta\alpha\nu\epsilon\iota$ is not original, yet reflects the Biblical Hebrew of Psalm 22:2, it is entirely possible that the original reading of $\sigma\alpha\beta\alpha\chi\theta\alpha\nu\iota$ was later amended to $\zeta\alpha\phi\theta\alpha\nu\epsilon\iota$ according to a text like the Hexapla. Alternatively, the manuscript may have been amended based on another text or oral tradition. However, a strong case can be made that it is a quotation from the Secunda. In Jerome's letter to Pammachius (*Epistula LVII*), he cites the words of Psalm 22:2 as *Eli Eli lama zaphthani*. When Jerome transliterates Hebrew, he often, but not always, seems to transcribe an already existing Greek transcription of Origen (or perhaps Theodotion) into Latin letters. The fact that his transliteration here agrees with that of Codex Bezae in two unique respects (omission of *a* in [a]zaphthani and interchange of *p* for *b* in zaphthani) almost certainly indicates that his Latin transliteration comes from the same Greek source as Codex Bezae, which is most likely the Secunda (or perhaps another source such as Theodotion or Aquila).

204. In the dialect of Qaraqosh, post-vocalic /b/ is occasionally realized as [β] (KHAN 2002, 26). In the dialect of Urmi, the reflex of */b/ (/w/) is realized phonetically as [β] or [v] (KHAN 2008a, 20). In the dialect of the Jews of Arbel, post-vocalic /b/ may be realized as [β] (KHAN 1999, 17).

Positing a bilabial rather than a labio-dental realization of post-vocalic /b/ actually better explains the interchanges of ב and פ. A bilabial fricative would be more similar in articulation to a labio-velar approximant ([w]) than a labio-dental fricative ([v]) would. The development of Latin consonantal *v* (*w/ > *[β] > [v]) supports this. It is likely that Hebrew *waw* developed in the same way (see SHARVIT [2016, 290–91] on the development in Aramaic). Also, post-vocalic Hebrew /b/ is consistently transcribed by Jerome as *b* in Latin, even though consonantal *v* would better approximate a [v].²⁰⁵ Therefore, in phonetic transcription of the Secunda, post-vocalic /b/ will be represented as a bilabial fricative [β], with the understanding that it was in the process of becoming or had already become [v] as in Tiberian Hebrew. A bilabial fricative [β] realization of ב is also attested in some Jewish communities in Yemen (YA'AKOV 2012), Aleppo, and Tunisia (HENSHKE 2013a, 537; HENSHKE 2013b, 861).²⁰⁶

6.3.1.2. Voiceless Labial Stop: /p/ = φ

In the Secunda, both syllable-initial and post-vocalic /p/ are represented with φ:

φανη	/pnē/	[p ^h ane:]	'the face of'	Ps. 18:43
θεσφιλ*	/tešpīl/	[t ^h ɪʃp ^h i:l]	'you bring down'	Ps. 18:28
αφαχθ	/hōpakt/	[hɔːʔaχt ^h]	'you turned'	Ps. 30:12
χοφρω	/koprō/	[k ^h ʊʔrɔː]	'his ransom'	Ps. 49:8

At the time of the Secunda, Greek φ represented an aspirated voiceless bilabial stop [p^h]. It was distinguished from Greek π, which represented an unaspirated voiceless bilabial stop [p] (4.5.3.1.24). It was not until the Byzantine period that φ represented a labio-dental fricative [f]. While the grapheme φ is used consistently to transcribe the phoneme /p/ in Semitic languages, π is used to transcribe the phoneme /p/ in Latin (5.3.6). This is best explained by positing an unaspirated realization of Latin /p/ ([p]) and an aspirated realization of Semitic /p/ ([p^h]), which would have corresponded perfectly with φ. In Greek loanwords in Mishnaic Hebrew, both φ and π are rendered with Hebrew פ, though the unaspirated π is sometimes ren-

205. Jerome actually distinguishes פ from consonantal פ: e.g., *aven* פֶּן but *azuba* פֶּזֶבָה (SIEGFRIED 1884, 39).

206. The bilabial fricative pronunciation is not merely a post-vocalic allophone, but a regular realization of ב.

dered by Hebrew ב, which probably reflects that lack of aspiration of Hebrew /b/ was prioritized over the lack of voicing yet presence of aspiration in Hebrew /p/ (5.4.1.3.1–3).

If Hebrew /p/ had a post-vocalic spirantized allophone, it would likely be transcribed by φ. Latin, Punic, and Arabic /f/ are represented by φ in Greek (5.3.1.3.5; 5.3.3.3.1; 5.3.5.3). In addition to exhibiting a perfect correspondence with Hebrew [p^h], Greek φ [p^h] would have been regarded as the closest approximation of a fricative allophone of /p/ ([ϕ] or [f]). In an Aramaic inscription from first-century BCE/CE Jerusalem, the diphthong εϖ is rendered by פא in the name אפטלמוס (for Εὐπτόλεμος) (CIIP I/1, no. 407). During the Roman period, the diphthong εϖ developed from [εw] > [εϕ] > [εf] (before voiceless consonants). Therefore, the rendering with פא is best explained by assuming that ̣ was near to [ϕ] or [f] in its realization.

There is also evidence for a post-vocalic spirantized allophone of /p/ in contemporary Hebrew evidence. Interchanges of פ/ב are attested in Mishnaic Hebrew (BREUER 2013, 111; BAR-ASHER 2015, 61–62) and in the Judaean Desert texts (MOR 2015, 121–22). Further, there is at least one potential interchange of פ and ו at Qumran (REYMOND 2014, 70–71).

The contemporary Greek and Hebrew evidence is consistent with positing a syllable-initial realization of /p/ as an aspirated voiceless bilabial plosive [p^h] and a post-vocalic realization of /p/ as a fricative [ϕ] or [f] in the Secunda. On the basis of similar reasoning for positing a bilabial rather than labio-dental realization for ̣, it is worth considering whether or not ̣ may also have been realized as a bilabial fricative [ϕ] before it was realized as a labio-dental fricative [f] as in Tiberian. This may also better explain the interchange of פ and ו found at Qumran. It would also explain why ̣ is sometimes transcribed by Jerome as *ph* (e.g., *basupha* בַּסוּפָה, *hasephataim* הַשְּׁפָתַיִם) and sometimes (less frequently) by *f* (e.g., *afar* אֶפֶר, *Efron* אֶפְרוֹן) (SIEGFRIED 1884, 36, 38, 40, 63–64). A labio-dental fricative [f] could have been adequately transcribed by *f* in Latin.²⁰⁷ In the Egyptian papyri, there are a few instances in

207. However, BARR makes the point that speakers conceive of their language phonemically and thus it is no wonder that Jerome would transcribe both a syllable-initial and post-vocalic realization of the phoneme /p/ in

which Greek φ was transcribed by Latin *f* (e.g., *egraf[e]* for ἐγράφη) (GIGNAC 1976, 100), perhaps after φ [p^h] had shifted to [f]. Therefore, in phonetic transcription of the Secunda, post-vocalic /p/ will be represented as a bilabial fricative [ɸ], with the understanding that it was in the process of becoming or had already become [f] as in Tiberian Hebrew. In both Tunisian and Moroccan reading traditions of Hebrew, ֿ may be realized as a voiceless bilabial fricative [ɸ] post-vocally (HENSHKE 2013b, 861; AKUN 2013, 704). In the Neo-Aramaic dialect of the Jews of Arbel, post-vocalic /p/ is also sometimes realized as [ɸ] (KHAN 1999, 18).

6.3.1.3. Voiced Dental Stop: /d/ = δ

In the Secunda, both syllable-initial and post-vocalic /d/ are represented with δ:

δαμμου	/dammū/	[dam:u:]	'they were silent'	Ps. 35:15
**μαγδιλμ	/ham-magdīlīm/	[ham:aɾdi:lī(m)]	'those who exult'	Ps. 35:26
χαβωδ	/kəbōd/	[k ^h ɔ:βo:ð]	'honor'	Ps. 29:1
ιδαθι	/hīdōtī/	[hi:ðɔ:θi:]	'my riddle'	Ps. 49:5

In Palestinian Koine during the Roman period, Greek δ most likely represented a voiced alveodental stop [d], but it is also possible that it had shifted to a fricative [ð] (4.5.3.1.31; 4.5.4.4). At some point during the Roman or Byzantine period, the grapheme δ came to represent a voiced interdental fricative [ð], but such a realization may not have obtained at the time of the Secunda. After δ had come to represent [ð] in Egypt, it occasionally interchanged with ζ (e.g., ζειαβαλεῖν for διαβαλεῖν). Following a nasal, the grapheme (ν)τ also represented the value [d] (4.5.3.1.26), which was even implemented to transcribe the sequence *nd* in Latin (e.g., ουντε *ündē*) (5.3.1.3.2). Both Latin /d/ and Semitic /d/ are regularly transcribed by Greek δ. In Greek loanwords in the Mishnah, δ is rendered by ט in Hebrew (5.4.1.3.2). If Greek δ had not yet shifted to a fricative by the time of the Secunda, then δ would overlap perfectly with Hebrew ט. If it had shifted to a voiced interdental fricative, voicing was prioritized over the manner of articulation in the choice of δ rather than τ to transcribe Hebrew ט.

the same way (1967, 9–16).

If we assume that Hebrew /d/ had a post-vocalic fricative realization of [ð], it is reasonable that it would be represented with δ. Although HORROCKS argues that δ did not become fricativized until the third or fourth century CE (2014, 170), it is possible that the shift had begun earlier (GIGNAC 1976, 75–76). Regardless, Arabic /d/ is transcribed with δ already in 164 CE at Ḥawrān (Δουσαρεος /dū-šarey/) (5.3.3.3.3). Moreover, Aramaic post-vocalic /d/ is also transcribed by δ (5.3.4.3). If Hebrew post-vocalic /d/ were to be transcribed by Greek ζ, it would unambiguously attest to a fricative pronunciation. Nevertheless, the regular transcription of post-vocalic Hebrew /d/ with δ is consistent with a fricative realization of [ð].

A couple phenomena in the Secunda require further explanation with respect to a post-vocalic fricative realization of /d/. In one instance, post-vocalic /d/ is represented by θ(ι):

αἰεγγιθι /hayeggīd/ [hajig:i:θ] 'will it tell?' Ps. 30:10

YUDITSKY corrects this transcription to αἰεγγιδ (2017, 300), but it may be possible to explain the transcription phonetically. First, final devoicing may have caused [ð] to shift to [θ].²⁰⁸ Second, the sequence of θ [tʰ] + ι [i], which might have indicated something like a palatalized [tʰ], could have been an attempt to approximate a fricative [ð]. This would be similar to the instances in the Egyptian papyri in which δι, δ, and ζ interchange (GIGNAC 1976, 75–76). Also, because the Hebrew voiced stops were likely unaspirated (5.4.1.3.2), the fact that a voiceless allophone is rendered with Greek *aspirated* θ instead of unaspirated τ likely points to a spirantized realization of /d/ (see KNOBLOCH 1995, 175). Mishnaic Hebrew also attests to occasional interchanges of /d/ and /t/, such as מות for מאד in the phrase והנה טוב מות (BAR-ASHER 2015, 183; SHARVIT 2016, 152). According to BAR-ASHER, the interchange of ד and ת is uncommon, but when it occurs, it usually happens in word-final position (2009, 151–52).

The second phenomenon requiring further discussion is the epenthetic vowel inserted to break up the final consonant cluster /dt#/ in the Secunda:

208. This is attested sporadically in both Greek and Latin transcriptions of Hebrew in other sources: e.g., Hebrew דוֹאֵג (Ps. 52:2) is transcribed as Δωακ in the LXX and as *Doec* in Jerome.

εεμεδεθ	/heʕmedt/	[hɛʕimɪðɪθ]	'you established'	Ps. 30:8, 31:9
βρεδεθι	/b-redtī/	[b(a)ɾɪðɪθi:]	'in my going down'	Ps. 30:10

These transcriptions seem to argue against a fricative allophone of /d/, since [dt#] would be more prone to require an epenthetic than [ðt#] (YUDITSKY 2017, 76–77).²⁰⁹ However, according to the Obligatory Contour Principle (OCP), homorganic consonants, irrespective of *manner* of articulation, are sufficient to occasion an epenthetic (see 6.5.1.5.1; 6.5.2.2). The fact that a similar phenomenon seems to occur in Babylonian Hebrew, in which post-vocalic /d/ and /t/ were pronounced as [ð] and [θ], suggests that the presence of an epenthetic between /d/ and /t/ does not necessarily indicate a plosive pronunciation /d/.²¹⁰ Rather, the voiced dental fricative [ð] and voiceless dental plosive [t^h] may have been regarded as similar enough phonetically so as to warrant an epenthetic. In fact, even in Tiberian Hebrew, *ṭ* was not an interdental fricative but a post-dental fricative, which would have made it more phonetically similar to *ṭ* (KHAN 2013a, 87, 93). Alternatively, the epenthetic vowel may have been inserted when spirantization was not yet in effect and remained thereafter. This would also account for the *rafeh* sign on the *ṭ* of the suffix in Babylonian רִפְּדָתִי *rippadātī* 'I spread out' (Job 17:13). This phenomenon is also attested in a Secunda quotation from Epiphanius:²¹¹

ελεδεθεχ*	/yledtek(k)/	[jəlɪðəθɪk ^h]	'I have begotten you'	Ps. 110:3
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In sum, the contemporary Greek and Hebrew evidence is consistent with positing a syllable-initial realization of /d/ as a plosive [d] and a post-vocalic realization of /d/ as a fricative [ð].

209. YUDITSKY also draws on the Babylonian evidence cited here in support of his claim (2017, 76–77).

210. In the suffix conjugation of Old Babylonian, a *shewa* sign may be marked on the consonant preceding the suffixes *ṭ* and *ṭ* when that consonant is *ṭ* or *ṭ*: e.g., רִפְּדָתִי and רִפְּדָתִי. Although it is not certain, YEIVIN regards the distribution of *shewa* in these instances as possibly indicative of a mobile *shewa* due to the phonetic similarity between *ṭ*/*ṭ* and *ṭ* of the suffix. However, the fact that the *rafeh* sign appears on the *ṭ* of the suffix after *ṭ* in another instance (רִפְּדָתִי) demonstrates that an epenthetic is entirely compatible with a fricative pronunciation of both *ṭ* of the root and *ṭ* of the suffix (1985, 427, 515). For a further discussion of the OCP as it relates to the /dt/ cluster in the Secunda, see 6.5.1.5.1.

211. The form ελεδεθεχ reflects a 1cs verb in the suffix conjugation from the root ילד (corresponding with MT ילדתי) against the MT reading of ילדתי. This reading is supported by the *ketiv* of the MT, the LXX, the quotation of this verse in the New Testament (Acts 13:33; Hebrews 1:5; 5:5), and possibly also the allusion to the verse and the reaction of the Sanhedrin in Jesus's trial (see Luke 22:69–70; FLUSSER 1988).

tive [ð] in the Secunda. The epenthetic vowel inserted to resolve /dt#/ consonant clusters in transcriptions like εμεδεθ does not necessarily reflect a post-vocalic plosive pronunciation of /d/ at the time of the Secunda (see above), but may only indicate that fricative /d/ was not an interdental but more of a post-dental fricative (and thus nearer to alveolar /t/).

6.3.1.4. Voiceless Dental Stop: /t/ = θ

In the Secunda, both syllable-initial and post-vocalic /t/ are represented with θ:

θαμιμ	/tōmīm/	[tʰɔ:mĩ:(m)]	'blameless'	Ps. 18:26
αμαρθι	/ʔōmartī/	[ʔɔ:marthi:]	'I said'	Ps. 30:7
αννωθην	/han-nōtēn/	[han:ɔ:θe:n]	'he who gives'	Ps. 18:48
βαραθα	/bōrōtō/	[bɔ:Rɔ:θɔ:]	'you created'	Ps. 89:48

At the time of the Secunda, Greek θ represented the aspirated voiceless alveodental stop [tʰ]. It was distinguished from Greek τ, which represented an unaspirated voiceless alveodental stop [t] (4.5.3.1.30–32).²¹² At some point in the Byzantine period, θ came to represent the voiceless interdental fricative [θ]. While the grapheme θ is used consistently to transcribe the phoneme /t/ in Semitic languages, τ is used to transcribe the phoneme /t/ in Latin. This is best explained by positing an unaspirated realization of Latin /t/ ([t]) and an aspirated realization of Semitic /t/ ([tʰ]), which would have corresponded perfectly with Greek θ. This correspondence is also present in Greek loanwords in Mishnaic Hebrew, where Greek θ is rendered by Hebrew ת and Greek τ is rendered by ט in Hebrew (5.4.1.3.1; 5.4.1.3.3).

If Secunda Hebrew had a post-vocalic spirantized allophone of /t/, we would expect it to be transcribed by θ. The Arabic interdental /t/ [θ] is usually transcribed by θ, but may be transcribed by τ on occasion (5.3.3.3.3). Aramaic post-vocalic /t/ is also transcribed by θ (5.3.4.3). This shows that, in addition to Greek θ [tʰ] corresponding perfectly with Hebrew syllable-initial /t/, Greek θ also would have been the closest realization of the fricative allophone of /t/ ([θ]). A parallel to Arabic /t/ being transcribed with Greek τ may be found in the transcription Νατανιλου (for נתנאל) from first-century CE Jerusalem (4.5.3.1.30). If post-vo-

212. For an alveodental rather than dental stop in ancient Greek, see PETROUNIAS (2007b, 561).

calic /t/ were a plosive in נתנאל, there would be no reason to represent it with anything other than Greek θ. However, because Greek scribes had no precise equivalent of fricative [θ], they had to choose between θ [t^h] and τ [t]. While they generally preferred θ for rendering Hebrew ת, the transcription Νατανιλου may be an example of a scribe preferring τ over θ as an imperfect approximation of Hebrew ת.²¹³ In Tiberian Hebrew, the fricative allophone of /t/ was realized as an alveolar fricative (KHAN 2013a, 93). There is one instance of post-vocalic ת being represented with ט (before it was corrected to ת) in MS Kaufmann of the Mishnah (בֵּית הַלֵּל for בית הלל), but it probably only reflects an Ashkenazi pronunciation (BAR-ASHER 2015, 65, 92).

In sum, while the evidence from the Secunda transcriptions themselves is inconclusive, it is consistent with contemporary Greek and Hebrew evidence to posit a syllable-initial aspirated realization of /t/ [t^h] and a post-vocalic fricative allophone of [θ].

6.3.1.5. Voiced Velar Stop: /g/ = γ

In the Secunda, both syllable-initial and post-vocalic /g/ are represented with γ:

μισγαβ	/maśgɔb/	[misɣɔːβ]	'a fortress'	Ps. 46:8
γαμ	/gam(m)/	[gã(m)]	'also'	Ps. 49:3
μαγεν	/mɔgen(n)/	[mɔːɣm]	'a shield'	Ps. 18:31
εδαλλεγ	/ʔdalleg/	[ʔɔalːɣ]	'I will leap'	Ps. 18:30

At the time of the Secunda, Greek γ represented a voiced velar fricative [ɣ] with an allophone of [j] in the environment of high vowels (4.5.3.1.37). After nasals, it would have been realized as a voiced velar stop [g]. Before another velar (γ, κ, χ), γ represented a nasal ([ŋ] or [n]) (4.5.3.1.38). Both Latin /g/ and Semitic /g/ are consistently transcribed by Greek γ (5.3.6). In Greek loanwords in the Mishnah, γ is rendered by ג in Hebrew (5.4.1.3.2). Although no longer a perfect correspondence with Hebrew /g/, γ was regarded as the nearest approximation of plosive ג. The plosive realization seems to be apparent in the following transcription:

βαμεθγε	/bɔ-metg/	[bɔːmɪθgɔ]	'with a bit'	Ps. 32:9
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213. AL-JALLAD explains the Greek transcription of Arabic /t/ and /t̤/ in the same way (2015, 13–14).

An epenthetic vowel is added in βαμεθγε to resolve the final consonant cluster /tg#/ (see YUDITSKY 2017, 79). The fact that we find paragodic epenthesis ($CC\# > CCv\#$) rather than anaptyctic epenthesis ($CC\# > CvC\#$) seems to indicate that there was no unrepresented vowel between /t/ and /g/ and that /g/ was thus realized with a plosive pronunciation (cf. BLAU 1998a, 8–9; see 6.5.2.1.1).

If Hebrew /g/ had a post-vocalic fricative allophone, it likely would have been realized somewhere between a velar [ɣ] and a uvular [ʁ] as in Tiberian (KHAN 2013a, 86–87). Greek γ, representing a velar fricative [ɣ], may have corresponded better with either of these phones than it would with a plosive /g/. This is the case with transcribing Arabic /ġ/ ([ɣ] or [u]), the Semitic consonant nearest to ʕ, which is rendered by Greek γ (5.3.3.3.4). At an earlier period, Hebrew /ġ/ was also transcribed by γ (e.g., Γομορρα עֲמֹרָה in the LXX). Evidence for a uvular post-vocalic /g/ in the Secunda may be present in the following transcription:

θαμωγ /t̪mūg/ [t^hɔːmoːʁ] '(it) will melt' Ps. 46:7

An expected long /ū/ vowel is realized as [oː]. While a morphological explanation is entirely possible (see YUDITSKY 2017, 60, 137), there may also be a phonetic explanation. In Akkadian, both /r/ and /h/ have a lowering effect on adjacent vowels, as is demonstrated by the Graeco-Babyloniaca texts (5.3.2.1.3–4). This may be because both /r/ and /h/ had a similar place of articulation, namely, uvular.²¹⁴ Therefore, if the explanation of the transcription θαμωγ is actually phonetic rather than morphological, the lowering of the vowel before /g/ may be evidence of a post-vocalic spirantized allophone of /g/ realized as a voiced uvular fricative [ʁ].

There may also be evidence of a spirantized ʕ in contemporary Hebrew epigraphy. The name of the Roman emperor Trajan, *Trajanus* ([trajanus]) in Latin, is rendered as טריאנוס in

214. Akkadian /h/ is a reflex of what may be reconstructed as either a voiceless uvular fricative [χ] or a voiceless velar fricative [x] in Proto-Semitic (HUEHNERGARD 2004, 142; KOGAN 2011, 54). Although the reflexes of PS /h/ in various Semitic languages vary between the velar fricative [x] and the uvular fricative [χ], the fact that /h/ eventually merges with the pharyngeal fricative /ħ/ [ħ] in Akkadian (see STEINER 2011) seems to indicate that Akkadian /h/ may have been a uvular fricative [χ] before the merger. This would better explain why /h/ and /r/, but not /k/ and /g/, lower vowels in Akkadian. Accordingly, /r/ was likely a uvular roll or uvular trill.

the Judaeen Desert texts (5/6Hev 8), as טרוגינז in the Mekhilta DeRabbi Shimon Bar Yochai (21:13) and as טרוגינז in the Jerusalem Talmud (*Sukkah* 23a). Τραιαυος is typical in Greek orthography, but spellings with γ such as Τραγαιουου are not uncommon, especially in inscriptions (GIGNAC 1976, 72). While it is possible that טרוגינז/טרוגינז is a slavishly literal transliteration of a variant Greek spelling, the spelling Τραιαυος is the norm in Palestine.²¹⁵ If the Hebrew spelling טרוגינז/טרוגינז is not a literal transliteration, it is likely evidence of a spirantized /g/, just as the same variant spelling is evidence of such in Greek. Finally, the omission of ר in the word מגש (for מגרש) at Qumran (QIMRON 1986, 26–27) may be explained by positing a similar realization of both ל and ר: i.e., /magraš/ [maʁaʃ] > [maʁ(:)a(:)].

In sum, while the evidence is inconclusive, it is consistent with both contemporary Greek evidence and Hebrew dialectology to posit that Hebrew /g/ was realized as [g] syllable-initially and as [ʁ] (or [ɣ]) post-vocally in the Secunda. Because of the possible lowering of the vowel in θαμωγ, post-vocalic /g/ will be transcribed as a uvular [ʁ], but it may have been realized as a velar [ɣ] if the transcription θαμωγ is better explained morphologically.

6.3.1.6. Voiceless Velar Stop: /k/ = χ

In the Secunda, both syllable-initial and post-vocalic /k/ are represented with χ:

כי	/kī/	[k ^h i:]	'because'	Ps. 18:28
וסכי	/ħoškī/	[ħʊʃk ^h i:]	'my darkness'	Ps. 18:29
באח	/bāk/	[bɑ:χ]	'in you'	Ps. 18:30
והחמי	/nēkīm/	[ne:χĩ:(m)]	'wretches'	Ps. 35:15

At the time of the Secunda, Greek χ represented the aspirated voiceless velar stop [k^h]. It was distinguished from Greek κ, which represented the unaspirated voiceless velar stop [k] (4.5.3.1.35). At some point in the Byzantine period, χ came to represent the voiceless velar fricative [x]. While the grapheme χ is used consistently to transcribe the phoneme /k/ in Semitic languages, κ is used to transcribe the phoneme /k/ in Latin. This is best explained by

215. In the Greek Judaeen Desert texts, Τραιαυος is spelled normally (without a γ) in all fourteen of its occurrences. Also, in an inscription from Ashkelon the same name is spelled Τραιαυε (*CIIP* 2395).

positing an unaspirated realization of Latin /k/ ([k]) and an aspirated realization of Semitic /k/ ([k^h]), which would have corresponded perfectly with Greek χ. This correspondence is also present in Greek loanwords in the Mishnah, where Greek χ is rendered by Hebrew כ and Greek κ is rendered by ק in Hebrew (5.4.1.3.1; 5.4.1.3.3).

If we assume a post-vocalic fricative allophone of Hebrew /k/, it likely would have been realized somewhere between a velar [x] and a uvular [χ] as in Tiberian (KHAN 2013a, 89–90).²¹⁶ Greek χ, representing an aspirated velar stop [k^h], would have been the nearest approximation of this phone. The nearest Semitic consonant to [x]/[χ] is /ħ/. Akkadian /ħ/ is transcribed by ξ [k^(h)s],²¹⁷ perhaps because of the combination of the voiceless velar [k^h] and the fricative [s] (5.3.2.3.4). Arabic /ħ/ is usually transcribed by χ (5.3.3.3.4). In each case, however, /ħ/ may also be transcribed by Ø, perhaps reflecting a shift to /h/. Nevertheless, the data indicates that Greek χ best approximated Semitic /ħ/.

The following form may also be relevant for the discussion of a potential post-vocalic spirantized allophone of /k/ in the Secunda:

λαμαλχη /l-malkē/ [lamalχe:] 'to the kings of' Ps. 89:28

In Tiberian Hebrew, the כ in this word is *rafeh* (i.e., spirantized) even though it is syllable-initial. A *rafeh* כ"ד letter following a post-vocalic *shewa*, referred to as *shewa medium* in the literature, is generally explained as the result of spirantization operating at a time when the כ"ד letter was still post-vocalic: *la-malakay > (contraction of diphthongs) > *la-malakē > (spirantization) > *la-malak̄ē > (syncope) > l-malk̄ē (see KHAN 2005, 86–87).²¹⁸ If spirantization had operated after vowel syncope in l-malk̄ē, the כ would not have been spirantized since it would not have been post-vocalic. Babylonian Hebrew exhibits the same appar-

216. See note 8 for the description of the place of articulation of spirantized כ in *Hidāyat al-Qāriʿ*? (ELDAR 1994, 59–61; KHAN 2013a, 89–90).

217. There is evidence that ξ represented [k^(h)s] in Palestinian Koine (5.4.1.3.6), but it may have represented [ks] in Mesopotamian Greek.

218. This is presumably the explanation for the regular plural in Biblical Aramaic מַלְכִין (Dan. 2:21) as well: *malakīn > *malak̄īn > malk̄īn.

ent rule ordering, though there are a small number of exceptional forms in which the third radical has a *dagesh* in a comparable pattern (e.g., מַלְכִּי־עֵם and מַלְכִּי־עֵם) (YEIVIN 1985, 342).²¹⁹

Because such rule ordering, namely, that vowel syncope in the form **qatalē* > **qatlē* operated *after* the spirantization of post-vocalic /k/, is evidenced in both Tiberian and Babylonian, an argument can be made that both developments had already occurred in a common Hebrew ancestor. The Secunda form λαμαλχη *with syncope* may indicate that such a common ancestor, in which spirantization and syncope had already operated, predates the composition of the Secunda. However, it should be noted that such a line of argumentation is entirely dependent on how closely Secunda Hebrew is related to Tiberian and/or Babylonian Hebrew, which is by no means clear.²²⁰ Unfortunately, a comprehensive treatment of this topic lies beyond the scope of the present work. Finally, it should also be noted that because Greek χ could represent either [k^h] or [x]/[χ], the form λαμαλχη cannot be taken as direct evidence of either pronunciation.

On the other hand, transcriptions of the 2ms verbal object suffix may reflect a non-fricative realization of post-vocalic /k/. Normally, it is represented by -εχ:

ιζαμμερεχ	/yzammerek(k)/	[(?)i(:)zammirik ^h]	'I will sing to you'	Ps. 30:13
ωδεχ	/ʔōdek(k)/	[ʔo:ðik ^h]	'I will praise you'	Ps. 35:18

In one instance, however, this 2ms verbal suffix is rendered with a κ (-εκ) rather than a χ:

ουωρεκ	/w-ʔōrek(k)/	[(?)uʔo:rik ^h]	'and I will show you'	Ps. 32:8
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While scholars have explained the -εχ suffix in various ways, it is best regarded as a historical development of what is a pausal form in Tiberian Hebrew: -inka > ikka > ikk > ik(k) > ek(k) (e.g., מַלְכִּי־עֵם [Isa. 10:24]). The ε (and not η) in the suffix points to etymological final gem-

219. YEIVIN suggests that dissimilation with the 2mp suffix may be a factor (1985, 342).

220. Note even the apparent dialectal variation in Jerome. In his commentary on Isaiah, Jerome states: *praeter unam litteram aleph, quae in angelorum vocabulo addita est, eodem reges et angeli apud hebraeos appellantur nomine, id est malache* 'except for one letter *aleph*, which is added in the noun "messengers," kings and messengers are called by the same name among the Hebrews, that is *malache*'. The form *malache* for מַלְכִּי may indicate a lack of syncope (see KHAN 2013h, 551; YUDITSKY 2013, 818), but Jerome might also have confused a text-critical issue with a phonological one.

ination (6.3.8.6), which is further supported by the one instance in which the final vowel is preserved: $\alpha\tilde{\omega}\delta\epsilon\chi\chi\alpha$ /ha-yōdekk̄/ [hajo:ðik̄^h:ɔ:] (Ps. 30:10).

If κ for χ in $\sigma\omega\rho\epsilon\kappa$ is not a scribal error—these two letters were written similarly throughout the history of Greek (THOMPSON 1966, 154–55)—then the spelling with κ seems to reflect both a non-fricative and non-aspirated realization of post-vocalic ς in this word. The non-fricative realization of ς may be explained in a few ways. First, it is possible that spirantization may not (yet) have applied to /k/ as in Samaritan Hebrew. Second, if post-vocalic spirantization did normally apply, it is possible that ς was defricativized in word-final position. In fact, despirantization of a fricative in syllable-final position is common cross-linguistically (HONEYBONE and SALMONS 2015, 418–19). Third, etymological final gemination may still have been preserved (at least on a phonological level) when the spirantization rule ceased to operate. Accordingly, the plosive realization of the consonant was maintained. Note also the word קֶס [ʔa:t] (not *[ʔa:θ]) in Tiberian Hebrew (see 6.3.8.6).²²¹ The non-aspirated realization of ς , then, according to YUDITSKY, is explained as the loss of aspiration in word-final position, which is common cross-linguistically. An interchange of κ/ς is also attested in the Secunda transcription $\lambda\alpha\kappa\tau\alpha\lambda$ לַטְּ קֶלֶ (Ps. 110:3) quoted in Epiphanius (2017, 22, 25, 104–106).

This example presents no problem in light of Greek evidence. In Rabbi Abbahu's clever Greek pun, Greek $\delta\alpha\tau\acute{\omega}$ is transcribed as אֶכְסִ"א (*Bereshit Rabbah* 14:2), indicating that the Greek sequence $\kappa\tau$ was equivalent to כֶּט and not קֶט, $\delta\alpha\tau\acute{\omega}$ being pronounced as either [ʔok^hto] or [ʔoxto] (BUBENIK 2007, 633). In Medieval Greek, voiceless obstruent clusters comprised of either [stop] + [stop] or [fricative] + [fricative] underwent dissimilation to become [fricative] + [stop]: e.g., $\kappa\tau\acute{\iota}\zeta\omega$ ['ktizo] 'I build' becomes $\chi\tau\acute{\iota}\zeta\omega$ ['xtizo] (HORROCKS 2014, 281–82). A similar realization of $\kappa\tau$ is found in Modern Greek. While the reflex of Classical

221. For a similar phenomenon with respect to spirantization in Syriac, see EDZARD (2001).

Greek $\kappa\tau$ is pronounced as [kt] in the *logio* ("learned") pronunciation, it is pronounced as [xt] in the *laiko* ("popular") pronunciation, resulting in persistent doublets: e.g., *logio* $\kappa\tau\acute{\iota}\zeta\omega$ ['kti-zo] 'I build' but *laiko* $\chi\tau\acute{\iota}\zeta\omega$ ['xtizo]; *logio* $\kappa\tau\acute{\iota}\sigma\iota\mu\omicron$ ['ktisimo] 'a building' but *laiko* $\chi\tau\acute{\iota}\sigma\iota\mu\omicron$ ['x-tisimo]; *logio* $\kappa\tau\upsilon\pi\acute{\omega}$ [kti'po] 'I knock' but *laiko* $\chi\tau\upsilon\pi\acute{\omega}$ [xti'po]; *logio* $\kappa\tau\acute{\upsilon}\pi\omicron\varsigma$ ['ktipos] 'a knock' but *laiko* $\chi\tau\acute{\upsilon}\pi\omicron\varsigma$ ['xtipos] (PARADIA and MITSIS 2013, 381).

In Mishnaic Hebrew, $\kappa/\text{כ}$ interchanges are common in the environment of פ (e.g., אסכופא for אסקופה [$< \sigma\kappa\omicron\text{פ}\omicron\varsigma$]), the liquid ר (e.g., לבכר for לבקר), a guttural consonant (e.g., עקבת for עכבת), and an emphatic consonant (e.g., טקסיס for טכסיס [$< \tau\acute{\alpha}\xi\iota\varsigma$] and לכתיקה for לקטיקה [$< \text{lectica}$]) (HENSHKE 2010, 430; SHARVIT 2016, 116, 118–20, 125–26, 133, 137–38). Curiously, these environments apply to both transcription variants: in ουωρεκ , $\chi > \kappa$ is in the environment of /r/,²²² and in λακταλ , $\chi > \kappa$ is in the environment of an emphatic. It is not entirely clear why these environments might condition $\kappa > \text{כ}$ or $\text{כ} > \kappa$, but it may be due to the fact that the distinction between emphatic and non-emphatic can become blurred in the environment of consonants associated with rounding or emphasis (e.g., labials, /r/, pharyngeals).

In sum, the evidence regarding a potential spirantized pronunciation of /k/ at the time of the Secunda is inconclusive. One may argue, depending on one's view of the relationship between Secunda Hebrew, Tiberian Hebrew, and Babylonian Hebrew, that the transcription λαμαλχη indicates that the post-vocalic spirantization of /k/ had already occurred in a common Hebrew ancestor. On the other hand, the transcription ουωρεκ seems to reflect a non-fricative realization of post-vocalic /k/. The variant spelling ($\chi > \kappa$), however, is susceptible to phonetic explanations whether a spirantized allophone of /k/ is posited for the Secunda or not. Accordingly, it is consistent with contemporary Greek and Hebrew evidence to posit a realization of syllable-initial /k/ as [k^h] and post-vocalic /k/ as [x] or [χ] in the Secunda.²²³

222. See also χορσελαῖ , in which $\kappa > \chi$ before ρ (see 6.3.2).

223. It may be preferable to posit [χ] since a uvular realization is more likely for post-vocalic /g/ due to the apparent lowering of vowels in θαμωγ (* $< \text{tāmūg}$).

6.3.1.7. Concluding Remarks

It should be noted, first of all, that there is not enough evidence to determine with certainty whether or not the כפ"ת בג"ד consonants had post-vocalic spirantized allophones in Secunda Hebrew. Nevertheless, assuming that the Hebrew reading tradition reflected in the transcriptions is not an outlier in the trends of the history of the language, we may conclude that the evidence of the Secunda transcriptions and contemporary Hebrew *is consistent with* positing post-vocalic fricative allophones for the Hebrew stops.

Another important point that has emerged from this discussion is that fricativization did not necessarily change the place of articulation immediately. For example, spirantized כ was likely first realized as a bilabial fricative [β] before it shifted to a labio-dental fricative [v]. Similarly, /d/ and /t/ probably developed fricative allophones in the same places of articulation before they shifted to interdental in modern reading traditions. Even as late as Tiberian Hebrew, ט and נ have the same places of articulation as their plosive counter parts ט and נ, respectively (KHAN 2013a, 87, 93).

6.3.2. Sibilants (/s/, /š/, /ś/, /z/)

Standard Biblical Hebrew originally distinguished three non-emphatic sibilants and a lateral fricative: a voiceless sibilant fricative /s/ [s] = ס,²²⁴ a voiced sibilant fricative /z/ [z] = ז,²²⁵ a voiceless palato-alveolar sibilant /š/ [ʃ] = ש,²²⁶ and a voiceless lateral fricative /ś/ [ɬ] = שׁ. Interchanges of ס/שׁ in Late Biblical Hebrew, the Judaean Desert texts, and Mishnaic Hebrew show that /s/ and /ś/ had merged to [s] by the Second Temple period in most Hebrew traditions (REDSBURG 2013a, 102; MOR 2015, 97–105; SHARVIT 2016, 181). The resulting consonant-phoneme correspondences (/s/ = שׁ, ס; /z/ = ז; /š/ = ש) are as in Tiberian. Unlike the other

224. The sibilants /s/ (= ס) and /z/ (= ז) are reflexes of the original Proto-Semitic affricates /ts/ and /dz/. However, these affricates were likely simplified to the sibilant fricatives [s] and [z] in ancient Hebrew.

225. See previous note.

226. Hebrew /š/ is the result of the shift of */s/ [s] > /š/ [ʃ] and the merger of */t/ [θ], /š/ [ʃ] > /š/ [ʃ]. While other Hebrew dialects likely maintained /t/, in Standard Biblical Hebrew /t/ > /š/ (REDSBURG 2013a, 102).

reading traditions, Samaritan Hebrew /š/ [ʃ] shifted to /š/ [ʃ] rather than /s/ [s] (FLORENTIN 2013, 446).

6.3.2.1. Voiceless Sibilant Fricatives: /s/, /š/, /ʃ/ = σ

In the Secunda, each of the voiceless sibilant fricatives is represented with σ:

αωσιμ	/ha(h)-ħōsīm/	[haħo:sī:(m)]	'who take refuge'	Ps. 18:31
βσεθρ	/b-setr/	[b(ɪ)stθɾ]	'in the hiding place of'	Ps. 31:21
σαμου	/šōmhū/	[sɔ:mħu:]	'they rejoiced'	Ps. 35:15
σαμ	/šōm/	[sɔ:(m)]	'is placing'	Ps. 46:9
μωσī	/mōšīʔ/	[mo:ʃi:ʔ]	'savior'	Ps. 18:42
λαμασαλ	/l-mōšāl/	[lamɔ:ʃɔ:l]	'to a proverb'	Ps. 49:5

In the Koine Greek of Roman period Palestine, the grapheme σ represented [s]. Before a voiced consonant, it was prone to represent a voiced allophone [z], sometimes represented with ζ (4.5.3.1.34). It is presumed that, just as in Modern Greek, ancient Greek /s/ was pronounced with the tip or dorsum of the tongue nearing the alveolar ridge but not closing completely so that air could pass through (PETROUNIAS 2007b, 562–63). In IPA terms, this may be regarded as a voiceless laminal sibilant [s̪] or a voiceless apico-alveolar sibilant [s̟]. It should be noted that this sound approaches the voiceless palato-alveolar sibilant [ʃ]. Accordingly, because Greek had no other voiceless sibilants, σ was the most appropriate grapheme to render both [s] and [ʃ]. In transcription, Latin /s/ and Semitic /s/ and /š/ are represented by σ (5.3.6). Voiced allophones of /s/ are occasionally transcribed by ζ. In Greek loanwords in the Mishnah, Greek σ is normally rendered by Hebrew ס, but its voiced allophone may be rendered by ט in Hebrew (5.4.3.1.5). There is at least one example of the voicing of /s/ in the Secunda (see YUDITSKY 2017, 81):

βεεζδαχ	/b-ħesdɔk/	[bɪħɪzdɔ:χ]	'in your mercy'	Ps. 31:8
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Presumably, this indicates that Hebrew /s/ tended to assimilate in voice to the following consonant and that Hebrew /s/ and /z/ had identical places of articulation, differing only in voice.

A peculiar characteristic of sibilants in the Secunda is that they seem to bring about the raising (and perhaps fronting) of adjacent vowels (YUDITSKY 2017, 92–95):

$e > i / _C_{[+sibilant]}:$

σμου	/šmʕū/ > /šemʕū/	[ʃimʕu:]	'listen!'	Ps. 49:2
νισβαθ	/nešbaʕt/	[niʃbaʕt ^h]	'you swore'	Ps. 89:50

$a > e / _C_{[+sibilant]}:$

βεσαυει ²²⁷	/b-šaw(w)ʕī/	[biʃawʕi:]	'when I cried'	Ps. 31:23
λαμεσφατι	/l-mašpōʕī/	[lamɪʃp ^h ɔ:tʔi:]	'to my judgment'	Ps. 35:23

$a > i / _C_{[+sibilant]}:$

χισους ²²⁸	/k-sūs/	[k ^h isu:s]	'like a horse'	Ps. 32:9
μισγαβ	/mašgōb/	[misgɔ:β]	'a fortress'	Ps. 46:8

Different patterns and morphological variants have been invoked to explain some of these forms, but the evidence for vowel raising in the environment of a sibilant is compelling (YUDITSKY 2017, 92–95). Vowel raising near a sibilant is also attested in Jerome (e.g., *messa* מֵשָׁא [HARVIAINEN 1977, 169]), Mishnaic Hebrew, and even Tiberian Hebrew (e.g., מִשְׁכָּח מִן הַיָּד (92)). In the Neo-Aramaic dialect of Barwar, the vowel /ə/ is realized especially high when followed by a sibilant: e.g., /məšxa/ [miʃxæ] ~ [miʃxæ] 'oil' (KHAN 2008b, 77).

This phenomenon does not necessarily constitute a sound change. In a linguistic-perceptual study of fricative-vowel coarticulation, YENI-KOMSHIAN and SOLI have shown that high vowels are more easily identifiable in the environment of [s] and [ʃ].²²⁹ Because of certain coarticulatory qualities of a fricative sibilant, which associate it with qualities of high vowels (e.g., similar degree of sonority), [a] is often misidentified as a high vowel near [s] and [ʃ] (1981).²³⁰ Another likely factor is the lack of voice of the sibilant. It is possible, then, that these transcriptions do not reflect an actual sound change but merely a linguistic-perceptual phenomenon (e.g., μισβιθ /mašbīt/ [miʃbi:θ], but cf. **μαγδύλιμ /ham-magdīlīm/

227. Note that the normal vowel on the preposition /b-/ is [a]: βα- (see YUDITSKY 2017, 224–29).

228. Note that the normal vowel on the preposition /k-/ is [a]: χα- (see YUDITSKY 2017, 224–29).

229. With the exception of the sequence [ʃi], for reasons given in YENI-KOMSHIAN and SOLI (1981, 974).

230. The relationship between high vowels and the palato-alveolar sibilant is also illustrated by the Greek transcriptions Μωυσης (for מֹשֶׁה) and συμα (שִׁמְעִי) (see BAR-ASHER 2010), in which the adjacent high vowel υ is likely added to approximate the palato-alveolar realization of שִׁ.

[ham:aɰdi:li:m]). The perceptual element becomes all the more significant when we consider that the same phenomenon occurs in Greek. In the environment of σ, raised allophones of vowels may occur (see 4.5.3.1.5–8; 4.5.3.1.12). This may demonstrate that the place and manner of articulation of Greek and Hebrew sibilants were similar.

Sibilants may also cause the deletion of adjacent vowels (YUDITSKY 2017, 61–62):

σφτηνι*	/šptēnī?/	[ʃəftʰe:ni:]	'judge me!'	Ps. 35:24
μσ'χνη	/mašknē/	[miʃkʰne:]	'the dwellings of'	Ps. 46:5
φσαμ	/peš'am(m)/	[pʰɪʃã(m)]	'their transgression'	Ps. 89:33
σφωθαῖ	/špōtay(y)/	[sʰo:θaj]/[sɪʰ(?)o:θaj]	'my lips'	Ps. 89:35

In Palestinian Koine, vowel deletion is also attested in at least one instance before a consonant cluster beginning with a sibilant (4.5.3.1.20). The nature of sibilants in both Greek and Hebrew may have been such that they were perceived as inherently vocalic as well. The study of YENI-KOMSHIAN and SOLI (1981) cited above may support this point. Additionally, in a separate perceptual study, YENI-KOMSHIAN and SOLI have shown that when a fricative is excised from a fricative-vowel sequence, the high vowels [i] and [u], but not the low vowel [a] can be identified *in the fricative itself* apart from the following vowel (1982). Cross-linguistically, the duration of sibilants is generally longer than that of other consonants (BLEVINS 2004; DMITRIEVA 2012, 20). It is consistent cross-linguistically, then, to suggest that the scribe identified both the sibilant fricative and the accompanying high vowel in the grapheme σ.²³¹

Finally, there may be evidence for lip rounding with /š/ in the following transcription:

μοσαυε	/mšawwē/	[mʊʃaw:ɛ:]	'making meet'	Ps. 18:34
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While the rounding is typically, and rightly, attributed to assimilation to the bilabial /m/ (YUDITSKY 2017, 91), it is curious that such rounding is not attested in other *pi^{el}* participles (e.g., μαλαμμεδ, λαμανασση, etc.). A few transcriptions of names in the LXX may actually indicate that such rounding was *partly* due to the /š/: e.g., μοσφαθαιμ מֹשֶׁפֶּתַיִם (Judg. 5:16), Μοσωβαβ

231. YUDITSKY suggests that short /i/ or /e/ was regarded as part of the frication (2017, 62). A similar example of this may be found in the Leningrad Codex of Psalm 45:3: מֹשֶׁפֶּתַיִם (cf. Aleppo מֹשֶׁפֶּתַיִם) (BLAPP 2016).

(I Chr. 4:34), and Συχεμ מִשֶׁחֶם (Gen. 12:6) (see also KNOBLOCH 1995, 459–60). If such a distribution is not merely a statistical coincidence, it may indicate that Hebrew /š/ was pronounced with some coarticulatory lip rounding similar to the English or French pronunciation of /ʃ/ (see LADEFOGED and MADDIESON 1996, 148). On the other hand, [a] > [o] may be facilitated by regressive assimilation due to the following /w/.

In sum, the representation of /s/ and /š/ by σ (and the voiced allophone of /s/ by ζ) points to a voiceless fricative sibilant [s] realization of /s/ and /š/ in the Secunda. The place of articulation was probably alveolar as in Tiberian (KHAN 2013a, 90, 93). It is theoretically possible, though less likely,²³² that /š/ merged with /š/ in Secunda Hebrew as it did in Samaritan Hebrew. The representation of /š/ by σ in the Secunda is consistent with its expected realization as a palato-alveolar fricative [ʃ]. The raising of vowels in the environment of the sibilants evidenced in the Secunda is attested both in contemporary Hebrew and Greek. Modern linguistic study suggests that this may be a phonetic-perceptual phenomenon.

6.3.2.2. Voiced Sibilant Fricative: /z/ = ζ

In the Secunda, Hebrew /z/ is regularly represented with Greek ζ:

μαζμωρ	/mazmōr/	[mazmoːR]	'a psalm'	Ps. 29:1
οζνι	/ʔoznī/	[ʔʊzniː]	'my ear'	Ps. 49:5
ζαναθ	/zōnaht/	[zoːnahtʰ]	'you rejected'	Ps. 89:39

In Palestinian Koine, the grapheme ζ represented [z]. Though it had represented [sd]/[zd] at an earlier stage in its history, by the Roman period it had already shifted from [zd] > [zz] > [z] (4.5.3.1.34). Before a voiceless consonant, it was prone to represent a voiceless allophone [s], sometimes represented by σ (4.5.3.1.34). Greek /z/ probably had the same place of articulation as /s/, namely, the tip or dorsum of the tongue nearing the alveolar ridge but not closing completely so that air can pass through (PETROUNIAS 2007b, 562–63). In IPA terms, this may be described as a voiced laminal sibilant [z̥] or voiced apico-alveolar sibilant [z̪]. In transcrip-

232. Note that in a Jerusalem inscription from the Second Temple period the Hebrew name מִשֶׁחֶם is written with a ס, thus indicating the merger of /š/ and /s/ and not /š/ and /s/: סרה (CIIP I/1, no. 201).

tion, Semitic /z/ is represented by Greek ζ (5.3.6). In Greek loanwords in the Mishnah, ζ is rendered by ʔ in Hebrew (5.4.1.3.5). The Secunda attests to one instance of devoicing of ʔ (see YUDITSKY 2017, 81):

νεγρεσθι	/negraztī/	[nɪʁæstʰi:]	'I was cut off'	Ps. 31:23
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Presumably, this indicates that Hebrew /z/ tended to assimilate in voice to the following consonant and that Hebrew /z/ and /s/ had identical places of articulation, differing only in voice. On the other hand, an interchange of ζ and σ in a Secunda quotation in Eusebius, μασμωρα מִמֶּמֶר (Ps. 9:1), is explained on the basis of Greek orthography. Because Greek σ before a voiced consonant was pronounced as [z] (e.g., κοσμος ['kozmos]) (4.5.3.1.34), the σ instead of ζ in μασμωρα is simply a Greek orthographic variant for representing [z].

The aforementioned transcription also provides a potential example of assimilation of the vowel to the sibilant (νεγρεσθι נִגְרַעְתִּי, but cf. νεμσαλ נִמְשַׁל) (see above 6.3.2.1). It is also probable that the vowel has been raised in the environment of the sibilant /z/ in the following transcriptions (cf. YUDITSKY 2017, 94–95):

ουναζερθι	/w-naʒzartī/	[(ʔ)unaʒzærtʰi:]	'and I was helped'	Ps. 28:7
ουαϊαλεζ	/way-yaʒloz/	[waj:aʒlɔz]/[waj:aʒlɪz]	'and it rejoiced'	Ps. 28:7
ιεζεβου	/yeʒzbū/	[jɪʒzəβu:]	'they will abandon'	Ps. 89:31

The voiced sibilant ζ does not bring about vowel raising in Greek. Therefore, the fact that vowel raising may occur in the environment of /z/ in Hebrew further supports the likelihood that this is a feature of Hebrew and not merely an element of the Greek accent of the scribe. Vowel raising in the environment of /z/ is also attested in Jerome (HARVIAINEN 1977, 62).

In sum, the consistent representation of /z/ by ζ in the Secunda supports the expected realization of a voiced fricative alveolar sibilant [z]. Devoicing of ζ before an unvoiced consonant (represented by σ) suggests a similar place of articulation as that of Hebrew /s/.

6.3.3. Emphatic Consonants (/q/, /t̤/, /s̤/)

It is generally accepted that the so-called "emphatic" consonants in Semitic were originally realized as glottalics (i.e., ejectives) (KOGAN 2011, 59–61). With respect to /s̤/, there is consid-

erable evidence that it was originally an affricate ([tʰ]) both in Proto-Semitic and in Hebrew (STEINER 1982, 11–40; KOGAN 2011, 61–71). This yields the following original realizations for the Hebrew emphatics: /q/ [kʰ], /t/ [tʰ], /s/ [sʰ]. In Tiberian Hebrew, however, the emphatics /t/ and /s/ were velarized (or pharyngealized) and /q/ was realized as a uvular or post-velar as in Arabic: /q/ [q], /t/ [tʰ], /s/ [sʰ] (KHAN 2013a, 89, 91–92). It is not clear when the Hebrew "emphatic" consonants shifted from glottalic to velarized/pharyngealized consonants (and from a velar to a post-velar/uvular in the case of /q/), though some scholars have suggested that the emphatics were velarized/pharyngealized already at the time of the Secunda (e.g., YUDITSKY 2017, 24–25). A possible clue for reconstructing the realization of the emphatics in the Hebrew of the Secunda is the behavior of vowels in the environment of the emphatics (see below). While pharyngealized consonants (and uvular [q]) are prone to lower vowels as in Arabic, ejective consonants should have no such effect as in Amharic.²³³

6.3.3.1. Emphatic Velar Stop: /q/ = κ

In the Secunda, Hebrew /q/ is represented with Greek κ:

κωλ	/qōl/	[kʰo:l]	'all'	Ps. 28:6
σαδδικιμ	/šaddīqīm/	[tsʰad:i:kʰi:(m)]	'righteous ones'	Ps. 32:11
(ou)ῥκραηνι	/hū yeqrōʔēnī/	[hu: jikʰrō:ʔe:ni:]	'he will call me'	Ps. 89:27

At the time of the Secunda, Greek κ represented the unaspirated voiceless velar stop [k]. It was distinguished from Greek χ, which represented the aspirated voiceless velar stop [kʰ] (4.5.3.1.35). Before voiced consonants and after nasals, κ was prone to assimilate and represent [g] (4.5.3.1.36). In transcription, κ is used to transcribe the /k/ phoneme only in Latin, whereas Semitic /k/ is transcribed by χ. Emphatic /q/ (or /k/) in Semitic is transcribed by Greek κ. These three facts are best explained by positing an unaspirated feature both of Latin /k/ ([k]) and the Semitic emphatic /q/ (or /k/), on one hand, and an aspirated feature of the

233. Note that the emphatics do not lower adjacent vowels in the Tiberian vocalization system. In my view, this is because the vocalization tradition is older than the velarized/pharyngealized realization of the emphatics, which likely entered the Tiberian pronunciation of Hebrew as a result of residence in an Arabophone area (see 6.3.3.4). Presumably, at least from the perspective of acoustic phonetics, the Tiberian emphatics probably did lower adjacent vowels to some degree even though it is not indicated in the *niqqud*.

regular Semitic voiceless velar stop /k/ ([k^h]) on the other. In Greek loanwords in the Mishnah, Greek κ is rendered by ק in Hebrew (5.4.1.3.1). Because both glottalic and pharyngealized emphatic stops in Semitic lacked aspiration, they were associated with the unaspirated Greek series (AL-JALLAD 2015, 13). Representing ק with κ only indicates that ק was distinct from כ, being either glottalic or pharyngealized, but it does not determine between the two.

The primary evidence for a glottalic realization of ק in the Secunda is its effect on adjacent vowels, which may raise near /q/ (or become more front) (YUDITSKY 2017, 96):²³⁴

κεσθ ²³⁵	/qašt/	[kʔɪʃtʰ/kʔæʃtʰ]	'a bow'	Ps. 18:35
σεκκι	/śaq(q)/; /śaqqī/	[sækʔ]; [sækʔ:i:]	'sackcloth'; 'my sackcloth'	Ps. 30:12; 35:13
ρεκ	/raq(q)/	[rækʔ]	'only'	Ps. 32:6
βεκορβ ²³⁶	/b-qorb/	[bɪkʔʊrb]	'in the midst of'	Ps. 36:2
κερου	/qōrʔū/	[kʔɛ:rʔu:]?	'they called'	Ps. 49:12
λαβεκρ ²³⁷	/lab-boqr/	[lab:əkʔɾ]	'at the morning'	Ps. 49:15
βεκοδοσι ²³⁸	/b-qodšī/	[bɪkʔʊðʃi:]	'in my holiness'	Ps. 89:36

Vowel raising in the environment of /q/ supports a velar rather than uvular "pharyngealized" realization of /q/. Cross-linguistically, in the environment of velars, back vowels tend to be fronted and low front vowels (e.g., [æ] and [ɛ]) tend to be raised (HILLENBRAND and CLARK 2001, 754). In the environment of uvular consonants, on the other hand, vowels tend to be lowered as in Arabic (BROSELOW 2006, 610). If Hebrew /q/ had already shifted from a glottalic velar stop to a uvular stop [q] as in Tiberian, not only would we not expect vowel raising, but we would expect vowel lowering to be reflected in the transcriptions.

Another relevant piece of evidence occurs in the one interchange of κ > χ = כ < ק:

234. YUDITSKY also cites the verbal prefix י- before κ (as opposed to regular יע-) as an example of a raised allophone of /e/ in the environment of κ (2017, 96).

235. Compare the form κασθ in Psalm 46:10.

236. Note that the normal vowel on the preposition /b-/ is /a/: βα-.

237. Compare the form βοκρ in Psalm 46:6.

238. See note 32.

This interchange, which presumably reflects an interchange of 𐤑 and 𐤒 in Hebrew, may indicate that 𐤒 and 𐤑 had the same place of articulation, namely, velar. It is also possible that it is merely a scribal error, since χ and κ were similar paleographically (THOMPSON 1966, 154–55). YUDITSKY suggests that χ for κ could be an example of the dissimilation of emphatics (i.e., Geers' law) (2017, 25),²⁴⁰ but this assumes that the sibilant is an emphatic against the attestation of the word in Hebrew (קורסל/קורסל and not קורצל as in Aramaic) and that Geers' law, which refers to Akkadian, also applied to Hebrew (cf. ZEMÁNEK 1996, 51–52).

In Mishnaic Hebrew, the interchange of 𐤑 and 𐤒 is common in the environment of /p/, /t/, emphatics, and gutturals (HENSHKE 2010, 430; SHARVIT 2016, 116). BAR-ASHER points out that the reverse shift of 𐤒 < 𐤑 may occur as a result of the influence of the back vowel /o/ (2015, 1466).²⁴¹ Just as labialization (and thus rounded vowels) is associated with emphasis in modern Semitic languages (KHAN 2013c, 387–88), it may be that the rounded vowel following 𐤒 blurred the distinction between emphatic and non-emphatic and occasioned the interchange. If this is the case, it is curious that labialization only seems to be a feature of 𐤒 and not the other emphatics 𐤕 and 𐤖. Cross-linguistically, when labialization is a secondary coarticulatory feature of ejectives, it usually occurs on velar and uvular ejectives (FORDYCE 1980, 133–34). Labialization in Geʿez, which occurs with the velars, is naturally only found with the velar emphatic (e.g., /k^w/, but cf. /tʰ/ and /ʕʰ/) (LAMB DIN 1978, 4–5). Finally, the inter-

239. Note the Mishnaic Hebrew form קורסל (see KUTSCHER 1974, 63).

240. YUDITSKY argues that the original pattern of this noun is *qutlub and that the form in the Secunda is the result of vowel dissimilation (*qurṣul > qurṣel) (2017, 206). If, however, the Proto-Hebrew pattern was *qatlub, one could explain the vowels in the Secunda as a result of an *a* > *o* shift before /r/ and an *o* > *e* shift in the environment of a sibilant; the former is attested in Mishnaic Hebrew (see below) and the latter is attested elsewhere in the Secunda (see below).

241. For velar/uvular ejective variation in the environment of back vowels in a modern language, see FALLON's work on Proto-Agaw (2009, 15).

change of λ and φ in Mishnaic Hebrew, especially in the environment of liquids (e.g., גלפתרא for קלפתרא) (SHARVIT 2016, 115–16), seems to favor a velar realization of φ [$k^?$].

In sum, the fact that Hebrew /q/ (= κ) is consistently transcribed distinctly from Hebrew /k/ (= χ) indicates that they represent distinct phonemes in Secunda Hebrew. The one occurrence of χ for κ in $\chi\omicron\rho\sigma\epsilon\lambda\alpha\tilde{\iota}$ is difficult to explain phonetically, but it corresponds with similar changes known from Mishnaic Hebrew. While κ for φ would fit either a glottalic or pharyngeal hypothesis, vowel raising (and not lowering) in the environment of φ seems to favor a non-pharyngealized and thus glottalic realization of /q/ in the Secunda ([$k^?$]).

6.3.3.2. Emphatic Dental Stop: /t̥/ = τ

In the Secunda, Hebrew /t̥/ is represented with Greek τ :

ταμνου	/t̥ɔmnū/	[t̥ɔ:mnu:]	'they hid'	Ps. 31:5
φαλητ	/pallē̃t̥/	[p̥ʰal:e:t̥ʔ]	'deliverance'	Ps. 32:7
σουαβωτη	/w-hab-bōtē̃h/	[(?)uhab:o:t̥ʰe:h̃]	'and the one who trusts'	Ps. 32:10

At the time of the Secunda, τ represented the unaspirated voiceless alveodental stop [t̥]. It was distinguished from Greek θ , which represented the aspirated voiceless alveodental stop [t̥ʰ] (4.5.3.1.30). After nasals, τ was prone to represent the voiced alveodental [d] (4.5.3.1.26). In transcription, Greek τ is used to transcribe the /t̥/ phoneme only in Latin, whereas Semitic /t̥/ is always transcribed by θ . Moreover, emphatic /t̥/ in Semitic is always transcribed by Greek τ . Like the other emphatic stop, these facts are best explained by positing an unaspirated feature both of Latin /t̥/ ([t̥]) and Semitic emphatic /t̥/, on one hand, and an aspirated feature of the regular Semitic voiceless dental stop /t/ on the other. In Greek loanwords in Mishnaic Hebrew, Greek τ is rendered by υ in Hebrew (5.4.1.3.1).

There is one instance in which an /e/ vowel lowers to /a/ in the environment of /t̥/ (or, the etymological */a/ vowel is preserved in the environment of /t̥/):

αττε	/ʔet̥t̥ē/ or /ʔatt̥t̥ē/	[ʔat̥ʰ:ɛ:]	'I will incline'	Ps. 49:5
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YUDITSKY suggests that such lowering may be explained by assuming a pharyngealized pronunciation of /t̥/ ([t̥ʰ]) (2017, 25, 57, 95). However, the fact that etymological */a/ was not

preserved in the imperative form (cf. $\epsilon\tau\tau\eta$ /hetṭē/ [hɪtʰe:] 'incline!' [Ps. 31:3]) calls into question such an interpretation. Also, Interestingly, there are no examples of interchanges between υ and η in Mishnaic Hebrew (HENSKE 2010, 438–40; SHARVIT 2016, 151–52).

In sum, the fact that Hebrew /t/ (= τ) is consistently transcribed distinctly from Hebrew /t/ (= θ) indicates that they represent distinct phonemes in Secunda Hebrew, with the lack of aspiration of Hebrew /t/ indicating either a glottalic or pharyngealized realization. One example of vowel lowering before /t/ would favor a pharyngealized realization of /t/ ([tʰ]) in the Secunda, but the evidence for "lowering" near /t/ is contradicted by a counterexample; further, there are other reasons for positing a glottalic realization ([tʰ]) (see 6.3.3.4).

6.3.3.3. Emphatic Affricate/Sibilant: /ʃ/ = σ

In the Secunda, Hebrew /ʃ/ is represented with Greek σ :

$\alpha\rho\upsilon\varsigma$	/ʔōrūs/	[ʔo:RU:ʔʰ]	'I will run'	Ps. 18:30
$\nu\omicron\sigma\eta\rho$	/nōṣēr/	[no:ʔʰe:R]	'keeping'	Ps. 31:24
$\sigma\alpha\beta\alpha\omega\theta$	/šbʔōt/	[ʔʰaβo:ʔo:θ]	'hosts'	Ps. 46:8

At the time of the Secunda, σ represented /s/ ([s] or [sʰ]) in general and [z] before voiced allophones. It caused vowel raising and sometimes deletion (for a fuller discussion of Greek σ at the time of the Secunda, see 6.3.2.1). In transcription, Semitic emphatic /ʃ/ is usually transcribed by Greek σ . There is one instance in which emphatic /ʃ/ in Akkadian is transcribed by ζ ($\zeta\alpha[\rho\alpha\rho]$ *šarār*). STEINER (1982), who investigates remnants of the affricated *šade* in the Semitic languages, has shown that the emphatic affricate in Semitic is represented in Greek by σ , τ , or $\sigma\tau$ in Hebrew (40–42), τ (e.g., $\alpha\tau\iota\rho$ *ḥašīr*), $\sigma\tau$, or σ in Punic (60–65) (see also 5.3.5.3),²⁴² and τ in Ethio-Semitic (82). In later Arabic documents, after Arabic /ʃ/ had shifted from an affricate to a pharyngealized sibilant, /ʃ/ is regularly represented by σ (AL-JALLAD forthcoming, 20). As far as transcription conventions go, Greek σ could have represented either [ʔʰ] or [sʰ]. In Greek loanwords in the Mishnah, Greek σ is perceived as emphat-

242. There is also one instance of Phoenician /ʃ/ transcribed with ξ (STEINER 1982, 69).

ic and transcribed by ʒ (not ɔ) when it precedes τρ , due to the influence of $/r/$ (HEIJMANS, 2013, 254–55), but this phenomenon is more common in the Babylonian branch (5.4.1.3.5).

The evidence for vowel lowering and raising in the environment of $/ʃ/$ in the Secunda is mixed. In one instance, an $/e/$ vowel is realized as $[a]$ in the environment of $/ʃ/$ (rather, the etymological $*/a/$ vowel is preserved in the environment of $/ʃ/$):

ασμιθημ* $/ʔaʃmītēm/$ or $/ʔeʃmītēm/$ $[ʔatsʰmi:θe:m]$ 'I will destroy them' Ps. 18:41

YUDITSKY believes that the $[a]$ vowel is the result of the influence of the pharyngealized emphatic consonant $/ʃ/$. He also compares the example $\alpha\sigma\lambda\iota\alpha\nu\nu\alpha$ in Origen's commentary on Matthew (2017, 25, 57, 95).²⁴³ On the other hand, just as was the case with $\alpha\tau\tau\epsilon$ and $\epsilon\tau\tau\eta$ in the Ambrosiana palimpsest, no lowering occurs in the *hif'il* prefix of the imperative form before $/ʃ/$ (e.g., $\epsilon\sigma\iota\lambda\eta\nu\iota$ $/heʃʃilēnī/$ $[hɪtsʰi:le:ni:]$ 'rescue me!' [Ps. 31:3]). Moreover, there is one example of vowel raising before $/ʃ/$ (YUDITSKY 2017, 92–95):

σερουφα $/ʃrūp̄ə/$ $[ʃʰʁu:ʔə:]$ 'refined' Ps. 18:31

YUDITSKY sets this example against the wider backdrop of vowel raising in the environment of sibilants attested both in the Secunda and Jerome (HARVIAINEN 1977, 58–66; YUDITSKY 2017, 94; see also 6.3.2.1). Alternatively, Greek ϵ may represent a centralized "*shewa*" vowel away from the stress (4.5.3.1.12). In external sources, $/a/$ (or $/e/$) is once raised to $[i]$ before $/ʃ/$ in an environment where it could not represent a *shewa* vowel: $\sigma\upsilon\mu\epsilon\mu\iota\sigma\rho\alpha\iota\mu$ וְמִצְוֹתַי (Hos. 11:1) (YUDITSKY 2017, 93). In another place, no vowel at all is represented before $/ʃ/$ (61–62):

$\sigma\upsilon\mu\sigma\omega\theta\alpha\acute{\iota}$ $/w-maʃwōtay(y)/$ $[ʔum(i)ʃʰ(w)o:θaj]$ 'and my commandments' Ps. 89:32

Short $/e/$ or $/i/$ were perceived as part of the hissing of the sibilant and thus not indicated in transcription (YUDITSKY 2017, 61–62; 6.3.2.1); alternatively, syncope applied (6.5.1.5.1).

Finally, further evidence for the realization of $/ʃ/$ is provided two or three centuries later in Jerome. In one place, he describes *ʃade* as a sound which "our ears thoroughly

243. There is a variant reading: K1 has ΑΣΛΙΑΝΝΑ but M and H have $\alpha\sigma\alpha\acute{\iota}\ \acute{\alpha}\nu\nu\alpha$ (KLOSTERMAN 1935, 541).

dread"²⁴⁴ (GRAVES 2007, 28). Elsewhere, he describes its pronunciation as "between *z* and *s* ... it is shrill (*stridulus*), and with the teeth clenched (*strictis dentibus*) it is barely articulated by pressing the tongue [against them]"²⁴⁵ (STEINER 1982, 43–44). The word Jerome uses to describe the sound of /s/ (*stridulus*) is used elsewhere in Latin to describe the notes a war trumpet strikes out²⁴⁶ or a whizzing saw.²⁴⁷ Note also Jerome's translation of τρίζει τοὺς ὀδόντας αὐτοῦ 'he is grinding his teeth' (Mk. 9:18) as *stridet dentibus* in the Vulgate. The real clue to the nature of the sound that Jerome's ears "thoroughly dread," however, is found in the phrase *strictis dentibus* in the passage above. This precise phrase is perhaps used only a couple times²⁴⁸ elsewhere in all of Jerome's writings, one of which is as follows (Letter to Damasus):

In sum, just as we in the Latin language also have some interjections, so that in exulting we say '*ua*' and in being amazed '*papae*' and in grieving '*heu*', when we want to command silence, with clenched teeth (*strictis dentibus*) we restrict and confine breath to utter the sound '*st*' ...²⁴⁹

The social context (shushing someone), restriction of breath, clenched teeth, and the identification of the sound with *st* seem to indicate an interjection similar to the "dental click" sound Arabic speakers might make to answer in the negative or the *tsk! tsk!* sound an English speaker might make to convey the meaning, "what a shame!" (see KIRCH 1979, 422). It seems more likely, then, that Jerome's description of *ṣade* indicates an affricate [tsʔ].²⁵⁰

244. *quam aures nostrae pentius reformidant.*

245. *inter z et s ... est enim stridulus et strictis dentibus uix linguae impressione profertur.*

246. Seneca (*Oedipus*, 732–33): *lituusque adunco stridulos cantus elisit aere* 'and the war trumpet with a curve shrill notes strikes into the air'.

247. Marcus Servius Honoratus glosses the phrase *argutae serrae* 'grading saw' as *stridulae* 'shrill' (*Commentary on the Georgics of Vergil*, 1.143).

248. See also *Epistula XXII*, 29: *Non delumbem matronarum salivam delicata secteris, quae nunc strictis dentibus nunc labiis dissolutis balbutientem linguam in dimidiata verba moderantur, rusticum putantes omne quod nascitur.* 'And do not, out of affectation, follow the sickly taste of married ladies who, now pressing their teeth together, now keeping their lips wide apart, speak with a lisp, and purposely clip their words, because they fancy that to pronounce them naturally is a mark of country breeding' (FREMANTLE, LEWIS, and MARTLEY 1893).

249. *Epistula XX*, 5.1.4: *Ad summam, sicuti nos in lingua Latina habemus et interiectiones quasdam, ut in exultando dicamus 'ua' et in admirando 'papae' et in dolendo 'heu' et, quando silentium uolumus imperare, strictis dentibus spiritum coartamus et cogimus in sonandum 'st' ...*

250. While analyzing ancient linguistic perception is by no means a simple task, an ejective affricate, rather than a pharyngealized sibilant, is more likely to "offend" the ears of one whose language has sibilants but no affricates. English speakers learning Arabic have difficulty distinguishing Arabic [sʔ] from [s] without the help

In sum, the fact that Hebrew /š/ is consistently transcribed by σ does not help determine whether it had an ejective or pharyngealized realization. Only transcriptions of /š/ by τ, τι or στ (not before /r/) would remove the ambiguity. Lowering in the environment of /š/ would seem to support a pharyngealized realization ([sʕ]), but it was shown that the evidence for lowering in the environment of /š/ is inconsistent. On the other hand, the fact that /š/ seems to bring about vowel raising would point to an affricate ejective realization ([tʃʔ]), since raising would not accompany a pharyngealized [sʕ]. At the same time, Palestinian Koine Greek is also witness to vowel raising in the environment of σ. Therefore, these phenomena may merely reflect the Greek accent of the scribe. Nevertheless, the descriptions in Jerome's writings, in my opinion, favor an ejective affricate realization of Hebrew /š/ ([tʃʔ]). It is possible that the pronunciation of [sʕ] existed alongside [tʃʔ] in various Hebrew dialects of ancient Palestine, but it makes more sense to posit [sʕ] entering Hebrew at a later period.

In the Hebrew traditions attested in the Middle Ages, /š/ was realized as an affricate in all non-Arabic-speaking areas, stretching geographically from Iran to northern Spain (STEINER 1982, 11). It is probably the case that the pharyngealization of glottalic consonants in Semitic originated in Arabic and was promulgated by the spread of Arabic (ZEMÁNEK 1996, 27). Therefore, it seems best to explain the pharyngealized realization of /š/ ([sʕ]) as a later Hebrew development as a result of contact with Arabic.²⁵¹ Nevertheless, the presence of the vowel α in the prefix of ασμιθημ* remains a difficulty.²⁵²

6.3.3.4. Concluding Remarks

Although the evidence for the realization of /q/, /t/, and /š/ at the time of the Secunda is inconclusive, there are a number of relevant pieces of evidence that argue against hypothesizing

of changes in adjacent vowels (HAYES-HARB and DURHAM 2016). With respect to identifying [sʕ], modern English speakers and ancient Latin speakers would have been in a similar position, having [s] but no pharyngealized consonants in their own language. It is difficult to imagine how a foreign sound, often indistinguishable from one's native [s] without the help of neighboring vowels, would "offend" the ear as Jerome says.

251. Note that potential earlier contact with Arabic is irrelevant, since šād was an affricate ejective in early Arabic as well (AL-JALLAD 2014; forthcoming, 20).

252. However, α also appears in the *hiphil* prefix in ιαγλ* אֵלֵךְ (Ps. 18:29).

a pharyngealized realization of the "emphatic" consonants. First, in the Secunda, there is no general lowering of vowels in the environment of the emphatics. Second, in the Secunda, both /q/ and /š/ occasion the raising of vowels on some occasions. Third, Jerome's description of the realization of /š/ favors an affricate pronunciation of /š/ in at least some Hebrew tradition in the fourth and/or fifth century CE. Fourth, the pharyngealized realization of /q/, /t/ and /š/ in Tiberian Hebrew is best explained as a result of the influence of Arabic. Therefore, the best synthesis of the data from the Secunda and the history of Hebrew points to an ejective (and affricate) realization ([kʔ], [tʔ], [tsʔ]) for the emphatic consonants.

YUDITSKY rejects this claim for two reasons. First, he believes that the glottalic co-articulation of an ejective would be perceived as aspiration in Greek and thus [kʔ] and [tʔ] would have been represented by χ and θ in Greek (2017, 25). However, such a claim runs contrary both to Greek transcription conventions²⁵³ and to the phonetic nature of ejectives.²⁵⁴ In the Jibbali language of Oman, for example, aspiration is actually a significant element that distinguishes the *non-glottalic* voiceless consonants from the glottalic consonants (RUBIN 2014, 27). Second, he attributes the "lowering" in the transcriptions αττε and αςμιθημ* to a pharyngealized realization of /t/ and /š/ (YUDITSKY 2017, 95). While these examples are difficult to explain, the apparent "lowering" in *one morphological category*²⁵⁵ in two out of four instances—if we include external sources, three out of five instances—is hardly enough to overturn the rest of the data. Nevertheless, in light of such apparent lowering, while /q/ only raises vowels, it is worth considering the possibility, though unlikely for Hebrew, that per-

253. Note how Geʿez /š/ is represented by τ (not θ) in Τιαμῶ *šayāmo* (KOGAN 2011, 62). In the earliest attestations of Greek transcription of Arabic, the ejectives are represented with κ and τ (AL-JALLAD 2015).

254. While glottalization is a form of aspiration, it is distinct from the sort of aspiration of the Greek and Hebrew stops that is represented with [h].

255. Note how "lowering" only occurs in the *1cs* forms in the Ambrosiana palimpsest, but it is absent in the imperative. Also, the prefix vowel of *hif'il* is etymological */a/ and is realized as /a/ in the main Hebrew reading traditions. Also, if the "lowering" in the *hif'il* prefix was due to the pharyngealized realization of the emphatics, we would expect it to occur also before pharyngeals, which it does not: e.g., ιεμιδηνι* יְיִמְדֵּן (Ps. 18:34), εεζεκ ρῶρῶ (Ps. 35:2). In external sources, the imperative also has α: αςλιαννα נִצְּלֵנוּ (Ps. 119:25).

haps not all of the emphatic consonants were pharyngealized at the same time or to the same degree.²⁵⁶

Finally, it should be noted that what is suggested here runs contrary to FABER's argument that assimilated forms in the *Dt* stem such as $\text{קָטַף$ 'he justified himself' prove that already in ancient Hebrew the emphatics were pharyngealized, since pharyngealization spreads more than glottalization (FABER 1980, 140–41). However, FALLON, in his comprehensive study of ejectives, cites numerous examples of glottalic assimilation: e.g., Oromo $\text{tʃ}^{\text{h}}\text{ap}^{\text{h}}\text{-ti}$ $[\text{tʃ}^{\text{h}}\text{ap}^{\text{h}}\text{t}^{\text{h}}\text{i}]$ 'it (f.) breaks' and Northwest Caucasian $/\text{t-ʃ}^{\text{h}}\text{ə}^{\text{h}}\text{e}/$ $[\text{t}^{\text{h}}\text{ʃ}^{\text{h}}\text{ə}^{\text{h}}\text{e}]$ 'we made' (2002, 43, 48).

6.3.4. Nasals (/m/, /n/)

In ancient Hebrew, /m/ most likely represented a bilabial nasal [m] and /n/ an alveolar nasal [n]. These are their respective realizations in Tiberian Hebrew (KHAN 2013a, 90).

6.3.4.1. Bilabial Nasal: /m/ = μ

In the Secunda, Hebrew /m/ is normally represented with Greek μ:

μαῖμ	/maym/	[majm]	'waters'	Ps. 32:6
ραββιμ	/rabbīm/	[rab.ĩ:(m)]	'great'	Ps. 89:51
σαλωμ	/šālōm/	[ʃɔ:lo:m]	'peace'	Ps. 35:20

In Palestinian Koine, μ represented a bilabial nasal [m]. In transcription, /m/ in both Latin and Semitic is transcribed by μ (5.3.6). In Greek loanwords in the Mishnah, Greek μ is regularly rendered by מ in Hebrew (5.4.1.3.4). In the Secunda, /m/ is once represented by Greek β:

βσεβωθαμ	/b-šmōtam(m)/	[b(ɪ)ʃəmo:θā(m)]	'by their names'	Ps. 49:12
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YUDITSKY corrects βσεβωθαμ to βσεμωθαμ* (2017, 303), but it is possible that [m] became a fricative in partial assimilation to the preceding sibilant fricative [ʃ] and was realized as [β], represented by β (= [β]) in Greek (see 6.3.1.1). This may be compared to the transcription

256. In the Mehriyōt dialect of Mehri, for example, /k/ has a glottalic initiation, whereas /t/ and /s/ are realized with pharyngeal contraction and tongue retraction (WATSON and BELLEM 2010). In the Mehreyet dialect, on the other hand, each of the emphatics /k/, /t/, and /s/ exhibits a different distribution of showing "ejective tokens." In both dialects, the emphatics tend to be accompanied by pharyngealization (WATSON 2012, 16). If pharyngealization began to occur in Hebrew earlier than suggested, /t/ and /s/ but not /q/ may have been pharyngealized by the time of the Secunda. We could then attribute the raising and fronting of vowels in the environment of /s/ to the influence of the Greek accent of the scribe, since σ brought about raising in Greek also.

Μενιαμι (*CIIP* III, no. 2223) for the Hebrew name בנימין (or מנימין?), exhibiting a shift of /b/ > /m/ word-initially (4.5.3.1.26). Interchanges of ב and מ are also attested in a few words in Mishnaic Hebrew (e.g., ימנה for יבנה) (SHARVIT 2016, 284). Hebrew /m/ is also once represented by Greek λ:

μαλλαχωθ	/mamlōkōt/	[māl:ɔ:χo:θ]	'kingdoms'	Ps. 46:7
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YUDITSKY, regarding assimilation unlikely, corrects it to μαμλαχωθ* (2017, 208), though μ and λ are not especially similar paleographically. Assimilation should not be ruled out. If the nasals were weakened in Greek or Hebrew (6.3.4.3), the following assimilation is conceivable: [mā(m)lɔ:χo:θ] > [mā(n)lɔ:χo:θ] > [māl:ɔ:χo:θ].

6.3.4.2. Alveolar Nasal: /n/ = ν

In the Secunda, Hebrew /n/ is normally represented with Greek ν:

ιαλιν	/yōlīn/	[jɔ:li:n]	'(it) will dwell'	Ps. 30:6
νααρ	/nōhōr/	[nɔ:hɔ:r]	'a river'	Ps. 46:5
ναθαν	/nōtan/	[nɔ:θan]	'he set'	Ps. 46:7

At the time of the Secunda, ν represented an alveolar nasal [n]. In transcription, /n/ (in both Latin and Semitic) is transcribed by ν (5.3.6). In Greek loanwords in the Mishnah, Greek ν is regularly rendered by נ in Hebrew (5.4.1.3.4).

6.3.4.3. Interchanges of μ/ν

There are a number of examples of μ and ν interchanging in the Secunda. Most significantly, word-final /m/ in the Secunda is occasionally represented with ν (see YUDITSKY 2017, 23–24):

θαμμιν	/tōmīm/	[tʰɔ:mĩ:(m)]	'blameless'	Ps. 18:31
θεσθιρην	/testīrēm/	[tʰistʰi:rē:(m)]	'you hide them'	Ps. 31:21
ααμιν	/hō-ʕammīm/	[hɔ:ʕam:ĩ(m)]	'the peoples'	Ps. 49:2
αυωναν	/ʕwōnam(m)/	[ʕawo:nã(m)]	'their iniquity'	Ps. 89:33

In one instance, /#n/ was originally written as μ and then corrected to ν above the line. If originally μηερθ, this would be another example of an *m/n* interchange (YUDITSKY 2017, 24):

μ ^ν ηερθ	/nēʔert/	[ne:ʔirtʰ]	'you abhorred'	Ps. 89:40
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At the time of the Secunda, there is evidence for the weakening (or even loss) of nasals in Greek pronunciation, demonstrated by the omission of μ and ν (especially word-finally) (4.5.3.1.26) and the interchange of μ and ν (4.5.3.1.27) in contemporary Greek orthography. The loss of nasals may have resulted in the nasalization of the preceding vowel. Alternatively, the nasals may have assimilated to a following consonant (GIGNAC 1976, 113–14). In transcription, there are a number of interchanges of μ and ν . Also, a rare transcription of ι for $/n/$ attested in both Latin and Akkadian transcriptions may reflect the weakening of the nasal (5.3.1.3.4; 5.3.2.3.5). In Palestinian epigraphy, the name בנימן (or מנימן?) is once transcribed as Μενιαμι (4.5.3.1.26), reflecting the elision of final $/n\#/$. The transcriptions Σαλω/Σαλων (CIIP I/1, no. 134a, 591) for the proper name שלום/שלון may also attest to this phenomenon.

The occasional interchange of $/m/$ and $/n/$ in the Secunda has been explained as the result of a lack of phonemic distinction of nasals in word-final position as in contemporary Hebrew (see below), dissimilation due to the presence of multiple nasals/sonorants in a given word, or the fact that Greek words tend to end in ν and not μ (YUDITSKY 2017, 23–24). There are a number of examples of this phenomenon in external sources as well.²⁵⁷

A number of parallels to this phenomenon exist in contemporary Hebrew evidence. The interchange of $\eta < \aleph$ in final position is attested in Mishnaic Hebrew, the Dead Sea Scrolls, and the Judaean Desert texts. It most frequently occurs when the masculine plural morpheme ים - is realized as ין - or suffix forms ending in ם - are realized as ן - (i.e., grammatical morphemes): e.g., עומדין (for עומדים). However, it also occurs below the morphological level (i.e., non-grammatical morphemes): e.g., אדן (for אדם). Final η may also be omitted in spelling: e.g., למע (for למען) and יוחנה (for יוחנן). Finally, an originally open final syllable may

257. Examples of $\mu > \nu$ external sources: שמים (Gen. 1:8; Procopius), ἀρχερουβιμ (Gen. 3:24; Heb 400), ציים (Jer. 50:39), and זעם (Ps. 7:12). Finally, in the transcribed list of biblical books from Origen quoted in Eusebius's history, the name of the book of Chronicles is transcribed as Δαβρηιαμειν (in the same list are present Ἐλεαδδεβαρειμ and Σαραθεαλειμ). There is one example of $\nu > \mu$: βεδεμ (Gen. 2:8).

be spelled with a ך instead of a ך: e.g., יודן (for יהודה/יהודה) and למטן (for למטה)²⁵⁸ (QIMRON 1986, 27–28; MOR 2015, 106–15; SHARVIT 2016, 226–28). KUTSCHER argues that the data reflect a realization of both final ך and ך as [n] (1976, 58–68). BEN-HAYYIM, on the other hand, argues that the elision of the final nasal resulted in the nasalization of the vowel (i.e., אדן = [ʔa:ðã:] or [ʔa:ðã:ŋ]) (1958, 210–11). The distribution of ך/ך interchanges in grammatical and non-grammatical morphemes in Mishnaic Hebrew has been treated comprehensively by NAEH.²⁵⁹ With respect to grammatical morphemes in the Judaean Desert texts, MOR has demonstrated that, aside from the dual form,²⁶⁰ the distribution of ך/ך is a scribal phenomenon. With respect to non-grammatical morphemes, the historical spelling is always maintained (NAEH 1992b, 297–306; NAEH 2013, 369–92; MOR 2015, 107–108).

Because the interchange of $\mu > \nu$ occurs in both non-grammatical morphemes (e.g., θαμμν) and grammatical morphemes (e.g., ααμν, αωναν) in the Secunda, it is likely that the variant spellings in the Secunda reflect a phonetic rather than a morphological reality. That is, this orthographic phenomenon likely indicates the weakening of the final nasal and subsequent nasalization of the vowel (i.e., θαμμν *[tɔ:mi:m] > [tɔ:mĩ:(m)]). Although such a change may seem unusual in Semitic, in which root integrity is important, it should be noted that a very similar change also occurs in the Jibbali language of Oman.²⁶¹ The suggestion that

258. When the following word begins with an ך (e.g., למטה מ-, final ך is not replaced by ך (MOR 2015, 112).

259. With respect to non-grammatical morphemes in Mishnaic Hebrew, final ך occurs after low vowels, whereas final ך occurs after high vowels. This points to a final nasalized vowel. With respect to the grammatical morphemes (*mp* endings/suffixes), nominal forms tend to maintain the ך - ending, whereas verbal participles tend to take the ך - ending. For NAEH, this distribution points to morphological change due to the influence of Aramaic and not a nasalized vowel (NAEH 1992b, 297–306; NAEH 2013, 369–92; MOR 2015, 107–108).

260. The dual is always written with ך (e.g., שנים, שנים, שנים). This is likely due to the fact that the dual ending had become lexicalized with the word and was not conceived of as an individual morpheme (MOR 2015, 111).

261. In Jibbali, after a full vowel, final /m#/ and /n#/ often undergo devoicing or are lost. Consequently, the preceding vowel is nasalized. Additionally, the vowel is followed by a "slight aspiration" or "nasal expiration." For example, /sem/ 'poison' is usually pronounced as [sẽ^h]. In verbs, however, the final nasal is usually preserved: e.g., /zəḥám/ 'he came' is pronounced as [zəḥ'ãm] (RUBIN 2014, 37–38).

dissimilation of nasals occurs, based on the transcriptions $\theta\alpha\mu\mu\iota\nu$ and $\alpha\alpha\mu\iota\nu$ (YUDITSKY 2017, 23–24), is unlikely in light of the transcription $\alpha\omega\omega\nu\alpha\nu$.

It is unclear whether this was a general change ($Vm, Vn > \tilde{V} / _ \#$) or limited in its distribution in the Secunda. In Mishnaic Hebrew, it is attested primarily after low vowels, likely due to their higher sonority (see note 54). This distribution does not apply in the Secunda, but all four instances of $\mu\# > \nu\#$ are preceded by a sonorant consonant, which would increase the sonority of the segment. The relatively low frequency of these spelling variants does not necessarily correspond to a low frequency in the actual vocalization (contra YUDITSKY 2017, 24), since writing is usually more conservative than speech. Even though we should not expect the Greek transcriptions to be as conservative as the Hebrew script itself in preserving historical spellings, there does seem to be evidence that the scribe was working from the consonantal text of the Hebrew Bible,²⁶² which likely would have prevented him from making a greater number of errors in transcribing consonants. It is entirely conceivable that a regular change of $Vm, Vn > \tilde{V} / _ \#$ applied in Secunda Hebrew and was only evidenced in a few spelling variants, just as is the case at Qumran (QIMRON 1986, 27–28). Accordingly, $/Vm\#/$ and $/Vn\#/$ are represented in phonetic transcription as $[\tilde{V}(m)]/[\tilde{V}(n)]$ to indicate the sound change while leaving open the possibility (by enclosing m/n in parentheses) of a conservative pronunciation (i.e., final Vm/Vn were pronounced as $[Vm]/[Vn]$) for the biblical reading tradition.

6.3.4.4. Concluding Remarks

The evidence of the Secunda transcriptions and the history of Hebrew is consistent with positing that Hebrew $/m/$ was realized as a bilabial nasal $[m]$ (represented by μ) and Hebrew $/n/$ was realized as an alveolar nasal $[n]$ (represented by ν). Word-finally after a vowel, both $/m/$ and $/n/$ were weakened with the consequent nasalization of the preceding vowel.

262. The reading $\sigma\upsilon\tilde{\iota}\epsilon\delta\alpha\beta\beta\epsilon\rho$ וַיְדַבֵּר (Ps. 18:48) is likely the result of the scribe vocalizing the consonantal text with the Hebrew verb most familiar to him for the consonantal frame of וַיְדַבֵּר.

One final observation worth emphasizing is the parallel between Hebrew and Greek with respect to the weakening of final nasals. Though numerous Hebraists have tied together the various data regarding final nasals in Mishnaic Hebrew, Qumran, Judaeen Hebrew, Aramaic, and the transcriptions, none have turned to the evidence of Koine Greek phonology to suggest that the weakening of final nasals in Hebrew and Aramaic might actually be an areal feature resulting from diffusion from Greek. The close contact of Greek and Hebrew/Aramaic in Palestine during the Second Temple period would certainly support such a hypothesis.

6.3.5. Liquids (/l/, /r/)

Throughout the history of Hebrew, /l/ was probably realized as a voiced lateral [l]. In Tiberian Hebrew, it is realized as an alveolar lateral continuant [l̪] (KHAN 2013a, 90), but there is some evidence for a "dark" velarized [l̠] in the earliest stages of Hebrew (FABER 1989). It is not clear how /r/ was pronounced in ancient Hebrew. Proto-Semitic /r/ is generally reconstructed as a dental resonant (KOGAN 2011, 54). In Tiberian Hebrew, /r/ has two allophonic realizations: a voiced uvular roll [ʀ] (or uvular frictionless continuant [ʀ̥]) and, in the environment of alveolar consonants, an emphatic apico-alveolar roll [r̥] (KHAN 1995; KHAN 2013a, 92–93). Babylonian Hebrew has only one pronunciation of *resh* (apico-alveolar trill [r]), with a more "robust" pronunciation occurring syllable-initially, though apparently they had two realizations of *resh* in their vernacular (KHAN 2013c, 385–86).

6.3.5.1. Alveolar Lateral: /l/ = λ

In the Secunda, Hebrew /l/ is normally represented with Greek λ:²⁶³

αἰλ	/ḥayl/	[ḥajl]	'force'	Ps. 18:40
λανου	/lōnū/	[lō:nu:]	'for us'	Ps. 46:2
φλαγαν	/plōgaw/	[p ^h (a)lō:ʁaw]	'its streams'	Ps. 46:5

At the time of the Secunda, Greek λ represented [l]. Greek λ occasionally interchanges with ρ (4.5.3.1.39), indicating that their places of articulation were similar, probably alveodental, λ

263. There are eight instances in which α (6x) or δ (2x) is transcribed instead of an expected λ. These are likely scribal errors arising from the fact that λ is similar to α and δ in shape.

being a lateral and ρ a trill (PETROUNIAS 2007b, 563–64). In transcription, both Latin /l/ and Semitic /l/ are transcribed by Greek λ (5.3.6). Twice, /l/ is not represented in transcription:

μεσσω > μεσσωλ*	/meš-š(?)ōl/	[mɪfːo:l]	'from Sheol'	Ps. 30:4
μηοδ > μηολδ* ²⁶⁴	/mē-ħold/	[meːħʊ(ɫ)d]	'from the world/lifetime'	Ps. 89:48

These transcriptions are probably scribal errors for μεσσω<λ> and μηο<λ>δ (YUDITSKY 2017, 309–310), but there is precedence in contemporary Greek orthography for the loss of liquids (4.5.3.1.39) or assimilation to a following stop (μηο<λ>δ) or nasal (μεσσω<λ> νεφσι) (GIGNAC 1976, 108). There are also comparable phenomena elsewhere in Semitic.²⁶⁵ There is no reason not to assume an alveolar lateral realization [l] of Hebrew /l/ in the Secunda. The transcription μαλλαχωθ may suggest that /l/ and /n/ had the same place of articulation (6.3.4.1).

6.3.5.2. Uvular Roll: /r/ = ρ

In the Secunda, Hebrew /r/ is normally represented with Greek ρ:

ραμωθ	/rōmōt/	[Rɔːmoːθ]	'lofty'	Ps. 18:28
σιρ	/šīr/	[ʃiːR]	'a song of'	Ps. 30:1
σουρ	/šūr/	[ʊʔuːR]	'the edge of'	Ps. 89:44

At the time of the Secunda, Greek ρ represented an alveolar trill [r]. In transcription, both Latin /r/ and Semitic /r/ are transcribed by Greek ρ. In Greek loanwords in Mishnaic Hebrew, ρ is regularly represented by ר in Hebrew (5.4.1.3.4).

The precise realization of /r/ in the Secunda may be examined on the basis of its effect on vowels. It is common for /r/ to lower an adjacent vowel (YUDITSKY 2017, 89–91):²⁶⁶

ρᾱννη	/ronnē/ /rannē/	[ranːeː]	'shouts of'	Ps. 32:7
ελθαρακ	/ʔal terħaq/	[ʔæ tʰarħakʔ]	'do not be far!'	Ps. 35:22

264. Other Greek translations support reading this as 'from the world' as phonologically transcribed.

265. The loss of final liquids occurs in Jibbali. The word μηοδ might also be compared to a phenomenon in Jibbali, in which /l/ is lost and the preceding vowel rounded, especially in monosyllabic nouns of the pattern *CaCC* (i.e., *#CalC#* > *#CɔC#*): e.g., **/gald/* > [gɔd] (cf. MT גִּלְדָּה) (RUBIN 2014, 35, 37–38). Note also how Proto-Semitic **kalb* is realized in Mehri as /kawb/ (RUBIN 2010, 17).

266. Note that YUDITSKY is not sure if ρᾱννη should be read with α or o (2017, 177). The correct reading is ρᾱννη. Lowering of vowels in the environment of /r/ also occurs in external sources: σῶρ צוּר 'rock' (Isa. 26:4).

αρφου	/harpū/herpū?/	[harp ^h u:]	'be still!'	Ps. 46:11
καρβαμ	/qerbam(m)/	[k ^ʔ arbã(m)]	'within them'	Ps. 49:12
ζεδαρχαμ	/zē derkam(m)/	[zɛː dɪrk ^h ã(m)]	'this is their way'	Ps. 49:14
ζαρω	/zarʕō/	[zarʕo:]	'his seed'	Ps. 89:30
αρφαθ	/ħarpat/	[ħarp ^h aθ]	'the reproach of'	Ps. 89:51
αρημωθ	/hrīmōt/ or /hrēmōt/	[hareːmoːθ]	'you lifted up'	Ps. 89:43

In contemporary Greek orthography, it is also common for vowels to have lower allophones in the environment of ρ (4.5.3.1.9; 4.5.3.1.12). Two transcriptions may be interpreted in such a way so as to indicate that /r/ is responsible for the rounding of an adjacent vowel:

χορσελαῖ	/qorslay(y)/	[k ^h ʊrsɛlaj]	'my ankles'	Ps. 18:37
βεκορβ	/b-qorb/	[bɪk ^ʔ ʊrb]	'in the midst of'	Ps. 36:2

Each example may also be explained as deriving from variant patterns (cf. קִרְסֵל²⁶⁷ in Mishnaic Hebrew and בקורב in the Dead Sea Scrolls).²⁶⁸ The change of $\alpha > o$ is also common in Greek in the environment of liquids (GIGNAC 1976, 288; 4.5.3.1.12).²⁶⁹ The rounding of vowels in the environment of *resh* is attested at Qumran (e.g., וְהִי־וֹרֵדִן) (QIMRON 1986, 39–40), in the western tradition of Mishnaic Hebrew (e.g., קורדום *qordom* for קִרְדֹּם), in Palestinian Aramaic, and in the LXX (e.g., Ἰορδανης for יַרְדֵּן) (KHAN 2013c, 387–88). Hebrew /r/ may also cause the lengthening of $o > \bar{o}$ / $_r\#$ (see YUDITSKY 2017, 67, 120–21):

εσμωρλω	/ʔešmor lō/	[ʔɪmoːr lo:]	'I will keep for him'	Ps. 89:29
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If *resh* was realized as a uvular, it may have been weakened in final position and thus the duration of the vowel was perceived as (or was actually) longer. At Qumran, there is evidence that *resh* has weakened by its omission in spelling, especially in the environment of gutturals (e.g., משע [for מִשְׁעַר], מע־כת [for מַעֲרֶכֶת], and מגש [for מִגְרֵשׁ]) (QIMRON 1986, 26–27). As the

267. The Mishnaic form may demonstrate the same phonetic change: $a > o$ / $_r$ (but cf. the discussion in KUTSCHER [1974, 63]).

268. So argues YUDITSKY, though he appeals to the Syriac form קרצל /qursul/ instead of the Mishnaic form קִרְסֵל. He cites the example of בקורב from Qumran to suggest a *qutl* pattern for βεκορβ (2017, 187–88, 206). For קִרְסֵל, note the attestations in Mishnaic Hebrew: קִרְסֵלִים (Hul. 3:7), קִרְסֵלָה (Bek. 7:6), קִרְסֵל (Ohol. 1:8). The final example has an erased ך. It is not clear which pattern, *qursVl* or *qarsVl*, is more original.

269. $\alpha > o$ also occurs in the Greek of Nabatea and Batanea from the fourth century CE (BUBENIK 2007, 632).

third radical in the *qVtl* pattern, /r/ is the only non-guttural that develops an anaptyctic vowel (cf. YUDITSKY 2017, 79):

ιεθερ	/yetr/	[jiθɪr]	'abundance'	Ps. 31:24
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The helping vowel here is probably due to the fact that the final consonant cluster begins with a minimally-sonorous consonant followed by a highly-sonorous consonant, though it may also reflect a realization of /r/ similar to the gutturals. Also, /r/ is never geminated and exhibits compensatory lengthening in two or three instances (see YUDITSKY 2017, 39–40):²⁷⁰

ουβαρεχ	/w-bōrek/	[(ʔ)uβɔ:ɾɪχ]	'and bless!'	Ps. 28:9
αρισωνιμ	/hō-rīšōnīm/	[hɔ:ɾiʃɔ:nī:(m)]	'the first'	Ps. 89:50
ηρφου	/hērpū/	[hɛ:ɾɸu:]	'reproached'	Ps. 89:52

Compensatory lengthening in the *piel* stem²⁷¹ and the lack of gemination after the definite article²⁷² may point to a guttural-like realization of /r/ in the Secunda. On the other hand, lack of compensatory lengthening is attested in the following transcription (see YUDITSKY 2017, 40):

μερεσθ	/me(r)-rešt/	[mɪɾɪʃtʰ]	'from the net'	Ps. 31:5
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Similar exceptions to compensatory lengthening occur in Tiberian (e.g., מְרִדֶּה, מְרִדֶּה, מְרִדֶּה), Babylonian, and Palestinian (KHAN 2013c, 386–87; YUDITSKY 2017, 40). The word μερεσθ reflects a time gap between the loss of gemination and compensatory lengthening of the vowel; after simplification of gemination, a mora slot was left empty (see KHAN 2013c, 386–87):

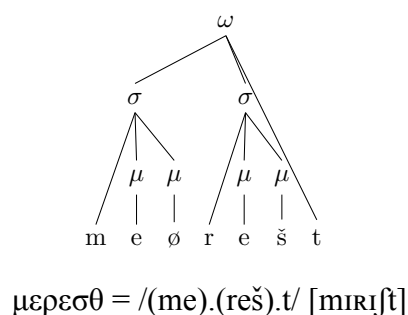


Figure 20: Moraic Representation of μερεσθ

270. Compensatory lengthening also occurs in the external attestation מְרִדֶּה מְרִדֶּה (Ps. 110:3).

271. Cf. the *pi^el* imperative φελλετηνι (Ps. 31:2) and the *pi^el* suffix conjugation ουκεσσεσ (Ps. 46:10).

272. The definite article is geminated 9/10x instances (excluding /r/ for now) when preceding a non-guttural. In the one exception, αἴωμ, the *trema* on the ι may point to gemination. Therefore, the lack of gemination of /r/ in ἀρισωνιμ probably indicates a phonemic reality, indicating that /r/ was treated more like a guttural consonant.

It is also possible that $\mu\epsilon\rho\epsilon\sigma\theta$ reflects an intrusion of the spoken language, which preserved geminated /r/ in some cases, similar to רֶשֶׁרֶשׁ in Song of Songs (5:2).²⁷³ Gemination of *resh* is attested in Mishnaic Hebrew, usually in the eastern tradition. It is likely that *resh* with *dagesh* in medieval manuscripts has roots at a time when Hebrew was still a living language (KHAN 2013d, 502–3). That is, instances of doubled *resh* in medieval manuscripts are not arbitrary, but reflect the preservation of a feature that was characteristic of at least some spoken dialects of Hebrew in which *resh* could still be doubled during the Second Temple period.

In sum, the evidence for the realization of /r/ could be interpreted to support either a uvular realization or an emphatic apico-alveolar realization. An emphatic pronunciation of *resh* is favored by the fact that it frequently lowers adjacent vowels and *may* cause the rounding of adjacent vowels, both of which are effects of emphasis attested in modern Semitic languages (KHAN 2013c, 387–88). However, the lowering of adjacent vowels could also be characteristic of a uvular roll. Moreover, the rounding of vowels is attested not only with /r/ in contemporary Hebrew, but also with the other sonorant consonants.

A uvular pronunciation of *resh* is favored by the fact that /r/ behaves like gutturals in the Secunda transcriptions, with respect to both gemination and epenthetic vowels in the *qVtl* form. If the behavior of *resh* in the Secunda was similar to that at Qumran, the weakening of *resh* in the environment of gutturals (e.g., משער for משַׁעַר 'from the gate of') also seems to support a uvular realization. In BOLOZKY's work on *resh* in Modern Hebrew, in which *resh* is realized as a uvular, he had difficulty distinguishing between the words שַׁעַר 'hour' and שַׁעַר 'gate', because they were both pronounced something like [ʃa:] (2013, 390). However, it should be noted that ʃ is no longer realized as a pharyngeal in modern Hebrew.

It may be that both pronunciations of /r/ go back to the Second Temple period. If we assume that it was phonetic similarity to the gutturals that brought about the degemination of

273. Note also that both of these are examples of what KHAN terms "junctural gemination" rather than "morphological gemination" (2013c, 387)

resh, it may be possible to draw a correlation between various traditions and the pronunciation of /r/. Tiberian Hebrew, in which /r/ is normally realized as a uvular [ʀ] with the emphatic [ʀ̥] as an allophone, would be similar to the western tradition of Mishnaic Hebrew and Palestinian Aramaic, in which the gemination of /r/ is virtually absent. The Babylonian tradition, in which /r/ is normally realized as an apico-alveolar [r], would be similar to the eastern tradition of Mishnaic Hebrew, in which gemination of /r/ is more common. Therefore, while the evidence is inconclusive, it seems more likely that /r/ was a uvular roll [ʀ] in the Secunda. A transcription such as $\mu\epsilon\rho\epsilon\sigma\theta$, just like $\Psi\text{רֵאשִׁי}$ (Song 5:2) in the Bible, may be indicative of linguistic diversity and the influence of spoken language on the reading tradition.

The transcriptions of Jerome may serve as a test case for this theory. When he transcribes *Biblical* Hebrew, *r* is not geminated (see YUDITSKY 2013, 806): e.g., *merehem* מֵרָחֵם. However, in a quotation of the lost Gospel of the Hebrews (or the Hebrew Gospel of Matthew), he indicates that the Hebrew corresponding to Ὡσαννά ἐν τοῖς ὑψίστοις 'Hosanna in the highest!' (Matt. 21:9) is *osianna barrama* (i.e., הוֹשִׁיעָה־נָּא בָּרָמָה) in Latin letters (*Epistula XX*, 5.45). The quotation from the Gospel of the Hebrew with geminated *rr* may reflect a more colloquial pronunciation than the biblical tradition without geminated *rr* in *merehem*.

6.3.6. Gutturals (/ʕ/, /ħ/, /ʁ/, /h/)

At the earliest stage of Hebrew, there were six guttural consonants: a voiced pharyngeal fricative /ʕ/ ([ʕ]), a voiceless pharyngeal fricative /ħ/ ([ħ]), a voiced velar/uvular fricative /ġ/ ([ɣ] or [ʁ]), a voiceless velar/uvular fricative /h/ ([x] or [χ]), a voiceless glottal stop /ʔ/ ([ʔ]), and a voiceless glottal fricative /h/ ([h]). Eventually, /ġ/ and /ħ/ merged with /ʕ/ and /h/, respectively (i.e., /ʕ/, /ġ/ > /ʕ/; /ħ/, /h/ > /h/), though there is evidence that /ħ/ remained distinct at least in some dialects and/or registers in the Second Temple period (see 3.3.2). Another development during the Second Temple period was the weakening of the gutturals, attested in locations such as Qumran, Beth She'an, and Haifa (MOR 2013, 162–65). While the guttural conso-

nants maintained their pronunciation in the Middle Ages in the Tiberian reading tradition, they were largely lost in Samaritan Hebrew.

6.3.6.1. Glottals and Pharyngeals: /ʔ/, /h/, /ħ/, /ħ/ = Ø

In the Secunda, gutturals are not represented directly. Typically, their presence is inferred:

αδαμ	/ʔd̥d̥m/	[ʔɔːð̥ː(m)]	'man'	Ps. 49:3
αφαχθ	/h̥pakt/	[hɔːf̥axtʰ]	'you turned'	Ps. 30:12
εριμ	/herʕīm/	[hɪrʕiː(m)]	'he thundered'	Ps. 29:3
ενναμ	/ħennam(m)/	[ħmːã(m)]	'without a cause'	Ps. 35:19

Their presence may also be indicated by a hiatus between vowels:

αηλ	/h̥-ʔēl/	[hɔːʔeːl]	'the God'	Ps. 18:31
νααρ	/n̥h̥h̥r/	[nɔːh̥ɔːr]	'a river'	Ps. 46:5
φααλθα	/p̥ʕalt̥/	[pʰɔːʕaltʰɔː]	'you made'	Ps. 31:20
αωσιμ	/ha(h)-ħōsīm/	[haħoːsīː(m)]	'those who take refuge'	Ps. 18:31

In Greek transcription, the gutturals (Semitic gutturals and Latin *h*) are usually left unrepresented. Only Semitic /ħ/ and /ġ/ are transcribed on occasion, being represented by χ (or ξ in Akkadian) and γ, respectively (5.3.6). At the same time, both /ħ/ and /ġ/ may be left unrepresented in transcription. Nevertheless, in light of general Hebrew transcription conventions, the fact that neither χ for /ħ/ nor γ for /ġ/ occurs in the Secunda is probably an indication that the following mergers had occurred: /ħ/, /h/ > /h/ and /ġ/, /ʕ/ > /ʕ/.

The gutturals /h/, /ħ/ are twice rendered by ι word-initially (see YUDITSKY 2017, 31):

ιεδι	/ħesdī/	[ħɪsdɪː]	'my mercy'	Ps. 89:34
ιωσια	/h̥ōšīʕ̥/	[h̥oːʕiːʕ̥ɔː]	'save!'	Ps. 28:9

These transcriptions probably reflect an attempt by the scribe to approximate the guttural sound, which was not present in Greek.

Although other contemporary Hebrew traditions show weakening of the gutturals, YUDITSKY has argued quite convincingly that the gutturals were still pronounced in the Secunda and that they were probably realized similar to the gutturals in Tiberian (2008a; 2008b; 2017, 25–32). Therefore, they will be transcribed as [ʔ], [h], [ʕ], and [ħ] in phonetic transcription.

6.3.6.2. A Note on "Furtive" *pataḥ*

There is at least one case of an apparent epenthetic before a final pharyngeal in the Secunda:

χρηε /x-rēʕ/ [k^h(a)re:ʕ] 'like a neighbor' Ps. 35:14

Previous scholars have correctly concluded that "furtive" *pataḥ* does not exist in the Secunda, citing forms such as $\theta\omega\sigma\iota \text{ תוֹשִׁיעַ}$ (Ps. 18:28) and $\alpha\beta\beta\omega\tau\eta \text{ וְהַבֹּטֶה}$ (Ps. 32:10). However, this conclusion leads them to interpret the transcription $\chi\rho\eta\epsilon$ as reflecting כְּרֵעַ rather than כְּרֵעַ as in the MT (BRONNO 1943, 160, 294–95; YUDITSKY 2017, 198). While positing a textual variant may certainly explain the form $\chi\rho\eta\epsilon$, this theory cannot explain the final ϵ in Origen's transcription of the name Joshua (Ιωσουε יהוֹשֻׁעַ [Josh. 1:1]), the form ιαδαε יָדַע (MT יָדַע) (Ps. 92:7), and, if correctly emended, the imperative σμαε* שָׁמַע (MT שָׁמַע) (Ps. 28:6). I would submit, rather, that the ϵ in the forms $\chi\rho\eta\epsilon$, Ιωσουε , ιαδαε , and σμαε is merely the result of a *perceptual* phenomenon with analogues in perception of modern Semitic.

It is not uncommon for students of Arabic to perceive a final high vowel before /ʕ/ as a vowel sequence such as [ia] or [ea]. This is illustrated by a nineteenth-century orientalist grammar of Arabic, notably before modern transliteration conventions, in which final $v_{[+high]}\text{ʕ}$ (but not $v_{[+high]}h$) is transliterated with an additional lower epenthetic vowel: e.g., *baeá* for بائع /bāʔiʕ/ 'a seller', *elbaddháeea* البضائع /el-badāyiʕ/ 'merchandise', but cf. *ráeh* for رايح /rāyiḥ/ (FULTON COMPTON HAYES 1859, 117, 129, 163).²⁷⁴ It is also worth noting that in a study of misperception of Arabic consonants by English speakers, SANKER demonstrated that /ʕ/ was the most common consonant misperceived, and one of the most common misperceptions of it was to identify it as a vowel (usually /a/) (2015, 456).

Acoustic studies of Arabic gutturals have shown that *at the transitional boundary* between a vowel and /ʕ/, the first formant is especially high (i.e., the vowel is lower) and the second formant becomes more characteristic of a more central vowel. The change at the V-C

274. Cf. also *isra* for اسرع /israʕ/ 'hurry!' (110) *tasma* for تسمع /tasmaʕ/ 'you hear' (113), and *errabee* for الربيع /er-rabiʕ/ (126).

boundary is more pronounced before /ʕ/ than it is before /ħ/ (BUTCHER and AHMAD 1987, 160; MCCARTHY 1991, 79). Therefore, it would not be unreasonable to suggest that the ε in transcriptions like *χρηε* and *Ιωσουε* reflects the phonetic reality of *the transition* to /ʕ/ or the consonant /ʕ/ itself. This by no means constitutes a fully developed and consistent "furtive" *pataḥ*, but rather a representation of how the phonetic reality at the V-C boundary was perceived by the Greek accent. KNOBLOCH points out a similar phenomenon in the LXX transcriptions in Genesis (1995, 414–16). Jerome also has similar forms with *e* instead of *a*: e.g., *thafue* תַּפִּי (Josh. 15:53).

6.3.7. Semi-Vowels (/w/, /y/)

In ancient Hebrew, ו represented a labiovelar approximant [w] and י represented a palatal approximant [j]. In Tiberian Hebrew, ו came to represent a labio-dental [v] in most positions, but remained a labio-velar approximant [w] when preceded or followed by a *u*-vowel (e.g., וּפִי [ufuw'wɔ:] and י represented a palatal unrounded semi-vowel [j] (KHAN 2013a, 87–89).

6.3.7.1. Voiced Labio-Velar Approximant: /w/ = *ou* and *u*

In the Secunda, when the conjunction *waw* /w-/ is followed by a vowel (13x) and thus consonantal, it is represented by *ouα* or *oue* (just *ou* for /w-/ is treated in 6.5.1.6):

ουαλωνι	/w-lšōnī/	[walʃo:ni:]	'and my tongue'	Ps. 35:28
ουαθθεμας	/wat-temʔas/	[watʰ:imʔas]	'and you rejected'	Ps. 89:39
ουεβροβ	/w-b-rob(b)/	[wɪβRʊb]/[wəβRʊb]	'and in the abundance of'	Ps. 49:7

Word-medial /w/ is represented by *u* or *ou*. After *α*, it is always represented by *u* (10x):

λδauειδ	/l-dōwīd/	[l(a)ðo:wi:ð]	'of David'	Ps. 29:1
εσθauου	/heštahwū/	[hɪʃtʰahwu:]	'worship!'	Ps. 29:2
auωναν	/ʕwōnam(m)/	[ʕawo:nã(m)]	'their iniquity'	Ps. 89:33

In two instances, one after η and one after a consonant, word-medial /w/ is represented by *ou*:

βσαλουι	/b-šalwī/	[b(ɪ)ʃalwi:]	'in my ease'	Ps. 30:7
βγηουαθω	/b-gē(ʔ)wōtō/	[b(a)ʕe:wɔ:θo:]	'in his pride'	Ps. 46:4

The diphthong /aw/ is always represented by *au* (17x):

σαυ	/šaw(ʔ)/	[ʃaw]	'vanity'	Ps. 31:7
μαυθ	/mawt/	[mawtʰ]	'death'	Ps. 49:15

In Palestinian Koine of the Roman period, the digraph ου represented the vowel [u] (4.5.3.1.16–17). The grapheme υ represented the vowel [y] (or [ø]) (4.5.3.1.2–4). In the sequence αυ or ευ, the second element of the diphthong represented a phone somewhere on the spectrum from [w] > [β]/[ϕ] > [v]/[f] (4.5.3.1.13–15). In transcription, [w] is most commonly represented by ου both in Latin and Semitic. In Akkadian, however, [w] is transcribed by υ (5.3.2.2). After Latin υ [w] had shifted to [β]/[v], it is represented by β in Greek (5.3.1.2.4–5). The diphthong [aw] in both Latin and Arabic is represented by αυ (5.3.1.2.2; 5.3.3.2.1). The latest Latin transcriptions are quite instructive, in which consonantal υ [β]/[v] is represented by β, the diphthong *au* [aw] is represented by αυ, and the labiovelar *qu* [k^w] is represented by κου (also κο, κυ) (5.3.1.2.4). In Greek loanwords in the Mishnah, the second element of the diphthongs αυ/ευ is represented by ן or ם in Hebrew (5.4.1.2.1).

In terms of distribution, the transcription of Latin names in Palestinian epigraphy is instructive. Word-medially, Latin υ ([w] > [β] > [v]) is represented by either Greek ου or υ: e.g., Φλαυοιου *Flavius*, Σευηριναν *Severina* [*CIIP* I, no. 764]). Word-initially, Latin υ is *only* represented by Greek ου: e.g., Ουεττηνου *Vettenus* [*CIIP* I, no. 9], Ουικτορ [*CIIP* II, no. 1134]). However, once Greek β [β] (< *[b]) had become an adequate representation of Latin υ, Greek β may be utilized at the beginning of a word: e.g., Βερινης *Verina* [*CIIP* I, no. 859] and Βικτωρος [*CIIP* III, no. 2432/2452]. We may explain this distribution as follows: Greek ου [u] was utilized to represent the phoneme [w] because the high back rounded vowel [u] was nearest to the labiovelar approximant [w]. Whether ου appeared word-initially or word-medially, it retained the value of [u]. In the same way, the grapheme β was realized as a bilabial fricative [β] (nearest to Latin υ after the shift of [w] > [β]/[v]) in all positions (except after nasals). The grapheme υ, on the other hand, would have represented the high front rounded vowel [y] word-initially and the value [w] > [β]/[ϕ] in the diphthongal sequences ευ and

αυ. However, because the second element of the Greek diphthongs αυ and εϋ had become consonantal, υ would have been an even better representation of [w] than ου after α/ε.

It is also important to remember that the use of Greek ου and (α)υ/(ε)υ to represent Latin *v* in Latin proper names has its roots at a time when Latin *v* was pronounced as [w]. Therefore, after Latin *v* and Greek β shift to [β] (> [v]), the representation of Latin *v* in proper names with Greek ου or (α)υ/(ε)υ instead of β does not necessarily indicate that ου represented [β] or [v], but that the historical spelling of the name was preserved.

A similar distribution is found in the third-century CE Arabic inscription from north-eastern Jordan. When preceding a vowel, the semi-vowel [w] is represented by ου, ω, and ο: αουα /wa/, ωα /wa/, αθαοα /ʔatawa/. The diphthong /aw/, on the other hand, is always represented with αυ: Αυσοϋ /ʔaws/, α-δauρα /ʔad-dawra/, and ειραυ /yirʔaw/ (5.3.3.2.1; 5.3.3.2.3).

The data of Greek orthography and transcription conventions for representing [w] is entirely consistent with the distribution of ου and υ in the Secunda. Word-initially, Hebrew /w/ is represented with ου, just as in Greek transcription of Latin names. Word-medially, /w/ is represented by υ if it can be represented in a Greek diphthongal sequence (i.e., αυ) but by ου if it cannot (i.e., after η and after a consonant). Finally, the diphthong /aw/ is represented by αυ, just as in Greek transcriptions of Latin in the language-learning texts from Egypt. This likely indicates that ου and υ are different orthographic variants for representing [w] in the Secunda, since the distribution of ου and υ corresponds to the distribution of representing Latin *v* [w] in Greek transcription of Latin.²⁷⁵ Further, the fact that Hebrew /w/ is represented by ου and not β confirms that Hebrew /w/ had not yet shifted to [v]. While cases of Latin *v* (when Latin *v* = [β] or [v]) corresponding with Greek ου and (α)υ/(ε)υ in proper names at a late period should be regarded as conservative historical spellings,²⁷⁶ there would be no rea-

275. YUDITSKY comes to a similar conclusion, drawing on the LXX and inscriptions (2017, 34–36).

276. Note that many of these Latin names were first rendered in Greek at a time when Latin *v* represented [w].

son for Hebrew /w/ to be transcribed by Greek ου unless it was still realized as [w].²⁷⁷ For the presence or lack of a vowel following the conjunction *waw* (ου-) in the Secunda, see 6.5.1.61.

In addition to the data explored above, /w/ may be unrepresented in the transcription:

αων	/ʎwōn/	[ʎawo:n]	'the iniquity of'	Ps. 49:6
ουμσωθαῖ	/w-maʃwōtay(y)/	[(ʔ)um(ɪ)ʃʔ(w)o:θaj]	'and my commandments'	Ps. 89:32
σφοθαῖ	/ʃpōtay(y)/	[sʃo:θaj]/[s(ɪ)ʃ(ʔ)o:θaj]	'my lips'	Ps. 89:35

YUDITSKY interprets these transcriptions as evidence that the semi-vowel /w/ had become weakened, drawing on comparative examples such as מצאות and שפאותיכה from the Dead Sea scrolls (2017, 36).²⁷⁸ While YUDITSKY's explanation is entirely possible, especially in light of contemporary Hebrew evidence, Greek transcription conventions may shed further light.

In Palestinian and Egyptian Koine, one of the indicators that the phone represented by the grapheme (α)υ/(ε)υ has shifted from [u] to [w] is that *it ceases to be represented* in the orthography (4.4.1.2.3; 4.5.3.1.13–14). In transcription, although /w/ is usually represented, there are also examples of /w/ left unrepresented in Latin (e.g., νοεμ[β]ερ *November*) (5.3.1.2.4), Akkadian (e.g., ωει *ūwī*) (5.3.2.2), and Arabic (e.g., Ροεος /ro(w)eyh/) (5.3.3.2.3). In each example, the /w/ is in the environment of a back rounded vowel. It seems that in these instances it is the transition between a back rounded vowel and another vowel that approximates the labio-velar semi-vowel [w]. This theory is supported by transcriptions of Latin names such as Φλαουβίου *Flavius* (120 CE) and Οὐβαλέρις *Valerius* (4th CE) in the Egyptian papyri (GIGNAC 1976, 69). The fact that consonantal β [β] intervenes *between* ου and the following vowel indicates that it was *the transition* between the two vowels that approximated the semivowel [w] in Greek orthography and not the digraph ου itself. The function of the ου digraph is merely to provide the back rounded articulation, which is why ου and ω can serve

277. Note how in Nikolaos of Otranto's (12th/13th CE) Greek transcriptions of the Biblical Hebrew reading tradition in Italy, in which consonantal *waw* was pronounced as [v] (RYZHIK 2013, 363), -י is transcribed as β, which represented [v] in contemporary Greek: e.g., βεεθ תנא (Gen. 1:1) (*Disputatio contra Judaeos*, 5.11).

278. My transcriptions of ουμσωθαῖ and σφοθαῖ are based on YUDITSKY's reconstruction (2017, 36).

that purpose in Arabic (e.g., $\alpha\omega\alpha$ and $\omega\alpha$ for /wa-/). As the articulators move between the back rounded vowel [u] and the adjacent phones, a (near) glide is created.

It is also entirely consistent with modern linguistic perceptual studies to suggest that a vowel sequence with a back rounded vowel may be phonetically equivalent to that same sequence with the semi-vowel [w] substituted for the back rounded vowel. For example, in a perceptual study of Romanian, CHITORAN has shown that there is no phonetic difference between the sequences [wa] and [oa] (2002, 221). Instead of the weakening of the semi-vowel [w], a transcription like $\alpha\omega\nu$ may be just as easily regarded as the Greek scribe's perception of Hebrew [ʃawo:n], especially in light of the variant form $\alpha\omega\omega\nu\alpha\nu$. One may also compare Greek transcription of Latin forms like $\sigma\upsilon\alpha\varsigma$ *ūvās* 'grapes' (P.Lond. II 481). In fact, all the above transcriptions exhibit the apparent weakening of /w/ in the environment of a back rounded vowel. Therefore, in phonetic transcription, [w] in these words is enclosed in parentheses, with the understanding that it may have been pronounced.

6.3.7.2. Palatal Approximant: /y/ = ι

In the Secunda, the palatal approximant /y/ [j] is usually represented by ι (or ī):

$\omega\tilde{\eta}\beta$	/ʔōyēb/	[ʔo:je:β]	'an enemy'	Ps. 31:9
$\phi\epsilon\delta\iota\omega\nu$	/pedyōn/	[pʰiðjo:n]	'the redemption of'	Ps. 49:9
$\tilde{\iota}\alpha\delta\omega$	/yōdō/	[jo:ðo:]	'his hand'	Ps. 89:26

The sequence /y/ + vowel is often represented by Greek ι (or ī) (see YUDITSKY 2017, 32–33):

$\alpha\tilde{\iota}\theta\iota$	/hōyītī/	[hɔ:ji:θi:]	'I was'	Ps. 30:8
$\iota\sigma\rho\eta$	/yašrē/ or /yišrē/	[jiʃre:]	'those upright of'	Ps. 32:11
$\iota\sigma\rho\phi$	/yesrop/	[jisrɔʃ]	'he will burn'	Ps. 46:10

At the time of the Secunda, Greek ι represented the vowel [i] (4.5.3.1.1). Greek ī with *trema* (ī) indicated that the ī was to be read as an individual grapheme distinct from the preceding vowel and not as a digraph including the previous vowel (4.5.3.1.10).²⁷⁹ In transcription, both Latin and Semitic /y/ [j] are represented by Greek ι. In Arabic, word-initial /yi/ is once repre-

279. It is worth noting that while JANSSENS claims that *trema* was added only in the eighth or ninth century CE (1982, 38–39), ι with *trema* (ī) is attested already in the ancient papyri (see THOMPSON 1966, 63).

sented by ει (e.g., εἶπαι /yirʰaw/), the contemporary phonetic value of which was [i] (5.3.3.2.4). This may indicate that, from the perspective of Greek, word-initial [ji] was perceptually equivalent to [i] (or [ʔi]).²⁸⁰ It is actually probable that certain prefix forms of the *piʿel* should be interpreted as reflecting [ʔi(:)] instead of [ji]: e.g., μαλλετ מַלְּטִי (Ps. 89:49) may represent */ymallet/ > /imallet/ [ʔi:mal:itʰ]. A similar phenomenon occurs in Old Babylonian manuscripts (YEIVIN 1985, 523–27; KHAN 2013e, 955). However, other transcription pairs such as ἰδαββερ יְדַבֵּר (Ps. 46:10) and οὐδεδαββερ יְדַבֵּר* (Ps. 18:48) may suggest that perhaps it is better to interpret the verbal prefix ἰ as an allophonic variant of ιε, representing [ji] and [ji], respectively (for a full discussion of these forms, see 6.5.1.4.3).

The diphthong /ay/ is usually represented by αἰ.²⁸¹

ελωαῖ	/ʔlōhay(y)/	[ʔilo:haj]	'my God'	Ps. 18:29
μαῖμ	/maym/	[majm]	'waters'	Ps. 32:6
αλαῖ	/ʕōlay(y)/	[ʕo:laj]	'against me'	Ps. 35:16

In contemporary Greek orthography, it is necessary to distinguish Greek αἰ from αῖ (with *trema*). In Roman Palestinian Koine, the digraph αἰ signified the vowel [ε], which is reflected by interchanges such as κε for και (4.5.3.1.10). That αἰ (without *trema*) represented [ε] is also indicated by the fact that Greek καιρός is rendered as קַיְרוֹס in Mishnaic Hebrew (5.4.1.1.2). The digraph αῖ signified the sequence [ai] throughout the Koine period.²⁸² This is demonstrated by interchanges such as τροπαιεικον for τροπαῖκόν (4.5.3.1.10). In transcription, the diphthong /ay/ is regularly represented by αἰ (or/for αῖ) in Latin and Semitic (5.3.6). Therefore, it is entirely consistent with the conventions of contemporary Greek orthography and transcription for the digraph αἰ/αῖ to signify [aj] in the Secunda (contra JANSSENS 1982, 20–21).

280. See note 67.

281. Out of the 44 times that the Hebrew diphthong /ay/ is represented by αἰ/αῖ in the Secunda, 41 of them have *trema* and 3 are without *trema*. It is highly likely that the 3 examples without *trema* are due to scribal error. Two small dots above a letter are very easily obscured, omitted, or erroneously added during transmission. The need for *trema* to indicate /ay/ shows that the Secunda was composed at a time when Greek αἰ (without *trema*) signified [ε] and not [ai].

282. The *trema* (¨) might not always be written in inscriptions, but it would be preserved in pronunciation.

The diphthong /ay/ is also transcribed once by εῖ and twice by η:

ὠλεῖ	/ʔēlay(y)/	[ʔeːləj]	'to me'	Ps. 31:3
ὠεβῆ	/ʔōy(e)bay(y)/	[ʔoː(j)ɪβaj]	'my enemies'	Ps. 35:19
σὼνῆ	/śōn(e)ʔay(y)/	[soːnʔaj]	'those who hate me'	Ps. 35:19

In Roman Palestinian Koine, it is necessary to distinguish between the digraph εῖ, which represented the same vowel as ι = [i], and the digraph εῖ (with *trema*) (4.5.3.1.1), which would have represented the sequence [εi]. The grapheme η would have represented [e] (4.5.3.1.7). In transcription, while the sequence εῖ is normally used to represent a vowel of the [i] quality (usually [iː]), it is used a couple times in Greek transcription of Latin to represent the sequence [ei] or [eːi] in texts from the first and second century CE (5.3.1.1.3). It is also used in Akkadian to represent [eː] (5.3.2.1.2). The Arabic diphthong /ay/, in addition to its typical rendering as αι, is rendered at times by εῖ and η/ε (5.3.3.2.2). AL-JALLAD interprets these variant renderings not as representing monophthongization but rather a raised allophone [ei] of the diphthong [ai]. In light of the fact that /y/ [j] tends to raise adjacent vowels in the Secunda (see YUDITSKY 2017, 96–98), this explanation is probably valid for the Secunda as well. This theory may find support in various transcription conventions for names from the base /zon-ayn/ in Palestinian epigraphy: e.g., Ζονενοϛ, Ζοναινου, Ζονηνωνοϛ (CIIP III, no. 2425, 2443, 2445–6, 2469). Also, in a cross-language perceptual study, it was found that Italian speakers identified the English diphthong [eɪ] with Italian [e] (FLEGELAN and MEADOR 1999, 2980).

In addition to the data cited above, /y/ is sometimes not represented by ι:

οὐεμινᾱχ	/w-ymīnōk/	[(ʔ)u(j)imiːnɔːχ]	'and your right hand'	Ps. 18:36
ὠεβῆ	/ʔōy(e)bay(y)/	[ʔoː(j)ɪβaj]	'my enemies'	Ps. 35:19
οὐεζρα	/w-yeʕzrō(h)/	[(ʔ)u(j)ɪʕzrɔː(h)]	'and he will help her'	Ps. 46:6
εὼσηβ	/yōšēb/	[(j)oːʃeːβ]	'dweller'	Ps. 49:2
αεα	/hōyō/	[hɔː(j)ɔː]	'he was'	Ps. 89:42

YUDITSKY argues that these transcriptions attest to the assimilation of the glide [j] to the previous vowel or the shift of the glide [j] to a glottal stop [ʔ] (2017, 32–33). Such an explanation

is entirely valid and supported by contemporary Hebrew evidence,²⁸³ but an examination of the Greek evidence may offer a more complete perspective.

In Palestinian and Egyptian Koine, the omission of ι in orthography is actually one of the indications that the vowel [i] has shifted to [j] in a particular word. For example, the spelling $\kappa\rho\alpha$ (for $\kappa\rho\acute{\iota}\alpha$) is usually interpreted as reflecting the following change: [kyria] > [kyrja] (> [kyra]) (4.5.3.1.19; GIGNAC 1976, 302–3; HORROCKS 2014, 169). In addition to the omission of ι as an indication of [j], there are also examples in which the semi-vowel [j] seems to be indicated by the sequencing of vowels (e.g., Μαριεαμη [for Μαριαμη = Hebrew מרים]). In Greek transcription of Arabic, the glide [j] may also go unrepresented: e.g., Μοεαρος /moʕe(yy)ar/ (5.3.3.2.4). It is unlikely that a geminated /yy/ would be weakened; rather, it seems that the Greek scribe regarded that particular sequencing of vowels as the best way to approximate the non-Greek phoneme [j]. Finally, [j] may be omitted in the transcription of the Arabic diphthong /ay/ when it is realized as its raised allophone [ey] (5.3.3.2.2).

In Koine Greek of Asia Minor, $\varepsilon\alpha\iota$ = /ɛ/ (or /ɛ̞/) before another vowel is allophonically realized as /i/: e.g., $\theta\acute{\alpha}\zeta$ for $\theta\epsilon\acute{\alpha}\zeta$. Moreover, ε or ι followed by another vowel eventually resulted in a shift to the palatal semivowel [j] (BRIXHE 2010, 233). Accordingly, sequences such as $\varepsilon\omega$ and $\varepsilon\alpha$, at a certain stage of Greek in Asia Minor, were realized as [jo] and [ja]. The same phenomenon may be attested in the spelling $\Gamma\epsilon\omega\pi\gamma\iota\upsilon\varsigma$ (for $\Gamma\epsilon\omega\pi\gamma\iota\upsilon\varsigma$) in Palestinian epigraphy (*CIIP* III, no. 2143).

In light of the evidence of Greek orthography and transcription conventions, it is possible that a vowel sequence such as $\varepsilon\alpha$ in $\alpha\varepsilon\alpha$ (for /hōyō/ [hɔː(j)ɔː]) was actually perceptually equivalent to [jaː]/[jɔː] for the Greek scribe. The use of the sequence $\varepsilon\alpha$ to represent [ja] is actually supported by modern linguistic perceptual studies. For example, in CHITORAN's work on

283. MOR has an excellent treatment of such forms. In the Judaean Desert texts, /y/ may be represented as א word-initially or word-medially when it precedes /e/ or /ə/: e.g., שׂאש for שׂישׁ 'that there is' and אשעיה for ישעיה 'Isaiah' (2015, 125–26). See also the inscriptions Εισμαηλ אשמעאל (for ישמעאל) (*CIIP* I/1, no. 543) and גאוס (for Latin *Gaius*) (*CIIP* I/1, no. 60) from Jerusalem of the Second Temple period.

glide-vowel sequences in Romanian, she found that although the sequence [ea] is phonetically distinct from [ja], it is prone to be misidentified as [ja] more than 20% of the time, stating at the outset that "impressionistically, [ja] and [ea] have very similar pronunciations" (2002, 219–221). Therefore, in our phonetic transcription, [j] in these words is enclosed in parentheses, with the understanding that it may have been fully pronounced. In those cases for which YUDITSKY suggests that the glide has assimilated to the previous vowel (e.g., αεα), we might also render /y/ in IPA transcription as [j] with a downtack ([j̥]) (i.e., [hɔːj̥ɔː]), indicating a lower tongue position in the articulation of the palatal approximant.

In light of these points, we may also posit that the reason ı may signify the glide [j] *and* a following vowel in the Secunda is because ı is inherently vocalic and the glide element [j] is actually derived from the behavior of the articulators as they move to and/or from the high front vowel [i], just as was the case with ou [u] and the glide [w]. Modern linguistic studies support the concept of the transition from one articulatory position to the next being interpreted as a glide. For example, for some English speakers, the sound between the [g] and the [r] in the word *guarantee* [ˌgærənˈtiː] is identified as a glide [j] because of the transitions of the F1, F2, and F3 formants from [g] to [r] (ESPY-WILSON 1987, 187). Also, in Greek loanwords in the Mishnah, the sequence ια is often rendered in Hebrew with a *consonantal yod*: e.g., σπεκλάριον הַיִּי לְפָקָרָה and ἐμπίλια אֶלְיִי לְפָקָרָה (HEIJMANS 2013, 262; 5.4.1.1.4).

Finally, /y/ is omitted in transcription in two instances without vowel sequencing:

...(ĩ) αγι	/yaggĩh/	[jag:i:h]	'he will illuminate'	Ps. 18:29
βακαρ	/b-yqōr?/	[ba(j)kʰɔːR]/[bɔːkʰɔːR]	'in luxury'	Ps. 49:13

It is possible that each of these transcriptions reflect a pattern different from that of the MT,²⁸⁴ but there are also alternative explanations. The first transcription may be Sandhi writing (context: ελωαι αγι [ʔɪlo:haj (j)ag:i:h]). The second transcription may be the result of an /áy/ > /a/

284. αγι may reflect הַיִּי and βακαρ may reflect פָּקָרָה (YUDITSKY 2017, 42, 164–65, 189).

sound change, which is also attested in Targum Onqelos and Babylonian Aramaic (GARR 1991). Because the vowel with the preposition /b-/ in the Secunda is /a/, the transcription βακαρ might have developed as follows: /b-yqār/ [bajəkʔɑːR] > [bajkʔɑːR] > [baːkʔɑːR].

6.3.7.3. Concluding Remarks

It is worth noting here, with respect to the transcription of Hebrew /w/ [w] and /y/ [j] in particular, how much the transcriber was working within typical Greek orthographic practices. For example, he only used υ to signify Hebrew /w/ when it followed α, because Greek υ only signified [w] (or [β]/[ϕ] > [v]/[f]) in the diphthongal sequences αυ and ευ. Elsewhere, he used Greek ου for /w/. If one were inventing an entirely new system, we would expect to find one-to-one consonantal correspondence. However, the distribution of the various transcriptions of Hebrew /w/ demonstrates that, although the transcriber knew Hebrew well, he was approaching the Hebrew perceptually *through his Greek accent and orthography*. This comes through no clearer than in the transcription εσθαυου (Ps. 29:2). Even though /w/ does not immediately follow /a/ in the Hebrew—the guttural /ħ/ intervenes—the scribe transcribes /w/ with υ because it follows α in the Greek. Finally, while it is indeed likely that the glides had weakened as in other contemporary attestations of Hebrew, it is also possible that their occasional omission in the Secunda may actually be a feature of Greek orthography, consistent with epigraphic evidence and modern linguistic studies on speech perception.

6.3.8. Consonant Gemination (C: or CC)

Gemination (doubling) is essentially consonantal length. Acoustically, it involves holding the closure for a longer duration than the corresponding singleton consonant, sometimes as little as around 1.2x longer and sometimes as much as 2x or 3x longer. Gemination is a phonemic category, with varying phonetic durations required to signify phonemic gemination relative to context (pause, nuclear stress, etc.).²⁸⁵ Early in Hebrew, all consonants could be geminated.

285. See the discussion on gemination in Neo-Aramaic in KHAN (2004, 51–52).

At various points during the history of Hebrew, the gutturals and *resh* lost the ability to be geminated: the process began with \aleph and \aleph , then \aleph and \aleph , and finally \aleph (BLAU 2010, 82–83).

6.3.8.1. Regular Gemination

In the Secunda, double consonants are usually signified by two graphemes in Greek:

αννωθην	/han-nōtēn/	[han:o:θe:n]	'he who gives'	Ps. 18:48
λεββι	/lebbī/	[lɪb:i:]	'my heart'	Ps. 28:7
ουμεσσιρι	/w-meš-šīrī/	[(ʔ)umɪf:i.ri:]	'and from my song'	Ps. 28:7
εδαλλεγ	/ʔdalleg/	[ʔɪðal:ɪɐ]	'I will leap'	Ps. 18:30
οκκωθαῖ	/ħoqqōtay(y)/	[ħʊkʔ:o:θaj]	'my statutes'	Ps. 89:32

In Palestinian Koine of the Roman period, many spelling interchanges attest to the fact that consonantal length was no longer phonemic (4.5.3.1.23). Previous minimal pairs, such as \aleph /alē/ ['ale:] 'wandering' and \aleph /allē/ ['al:e:] 'elsewhere' were no longer distinct in pronunciation, both being realized as ['ale]. Nevertheless, in transcription, gemination is often represented. In Greek transcription of Latin, gemination is represented about 80% of the time (5.3.1.3.8). In Greek transcription of Akkadian, gemination is only represented about 30% of the time (5.3.2.3.8). In Greek transcription of Arabic, while gemination is normally represented, sometimes it is not (5.3.3.3.9). In a few instances in Latin and Akkadian, singleton consonants are represented as geminates. Therefore, in light of contemporary Greek orthography and transcription conventions, the inconsistent representation of gemination (see below) in the Secunda is not surprising.

YUDITSKY conducts a thorough analysis of gemination in the Secunda. In general, he tends to accept that gemination in the transcription reflects gemination in Secunda Hebrew and lack of gemination in the transcription reflects lack of gemination in Secunda Hebrew. He does, however, admit a number of exceptions (see below). Instances of incongruity between the representation of gemination in the Secunda transcriptions and the presence or lack of gemination in the history of Hebrew (or in other attestations in the Secunda) he explains phonetically either as degemination or secondary gemination (2017, 36–44).

While YUDITSKY has provided a valuable and potentially accurate account of how degemination and secondary gemination might be explained phonetically in the Secunda, I will proceed by focusing on some perceptual elements that may also have played a role in the representation of gemination in the Secunda.²⁸⁶ It should be noted that YUDITSKY's approach finds support in parallel cases of degemination and secondary gemination in Neo-Aramaic (see KHAN 1999, 57–61; 2002, 58–61; 2004, 52–55; 2008, 40–42; 2016, 195–200; FASSBERG 2010, 29–30). My emphasis on perceptual factors is intended to complement his work.

The light that modern linguistics has shed on the acoustic nature of the singleton/geminate contrast is also worth mentioning here. Although phonologically we tend to regard geminate consonants as C[+long] (/C:/) and singleton consonants as C[-long] (/C/), the durational ratio between a geminate and singleton consonant may vary inasmuch as it depends on a number of factors: type of consonant (stop, nasal, sibilant, etc.), vocalic context, speed of speech, etc. (AOYAMA and REID 2006). Moreover, in a transcriptional context, we are dealing with the *perception* of consonant duration from the perspective of a Greek accent and not necessarily a native phonological conception of gemination. All these factors need to be taken into account in an examination of the various representations of gemination in the Secunda.

6.3.8.2. Gemination of /w/, /y/, and /z/

While most instances of gemination or lack thereof in the Secunda are expected,²⁸⁷ there are a number of contexts in which gemination is not regularly represented. First, the consonants /w/, /y/, and /z/ are never geminated in transcription:

μοσῶε	/mšawwē/	[mʊʃawːɛː]	'making meet'	Ps. 18:34
αῖη	/ʔayyē/	[ʔajːɛː]	'where?'	Ps. 89:50
εχαζεβ	/ʔkazzeb/	[ʔɪχazːɪβ]	'I will lie'	Ps. 89:36

286. See also SPEISER (1932–33) and JANSSENS (1982, 44), albeit with a less sophisticated linguistic framework.

287. Just as gemination is usually represented as expected, the lack of gemination is also usually represented as expected. YUDITSKY shows that gutturals and /r/ are not geminated in the transcriptions. There are a couple ambiguous cases in which /h/ and /h/ do not exhibit compensatory lengthening, but even these are parallel with the same forms in the Tiberian tradition (2017, 39–40). For the one possible case of /r/ doubling, see 6.3.5.2.

Although these consonants were actually geminated in Secunda Hebrew, YUDITSKY suggests that they were not doubled in the transcription because *υ*, *ι*, and *ζ* were not doubled in Greek orthography. He points out that both *υ* and *ι* represented double consonants after a vowel (-*ayy*-, -*aww*-) and that *ζ* represented the sequence /*zd*/ (2017, 40).

Although *υ*, *ι*, and *ζ* are not doubled in standard Greek orthography, there are attestations of *ζζ* in Palestinian Greek orthography and transcription: e.g., *τευχιζζει* (for *τευχιζει*) and *αζζανα* (for *αζινη*). By the time of the Secunda, the grapheme *ζ* /*zd*/ had shifted to /*zz*/ and then simplified to /*z*/ (4.5.3.1.23; 4.5.3.1.34). In Greek transcription of Arabic, gemination of the glides /*w*/ and /*y*/ is never indicated in transcription (5.3.3.3.9). Cross-linguistically, glides typically have the smallest durational difference between singleton and geminate consonants (AOYAMA and REID 2006). In spite of the couple examples of *ζζ* in Palestinian epigraphy, we may conclude that the gemination of /*w*/, /*y*/, and /*z*/ is not represented in the Secunda in accordance with standard Greek orthography.

6.3.8.3. Gemination in Sonorous Segments

Second, gemination may not be indicated in segments with higher sonority:

ονηνι	/honnēnī/	[hʊnːeːniː]	'have mercy on me!'	Ps. 31:10
μενεγδ	/men-negd/	[mɪnːɪbd]	'from before'	Ps. 31:23
ραβιμ	/rabbīm/	[rabːiː(m)]	'great'	Ps. 32:6
φαλητ	/pallēt/	[pʰalːeːtʰ]	'deliverance'	Ps. 32:7
μεμμενι	/mem-mennī/	[mɪmːɪniː]	'from me'	Ps. 35:22
θελαθαχ	/thellōtāk/	[tʰɪlːɔːθɔːχ]	'your praise'	Ps. 35:28
ιαμιμ	/yammīm/	[jamːiː(m)]	'seas'	Ps. 46:3
ααμιν	/hō-ḡammīm/	[hɔːḡamːiː(m)]	'the peoples'	Ps. 49:2
αμιμ	/ḡammīm/	[ḡamːiː(m)]	'peoples'	Ps. 89:51

Also, in segments with high sonority, singleton /*b*/ and /*m*/ may be doubled in transcription:

οϊεββαϊ	/ʔōy(e)bay(y)/	[ʔojɪbaj]	'my enemies'	Ps. 30:2
λεββαβεχεμ ²⁸⁸	/lbōb(ə)kɛm(m)/	[lɪbɔːbɛχɪ(m)]/[lɪbɔːbɪχɪ(m)]	'your heart'	Ps. 31:25

288. It is likely that the form *λεββαβεχεμ* is a *forma mixta*, combining ***λεββεχεμ* with *λεβαβεχεμ* (see YUDITSKY 2017, 41).

θαμμιν	/tōmīm/	[t ^h ɔːmĩː(m)]	'blameless' Ps. 18:31
θαμμμ	/tōmīm/	[t ^h ɔːmĩː(m)]	'blameless' Ps. 18:33
σαμμαῖμ	/šōmaym/ or /šammaym/	[ʃɔːmajm]/[ʃamːajm]	'heaven' Ps. 89:30

YUDITSKY devotes a discussion to the irregular behavior of gemination as it relates to *the labials* /b/ and /m/. According to him, the representation of gemination or lack thereof around the labials actually reflects variant forms in the Hebrew. He derives the following rule: the labials /b/ and /m/ tend to be geminated or lose their gemination especially when they appear at least twice in the same word (2017, 40–41). YUDITSKY highlights an important phenomenon, but in my opinion, it is better to classify this group in terms of high sonority.

In Roman Palestinian Koine, similar examples are attested both in general orthography and transcription: e.g., [α]ν[ο]ιωγμμενον (for ἀνεωγμένον), Αμια (for Αμμια), Βεννιαμιν (for Βενιαμιν מְנַיִם), δεκαενα (for δεκαεννεα), and Παβι (for Παββι רַבִּי) (4.5.3.1.23). In transcription of Punic, there are similar pairs such as Θινιθ alongside Θεννειθ (5.3.5.2).

The first group of Secunda transcriptions, in which etymological gemination is unrepresented, may be explained in light of the phonetic context. Cross-linguistically, the geminate-to-singleton durational ratio tends to be higher with sonorant consonants (with the exception of semivowels, see AOYAMA and REID 2006) than most other types of consonants. Because sonorant consonants exhibit greater similarity with vowels, which are inherently at the top of the sonority hierarchy, a greater duration is presumably necessary to set off the geminate ([+long]) from the surrounding context. In a study of geminates in Arabic, KAWAHARA found that sonorant consonants tend to be more difficult to perceive than obstruent consonants. Moreover, as the sonority of a segment increases, the difficulty of perceiving a geminate sonorant also increases (2007, 1, 57).²⁸⁹ In a perceptual study of geminates, HARDISON and SAIGO found that a greater difference in sonority between the geminate consonant and the surrounding vocalic context aided perception. When geminates are misperceived, they may

289. But cf. DMITRIEVA (2012, 137), who argues against the general consensus regarding sonority and geminates.

be perceived as a long vowel and singleton consonant (2010, 81).²⁹⁰ Most of the misperceptions of gemination above occur with a sonorous geminate or singleton consonant in a highly sonorous context (e.g., adjacent to glide, adjacent to liquid/nasal, adjacent to nasalized vowel). The high level of sonority in the segment likely obscured a plain distinction between the geminate or singleton consonant and the surrounding environment.

6.3.8.4. Gemination in Sibilants

Third, gemination of sibilants is often unrepresented in transcription (see SPEISER 1932, 261):

ουεσιγημ	/w-ʔeśšīgēm/	[(ʔ)uʔis:i:ʔe:m]	'and I will catch them'	Ps. 18:38
εσιληνι	/heşšīlēnī/	[hɪtsʔ:i:le:ni:]	'save me!'	Ps. 31:3
ιαροσου	/yɔroşšū/	[jɔ:ʔɪtsʔ:u:]	'they will oppress'	Ps. 49:14
χασαμς	/kaš-šamš/	[kʰaʃ:amʃ]	'like the sun'	Ps. 89:37
σασουου	/šassūhū/	[ʃas:u:hu:]	'they plundered it'	Ps. 89:42
αλ·μα·σαν	/ʕal maš-šaw/	[ʕal maʃ:aw]	'on account of what vanity?'	Ps. 89:48

There is also evidence in Palestinian Koine for singleton/geminate alternations of sibilants: e.g., εξεσστω (for εξεστω) and τεσερεσκαιδεκατου (for τεσσαρεσκαιδεκατου). Cross-linguistically, sibilants tend to be longer than other types of consonants and sibilants also tend to have a lower geminate to singleton durational ratio than other consonant types (BLEVINS 2004; DMITRIEVA 2012, 20). In a perceptual study of geminated /tt/, /kk/, and /ss/ followed by the vowels /a/ or /u/, it was found that /ss/ + /u/ was the hardest sequence in which to identify the geminate consonant. This is because the sequence /ss/ + /u/ has the smallest difference in sonority between the consonant and the vowel (HARDISON and SAIGO 2010, 81, 85, 95). At least in the case of the transcriptions ιαροσου and σασουου, these principles likely apply.

A couple transcriptions in the Secunda, ἰεσσι יֶשְׁשִׁי (Ps. 18:47) and ουνεσσαφου וְנֶעְשָׂאפוּ (Ps. 35:16), may attest to the assimilation of a guttural to an adjacent sibilant: $\zeta > C_1 / C_{1[+sibi]}$.

290. The reverse of this, misperceiving a long vowel and a singleton as a short vowel and a geminate, is also possible. Anecdotally, I may cite my experience learning Arabic, during which I remember hearing the word /muġāmarāt/ 'adventures' and misperceiving and misproducing it as /muġammarāt/. Curiously, this misperception also occurred in the environment of a highly sonorous segment (i.e., low vowel and nasal).

lant]_ and $\text{?} > C_2 / _ C_{2[+sibilant]}$; it is more likely, however, that they should be corrected to $\text{?} > \text{?} > C_2 / _ C_{2[+sibilant]}$ and $\text{?} > \text{?} > C_2 / _ C_{2[+sibilant]}$ (see YUDITSKY 2017, 40, 81–82).

The transcriptions $\alpha\sigma\sigma\alpha\kappa\epsilon\rho$ ܐܣܣܐܟܥܪ (Ps. 89:34) and $\alpha\sigma\sigma\alpha\nu\epsilon$ ܐܣܣܐܢܥܪ (Ps. 89:35) exhibit a double $\sigma\sigma$ /šš/ in an unexpected context, making them appear as *niphal* forms instead of *piel* forms. YUDITSKY also mentions the form $\theta\epsilon\sigma\sigma\alpha\beta\epsilon\rho$ ܐܬܣܣܐܒܥܪ (Ps. 48:8),²⁹¹ found in a quotation in Chrysostom. These forms are unusual in two ways: (1) the first radical is doubled in the *piel* prefix forms and (2) the vowel of the prefix is α instead of ϵ (cf. $\epsilon\chi\alpha\zeta\epsilon\beta$ ܐܚܘܒܐ). YUDITSKY compares these forms to the secondary doubling of the initial radical in Syriac *1cs* forms (*ʔeqqatel*), but does not believe the Secunda has been influenced by Syriac. Nevertheless, his comment that the first radical of all three forms is /š/ is significant (2017, 42, 152–53). We may also add to this list the most recent, though uncertain, reading of Ps. 46:10 in the Ambrosiana palimpsest, which has $\text{?} > \text{?} > C_2 / _ C_{2[+sibilant]}$ for the *piel* form ܐܬܣܣܐܒܥܪ. Because all of these examples involve a sibilant and a high vowel, it may be explained perceptually as above. However, the uniformity of this change suggests that it may be a more well-defined phonological phenomenon.

While the Syriac forms that YUDITSKY mentions occur irrespective of the type of consonant, other Aramaic phenomena offer better parallels. HUEHNERGARD has shown that the doubling of /š/ occurs in the environment of $\#Ci_V$, citing the following examples: Common Aramaic $*\text{?}i\text{š}\text{š}-a/\bar{a}t-$ 'fire' < $*\text{?}is-\bar{a}t$; Syriac *neššīn* 'women' < *nīs-īna* and *qeššat* 'bow' (cstr. of *qeštā*) (2017?, 7). Because the prefix vowel in the *pi'el* stem was originally /i/ in Hebrew (STEINER 1980), all of these forms in the Secunda would correspond with this limited sound change in Aramaic. The New Testament Greek form Μεσσίας ܡܫܝܚ 'Messiah' may also be relevant here: $*mašīh > (\text{vowel raising in environment of sibilant}) > mešīh > (\text{š} > \text{šš} / \#Ci_V) > meššīh$. Finally, KHAN points out that in the Neo-Aramaic dialect of the Jews of Arbel, phonological /lišāna/ 'tongue' is realized variously with respect to gemination: [lɪʃɑː'næ],

291. YUDITSKY incorrectly cites this as Psalms 46:8 (2017, 153).

[lɪʃaːˈnæ], [liːʃaːˈnæ] (KHAN 1999, 58). A form in the Kaufmann manuscript of the Mishnah also attests to a comparable phenomenon: עַד יִשְׁמְרֵם אֶת גַּגּוֹ 'until he keeps watch on his roof' (Tohar. 9:6, folio 265v). The lack of doubling in the middle radical in the forms mentioned above (θεσσαβερ, ισσαβερ, etc.) may be due to subsequent confusion with *nifʿal* after the doubling of the initial radical. The prefix α in the forms ασσακερ and ασσανε is difficult to explain. Nevertheless, it is possible that these forms exhibit influence of Aramaic phonology.

6.3.8.5. Gemination of /t/

Fourth, gemination is often left unrepresented in the environment of /t/:

φεθεθα	/petteht̪̥/	[pʰɪtʰːɪhtʰɔː]	'you released'	Ps. 30:12
ουεθαζερηνι	/wat-tʔazzerēnī/	[wætʰː(a)ʔazːɪrɛːniː]	'and you girded me'	Ps. 30:12
ἔθεεν	/yetten/	[jɪtʰːɪn]	'he will give'	Ps. 49:8
σαθου	/šattū/	[ʃatʰːuː]	'they set themselves'	Ps. 49:15

Aside from the instances of irregular gemination that he attributes to the presence of /b/ and /m/, YUDITSKY suggests that degemination occurs after short /e/ in the Secunda. He also argues that the lack of gemination in the initial syllable of *wayyiqtol* forms such as ουεθαζερηνι וַיַּעֲזֹרֵנִי (Ps. 30:12), ουθεθθεν וַיִּתֶּן (Ps. 18:36) and ουθεζορηνι וַיִּצָּרֵנִי (Ps. 18:40) is evidence that the Hebrew of the Secunda reflects a transitional period during which the narrative past tense form *w-yiqtol* (< **wa-yaqtul* [\neq **wa-yaqtulu*]) was gradually shifting to *wayyiqtol*. During this transitional period, gemination would be present in some *past yiqtol* verbs and absent in others (2017, 44, 231–32).²⁹²

There is evidence in Palestinian Koine for alternations of τ/ττ and θ/θθ in orthography and transcription: e.g., σωττριας (for σωτηριας), πιτακιου (for πιττακιου), and Μαθεθ<ος> (for Μαθθεθος). Cross-linguistically, voiceless stops require a greater duration than voiced

292. These forms may have another explanation. In my view, because the narrative past tense *wayyiqtol* was not a part of the spoken language, it was not always identified in the consonantal text, especially in poetry. The ancient Greek translations also indicate inconsistency in the renderings of *w(ay) + yiqtol* forms in Psalms. Therefore, forms without a vowel after ου and without double θθ in the Secunda may indicate that the transcriber identified them as *w + yiqtol* non-past tense forms just as the ancient translators sometimes did. Note that ουἱεδαβερ וַיְדַבֵּר (Ps. 18:48) is translated as present in Aquila, Symmachus, and Theodotion and ουθεθθεν וַיִּתֶּן (Ps. 18:36) as future in Symmachus.

stops to be perceived as geminates (DMITRIEVA 2012, 31–32). Geminates followed by high vowels are more difficult to discern than geminates followed by low vowels (HARDISON and SAIGO 2010, 90). Further, there is some evidence that the contrast between singleton and geminate consonants is less between unstressed vowels (DMITRIEVA 2012, 137).²⁹³ This is the case for the prefix consonant /t^h(:)/ = θ(θ) of the *waw consecutive* forms.

6.3.8.6. Gemination and Syllable Structure

Fifth, and finally, a lack of gemination in the Secunda is often precipitated by syllable structure. Final gemination is never represented, but it is always preceded by a short vowel:

λεβ	/leb(b)/	[lɪb]	'heart'	Ps. 32:11
σεκ	/śaq(q)/	[sækʔ]	'sackcloth'	Ps. 35:13
εμ	/ʔem(m)/	[ʔĩ(m)]	'a mother'	Ps. 35:14
χολ	/kol(l)/	[k ^h ʊl]	'all'	Ps. 35:28

In Greek transcription of Arabic and Akkadian, final gemination is not represented (5.3.2.3.8; 5.3.3.3.9). A number of modern Semitic dialects (mostly Arabic) have final geminates (phonologically) which surface phonetically as singletons: e.g., Syrian Arabic /māyy/ [maj] 'water' and Modern Mandaic /rabb/ [rab] 'large'. In Arabic, final geminates are allowed in the coda-maximalizing dialects. In the Ġubb'adīn dialect of Neo-Aramaic, final -CC# was simplified. Cross-linguistically, it is common for final -CC# to appear only after monosyllabic words with short vowels (CVCC#), since a long vowel followed by a final geminate (CV:CC#) is not permitted in the phonotactics of most languages (DMITRIEVA 2012, 2, 161–62, 166, 168, 219). These principles may be illustrated by a comparison of the various monosyllabic syllable structures in the Secunda:

293. But cf. DMITRIEVA (2012, 139), who suggests that the decreased perceptibility might not be significant.

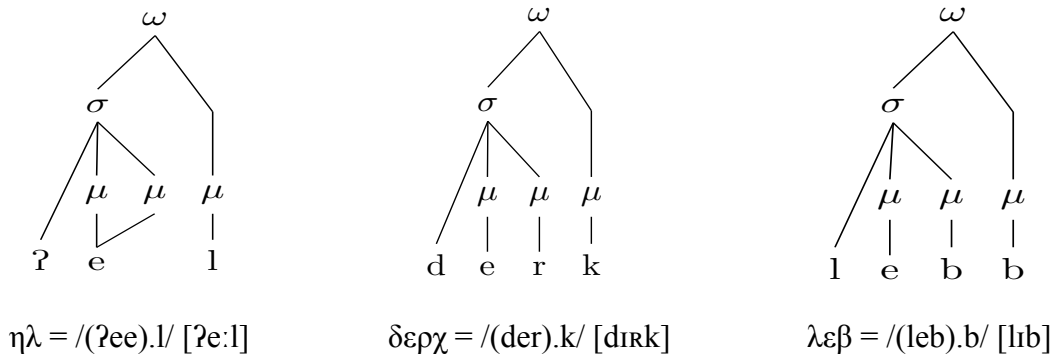


Figure 21: Moraic Representation of ηλ, δερχ, and λεβ

The short vowel in the *qill* and *qoll* patterns above demonstrates that the syllable structure of words like λεβ resembles δερχ more than ηλ. In light of the cross-linguistic evidence and the evidence of modern Semitic dialects, we may posit that the Hebrew reflected in the Secunda had at least *underlying final geminates*, though they may have surfaced as singletons.

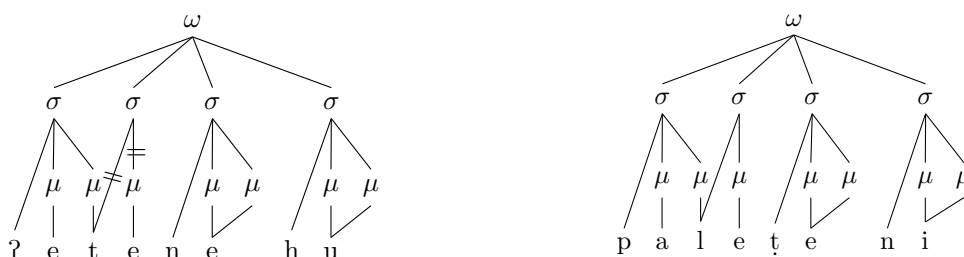
If a final underlying geminate was a כפ"ת בג"ד consonant as in λεβ, it is not clear whether it would have been realized with the plosive or spirantized realization. Note that in the Northeastern Neo-Aramaic (NENA) dialects, in which the reflex of post-vocalic */b/ is generally realized as /w/ and in which synchronic post-vocalic /b/ is sometimes realized as [β], plosive /b/ is maintained when it originates from */bb/, including in syllable-final contexts: e.g., the dialect of Qaraqosh has *gib* (< *gebb) 'with' and *šabtā* (< *šabb^ʔtā) 'week' (KHAN 2002, 26, 31). In light of the interchange of κ for χ for k# (< *kk#) in the transcription discussed earlier (ουωρεκ [6.3.1.6]), we will tentatively posit the same phenomenon for the Secunda, though it is highly speculative.

An underlying geminate is also likely for the following C₁VC₂:C₃V segments (cf. YU-DITSKY 2017, 43):

ἔσανου	/yšaw(w)ʕū/	[jɪʃawʕu:]	'they will cry out'	Ps. 18:42
μεχφριμ	/mek-(k)pīrīm/	[mɪk ^h φi:rī:(m)]	'from young lions'	Ps. 35:17
ἐθνηου	/ʔet(t)nēhū/	[ʔɪt ^h ne:hu:]	'I will set him'	Ps. 89:28

Arabic dialects also bear witness to consonant-adjacent geminates that are neutralized on the surface: e.g., Iraqi Arabic /dabbrat/ [dabrat] 'she arranged' and Syrian Arabic /waʔʔef/

[waʔʔef] 'stop! (masc.)' vs. /waʔʔfi/ [waʔfi] 'stop! (fem.)' (DMITRIEVA 2012, 2, 21, 161). In the underlying form, a geminate is followed by an unstressed short vowel. Syncope occurs followed by a neutralization of the geminate in the new consonant-adjacent context. We may compare two Secunda forms of similar syllable structure, one in which syncope and degemination occur (εθνηου) and one in which they do not (φελλετηνι) (see WATSON 2007, 352):



εθνηου = /(ʔet).ø.(nee).(huu)/ [ʔɪtne:hu:] φελλετηνι = /(pal).(le).(tee).(nii)/ [pæl:ɪt'e:ni:]

Figure 22: Moraic Representation of εθνηου and φελλετηνι

Syncope and degemination do not typically occur in this syllable structure (CVCCVCV́:) in the Secunda (e.g., φελλετηνι פֶּלֶלֶתֵּינִי [Ps. 31:2], ζαμμερου* זָמְמֵרוּ [Ps. 30:5], ιεφοφολου יֶזְפוֹפוֹלוּ [Ps. 18:39], but cf. βεσσαυει בִּשְׁסָאוּי [Ps. 31:23] and ιεσσαου ιֶשְׁסָאוּ [Ps. 18:42]). Phonetically, degemination and subsequent syncope may have occurred because of the homorganic nature of /t/ and /n/ in Hebrew.²⁹⁴ Because gemination is preserved in other parts of the paradigm (e.g., ουῖεθθεν), we may posit underlying gemination that is neutralized on the surface in the transcription εθνηου. A similar phenomenon is likely reflected also in βεσσαυει and ιεσσαου.

Other potential instances of degemination in relation to syllable structure are covered in YUDITSKY (2017, 43). However, because their relevance for potential degemination depends on our interpretation of whether or not the word is intended to be definite, an interpretation which must remain uncertain, they have been omitted from the discussion here.

6.3.8.7. Concluding Remarks

A number of the suggestions put forth in this section to explain the irregular representation of gemination in the Secunda merely constitute possible explanations and are, to a degree, *ad*

294. Note how in Tiberian Hebrew, /l/ is usually degeminated in the *hithpa'el* stem with suffixes if it is followed by another /l/ but not otherwise: e.g., יִתְפַּלֵּל but יִתְפַּלֵּלִי.

hoc. This is because there is no definite way of knowing precisely how geminates were realized in Secunda Hebrew with respect to their relative durations across different consonant types and phonetic and prosodic environments. Even if some of the suggestions put forth turn out to be incorrect, the discussion has demonstrated that when dealing with irregular representations of gemination in the Secunda, a whole array of factors must be taken into account. Standard Greek orthographic conventions may limit the ability of the scribe to represent gemination in the most efficient way. The acoustic and articulatory characteristics of the consonant and its immediate context may lessen the geminate-singleton contrast. One must also consider how the underlying phonology might have been neutralized in the surface forms. Finally, all of these issues must be constantly viewed through the lens of the *linguistic perception* of the transcriber. Certain distinctions particular to a certain language are sometimes perceived quite differently by speakers of another language, even if they are fluent in both.²⁹⁵

In light of these principles, we may refine the approach of YUDITSKY, who generally assumes that the presence or lack of gemination in the transcriptions reflects the same in the phonology of the Hebrew. What is missing from his approach is an appreciation of how significant a role linguistic perception can play in all of these cases. Because of misperception across languages, a singleton in transcription may still represent a geminate in Hebrew, and vice versa. The representation of gemination in Greek transcriptions of Latin and Akkadian support this point. One may also consider modern examples, such as the transliteration of Arabic names into English, in which gemination may go unrepresented (see 6.4.2.4).

6.3.9. Summary

The suggested realization of each consonantal phoneme in the Secunda is outlined below (chart 19):

295. See, for example, HAN's study on Japanese geminates among native Japanese and fluent Americans. He found that the Americans tended to pronounce the geminates with considerably less duration than did the Japanese (1992). See also CELATA and CANCELA's study of the perception of geminates in the Lucchese community in San Francisco. She found that the longer one had been in the United States the more difficulty they had discerning the singleton-geminate distinction in Lucchese (2010).

Hebrew Letter	Phoneme	Phone	Greek Grapheme	Written Word	Pronunciation
STOPS:					
ב	/b/	[b]	β	βανau	[bɔːnaw]
בּ		[β]	β	αβδω	[ʒaβdoː]
פ	/p/	[p ^h]	φ	φααλθα	[p ^h ɔːʒalt ^h ɔː]
פּ		[Φ]	φ	αφαχθ	[hɔːΦaxt ^h]
ד	/d/	[d]	δ	δερχ	[dɪrk ^h]
דּ		[ð]	δ	ιαδω	[jɔːðoː]
ת	/t/	[t ^h]	θ	θαμιδ	[t ^h ɔːmiːð]
תּ		[θ]	θ	ασιθι	[ʒɔːsiːθiː]
ג	/g/	[g]	γ	γαμ	[gam]
גּ		[ɣ]	γ	μαγεν	[mɔːɣɪn]
כ	/k/	[k ^h]	χ	χι	[k ^h iː]
כּ		[χ]	χ	βαχ	[bɔːχ]
SIBILANTS:					
ס	/s/	[s]	σ	σaμ	[sɔːm]
סּ		([z])	σ, ζ	βεεζδαχ	[bɪɦɪzɔːχ]
שׁ	/ś/	[s]	σ	σaμου	[sɔːmɦuː]
שׂ	/š/	[ʃ]	σ	σaλωμ	[ʃɔːlɔː(m)]
ז	/z/	[z]	ζ	μαζμωρ	[mazmoːR]
		([s])	ζ, σ	νεγρεσθι	[nɪɣræst ^h iː]
EMPHATICS:					
ק	/q/	[kʔ]	κ	κωλ	[kʔoːl]
ט	/t/	[tʔ]	τ	ταμνου	[tʔɔːmnɪuː]
צ	/ʒ/	[tsʔ]	σ	σεδκι	[tsʔɪðkʔiː]
SONORANTS:					
מ	/m/	[m]	μ	μaιμ	[majm]
		[ṽ(m)]	μ, ν	θαμμιν	[tɔːmĩː(m)]
נ	/n/	[n]	ν	νααρ	[nɔːhɔːR]
		[ṽ(n)]	ν, μ ²⁹⁶	ναθaν	[nɔːθã(n)]
ל	/l/	[l]	λ	λανου	[lɔːnuː]

296. One example of ν > μ is attested in external sources: βεδεμ ἡγῶν (Gen. 2:8). In the Ambrosiana palimpsest, initial /#n/ is once transcribed with μ before being corrected to ν: μ^νηρθ (Ps. 89:40).

ך	/r/	[ʀ]	ρ	ραμωθ	[ʀɔ:mo:θ]
<i>GUTTURALS:</i>					
א	/ʔ/	[ʔ]	Ø, α_α ²⁹⁷	אחל	[hɔ:ʔe:l]
ה	/h/	[h]	Ø, α_α	מההרא	[mehe:ʀɔ:]
ע	/ʕ/	[ʕ]	Ø, α_α	מאעג	[mɔ:ʕo:ʕ]
ח	/ħ/	[ħ]	Ø, α_α	אעסח	[haħo:sĩ:(m)]
<i>SEMI-VOWELS:</i>					
			ou	חחואח	[ge:wɔ:θo:]
ו	/w/	[w]	u (/ α_)	אחחחח	[ʕawo:nã(n)]
		[ʔ]	α_α	אחח	[ʕawɔ:(n)]/[ʕaʔɔ:(n)]
		[j]	ɪ, i	אחח	[ʔo:je:β]
י	/y/	[j]/[ʔ]	α_α	אחח	[hɔ:jɔ:]/[hɔ:jɔ:]

Chart 19: Consonantal Phonology, Phonetics, and Orthography in the Secunda

6.4. VOWELS

There are essentially two possible interpretations of the vowel system of Secunda Hebrew, one which posits an eight-vowel system (/a/, /e/, /o/, /ā/, /ē/, /ō/, /ī/, /ū/) (BRØNNO 1943, 12; JANSSENS 1982, 51; YUDITSKY 2017, 71) and one which posits a ten-vowel system (/a/, /e/, /o/, /ā/, /ē/, /ō/, /ī/, /ū/ + /ɛ/, /ē/) (BLAU 1984). Additionally, there is the question regarding whether vocalic *shewa* is a real feature or merely the preservation of a short historical vowel in an open unstressed syllable (6.5.1.2). Based on my analysis of the transcriptions, which will be borne out in this section, the Hebrew tradition reflected in the Secunda has the following vocalic phonemic inventory:

	<i>Front</i>		<i>Back</i>	
<i>close</i>	ī		ū	
<i>mid-close</i>	ē	e	o	ō
<i>mid-open</i>		(ē, ɛ)	ɔ	
<i>open</i>		a		

Chart 20: Vocalic Phonemic Inventory of the Secunda

297. The sequence α_α indicates that a hiatus between vowels may signify this consonant.

Oppositions between phonemes are indicated by the minimal pairs below. Due to the limited corpus, minimal pairs are not always attested. Therefore, hypothetical, yet justifiable, forms are reconstructed (marked with ***) on the basis of comparable forms (marked with →):²⁹⁸

/ī/ : /ē/	(σῆρ→) νῆρ***	/nīrī/	'my fallow ground'	/ō/ : /o/	(σαμ→) χαλ***	/kāl/	'he enclosed'
	νῆρ	/nērī/	'my light'		χαλ	/kol(l)/	'all'
/ē/ : /e/	ἡλ	/ʔēl/	'God of' (cstr.)	/ō/ : /ō/	βα	/bō/	'he is coming'
	ελ	/ʔel/	'to'		βω	/bō/	'in him/it'
(/ē/ : /e/)	(ωση→) μαση***	/mahsē/	'refuge of'	/o/ : /ō/	οζ	/ʔoz(z)/	'strength'
	μασε	/mahsē/	'refuge'		(μωτ→) ωζ***	/ʔōz/	'(to) seek refuge'
/a/ : /ā/	(ναθαν→) ζαχαρ***	/zākar/	'he remembered'	/ō/ : /ū/	(δωρ→) σωρ***	/šōr/	'bull'
	ζαχαρ	/zākar/	'male'		σωρ	/šūr/	'wall'

Chart 21: Vocalic Phonemic Oppositions in the Secunda

I will begin this section by analyzing the representation of /ē/ and /ō/ in the Secunda to address the fundamental question as to whether or not the transcriber utilized the Greek vocalic graphemes to represent length or quality in the Secunda. Following this, I will address each Hebrew vocalic phoneme in turn, dealing with its graphemic representation, phonemic value, and phonetic realization. The issue of vocalic *shewa* will be dealt with in 6.5.

6.4.1. Length and Quality: /ē/ = η and /ō/ = ω

In the Secunda, the transcription of long /ē/, /ō/ and short /e/, /o/ corresponds with the historical-grammatical distinction between long and short vowels in Greek. Long /ē/ is represented by η, which represents a close-mid front vowel [e] in Palestinian Koine (4.5.3.1.7):

εκκλης	/ʔeqqēš/	[ʔikʔeːʃ]	'a perverse one'	Ps. 18:27
ουην	/w-ʔēn/	[ʔuʔeːn]	'and there is no'	Ps. 18:42
αμμααζερηνι	/ham-mʔazzerēnī/	[hamːaʔazːɪreːniː]	'the one who girds me'	Ps. 18:33

298. Unattested νῆρ*** נֶרִי (< *qīl) 'my fallow ground' has been reconstructed on the basis of attested σῆρ נֶרִי (< *qīl) 'my song', the final vowel of a III-weak construct noun in unattested μαση*** (< *-yyn#) 'refuge of' on the basis of the final vowel in attested ωση נֶרִי (< *-yyn#) 'doer of', the unattested 3ms strong suffix conjugation form ζαχαρ*** זָכַר 'he remembered' on the basis of attested ναθαν נתן 'he gave', the unattested 3ms II-weak suffix conjugation form χαλ*** חָלַל 'he enclosed' on the basis of attested σαμ שָׁם 'he set', the unattested II-weak qal infinitive ωζ עוֹז (< *qōl) '(to) seek refuge' on the basis of attested μωτ מוֹט (< *qōl) '(to) shake', and the unattested II-weak noun σωρ שׁוֹר (< *qōl) on the basis of attested δωρ דּוֹר (< *qōl) 'generation'.

299. I argue that [ɛː], indicated by ε, was present in the Secunda, but it may be an allophone of /ē/ (see 6.4.4).

Long /ō/ is rendered by ω, which represents a mid back rounded vowel [o] in Palestinian Koine at the time of the Secunda (4.5.3.1.11):

κωλ	/qōl/	[kʰo:l]	'voice'	Ps. 28:6
νωσηρ	/nōṣēr/	[no:tsʰe:r]	'keeping'	Ps. 31:24
σαβαωθ	/ṣ(a)bōṭōt/	[tsʰaβo:ʔo:θ]	'hosts'	Ps. 46:8

For a discussion regarding the transcription of short /e/ with ε and short /o/ with o, see 6.4.2.

Before analyzing other vocalic correspondences in the Secunda, we must begin by addressing a fundamental question: are both length and quality directly represented in the transcription, or is only quality directly transcribed? Most scholars who have dealt with the Secunda seem to assume that the Greek historically long vocalic graphemes η and ω must always represent long vowels and ε and o must always represent short vowels (e.g., BRONNO 1943; JANSSENS 1982; YUDITSKY 2017), but it has also been suggested that the Greek transcriptions may correspond only with quality (BLAU 1984). In this section, I will argue that the Secunda transcriptions represent *primarily* quality, with direct representation of quantity as a possible *secondary* convention as long as it did not affect the perception of quality.

6.4.1.1. The Presence of Real Vowel Quantity in the Secunda

Although the terms "long vowels" and "short vowels" are often used to refer to *qualitative* differences, especially in Biblical Hebrew, an important distinction must be made between *vowel quality* and *vowel quantity*. Traditionally, *vowel quality* has been understood as the relative height and backness of the tongue when pronouncing particular vowels.³⁰⁰ Any vowel may be described in terms of how high, low, back, or front it is.³⁰¹ *Vowel length* refers to the duration for which a particular vowel quality is pronounced. In many instances, length is merely a phonetic feature, but many languages make use of length for phonemic contrasts.

300. There are also additional features such as rounding, ATR (width of the pharynx), rhotacization, and nasalization (LADEFOGED 2001, 215).

301. While phoneticians have used such terms for a long time, "height" and "backness" actually correspond more to acoustic frequencies than they do to the position of the tongue. The high-low distinction corresponds to what is referred to as the first formant (F1) and the front-back distinction roughly corresponds to the difference between the first formant (F1) and the second formant (F2) (LADEFOGED 2001, 14–15, 170–78, 232–33).

Unlike vowel quality, vowel length is a suprasegmental feature imposed on a particular vowel segment. It is not a feature like height, backness, or roundness, but merely specifies the *duration* of the vowel segment (LADEFOGED 2001, 14–15, 170–78, 232–33).

There are several pieces of evidence that support the presence of real phonemic length (i.e., duration) in Hebrew in the first few centuries CE. First, when discussing Christians who mispronounce Hebrew names, which they only knew as they were presented in the Greek transcriptions of the LXX (see HARVIAINEN 1977, 49–50; BRØNNO 1970, 205), Jerome writes:

And if we make a mistake in pronunciation, in lengthening or shortening of a syllable, whether lengthening that which is short, or shortening that which is long, they (the Jews) are accustomed to mock us for our ignorance ...³⁰²

The Latin terms Jerome uses here, *produco* and *brevio*, are technical terms referring to the lengthening and shortening of vowels and syllables (see MORENO 2008). Cicero (1st BCE), for example, uses the term *produco* when referring to the compensatory lengthening of a vowel before a nasal, and Quintilian (1st CE) uses the term *brevio* when referring to the shortening of the long vowel in the name *Amphīon*.³⁰³ Second, a number of ordered sound rules in the history of Hebrew require real durational length to be present at the time of the Secunda.³⁰⁴ Third,

302. *Commentary on Titus* (3.9): *Et si forte erraverimus in accentu, in extensione et brevitate syllabae, vel brevia producentes, vel producta breviantes, solent irridere nos imperitiae, maxime in aspirationibus in quibusdam cum rasura gulae litteris proferendis.*

303. *Orator* (48.159): *indoctus dicimus brevi prima littera, insanus producta, inhumanus brevi, infelix longa.* "We know that 'indoctus' is to be pronounced with the first letter short (*brevi*), 'insanus' long (*producta*), 'inhumanus' short (*brevi*), 'infelix' long (*longa*)."

Institutio Oratio (12.10.57): *...cum interrogasset rusticum testem, an Amphionem nosset, negante eo, detraxit aspirationem breviavitque secundam eius nominis syllabam, et ille eum sic optime norat. huiusmodi casus efficient, ut aliquando dicatur liter quam scribitur; cum dicere, quomodo scribendum est, non licet.* "When he asked a rustic witness whether he knew Amphīon, and the witness replied that he did not, dropped the aspirate and shortened (*breviavit*) the second syllable, whereupon the witness recognised him at once. Such situations, when it is impossible to speak as we write, will sometimes make it necessary to speak in language other than that which we use in writing" (translation from BUTLER 1922).

304. KHAN points out that at some point in the history of Hebrew, the pairs of long and short *a/ā* and *e/ē* vowels became differentiated by quality in addition to length: *a-ā* > *a-ṣ* and *e-ē* > *ε-ē*. Another relevant sound change was the lengthening of stressed syllables in a particular group of words, including final syllables in certain verbal forms and originally monosyllabic nouns closed by gemination. This lengthening rule is demonstrated by Tiberian Hebrew forms such as לִבֵּי (< *libb) and כֻּלִּי (< *kull). It is apparently problematic, however, that the same sort of lengthening does not apply to Tiberian Hebrew עֵץ. Being from geminate roots, all of these forms exhibit short vowels in the Secunda (λεβ, χολ, αμ/εμ). In Tiberian Hebrew, the fact that all stressed syllables were pronounced long—this was a separate, later lengthening than the one just mentioned—shows that the difference between לִבֵּי/כֻּלִּי and עֵץ lies not in the fact that עֵץ is not lengthened, but in the fact that it did not undergo the quality shift to /ɔ/. This is best explained by assuming that the lengthening rule operated *after* the

certain minimal pairs in the Secunda, such as the distribution of Greek ο and ω, are best explained by assuming a real phonemic contrast in vowel duration.³⁰⁵

6.4.1.2. Contemporary vs. Historical Orthography

Previous scholars who have worked on the transcriptions concur that vowel quantity was present and phonemic in the Hebrew of the Secunda (e.g., BRONNO 1943, 12; JANSSENS 1982, 51; YUDITSKY 2017, 45–61). They also point out that Greek η and ω are used to represent the Hebrew long vowels /ē/ and /ō/ and Greek ε and ο are used to represent the Hebrew short vowels /e/ and /o/. While this is a correct description, incorrect assumptions, resulting from a lack of precision and a lack of sensitivity to Greek orthography and phonology, have undergirded the approach. For example, the Greek vocalic graphemes η and ω are considered to be inherently long at the time of the Secunda (e.g., JANSSENS 1982, 20). Also, Greek ε and η are portrayed as differing only in length, ε representing short /e/ and η representing long /ē/ (e.g., YUDITSKY 2007a, 5; YUDITSKY 2017, 46).³⁰⁶

Neither of these assumptions is consistent with the Greek evidence. First, in Palestinian Koine Greek of the Roman period—in fact, as early as the Koine Greek of the second century BCE (HORROCKS 2014, 169)—vowel-length distinctions had been neutralized and the Greek vocalic graphemes came to represent only quality (4.5.3.1.22). At the time of the Secunda, one reading Greek would not have made phonemic length distinctions, just as Jerome's contemporaries were unable to pronounce vowel length in Hebrew names correctly

$\bar{a} > \bar{\alpha}$ quality shift had ceased to operate (KHAN 1987, 45). We may summarize these changes as follows: (1) $a - \bar{a} > a - \bar{\alpha}$, (2) stressed vowels in certain words subsequently lengthened, and (3) $e - \bar{e} > \varepsilon - \bar{e}$. While there is some evidence for (1) in the Secunda, there is counter-evidence for (2), which suggests that phonemic length was still been present in Secunda Hebrew. Note, however, that there may be evidence for (2) in Chrysostom's transcriptions ωμ ἡν 'heat' (< */homm/) and ην ἡν 'favor' (< */henn/) (*Fragmenta in Jeremiam*, 64.969.50–51).

305. Because ο and ω both represent [o] in Palestinian Koine Greek during the Roman period, the best interpretation of their complementary distribution in the Secunda, attested in such minimal *patterns* (minimal pairs are not always attested) as the imperative ζῶρε 'remember!' (Ps. 89:48) and the nominal βῆρε 'firstborn' (Ps. 89:28), is that ω is utilized to represent long /ō/, despite the fact that it no longer represented a long vowel in Greek at the time of the composition of the Secunda (4.5.3.1.22).

306. In his dissertation, YUDITSKY states that "in Greek, long e and short e are represented by different [graphemes]: η for the long [vowel] and ε for the short [vowel]" (my translation) (2007a, 5). In his monograph, YUDITSKY describes Greek ε as "a short front middle vowel, lower than /i/ and higher than /a/" and η as "a long front middle vowel, lower than /i/ and higher than /a/" (my translation) (2017, 46).

because they only knew them from the *Greek transcriptions* of the LXX (6.4.1.1). Second, not only was there no distinction in length between Greek η and ε at the time of the Secunda, neither were they equivalent in quality. Greek η represented [e] and Greek ε represented [ε] (or [ɛ]) (4.5.3.1.7). YUDITSKY does operate under the assumption that the orthography of the Secunda reflects the Greek pronunciation of at least a few centuries prior to Origen's time (2017, 46), but at no stage in the history of Greek would a synchronic description result in η and ε having no difference in quality (see PETROUNIAS 2007c, 602–605).³⁰⁷

Although the evidence demonstrates that in contemporary Greek spelling and pronunciation the vocalic graphemes corresponded to vowel *quality* and not vowel *quantity* (4.5.3.1.22),³⁰⁸ the historical pronunciations (with the vocalic graphemes corresponding to both vowel quality *and* vowel quantity) would have been remembered by a portion of the literate population. Those educated in Greek grammar and literature would have been aware of the fact that η/ω were associated with long vowels and ε/\omicron were associated with short vowels. This knowledge is clearly preserved in grammatical works such as that of Dionysius Thrax (170–90 BCE), who, when discussing the Greek alphabet, writes, "And of these, seven are vowels ... and of the vowels, two are long, η and ω , two short, ε and \omicron , three of either length, α ι υ ..." ³⁰⁹ We must remember, however, that only a rudimentary knowledge of the alphabet was needed both to compose and to use the Secunda transcriptions.

This leads to the following question: *how did the author of the Secunda utilize a graphemic system, which only represented vowel quality in his day, to transcribe a vocalic system characterized by both quality and quantity?* Did he follow the grapheme-phoneme

307. It is possible that during the third century BCE η and ε had similar qualities. However, if they did indeed have similar qualities at that point, it was quite brief. Already by the second century BCE they were distinguished in quality again (KNOBLOCH 1995, 124).

308. Note the various Greek renderings of the Hebrew name $\eta\omega\sigma\epsilon$ /I ω σ ϵ /I ω σ η (CIIP I/1, no. 46, 81, 573).

309. Τούτων φωνήεντα μὲν ἔστιν ἑπτὰ ... Τῶν δὲ φωνηέντων μακρὰ μὲν ἔστι δύο, η καὶ ω , βραχέα δύο, ε καὶ \omicron , δίχρονα τρία, α ι υ .

correspondences of his day by representing only vowel quality or did he follow historical and grammatical conventions³¹⁰ to utilize the historically long Greek vocalic graphemes to represent the long vowels in Hebrew? In this section, I will advance the claim that, unless the author of the Secunda was working with two alternative Greek graphemes of the same quality (e.g., o/ω = [o]), he prioritized quality, rather than quantity, in transcribing the Hebrew reading tradition.

6.4.1.3. The Case of η and Vowel Harmony

The main piece of evidence in support of this theory concerns the use of the Greek grapheme η to represent an assimilated vowel that is a result of vowel harmony. In the Secunda, when preceding a guttural, "reduced"³¹¹ vowels may assimilate to the the vowel of the guttural: βεεζδαχ³¹² בְּדָחַד (Ps. 31:8), μεεθθα הַתְּחָתִּי (Ps. 89:41), χεεβλ לְבָאֵב (Ps. 35:14), λooμ םתִּלִּי (Ps. 35:1), βειρ בְּעִיר (Ps. 31:22), αβωτεειμ םתְּבִטִּי (Ps. 49:7), ααλλελ לְלִתְּלִי (Ps. 89:35), μηηρα מְהִרָה (Ps. 31:3), βηηκα בְּחִיקָי (Ps. 89:51), and possibly also βηναν/βηηναν³¹³ יְעִינִי (Ps. 36:3).³¹⁴ In each instance, the reduced vowel assimilates in quality to the following vowel. The assimilations to ε and o are not especially interesting, but the assimilation to η in μηηρα and βηηκα is significant for understanding the representation of length in the Secunda.

310. This seems to be the claim of YUDITSKY, who argues that even if the Secunda were composed during Origen's lifetime, it would reflect pronunciation at least a couple hundred years earlier since writing is conservative (2017, 45–46). However, speaking of a "conservative" writing system only makes sense when there is an established historical tradition with historical spellings that may be preserved. Unless YUDITSKY would argue that the Secunda continues a well-established tradition that is hundreds of years old, this argument may be dismissed. The fact that we have variations in transcription of Hebrew proper names in Palestinian epigraphy would argue against a well-established and well-known transcription tradition.

311. By "reduced vowels" I mean those vowels that are equivalent to phonological zero but not necessarily phonetic zero. In the Secunda, as a general rule, reduced vowels may be defined as those which may be omitted in transcriptions. This is certainly the case for the inseparable prepositions. For a fuller discussion, see 6.5.1.

312. It should be noted that the inseparable prepositions may be represented with or without a vowel; when they are transcribed with a vowel, it is most commonly α (e.g., βα-, χα-, λα-).

313. The reading is uncertain.

314. There are also a couple instances in which vowel harmony seems to occur before non-gutturals: αμμμμ עֲמִמִּים (or Aramaic עֲמִמִּין) (Ps. 18:48) and εφικαυδ κִידָּבֶלֶט (Ps. 31:6) (see 6.5.1.3.2).

MARGOLIS compares this phenomenon to the rules outlined by the medieval Hebrew grammarians Ben-Asher and Ḥayyūj.³¹⁵ Though the system in the *Secunda* is not consistent, the transcriptions $\mu\eta\eta\rho\alpha$ and $\beta\eta\eta\kappa\iota$ are "clearly [based] on the principle of assimilation" (1909, 66). PRETZL argues that the first η in $\beta\eta\eta\kappa\iota$ and $\beta\eta\eta\nu\alpha\upsilon$ represents a short or ambiguous *e* vowel assimilated to the following vowel, which indicates that the quantitative system of transcription gave way to a qualitative one (1932, 9, 13). BRØNNO, while admitting that the phenomenon of assimilation before a guttural exists in the *Secunda*, doubts that it applies in the case of $\mu\eta\eta\rho\alpha$ and $\beta\eta\eta\kappa\iota$ for two reasons: (1) elsewhere, η reflects a long vowel and (2) in another example, only one η appears in the same environment ($\beta\eta\sigma\alpha\theta$ תַּשְׁבַּח [Ps. 1:1]). The forms with $-\eta\eta-$ could be a scribal error or represent an extra long $/\bar{e}/$ after the elision of the guttural (1943, 255–56, 340–41). JANSSENS acknowledges that *shewa* preceding a guttural sometimes assimilates to the following vowel, including $\beta\eta\eta\kappa\iota$ in his examples (1982, 86). YUDITSKY argues that the first vowel in the forms $\mu\eta\eta\rho\alpha$ and $\beta\eta\eta\kappa\iota$ has lengthened under the influence of the following guttural (2017, 88–89).

A summary of previous explanations for $\mu\eta\eta\rho\alpha$ and $\beta\eta\eta\kappa\iota$ highlights the tension between the apparent assimilation of a reduced (or short) vowel and the representation of such a vowel with a grapheme (η) used for long vowels everywhere else. There is no need to resort to scribal error (contra BRØNNO) to explain these forms and the suggestion that the guttural was not pronounced (see BRØNNO 1943, 256) has since been refuted by YUDITSKY (2008a; 2008b).

The idea that the vowel lengthened under the influence of the guttural (YUDITSKY 2017, 88–89) may be rejected for several reasons. First, this lengthening does not occur in

315. See, for example, Ḥayyūj's comments in *Kitāb al-af'āl dawāt ḥurūf al-līn*: وذلك أن منها ما يحرك بمثل حركة ما بعده إذا كان ما بعده ألفاً أو هاء أو حاء أو عيناً أعني إن كان الذي بعد الـشׁבּא من هذه الأربعة أحرف محرّكاً بالفتح حرّكت الـשׁבּא قبلها بالفتح وإن كان ما بعده ألفاً أو هاء أو حاء أو عيناً أعني إن كان الذي بعد الـשׁבּא من هذه الأربعة أحرف محرّكاً بالضم حرّكت الـשׁבּא بالضم وإن كان بالكسر حرّكت الـשׁבּא بالكسر ... '[The *shewa*] is vocalized like the vowel that comes after it. If an *ʾalef*, *heh*, *het*, or *ʾayn* comes after it, that is, if one of these four letters comes after the *shewa* and is vocalized with a *fatha* (i.e., an /a/ vowel), the *shewa* before it will be vocalized with a *fatha*, and if it has a *damma* (i.e., a /u/ vowel), the *shewa* will be vocalized with a /u/ vowel, and if it has a *kasra* (i.e., an /i/ vowel), the *shewa* will be vocalized with a *kasra*'.

other forms with similar syllable structures (e.g., μεεθθα and βεεζδαχ).³¹⁶ In order to explain why the assimilated vowel is ε in μεεθθα yet η in μηηρα, one would need to posit that the reduced (or short) vowel assimilated to the *quantity* of the following vowel, which is extremely rare cross-linguistically.³¹⁷ Second, the fact that a vowel in this same phonological environment may be omitted (e.g., βησαθ), indicates that it is not a long vowel. Third, unless the guttural ceased to be pronounced,³¹⁸ gutturals do not cause adjacent vowels to lengthen in the other Hebrew reading traditions.

However, there may actually be a couple examples in Tiberian Hebrew of a comparable phenomenon. Before certain weak consonants (אהעחינל), vowels may be lengthened phonetically so that the weak consonants were not elided in pronunciation (KHAN 2013f, 983). The fact that the prepositions ל/כ/ב are more likely to be transcribed with a vowel before a guttural seems to support a similar phenomenon in the Secunda (6.5.1.6.2), but suggesting that such a rule applies in the case of μηηρα and βηηκι is problematic in light of forms like μεεθθα. The only other possible Hebrew parallel for the lengthening of the first vowel in μηηρα and βηηκι is the musical *shewa ga'ya* in the Tiberian tradition which, when placed on a *shewa*, lengthens the *shewa* to a long vowel.³¹⁹ Positing that the initial traces of such a phe-

316. Further evidence that the initial vowel in a structure like this should be regarded as short is found in the LXX's rendering of רחב as Ρωβ (see KHAN 2013h, 551). At the time of the LXX, o and ω were identical in quality, but historically short o is utilized to represent the short vowel and historically long ω to represent the long vowel (see 6.4.1.5). Phonemic length may still have been applicable in Greek at that time.

317. The problem with "length harmony" is that real length (i.e., duration) does not indicate a feature of the vowel but actually indicates that a particular vowel is maintained for two "moraic slots." The consensus among phonologists is that the difference between the syllables C \check{v} and C \bar{v} is not between C $v_{[-long]}$ and C $v_{[+long]}$ (an erroneous representation), but between C v and C vv . These issues are presented and discussed by HYMAN and UDOH (2007), who claim that "there is no known process by which a short vowel assimilates in length to a long vowel in a neighboring syllable ... long vowels have been known to shorten in the context of another long vowel" (2007, 75).

318. In Samaritan Hebrew, the vowel of the inseparable prepositions may "fuse" with the vowel of a word which *originally* began with a guttural, as in *bēšār* באשר and *lūlām* לְעוֹלָם (BEN-HAYYIM 2000, 316).

319. Tiberian *ga'ya* marks secondary stress. When musical *shewa ga'ya*, rare in the twenty-one books but common in the three books (Psalms, Proverbs, Job), is placed on a *shewa*, it lengthens the *shewa* to a long vowel. That *shewa ga'ya* is often found on a guttural may indicate that a phonetic impetus lies behind the *shewa ga'ya* (KHAN 2013g, 8–9). An example of *shewa ga'ya* occurs on the preposition בְּ in the word בְּעֵינָיו 'in his eyes' (Ps. 15:4). Because the *shewa* precedes a guttural and is marked with *ga'ya*, it both assimilates to the quality of the following vowel and lengthens. The resulting Tiberian realization, /b-ʕēnāw/ [be:ʕe:nā:v], would correspond quite nicely with the uncertain Hexaplaric reading βηηναυ (Ps. 36:3), though its Tiberian counterpart

nomenon are attested in the Secunda, however tempting, is unwarranted. It is far simpler to conclude that η did not represent a long vowel in these forms.

If we do not hold to the assumption that η must always represent a long vowel in the Secunda, these forms are easily interpreted and our earlier question regarding whether the transcriber followed contemporary or historical spelling is answered as well. If η is regarded as primarily representing the vocalic quality [e] as it did in contemporary Greek, we may interpret the transcriptions $\beta\eta\eta\kappa\iota$ and $\mu\eta\eta\rho\alpha$ as examples of a reduced vowel assimilating in *quality* to the vowel of the following guttural. The resulting forms, /b-ḥēqī/ [behe:kʰi:] and /mhērā/ [mehe:Rɔ:], fit well with the other Biblical Hebrew reading traditions. At least in these instances, the transcriber prioritized quality over quantity, following orthographic conventions of his own day rather than historical or grammatical conventions.

6.4.1.4. Tense/Lax Distinction and Qualitative Transcription

If the transcriber operated according to the writing conventions of his own day, transcribing quality rather than quantity, this means that the vowel quality [e] (= η) was regarded as a better approximation of Hebrew long /ē/ than the vowel quality [ɛ]/[ɛ̆] (= ε) was. Apparently, Hebrew long /ē/ and short /e/ were not only distinguished by quantity but also by quality. This presents two questions: First, if vowel duration is merely a suprasegmental feature, why does there seem to be a qualitative difference between long /ē/ and short /e/ in the Secunda? Second, if only Hebrew long /ē/ and not short /e/ was best approximated by the quality η in the Secunda, why is it that the quality of the short vowel is nearest to the quality represented by η only in a few transcriptions (e.g., $\mu\eta\eta\rho\alpha$, $\beta\eta\eta\kappa\iota$)?

Although a sharp distinction was made earlier between vowel quality as a segmental feature and vowel quantity as a suprasegmental feature (6.4.1.1), there are actually a number

is without *shewa gaʿya*. The forms $\beta\eta\eta\kappa\iota$ and $\mu\eta\eta\rho\alpha$ would also correspond perfectly to their Tiberian counterparts, *if* they were marked with a *shewa gaʿya* in the Tiberian tradition, which they are not. If one wanted to maintain the interpretation that the first η in $\beta\eta\eta\kappa\iota$ and $\mu\eta\eta\rho\alpha$ represents a long vowel, one could argue that these forms represent an isolated example of what would eventually develop into *shewa gaʿya*.

of features of quality that tend to be associated with length. These may be described in terms of what is called "tenseness" and "laxness."³²⁰ The terms "tense" and "lax" usually correlate with features of vowel length and vowel height. Tense vowels are associated with length and lax vowels with shortness. Non-low tense vowels are typically higher and non-low lax vowels are typically lower. Tense vowels are generally more peripheral and lax vowels closer to the acoustic center. All of these are trends rather than rules (HOCK 1991, 143–44). In this work, I will use the terms "tense" and "lax" primarily to refer to the degree of peripherality or closeness to the acoustic center. For example, [i] and [u] are tense whereas [ɪ] and [ʊ] are lax.

The correlation of length and tenseness has been borne out in a study conducted by GENDROT and ADDA-DECKER (2007) on phonetic reduction and acoustic duration in eight of the world's languages. They found that as the duration of a vowel decreases, the closer it is articulated to the acoustic center (i.e., more centralized or reduced). This is explained as a result of articulatory "undershoot" and "overshoot" (GENDROT and ADDA-DECKER 2007, 1417, 1419). With the acoustic center as the "default" articulatory point of departure, more time is required to attain the target quality of vowels at a greater distance from that center. As the duration of a vowel grows shorter and shorter, there is less time to reach the target quality and return to the "default" articulatory position; thus, the vowel is "undershot," being articulated closer to the acoustic center (PEARCE 2008, 137; CROSSWHITE 2001).

PEARCE has demonstrated that there is one exception to the correlation between vowel duration and nearness to the acoustic center, namely, that it is nullified when spreading processes such as vowel harmony are in effect. The idea behind this is that the acoustic center acts as a sort of "neutral position" for pronunciation, with each individual vocalic segment being treated in its immediate environment. The target quality must then be attained in whatever duration is allotted for a particular segment before returning to the neutral position. In

320. Although these terms are commonly used by linguists, phoneticians have not found any acoustic corollary of what is called 'tenseness'. The term is only loosely defined as "greater muscular tension" (HOCK 1991, 143).

the case of vowel harmony, the shorter duration no longer impacts the quality of the vowel because the articulators are set in position in anticipation of the following vowel. The anticipation nullifies the need to return to the neutral position and thus enables the articulators to attain the target quality without being restricted by duration (PEARCE 2008; 2012).

These principles may be applied to the distribution of η and ε in the Secunda transcriptions. Assuming that Secunda Hebrew is not a linguistic outlier with respect to the relationship between vowel duration and proximity to the acoustic center,³²¹ we may posit that Hebrew long vowels were generally more tense and Hebrew short vowels were generally more lax. Thus, Hebrew long /ē/ would have been pronounced with a more tense-peripheral quality [e] and Hebrew short /e/ (< */i/) with a more lax-centralized quality [ɪ]³²² (or [ĕ]) (see 6.4.2). Accordingly, Hebrew long /ē/ [e:] was transcribed with the more tense Greek η = [e] and Hebrew short /e/ was transcribed with the more centralized Greek ε = [ɛ] (6.4.2). The identification of long vowels with a tense quality and short vowels with a lax quality is also supported by modern linguistic studies of cross-linguistic perception (see 6.4.2.4).

The only exception to this rule occurs in the words $\mu\eta\eta\rho\alpha$ and $\beta\eta\eta\kappa\iota$, in which the spreading process of vowel harmony was operative. Because the articulators did not need to return to the neutral position and were assimilated in anticipation of the following vowel [e:], the short vowel was realized with a quality normally only attained with a longer duration. Thus, the distribution of ε/η reflects a transcription based on quality (not quantity):

	Hebrew /ē/	Hebrew /e/	Hebrew "shewa" (ə)
<i>Realized as ...</i>	[e:]	[ɪ]	[e] (/ C_Ge:)
<i>Transcribed as ...</i>	η = [e]	ε = [ɛ]	η = [e]

321. There is actually positive evidence that the long and short vowels in ancient Hebrew also differed in tenseness and laxness. This argument will be developed more fully below (see 6.4.2).

322. Note that Hebrew /e/ is the reflex of etymological short */i/.

Such an interpretation of the Secunda transcriptions should be preferred over one which regards η as inherently long, because it offers greater explanatory power in the case of the exceptional spellings in the Secunda, while remaining consistent with internal-Hebrew and cross-linguistic evidence. In sum, at least in the case of η and ϵ , the transcriber's *modus operandi* in the Secunda was to transcribe according to quality, rather than quantity, thus placing him within the conventions of Greek orthography and phonology of his day.

6.4.1.5. Length and Historical Orthographic Convention

At this point, a distinction must be made between the Hebrew long vowels whose quality corresponded with only one Greek grapheme and the Hebrew long vowels whose quality corresponded with two Greek graphemes. In the case of $\bar{e}/$, the transcriber chose Greek η ([e]) to transcribe Hebrew long $\bar{e}/$ not because Greek η was inherently long (cf. $\mu\eta\eta\rho\alpha$ and $\beta\eta\eta\kappa\iota$), but because it best approximated the vowel quality of Hebrew $\bar{e}/$ [e]. Since there was only one Greek grapheme that represented the vowel quality [e], quality was the only factor in the transcriber's choice. The same may be said about the transcriber's choice of Greek α to transcribe Hebrew long $\bar{o}/$ and Greek $\omicron\upsilon$ to transcribe Hebrew long $\bar{u}/$. (For the transcription of Greek long $\bar{i}/$ [i], which corresponded in quality to both the historically length-neutral ι and the historically diphthongal/long $\epsilon\iota$, see the discussion in 6.4.5.)

The same principle does not apply, however, in the case of Hebrew long $\bar{o}/$ [o], the quality of which corresponded with two Greek graphemes: o , ω = [o] (4.5.3.1.11). Accordingly, even after identifying [o] as the most appropriate vowel quality to represent Hebrew long $\bar{o}/$, the transcriber still had two options from which to choose: o and ω . The transcriber opted for ω to represent long $\bar{o}/$ and o to represent short o , reflecting the historical-grammatical distinction between Greek long ω and Greek short o . We cannot be sure if the utilization of ω to represent a long vowel reflects knowledge resulting from an education in Greek grammar and literature or knowledge resulting from familiarity with an earlier tradition of Greek

transcription of Hebrew such as the LXX. In either case, however, it would reflect a historical-grammatical convention no longer relevant for the phonology of his day.

6.4.1.6. Greek Transcription of Vowel Length in Other Languages

A primarily qualitative transcription practice—or at least one that did not treat the grapheme η as inextricably linked to length—is also attested in Greek transcription of other languages. In general, Greek η is used to represent a long $/\bar{e}/$ vowel, though in certain phonetic environments it may also represent a short vowel. For example, in Greek transcription of Latin, while Greek η almost always renders Latin \bar{e} , in the environment of r Latin short \check{e} is transcribed with η (5.3.1.1.2). In transcription of Arabic, while etymological short $*/i/$ is usually rendered by Greek ϵ , it may also be transcribed by η especially in the environment of liquids and nasals (5.3.3.1.2). Greek η may also be used to transcribe a short vowel in Akkadian, though it can also be interpreted as long (5.3.2.1.2). Finally, there are a few interchanges of ϵ and η for e -vowels in both Phoenician and Aramaic (5.3.4.1; 5.3.5.1.5). In sum, while Greek η is normally used to transcribe long $/\bar{e}/$ in various languages, there are exceptional cases, such as certain phonetic environments, in which it may also represent a short vowel. This too indicates a qualitative rather than strictly quantitative transcription practice.

Greek ω for long $/\bar{o}/$, on the other hand, is more stable in transcription of both Latin and Semitic (5.3.1.1.4; 5.3.2.1.4; 5.3.3.1.3; 5.3.5.1). The only real instance of length confusion regarding ω and long $/\bar{o}/$ occurs in Greek transcription of Latin long \bar{o} and short o , yet this is more common after length distinctions are neutralized in *both Greek and Latin*.³²³ This is not surprising, since there were two Greek graphemes which represented the quality $[o]$.

6.4.1.7. Concluding Remarks

It has been demonstrated that the transcriber operated in a manner consistent with the Greek orthography and phonology of his day, prioritizing *quality* over historical-grammatical quantity to best approximate the Hebrew vowels. This is demonstrated by the transcriber's

323. It should also be noted that paleographic similarity between Greek o and Latin o may have been a factor.

use of η , a historically long vowel, to transcribe the short (or reduced) vowel in the words $\mu\eta\eta\rho\alpha$ and $\beta\eta\eta\kappa\iota$. It was only when the transcriber had before him two Greek graphemes of the same quality that he made use of historical-grammatical distinctions in his transcription conventions, as demonstrated by the use of ω to represent Hebrew / \bar{o} /. A similar distribution is attested in roughly contemporary Greek transcription of other languages.

Another implication of the present section is that the transcriptions of the Secunda are indeed transcriptions and not transliterations. That is, contrary to the conclusions of previous scholars, it is not necessarily true that one Greek vocalic grapheme must always represent only one Hebrew vocalic grapheme. One Greek grapheme may represent multiple Hebrew phonemes and, conversely, one Hebrew phoneme may be represented, in different circumstances, by more than one Greek grapheme.

All these findings will guide our interpretation of the Secunda transcriptions in the remainder of this chapter. Methodologically, it will be assumed that the transcriber generally chose the quality that best approximated that of the Hebrew vowel.³²⁴

6.4.2. Lax /e/ (< */i/) and /o/ (< */u/), Tense /ī/ and /ū/

In the Secunda, etymological short */i/ is usually transcribed by ϵ , which represents an open-mid front vowel [ɛ] (or true mid [ɐ]) in Roman Palestinian Koine (4.5.3.1.10) (for the phonetic transcription of /e/ as [ɪ], see further below for discussion):

σεμα	/semh̄d̄/	[simh̄o:]	'joy'	Ps. 30:12
λεβ	/leb(b)/	[lb]	'heart'	Ps. 32:11
ελλελθ	/hellelt/	[hɪl:ɪlt ^h]	'you profaned'	Ps. 89:40

Etymological long /ī/, on the other hand, is usually transcribed in the Secunda by ι , which represents a close front vowel [i] in Roman Palestinian Koine (4.5.3.1.1):

δερχι	/derkī/	[dɪrk ^h i:]	'my way'	Ps. 18:33
σαδδικιμ	/ʃaddīqīm/	[tsʰad:i:kʰi:(m)]	'righteous ones'	Ps. 32:11
νηχιμ	/nēkīm/	[ne:χī:(m)]	'wretches'	Ps. 35:15

324. BLAU (1984, 77) comes to a similar conclusion in his review of JANSSENS (1982).

Etymological short */u/ is usually transcribed in the Secunda by o, which represents a mid back rounded vowel [o] in Roman Palestinian Koine (4.5.3.1.11) (for the phonetic transcription of /o/ as [ʊ], see further below for discussion):

ερδοφ	/ʔerdop/	[ʔɪrdʊʔ]	'I will pursue'	Ps. 18:38
χολ	/kol(l)/	[kʰʊl]	'all'	Ps. 49:2
βεκοδσι	/b-qodšī/	[bɪkʰʊðʃi:]	'in my holiness'	Ps. 89:36

Etymological long /ū/, on the other hand, is usually transcribed by ou,³²⁵ which represents a high back rounded vowel [u] in Roman Palestinian Koine (4.5.3.1.16–17):

βαρουχ	/bōrūk/	[bɔːruːχ]	'blessed'	Ps. 31:22
χισους	/k-sūs/	[kʰisuːs]	'like a horse'	Ps. 32:9
σασουου	/šassūhū/	[ʃasːuːhuː]	'they plundered it'	Ps. 89:42

There are essentially two ways of interpreting the use of Greek ε and o for transcribing etymological */i/ and */u/. First, /i/ and /u/ had lowered to /e/ and /o/ in the pronunciation of Hebrew reflected in the Secunda. Second, Hebrew /i/ and /u/ maintained their close pronunciations, but because of some limitation in the Greek orthographic system (e.g., length, quality), ε and o were the nearest approximations of /i/ and /u/.³²⁶ After a brief review of scholarship, I will argue that etymological */i/ and */u/ are represented with ε and o in the Secunda because they were phonetically realized as the more lax (i.e., centralized) vowels [ɪ] and [ʊ].

6.4.2.1. Review of Scholarship

KUTSCHER has argued that the use of ε and o to transcribe Hebrew etymological */i/ and */u/ in the Secunda, in addition to other contemporary evidence,³²⁷ indicates that */i/ and */u/ had shifted to /e/ and /o/ in the vocalic systems of contemporary Hebrew pronunciation by 200 BCE (1969). The problem with such an argument, however, is that short /i/ and /u/ are attested

325. There is one instance in which /ū/ is transcribed by ου: ιουχαλεου יְחִזְקִיָּה (Ps. 18:39). This is generally corrected to ιουχαλου*, but there may be an orthographic basis for such a variant. In Egyptian Koine, the Latin name *Lucias*, usually spelled in Greek as Λούκιος, also has a variant of Λεύκιος (GIGNAC 1976, 216).

326. One could also suggest that Greek ε and o were realized with more close pronunciations. In fact, BRIXHE found that ε and o had more close pronunciations in Koine Greek of Asia Minor (2010, 233).

327. He cites evidence for /i/, /u/ > /e/, /o/ in Greek and Latin transcriptions of Biblical Hebrew, Jewish Palestinian Aramaic (JPA) manuscripts, and Mishnaic Hebrew (MH) manuscripts (1969).

in the pronunciations of all of the main Hebrew reading traditions of the Middle Ages (Tiberian, Babylonian, Palestinian). KUTSCHER deals with this problem by positing a "substandard" colloquial pronunciation, in which /i/, /u/ > /e/, /o/ obtained, over against a "standard" pronunciation used in prestigious biblical recitation, in which /i/ and /u/ maintained their close pronunciations (1969, 226).

HARVIAINEN questions whether the transcriptions truly reflect a "substandard" reading tradition, instead proposing that /i/ and /u/ were actually somewhat flexible, vacillating between [i e ɪ] and [u ɔ ʊ] depending on their consonantal environment (1977, 37–47, 70–72, 75–76, 95–98). This explanation seems closer to the truth, given the fact that KUTSCHER's theory would require Hebrew and Aramaic speakers to maintain two slightly distinct vocalic systems simultaneously. HARVIAINEN's explanation is also supported by MORAG's research on the relationship between various vernaculars and Biblical Hebrew reading traditions, in which he finds that most communities have the same vocalic phonemes in the reading tradition as in the vernacular (MORAG 1958; 1963; HARVIAINEN 1977, 82).

The idea of a "substandard" tradition also goes against the distribution of the *mater lectionis* ֿ in Second Temple period Hebrew. At both Qumran and in the Judaean Desert texts, while the *mater lectionis* ֿ is used for long /ū ō/, and short /o/ (< */u/), the *mater lectionis* ֿ is used only for long /ī/ (but not short /e/ [< */i/]). This is interpreted as indicating that short /i/ was slightly lower or more centralized in quality than long /ī/ (QIMRON 1986, 19; MOR 2015, 46–51). If this was a trait of a "substandard" tradition of Hebrew, then we might expect to find some biblical texts exhibiting the "standard" tradition, in which the *mater lectionis* ֿ was used also for short /i/. However, at least at Qumran, no such texts have been found.

KHAN points out that when etymological short /i/ lengthens it results in *šere* and not *ḥiriq*. Therefore, the realization of */i/ must be closer to [e]; words like עֲדָה 'congregation' and עֵנָב 'grape' should then be reconstructed as */ʕida/ [ʕida] and */ʕinab/ [ʕinab] with etymological

short */i/ being realized phonetically as [ɪ].³²⁸ Greek ε (parallel to Tiberian *hiriq*) in the transcriptions is an attempt to reflect the Hebrew vowel quality [ɪ] (2013i, 329). Presumably, a centralized realization [ʊ] of etymological short */u/ is also likely, since when */u/ lengthens it results in *holem* and not *shureq/qibbuṣ*: e.g., פִּרְדּוּפְּ (* < *ṭirdup*) 'I will pursue'.

The development of pretonic lengthening as outlined by KHAN actually helps mediate between the theories of KUTSCHER and HARVIAINEN. If we assume that */i/ and */u/ were realized with more lax pronunciations as [ɪ] and [ʊ], differences in speech production and perception (see below) may prove to be just as relevant for explaining their different representations in the transcriptions and the reading traditions as differences in dialect or register.

6.4.2.2. Greek Transcription

An argument could be made that Hebrew */i/ (> /e/) and */u/ (> /o/) maintained their close pronunciations and were only transcribed with ε and ο because of a limitation inherent in Greek orthography. The evidence of Greek transcription of other languages, however, demonstrates clearly that this is not the case. Moreover, the specific transcription choices support a lax realization of [ɪ] and [ʊ] as opposed to a complete shift to [e] and [o].

There are three potential options for transcribing Hebrew /e/ (< */i/): ι-ει = [i], η = [e], or ε-αι = [ε]. The fact that a short *i*-vowel *could* be transcribed by Greek ι is clearly demonstrated by the regular transcription of short /i/ by ι in both Latin and Akkadian (5.3.1.1.3; 5.3.2.1.3). Arabic short /i/, on the other hand, is almost always transcribed by Greek ε. However, in the environment of liquids and nasals, Arabic short /i/ may also be transcribed by Greek η (5.3.3.1.2). Latin and Semitic long /ī/, on the other hand, are regularly transcribed by ι (or ει). Taken together, all of this evidence would indicate that Hebrew long /ī/ and Hebrew short /e/ (< */i/) were not of the same quality in the Secunda. If they were, Hebrew short /e/ (< */i/) should have been transcribed by ι just as it was in Akkadian.

328. KHAN points out that a slightly centralized [e], which would be very near in its articulation to [ɪ], is transcribed as [ë] in IPA conventions (2013i, 329).

The precise realization of Hebrew etymological */i/, in light of its representation by ε, is difficult to determine. Theoretically, if its quality was nearest to [e], it could be represented by Greek η as it is on occasion in Arabic. One might argue that the association of η and length might prevent such a transcription, but there are examples of ε and η interchanging in Greek transcription of Hebrew names in Palestinian epigraphy: e.g., Ιωσε/Ιωση (for יוסה) (*CIIP* I/1, no. 46, 81, 573), Ελιας/Ηλιας (*CIIP* I/2, no. 1021; *CIIP* II, no. 1165.3a), and Ιεσους/Ιησους (*CIIP* I/1, no. 247, 425). The realization of ε was rather open in Palestinian Koine, as shown by the fact that ε in Greek loanwords is rendered by *pataḥ* in Mishnaic Hebrew (see 6.4.4.5), and it is unlikely that Hebrew /e/ (< */i/) was identical in quality to Greek ε [e] at the time of the Secunda. Rather, Hebrew /e/ (< */i/) was likely realized as a more centralized [ɪ] and was thus transcribed by Greek ε [e] because of its greater proximity to the acoustic center than ɪ or η (see 4.5.3.1.12 for Greek ε representing centralized vowels).

There are also three potential options for transcribing Hebrew short /o/ (< */u/): ου = [u], υ = [y], or ο-ω = [o]. Because of its unique fronted quality, Greek υ [y] is not typically used in transcription.³²⁹ Claims that ου could only transcribe long vowels because it was long in Greek (see YUDITSKY 2017, 70) are not supported by contemporary transcriptional evidence. The fact that short /u/ could be transcribed by ου is clearly demonstrated by the regular transcription of Latin *ŭ* with Greek ου, even in unaccented syllables. Latin *ŭ* is represented by Greek ο only in certain phonetic environments (5.3.1.1.5). Semitic short /u/, on the other hand, is regularly transcribed by Greek ο (5.3.6.), though there are exceptional cases in Arabic in which /u/ is transcribed by ου (5.3.3.1.3). Latin and Semitic long /ū/ are normally rendered by ου in Greek. These data indicate that Hebrew /ū/ and /o/ (< */u/), like /ī/ and /e/ (< */i/), were realized with different qualities in the Secunda. Had they both been realized

329. In the environment of λ, however, Latin /u/ seems to be fronted to [y] and transcribed as υ (instead of its normal rendering ου): e.g., Μαρυλλα.

with the quality of [u], Hebrew short */u/ would have also been rendered as Greek ου just like Greek transcriptions of Latin *ū* and of Arabic /u/ in exceptional cases.

An argument could be made for either a centralized near-close [ʊ] realization or a close-mid [o] realization of Hebrew etymological */u/ in the Secunda. Contemporary Greek orthography and transcription conventions leave either possibility open. However, in light of certain developments in the history of Hebrew, such as short */u/ becoming /ō/ under pretonic lengthening and the presence of short [u] in the medieval reading traditions, it seems best to posit that Hebrew /o/ (< */u/) was realized as a more centralized [ʊ] and was thus transcribed by Greek o [o] because of its greater proximity to the acoustic center than ου. This claim may also be supported by the fact that in Greek loanwords in the Mishnah, while Greek o is usually rendered by *holem-waw* ם in Hebrew, in a few instances it is also rendered by *shurq* ש in Hebrew (5.4.1.1.5).

One final piece of evidence to be mentioned here concerns exceptional spelling in the quotations of the Hexapla in external sources. When preceding geminate consonants,³³⁰ ι and ου may replace expected ε and ο: e.g., γιβὼρ κτββγ 'mighty warrior' (Isa. 9:5) (Chrysostom; Procopius), ακοββαυ/ακουββαει εקבבי/עקבבי 'those who cheat me' (Ps. 49:6), and ισοββουυ/ισουββουει ιסבבוי/יסבבוי 'they encircle me' (Ps. 49:6) (Ambrosiana; Chrysostom).³³¹ While more work needs to be done regarding the reliability and antiquity of such transcriptions, if reliable, these spelling variants in specific phonetic environments attest at the very least to two facts: First, the transcription of */i/ and */u/ with ε and ο were not merely a transliteration convention, but were particularly chosen to more accurately reflect the quality of the vowel. Second, at least in certain phonetic environments, */i/ and */u/ had not completely shifted to

330. KUTSCHER also finds variants in the Greek and Latin transcriptions in which ι and ου may precede geminated consonants (1969, 219–226).

331. In each case, the transcription with Greek o is from the Ambrosiana palimpsest and the example with Greek ου is from a quotation of the Secunda in Chrysostom's commentary on Psalms.

[e] and [o]. It may be that /e/ [ɪ] and /o/ [ʊ] had allophonic realizations of [i] and [u] in unstressed syllables closed by a geminate consonant.

6.4.2.3. Comparative Evidence: Modern Semitic Dialects and the Development of Latin

Positing a tense realization of long /ī/ and /ū/ as [i:] and [u:] and a lax realization of short /i/ and /u/ as [ɪ] and [ʊ] in ancient Hebrew has parallels in the vocalic systems of dialects of modern Arabic, Neo-Aramaic, and in the diachronic development of the Latin vocalic system.

In Cairene Arabic, the long high vowels /ī/ and /ū/ are realized as tense [i:] and [u:], and short /i/ and /u/ are realized as lax [ɪ] and [ʊ] (McCarthy 2005, 20). Syrian Arabic (SA), which has five long vowel phonemes (/ā ī ū ē ō/) and three short vowel phonemes (/a i u/), exhibits a similar situation. ALMBARK and HELLMUTH's acoustic analysis of Syrian Arabic demonstrated that short /a i u/ were more centralized than long /ā ī ū/, so that long /a i u/ are realized as [a: i: u:] and short /a i u/ are realized as [ɐ ɪ ʊ], with short /i u/ having allophonic realizations of [e,ə o]. In fact, short /i u/ are nearer in quality to long /ē ō/ than to long /ī ū/ (ALMBARK and HELLMUTH 2015). Even an acoustic analysis of standard Quranic recitation, in which are only short /a i u/ and long /ā ī ū/, demonstrated that the short vowels were realized with a more centralized pronunciation than the long vowels (NEWMAN and VERHOEVEN 2002).

The vocalic systems of various dialects of Neo-Aramaic provide similar parallels. In the dialect of Sulemaniyya and Ḥalabja, /i/ and /u/ are realized as [i:] and [u:] when long and as [ɪ]/[ə] and [ʊ] when short, respectively. There is, in fact, some overlap in the phonetic realizations of short /i/ and short /e/ this dialect (KHAN 2004, 48–50). A similar phonetic realization of /i/ and /u/ is also found in the dialect of the Jews of Arbel (Khan 1999, 52–53).

Classical Latin was characterized by five long vowels /ī ē ā ō ū/ [i: e: a: o: u:] and five corresponding, but more centralized (aside from /a/), short vowels /i e a o u/ [ɪ ɛ a ɔ ʊ] (ALLEN 1977, 47). When vowel-length distinctions were lost in the development from Classical Latin to Vulgar Latin, short /i u/ merged with long /ē ō/ and not with long /ī ū/. The results of this merger are reflected in the modern Romance languages (MARTINEZ 1989, 106, 110). In

Latin loanwords in Koine Greek, Latin *ĩ* is typically transcribed by Greek *ι*, but is sometimes transcribed by Greek *ε* (e.g., Δομετιανοῦ/Δομιτιανοῦ). Also, although Greek *ου* typically transcribes Latin *ũ*, there are certain words in which *ου* interchanges with Greek *ο* (e.g., ταβολαρίου/ταβουλαρίου).

6.4.2.4. Cross-Language Perception and Production of [ɪ] and [ʊ]

That *ε* [ɛ] and *ο* [o] would represent [ɪ] and [ʊ] and that *ι* [i] and *ου* [u] would represent /ɪ/ and /ū/ is also supported by studies on cross-language perception, for a number of reasons.

First, vowel length and vowel tenseness are often associated perceptually. In a study of second language acquisition, it was found that Arab students of English tend to associate the tense and lax vowels of English with the long and short vowels of Arabic. For example, the tense [i] vowel in the word [tin] 'teen' was pronounced by Arab students with a long /ɪ/ vowel [ti:n], whereas the lax [ɛ] vowel in the word [bed] 'bed' was pronounced by Arab students with following gemination [badd], thus indicating that it was interpreted as short (BROSELOW 1988, 298–300). In another study of English vowel production by native Arabic speakers, it was demonstrated that Arabic speakers exaggerated the durational difference in their production of tense and lax vowels (MUNRO 1993, 44–45).

Second, when [ɪ] is absent from the vocalic inventory of a language that has /i/, /e/, /ɛ/ but not /ɪ/, it *may* be perceived as /ɛ/. The vocalic inventories of Italian (/i, e, ɛ, a, ɔ, o, u/), Catalan (/i, e, ɛ, a, ɔ, o, u/), and Korean (/i, e, ɛ, y, ø, ʌ, ɑ, o, u, i/) are suitable examples for illustration.³³² In a number of vowel perception studies with Italian–English bilinguals, the most common mistake the Italians made in the perception and production of English /ɪ/ was to identify it with English /ɛ/ (MUNRO et al. 1996, 330; FLEGELAN and MEADOR 1999, 2977; PISKE et al. 2002, 64). Two studies of Catalan students learning English found that inexperienced students were most likely to identify English /ɪ/ with Catalan /e/, and less frequently

332. For the Italian vocalic inventory, see AGARD and DiPIETRO 1964 apud PISKE et al. 2002. For the Catalan vocalic inventory, see RECASENS and ESPINOSA 2005. For the Korean vocalic inventory, see SONG 2005 apud JIN and LIU 2014, 584.

identified it with Catalan /ɛ/ or /i/. An interesting trend found in one of the studies was that as students became more experienced in English they grew to identify English /ɪ/ more with Catalan /i/ and less with Catalan /ɛ/ or /e/ (CEBRIAN 2006, 378; FABRA and ROMERO 2012, 495).³³³ In studies on Korean–English bilinguals, Koreans generally identify English /ɪ/ with Korean /i/. However, there was a tendency for Koreans less-experienced in English, when they made a mistake in the production or perception of English /ɪ/, to either produce it as English /ɛ/ or identify it with Korean /e/ or /ɛ/ (YANG 1996; FLEGE, BOHN, and JANG 1997, 443, 448; TROFIMOVICH et al. 2001, 175, 179; BAKER et al. 2002; BAKER and TROFIMOVICH 2005, 10–19; TSUKADA 2005, 269, 278–80; JIN and LIU 2014, 587). These variations in perception may be explained by the relatively lower more centralized articulation of Korean /i/ (YANG 1996, 257–58), somewhere between English /i/ and /ɪ/, and the relatively higher articulation of the *e*-vowels in Catalan and Italian (FLEGELAN and MEADOR 1999, 2978; FABRA and ROMERO 2012, 494). Finally, German speakers tended to equate /ɛ/ and /ɪ/ in their production and perception of English vowels (FLEGE BOHN, and YANG 1997, 449).

Third, when [ʊ] is absent from the vocalic inventory of a language that has /u/ and /o/ (but not /ʊ/) it *may* be perceived as /o/. For Italian–English bilinguals, the most common mistake made in the perception and production of English /ʊ/ was to identify it with English /o/, though identifying /ʊ/ with /ʌ/ also occurred (MUNRO et al. 1996, 330; FLEGELAN and MEADOR 1999, 2977; PISKE et al. 2002, 64). For Catalan speakers, English /ʊ/ was most frequently identified with Catalan /u/, less frequently with Catalan /o/. More experienced learners did not identify English /ʊ/ with Catalan /o/ at all, instead opting for /u/ and occasionally for /ɔ/ (FABRA and ROMERO 2012, 495). In studies on native Korean speakers, English /ʊ/ was identified most commonly with Korean /u/, less frequently with Korean /i/. In terms of mistakes of production, English /ʊ/ was commonly misproduced as English /u/ by Koreans (TROFIMOVICH

333. It should be noted that in the part of the experiment that tested vowel production, the more experienced a learner was the more centralized and lower they pronounced English /ɪ/ (FABRA and ROMERO 2012, 502).

et al. 2001, 175, 179; BAKER et al. 2002; BAKER and TROFIMOVICH 2005, 10–19; JIN and LIU 2014, 587).

Fourth, interchanges of *i/e* and *u/o* occur in representing the etymologically short Arabic vowels */i/ and */u/ in the different contexts in which Arabic is written in Latin characters in the modern world. In a study regarding Arabic students learning English as a second language, one student by the name of Muhammad (مُحَمَّد /muḥammad/) was found to spell the initial vowel of his name with a *u* on some occasions (*M-u-h-a-m-a-d*) and with an *o* on other occasions (*M-o-h-a-m-e-d*, *M-o-h-a-m-m-a-d*). Moreover, the general variations in transliterated Arabic words, such as *Muslim/Moslem* and *Qur'an/Koran*, also attest to *i/e* and *o/u* variation (THOMPSON-PANOS and THOMAS-RUŽIĆ 1983, 612). In another study on "ASCII-ized" transcriptions of Gulf Arabic, short /i/ may be transcribed with either *i* or *e*, as in *yimkin/yemken/yemkin* for /yimkin/ 'could be' and short /u/ is transcribed with either *u* or *o*, as in *shukran* for /šukran/ 'thanks' and *sho* for /šu/ 'what...?' (PALFREYMAN and AL-KHALIL 2003).

6.4.2.5. Concluding Remarks

The reflexes of */ī/, */ū/, */i/, and */u/ in Secunda Hebrew may be summarized as follows:

	Hebrew /ī/	Hebrew /e/ (< */i/)	Hebrew /ū/	Hebrew /o/ (< */u/)
<i>Realized as ...</i>	[i:]	[ɪ]	[u:]	[ʊ]
<i>Transcribed as ...</i>	ɪ = [i]	ε = [ε]	ov = [u]	o = [o]

KUSTCHER's 1969 article on the shift of */i/ and */u/ to /e/ and /o/ was indeed a seminal one, yet not beyond the need for refinement. On the basis of Greek transcription conventions, a comparison of modern and ancient vocalic systems, and modern linguistic studies on cross-language perception and production, we have demonstrated that what might be attributed to a difference in register or dialect, can also be attributed to the difference in linguistic perception from one language to another.

6.4.3. Long /ā/ [ɔ:] and Short /a/ [a]/[æ]

6.4.3.1. "Qamaṣ": /ā/ [a:] or /ā/ [ɔ:]?

In the Secunda, Hebrew etymological long */ā/ is transcribed by Greek α, which probably represents a back open unrounded vowel [a] (or [ɑ]) in Roman Palestinian Koine:³³⁴

αδαμ ³³⁵	/ʔɔdɔm/	[ʔɔ:ðɔ:(m)]	'man'	Ps. 31:20
εμμανου	/ʕemmɔnū/	[ʕim:ɔ:nu:]	'with us'	Ps. 46:8
σαμ	/šɔm/	[sɔ:(m)]	'is placing'	Ps. 46:9

In Greek transcription of other languages, α is used regularly to transcribe both short /a/ and long /ā/. In Greek loanwords in the Mishnah, α is typically rendered by a Hebrew /a/ vowel (i.e., *pataḥ/qamaṣ*), but is sometimes rendered with an /o/ or /u/ vowel in the environment of the sonorants λ, μ, ν, ρ or in the environment of κ (5.4.1.1.1).

The central issue regarding the transcription of etymological long */ā/ by Greek α is whether Hebrew */ā/ had yet shifted to a half-open back rounded vowel /ɔ/, more commonly referred to as "*qamaṣ*." After a brief review of scholarship, I will argue that there is tentative evidence for positing /ɔ/ in the Hebrew of the Secunda and that Greek α could be a suitable representation of it.

6.4.3.1.1. Review of Scholarship

There are different opinions as to when precisely Hebrew long /ā/ shifted in quality to [ɔ:]. HARVAINEN argues that there is no positive consistent evidence for the $\bar{a} > \bar{\varepsilon}$ quality change until the fifth century CE (HARVAINEN 1977, 104–7). MORAG (1963) and MEYER (1958) argue that forms such as כבושים in the Dead Sea Scrolls indicate that the shift had taken place by the

334. The relative infrequency of spelling interchanges with α in Palestinian epigraphy indicates that α remained distinct from the other Greek vocalic phonemes. It was probably realized as α was realized in Classical and Hellenistic Greek, as a back open unrounded vowel [a] (or perhaps near [ɑ]) similar to the *a*-vowels in the Italian word *amare* [amare] (PETROUNIAS 2007b, 558; PETROUNIAS 2007c, 602–605).

335. In a word like אָדָם in Tiberian Hebrew, the second *qamaṣ* is the result of tonic lengthening and the first *qamaṣ* is the result of pretonic lengthening. In the Secunda, there is evidence that tonic lengthening has taken place from the form *ααφης** /ha-ḥāpēs/ הָפֵץ 'who is pleased' (Ps. 35:27) and there is evidence that pretonic lengthening has taken place from the form *νηκαρ* /nēkār/ נֶכָר 'foreigner' (Ps. 18:46). Therefore, we may reasonably conclude that, even though α can represent either /a/ or /ā/ in the Secunda, the vowels represented by α in *αδαμ* and similar forms were long.

Second Temple period, but KUTSCHER (1974) and QIMRON (1986) argue that such spellings are to be explained otherwise (for a full review of scholarship, see REYMOND 2014, 138–40).

6.4.3.1.2. Possible Evidence of *Qamaš* in the Secunda

There are a few pieces of evidence that may indicate that /ā/ > /ā/ had already taken place by the time of the Secunda, namely, the transcription *ουαλεα* found in Chrysostom, the etymology of *Ενωχ* 'Enoch' in Philo, and data from Jerome and the Babylonian incantation bowls.

6.4.3.1.2.1. Chrysostom's *ουαλεα*

In Biblical Hebrew, when a pronominal suffix attaches to a noun with a plural base, the plural construct ending is typically pointed with *šere* (e.g., סוּסֵינוּ 'our horses', סוּסֵיהֶם 'their horses', סוּסֵיכֶם 'your horses'). However, when the pronominal suffix is pointed with *qamaš*, the quality of the preceding vowel is *seghol* (e.g., סוּסֵיךָ 'your horses', סוּסֵיהָ 'her horses'). The *seghol* is typically explained as the result of the *šere* (< **ay*) assimilating in quality to the following *qamaš*, since *seghol* and *qamaš* were of the same half-open vowel height (KHAN 2013k, 268). Therefore, if the Secunda transcriptions reflect *seghol* in such an environment, it would presumably indicate that the shift /ā/ > /ā/ had already obtained.

While there are no relevant transcriptions in the Ambrosiana palimpsest, a quotation of the Secunda in John Chrysostom's comments on Psalm 7:8 (*Expositio in Psalmos*, 55.90) renders the parallel of MT עָלַי as *ουαλεα* (LXX: ὑπὲρ ταύτης 'for this'). We might expect the 3fs suffix on a preposition with a plural base such as עַל to be something like ***αλα* in the Secunda on the basis of a comparison with the 3fs suffix on the plural (e.g., αμουδα עֲמֻדָּיהָ [Ps. 75:4]) or the form in Aramaic (עֲלֵהָ).³³⁶ It is possible, then, that the reading *ουαλεα* is not original. It would not be unusual if an earlier transcription resembling ***ουαλα* (or *ουαληα*) was later corrected in conformity with the MT, since this phenomenon is attested elsewhere.³³⁷

336. Note that in Origen's commentary on Psalms, he specifically says that αμουδα is the Hebrew for στύλους (pl.) αὐτῆς 'its pillars' (*Selecta in Psalmos*, 12.1060.11). For the possibility of the intrusion of a spoken Aramaic form עֲלֵהָ, note that the preposition עַל with the 3fs suffix is written as עֵלָה in the Judaean Desert texts (see 5/6Hev3 and XHev/Se13).

337. For example, in Origen's list of biblical books found in his commentary on Psalms and quoted again in Eusebius's history, the original reading for the title of the Book of Chronicles, Δαβρηταμειν, is eventually changed to Διβρη Ἀϊαμίμ (see MOMMSEN 1908, 574), suspiciously identical to the Tiberian vocalization and

6.4.3.1.2.2. Philo's and Origen's Etymology of Enoch (חֲנוֹךְ = Ενωχ)

6.4.3.1.2.3. Mid-First Millennium CE Evidence for Qamaş

inconsistent with the phonology and orthography of the Secunda (cf. δαβρη [Ps. 35:20]).

339. There is, however, a variant in the apparatus of *lachen*, though *lochen* was judged by the editor as the more faithful reading (see HILBERG 1910).

in the middle of the first millennium CE and present in both Tiberian and Babylonian strongly suggests that it has more ancient roots than these mid-first millennium CE attestations.

6.4.3.1.3. Greek α for [ɔ]?

The salient question that remains, then, is whether Greek α could represent a vowel of the quality [ɔ(:)], or if Greek ω/o would be better suited to transcribe such a quality.

While there is insufficient *ancient* evidence to rule in favor of one possibility over the other, some data may be interpreted as indicating that ω/o would be preferred for transcribing [ɔ:]. In Greek transcriptions of Phoenician, the vowel resulting from the "Phoenician Shift" (*a/ > *ā/ > *ɔ/ > /o/) is transcribed as ω/o: e.g., λαβον 'white', ναδωρ 'he vowed', σαμω 'he heard' (FRIEDRICH and RÖLLIG 1999, 40–41). It is not clear, though, whether ω/o transcribes the end result (/ó/ [o:]) or the intermediate stage (/ǝ/) of the shift (see also Fox 1996, 38–39). In Greek transcriptions of Latin, short ɔ̄, which was realized phonetically as [ɔ], is usually transcribed by Greek o. However, we must remember that Latin o and Greek o were very similar or identical paleographically (5.3.1.1.4).

On the other hand, modern linguistic studies on cross-language perception suggest that a vowel with the quality of /ɔ/ can be identified with either /o/ or /a/ depending on the relationship of the vowel spaces of the respective languages. For example, in a study of Spanish speakers' (Spanish vocalic inventory: /i/, /e/, /a/, /o/, /u/) identification of Southern Standard British English (SSBE) and American English (AE) vowels, it was found that while SSBE /ɔ/ was almost always identified with Spanish /o/, AE /ɔ/ was identified also with Spanish /a/ about 29% of the time. This is presumably because SSBE /ɔ/ is higher than AE /ɔ/ (ESCUADERO and CHLÁDKOVÁ 2010, 256–57). In another study, native Catalan speakers (Catalan vocalic inventory: /i/, /e/, /ɛ/, /a/, /ɔ/, /o/, /u/) were found to identify AE /ɔ/ most frequently with Catalan /a/ (FABRA and ROMERO 2012, 494–95).

FABRA and ROMERO'S study of Catalan speakers' perception of AE vowels is especially instructive, as well as cautionary, for our present analysis. Particularly noteworthy is the fact

that AE /ɔ/ was most frequently identified with Catalan /a/, even though Catalan has /ɔ/ (!) in its own phonemic inventory. Moreover, a comparison of the normalized vowel spaces depicted in FABRA and ROMERO's charts (2012, 494) reveals that AE /ɔ/ is between Catalan /o/ and /ɔ/. The F1 and F2 frequencies illustrate this point (RECASSENS and ESPINOSA 2006, 655):

	<i>F1</i>	<i>F2</i>
<i>Catalan /o/</i>	489	1047
<i>English /ɔ/</i>	570	840
<i>Catalan /ɔ/</i>	608	1125
<i>Catalan /a/</i>	730	1358

The fact that Catalan /a/ is more distant from English /ɔ/ than both Catalan /o/ and Catalan /ɔ/ demonstrates how non-intuitive perceptual assimilation can be across languages. This is especially relevant when we consider that, at least at face value, Greek o/ω (a true mid [ɔ]) was likely nearer in the vowel space to Hebrew /ɔ/ [ɔ:] than Greek α ([a] or [a]) was.

These modern cross-linguistic studies provide justification for exploring the possibility that ancient Greek α *could* have represented "*qamaš*". If ancient Hebrew *qamaš* was a half-open /ɔ/ as in Tiberian, it probably would have been even lower than AE /ɔ/. Moreover, it is probable that ancient Greek /a/ was a low *back* vowel as suggested by PETROUNIAS (2007b, 558; 2007c, 604). The vowel space of Palestinian Koine also supports this. Because ε was particularly open (5.4.1.1.2), a more back realization of Greek /a/ (perhaps approaching [a]) would have been more contrastive. The only difficulty with Greek α representing Hebrew /ɔ/ concerns the precise phonetic realization of o/ω. If it was a true-mid vowel [ɔ], it would be closer to /ɔ/ and thus more likely to be the most apt for transcription (but note Catalan /a/ ≈ AE /ɔ/).

In sum, there is insufficient evidence to determine whether o/ω or α would be the best transcription choice for /ɔ/. Nevertheless, in light of modern cross-linguistic perceptual studies and ancient Greek phonology, it seems entirely *possible* that a low back Greek /a/ (≈ [a])

vowel represented by α may transcribe a mid-open rounded / $\bar{\alpha}$ /. There are, of course, numerous conceivable ways in which the various vocalic systems might relate to each other.

6.4.3.1.4. Summary

In light of the fact that it is entirely feasible that ancient Greek α may have represented / $\bar{\alpha}$ /, the argument for the existence of / $\bar{\alpha}$ / in the Secunda can be summed up as follows: The presence of *qamaš* in both Tiberian and Babylonian indicates that "*qamaš*" probably has more ancient roots than its earliest attestations in Babylonian incantation bowls from the middle of the first millennium CE. Greek ϵ (instead of η) in the transcription $\sigma\alpha\lambda\epsilon\alpha$ reflects assimilation to a following / $\bar{\alpha}$ /. Therefore, if $\sigma\alpha\lambda\epsilon\alpha$ is an original reading *and* assimilation to *qamaš* is the only appropriate explanation for *seghol* in forms like שְׁחֹל , the evidence seems to indicate that / $\bar{\alpha}$ / was present in the Secunda. While this issue requires further research and text-critical work, we will operate on the very tentative supposition that "*qamaš*" / $\bar{\alpha}$ / [a:] existed in the Secunda and will transcribe it as such with the understanding that it may still have been realized merely as / \bar{a} / [a:] (or [a:]).

6.4.3.2. Short /a/: [a] or [æ]?

In the Secunda, Hebrew short /a/ is normally transcribed by α in the Secunda:

$\alpha\lambda$	/ $\varsigma\alpha\lambda$ /	[$\varsigma\alpha\lambda$]	'on'	Ps. 18:42
$\rho\alpha\beta\beta\iota\mu$	/rabbīm/	[rab:ĩ:(m)]	'great'	Ps. 32:10
$\sigma\alpha\mu\theta$	/samt/	[samt ^h]	'you set'	Ps. 89:41

There are also a number of instances in which an expected /a/ is transcribed by ϵ , which represents an open-mid front vowel [ɛ] (or true mid [ɐ]) in Palestinian Koine (4.5.3.1.10).³⁴⁰

These can be divided into a number of categories, most (~16x) in the prefix vowel of *hif'il*.³⁴¹

$\theta\epsilon\rho\iota\beta$	/terħīb/	[t ^h IRħi:β]	'you widen'	Ps. 18:37
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340. The upshot of this section is as follows: Hebrew short /a/ is at least sometimes represented by Greek ϵ , which indicates that its phonetic realization was a front vowel [a] and perhaps (at least in some instances) a slightly raised vowel [æ]. While it lies beyond the scope of this dissertation to evaluate every possible instance of Greek ϵ for Hebrew /a/, I have stated my reasonings for my transcriptions in the following footnotes. Full and detailed argumentation for each of these transcription choices will have to be articulated in future works.

341. It is assumed that the prefix vowel of the *hif'il* stem was /e/ [ɪ] as a result of analogy to the prefix vowel in other verb stems such as *qal*. A similar analogy seems to occur in Palestinian Arabic (ELIHAY 2012, 760–61).

εττη	/het̥tē/	[hɪt̥ːe:]	'incline!'	Ps. 31:3
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There are also about five instances in which ε represents the initial vowel of the *pi^ʿel* stem:³⁴²

χελλωθαμ	/kallōtam(m)/	[k ^h æl:o:θã(m)]	'annihilating them'	Ps. 18:38
φελλετηνι	/palletēnī/	[p ^h æl:it̥ːe:ni:]	'rescue me!'	Ps. 31:2
εελλελεχ*	/ʔhallelek(k)/	[ʔæhæl:ɪlɪk ^h]	'I will praise you'	Ps. 35:18

Even before gutturals, the prefix vowel of the *qal* stem is represented with ε:³⁴³

ἱεζεβου	/yeʕzbū/	[jɪʕzəβu:]	'they will abandon'	Ps. 89:31
ουἱερογου	/w-yeħr(o)gū/	[(ʔ)uɪħRʊku:]	'and they will tremble'	Ps. 18:46

There is one instance in which the initial vowel of the *qal* stem is represented with ε:³⁴⁴

σεωθι	/ša(h)hōtī/	[ʃæho:θi:]	'I was bowed down'	Ps. 35:14
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In a few construct forms, expected /a/ is also transcribed with ε:³⁴⁵

βααδαρεθ	/b-hadrat/	[bahaðaræθ]	'in raiment of'	Ps. 29:2
βιεδ	/b-yad/	[b(i)jæð]	'into the hand of'	Ps. 31:9
μεῖεδ	/mey-yad/	[mɪj:æð]	'from the hand of'	Ps. 89:49

In guttural and geminate *Qatl(-at)** nominal forms, expected /a/ is also transcribed with ε:³⁴⁶

θεθ	/teħt/ or /taħt/	[t ^h ɪħt ^h]/[t ^h æħt ^h]	'under'	Ps. 18:39
ρεκ	/raq(q)/	[Ræk ^ʔ]	'only'	Ps. 32:6

In *waw consecutive* forms, the vowel of the conjunction is sometimes represented with ε:³⁴⁷

342. On the basis of the forms ουβαρεχ וְבָרַח (Ps. 28:9), ζαμμερου* וְזָמַר (Ps. 30:5), and φαλητ וְלָחַץ (Ps. 32:7), instances of ε in the stem of the *pi^ʿel* are regarded as reflecting a raised [æ] realization of Hebrew short /a/.

343. There is a tendency for the pattern of the strong *qal* non-stative verb (*qṣtal*, *qōtēl*, *yeqtol*) to be generalized across the paradigm in the Secunda. For example, originally stative **hapišē* (MT וְצִפְּתָה) is realized as ωφση (Ps. 35:27) and original **tisʕadēnī* (MT וְיִצְדָּקְתָּ) as θεσοδηνι (Ps. 18:36). It is assumed, then, that the /e/ prefix vowel in I-guttural *qal* forms, represented by Greek ε, is the result of analogy to the *qal* strong verb: **kṣtab* : **yektob* :: **ʕzab* : ? (> **yeʕzob*).

344. On the basis of a comparison with Jerome's *calloth* קָלוֹת (SIEGFRIED 1884, 41), the ε in this form likely reflects a raised realization [æ] of Hebrew short /a/, though raising could also be due to the sibilant (see 6.3.2).

345. Greek ε reflects a raised realization [æ] of Hebrew short /a/ in these instances (see 6.4.3.2.2.1), though the ε in βιεδ and μεῖεδ may be due to assimilation to /y/ (see YUDITSKY 2017, 96–98).

346. The form ρητ may have had an alternate pattern (i.e., **qitl*). It is assumed that Greek ε in ρεκ reflects a raised [æ] realization of Hebrew short /a/, though raising may also be due to the ʔ (see YUDITSKY 2017, 96).

347. On the basis of a comparison with forms like οσαῖαλεζ וְשָׁאַלְתָּ (Ps. 28:7) and οσαθθεμας וְשָׁאֲתָה (Ps. 89:39) and the realization of *wayyiqtol* throughout the various traditions of Hebrew, it is assumed that Greek ε reflects a raised [æ] realization of Hebrew short /a/.

ουεθαζερηνι	/wat-tʔazzerēnī/	[wætʰ:(a)ʔaz:IRE:ni:]	'and you girded me'	Ps. 30:12
ουῖεριβου	/way-yerhībū/	[wæj:IRhi:βu:]	'and they made wide'	Ps. 35:21

Finally, the interrogative pronoun םִה, the negative particle לֹא, and the relative particle אשר all have a vowel transcribed by ε where we would expect /a/.³⁴⁸

μεββεσε	/meb-beʃʃ/	[mæb:ɪʃʃɪ]	'what gain?'	Ps. 30:10
ελθαρακ	/ʔal terħaq/	[ʔæl tʰarħakʔ]	'do not be far!'	Ps. 35:22
εσερ	/ʔšer/	[ʔæʃER]	'which'	Ps. 46:9

There are essentially two ways of interpreting the use of Greek ε to transcribe what we would expect to be Hebrew /a/. First, Greek ε does indeed reflect Hebrew /a/ in these instances and, for some phonetic reason, approximates Hebrew /a/ just as well as or better than α does. Second, Greek ε here reflects the phoneme /e/ [ɪ] (or an allophone of another phoneme realized as [ɪ]/[ə]/[ɛ]) in these forms just as it does regularly in the Secunda. In each case, there is either a morphological or phonetic explanation for the presence of /e/ instead of /a/. It is also possible, of course, that some but not all of the forms are given to one or the other explanation. After a review of scholarship, I will argue that, though many of these forms can be explained morphologically or phonetically, the evidence suggests that at least in some of these words, ε is used to represent Hebrew /a/, realized as a near-open front unrounded vowel [æ].

6.4.3.2.1. Review of Scholarship

PRETZL argues that in a closed stressed syllable, in addition to representing */i/, ε can also represent an etymological */a/ vowel that had shifted to an open front vowel (perhaps [æ]?) in the environment of certain consonants (liquids, gutturals, sibilants) (1932, 8, 13).

SPEISER argues that while "*qamaṣ*" is represented by α in the Secunda, "*pataḥ*" may be represented by either α or ε, particularly in closed syllables far from the stress.³⁴⁹ At the time

348. Greek ε reflects a raised realization [æ] of Hebrew short /a/ in these instances (see 6.4.3.2.2.2–3), though the ε in εσερ may be due to the sibilant (see 6.3.2).

349. His list includes the vowel of the prefix conjugation in the *hif'il* stem (9 times), the prefix vowel of the imperative in the *hif'il* stem (5 times), the vowel between the first and second radical in various forms in the *piel* stem (5 times), various verbal forms (6 times), *segholate* nouns (19 times), other nominal forms (7 times), and pronouns and particles (15 times) (1943, 267–68).

of the Secunda, short /a/ inclined towards /e/ and long /ā/ was more of a pure *a*-quality vowel. After /ā/ shifted in quality to /ā̄/, "*pataḥ*" then shifted in quality to occupy the space previously held by "*qamaṣ*" (1933, 35–44).³⁵⁰

BRØNNØ is unwilling to accept that short /a/ can be signified by ε in the Secunda. Rather, he argues for a pervasive /a/ > /e/ sound change occurring in closed unstressed syllables in the Secunda, similar to the rule known as "attenuation" (e.g., */magdāl/ > /migdāl/) in Tiberian Hebrew. Many forms (e.g., the irregular /i/ in *hif'il*) are the result of this change, but others (e.g., θεθ) must ultimately derive from variant patterns or scribal errors (1943, 18, 26, 30–31, 203, 245–46, 267–68, 290–93, 301, 304, 307–309, 443, 439, 449).

JANSSENS continues in the line of PRETZL and SPEISER, arguing that etymological */a/, if not lengthened to /ā/, was realized as a more close [æ] in the Secunda; thus, /e/ (< */i/) is transcribed as ε, /a/ (< */a/) as α/ε, and /ā/ (< */ā/) as α (1982, 67, 70–74).³⁵¹

Finally, YUDITSKY argues that instances of ε in the Secunda are either the result of the development of etymological */i/ or the result of contraction. To explain the unusual instances of */a/ > ε cited above, he appeals to analogy, assimilation to adjacent consonants (e.g., sibilants, /k/, /y/), and derivation from different patterns. For example, he suggests that the *hif'il* and *pi'el* forms are the result of assimilation to the past tense and that θεθ derives from a **qitl* pattern. (2007b, 303 n13; 2017, 49–52, 150–51, 159–61, 222–23).

It is true that many of the forms discussed above can be explained on the basis of analogy, assimilation, or derivation from variant patterns. However, there are some forms for which these explanations are not sufficient: e.g., μεββεσε, ελ, and βααδαρεθ (see below). It is difficult to determine whether such forms would indicate a general realization of /a/ as [æ] or

350. According to SPEISER, /ā/ did not shift to /o/ in Babylonian Hebrew and thus "*pataḥ*" remained as a more front vowel. For this reason, *pataḥ* can signify both *pataḥ* and the equivalent of Tiberian *seghol* (1933, 35–44).

351. JANSSENS transliterates this hypothesized vowel as ä, but due to his use of the word "close" to describe the pronunciation of the vowel he probably means something more like [æ] (1982, 67).

merely that a sporadic sound change (e.g., $a > e / C_C_{[-stress]}$) was in operation. I concur with YUDITSKY (2007a, 10–11) that a wide "attenuation" rule did not operate in the Secunda, though we should keep in mind that reduction and centralization away from the stress is common in many languages.

6.4.3.2.2. Etymological */a/ > ε: Analysis of Forms

It would be unfruitful to discuss forms in which the presence of ε could likely be explained as the result of analogy, such as the prefix vowel of the *hif'il* stem. Only those forms with ε for */a/ which are unlikely to be explained by analogy, assimilation to nearby consonants, or derivation from a variant pattern are valuable for argumentation. Additionally, a strong case for ε = [æ] can be made if a particular transcribed word with ε has a biform with α elsewhere in the Secunda and is attested in all other Hebrew reading traditions with /a/. If the most likely interpretation of such words is that ε is representing a realization of /a/ [æ], the principle can then be considered for other transcriptions. The three words in which it is most likely that ε represents /a/ [æ] are βααδαρεθ, μεββεσε, ελ-, and -εννα. They will be examined in turn.

6.4.3.2.2.1. βααδαρεθ

In the transcription βααδαρεθ בְּהִדְרָתָּ (Ps. 29:2), the feminine construct ending */-at/, which is attested everywhere in Hebrew as /-at/,³⁵² is transcribed as -εθ. Parallel Secunda forms show that the feminine ending */-at/ is usually transcribed by -αθ: e.g., εμαραθ אֶמְרַת 'word of' (Ps. 18:31), οννεχαθ הַנִּבְחַת 'dedication of' (Ps. 30:1), and αρφαθ הַרְפָּת 'reproach of' (Ps. 89:51).

BRØNNO explains the unusual ending on this form as either the result of dittography (βααδαπαθ > βααδαπαθθ > βααδαρεθ) or a *segholate* pattern with an epenthetic (**hadart* > (βα)αδαρεθ) (1943, 152–53). YUDITSKY also argues that the transcription βααδαρεθ may derive from the pattern **qatal* and the ε is an epenthetic vowel. However, because an epenthetic is rare in the Secunda, he concludes that the transcription is corrupt (2017, 79, 192–93).

352. In Samaritan Hebrew it is realized as -āt as in *yēšuwwāt* 'salvation of', *ašfāt* 'edge of', and *wtirruwwāt* 'and the shout of' (FLORENTIN 2016b, 73, 75, 87).

It is unlikely that this form is the result of scribal error, since we have a parallel form in which */-at/ is transcribed by -εθ in external sources. In John Chrysostom's comments on Jeremiah 49:28 (30:23 in the LXX), he says that τῇ βασιλίσσει τῆς αὐλῆς 'to the queen of the court' is realized in Hebrew as Μελεθεθ Ασωρ (64.1029), presumably reflecting a variant מלכת חצור from the MT וּלְמַלְכוֹת חָצוֹר. It is unlikely that this is a scribal error in Chrysostom, since he also renders βασιλισσα 'queen' with μελεθεθ in his comments on Jeremiah 44:17 (51:17 in the LXX) (64.1013).

The word βααδαρεθ may derive from a different pattern, but no such pattern is attested in Hebrew for this word. In Tiberian, the form is always vocalized as הֶדְרֶת, Babylonian only attests to הֶדְרֶת/בְּהֶדְרֶת (YEIVIN 1985, 927), and Palestinian only attests to *hedrat* (MURTONEN 1988 I/Ba, 83). Targumic Aramaic has the forms הֶדְרֶת and הֶדְרֶתָא, but even there the construct form attested is הֶדְרֶת (JASTROW 1926, 335). YUDITSKY compares βααδαρεθ to forms such as Ναζαρεθ נֶצְרַת in the Gospels and μαελεθ מְחֶלֶת in the LXX (2017, 193). ELIZUR argues that original **qatal̥t*, as in Ναζαρεθ, tends to be realized as *qatelet* in an older layer of Hebrew, but as *qātl̥at* in a later layer of Hebrew: e.g., בְּרֶקֶת 'carbuncle' (type of stone) in the Pentateuch but בְּרֶקֶת in Ezekiel (2004, 227–28).³⁵³ However, the fact that the initial vowel in the various Hebrew vocalization traditions is short demonstrates that הֶדְרֶת derives from a different pattern than that of ברקת or נצרת. Moreover, this pattern (**qatal̥t* > *qatelet/qatlat*) seems to be assigned to special classes of nouns (e.g., place names, infirmities).

Even if we allow for a unique nominal pattern behind βααδαρεθ in the Secunda, both the *presence* of epenthesis and the *quality* of the epenthetic vowel in βααδαρεθ are inconsistent with the typology of *segholation* in the Secunda. Epenthesis in *segholate* nouns in the Secunda is only found in the environment of gutturals or in the environment of *resh* when the

353. Note that בְּרֶקֶת is probably a loanword.

final consonant cluster follows the Sonority Sequencing Principle (SSP) (אֶתֶּר יְהוָה).³⁵⁴ In Hebrew and Semitic, epenthesis in a final consonant cluster is more likely with rising sonority (e.g., אֶתֶּר), but less likely with decreasing sonority (e.g., יְהוָה) (KIPARSKY 2003, 149, 160–61, 168–172). Also, except in the case of the pharyngeal /ʕ/, epenthetics in the Secunda have the same quality as the adjacent vowel (YUDITSKY 2017, 79–80). In the case of βααδαρεθ, not only does sonority fall significantly—C₂ (ר) is at the top of the sonority hierarchy in Hebrew and C₃ (ת) is at the bottom (see ALVESTAD and EDZARD 2009, 49)—but the epenthetic is of a different quality than the preceding vowel. Therefore, despite the comparative patterns in the Gospels and the LXX such as Ναζαρεθ תִּצְרֶנֶּה and μαελεθ תִּלְחָמְךָ (YUDITSKY 2017, 193), it would be inconsistent typologically with Secunda Hebrew to posit that ε in βααδαρεθ reflects a helping vowel. A much simpler phonetic explanation is laid out in 6.5.1.5.1.

In sum, while it is possible that βααδαρεθ constitutes a unique pattern in the Secunda, such a claim is inconsistent with the semantics of the noun, its attestations elsewhere in Hebrew, and the phonotactics of Secunda Hebrew. Alternatively, we may suggest that the ending -εθ in the form βααδαρεθ, just as in the transcription μελχεθ in Chrysostom's commentary on Jeremiah, reflects the Hebrew ending /-at/ realized as something like [æθ]. Whether the raising of the vowel was the general realization of short /a/ in the Secunda or due to a sporadic change as a result of being far from the stress is unclear.

6.4.3.2.2.2. μεββεσε

In the word μεββεσε מְבַבֵּסֶה (Ps. 30:10), the interrogative pronoun מֶה־ is realized with ε for an expected /a/. Parallel forms in the Secunda demonstrate that the word is regularly spelled with α: e.g., χαμμα מַחֲמָה 'how long/much?' (Ps. 35:17), λαμα מַלָּמָה 'why?' (Ps. 49:6), αδ·μα מַדְמָה 'how long?' (89:47), and αλ·μα·σαυ מַלְמָה 'on account of what vanity?' (89:48).

BRØNNO argues that the first ε in μεββεσε may be the result of an /a/ > /e/ shift in unstressed closed syllables. It corresponds etymologically with Tiberian Hebrew מֶה before non-

354. But cf. νεεμαναθ מְנַמְנָה. However, note the relevance of the OCP (see 6.5.2.2). For the SSP, see 6.5.2.1.2.

gutturals (1943, 211). YUDITSKY, though he admits that there is no clear solution for the presence of ϵ in $\mu\epsilon\beta\beta\epsilon\sigma\epsilon$, suggests that instead of being a transcription of the interrogative pronoun מה 'what?', $\mu\epsilon$ may actually be a transcription of a negative particle which may be compared with Mishnaic Hebrew שִׁמָּה and Samaritan Aramaic *dimme* (2017, 111).

In Tiberian Hebrew, the various syntactic states of the interrogative מה may be classified as proclitic (i.e., attached to following word [e.g., מה־שָׁמוֹ]), enclitic (i.e., after a preposition [e.g., בְּמָה]), or independent (i.e., with a disjunctive accent [e.g., הֲיִהְיֶה לָּהּ]). The vocalization מָה only occurs in proclitic מה before a pharyngeal with *qamaš* (e.g., מָה־עֲשֶׂה), in enclitic non-pausal מה (e.g., בְּמָה), and in independent מה (e.g., מָה קוֹל הַהֶמְיוֹן הַזֶּה).³⁵⁵ It is only the last of these three, independent מה before non-gutturals, that might correspond with $\mu\epsilon\beta\beta\epsilon\sigma\epsilon$ in the Secunda. However, a diachronic analysis of מה in the various Hebrew reading traditions demonstrates that the vocalization of independent מה as מָה before non-gutturals in phrases like מָה קוֹל הַהֶמְיוֹן הַזֶּה is most likely a later Tiberian innovation.³⁵⁶

355. When proclitic, it is vocalized as מָה with gemination in the following consonant. When it is enclitic, it occurs as מָה in context (e.g., בְּמָה) and as מָה in pause (e.g., בְּמָה) and in the word לְמָה/לָּמָה. When it is independent, it occurs as מָה before a word and as מָה after a word. Before a guttural, it usually appears as מָה. However, if it is proclitic, it will appear as מָה when the guttural takes virtual gemination and as מָה before a pharyngeal with *qamaš* (JOÜON and MURAOKA 2009, §37).

356. In Babylonian, the rules for מה are fairly similar, but in several instances Babylonian has *qamaš* where Tiberian has *seghol* (YEIVIN 1985, 1134–39). In Palestinian, מה is often left unpointed when it corresponds to Tiberian *pataḥ*, but doubling may be marked (e.g., לִי). It may be pointed with *qamaš* before a guttural (e.g., מָה חֲרֹל and מָה חֲרֹל) (REVELL 1970, 176), but with /e/ before ה with an /a/ vowel (e.g., מָה חֲרֹל [YAHALOM 2016b, 111–12]). In Samaritan Hebrew, מה is always vocalized as *mā*. However, there is a distinction in vocalization between במָה/כָּמָה *bāmā/kāmā* and לָמָה *lēmā* (BEN-HAYYIM 2000, 238–39, 320–21).

Assuming that מה pointed with a *pataḥ* and following gemination (· מה) is the most original form, we may divide the various changes in the vocalization of מה into two categories. First, there are sound rules that operate relatively consistently based on the immediate phonological environment (e.g., proclitic מָה before gutturals and מָה before pharyngeals with *qamaš*). Second, there are sound changes that operate based on the prosodic and syntactic structure of the verse (e.g., enclitic and independent מָה/מָה).

A few diachronic observations may be made regarding these distinctions as they relate to the Secunda. First, there is evidence against the phonological rule $a > e / _C\text{[+laryngeal]}\bar{a}$, which applies to *proclitic* מה, operating in the Secunda (e.g., $\alpha\alpha\phi\eta\varsigma^*$ פֶּן הֶהְפֵּךְ) and in Jerome's transcriptions. However, there is evidence for the $a > e / _C\text{[+laryngeal]}\bar{a}$ change in Tiberian (e.g., מָה עֲשִׂיתָ), Babylonian (e.g., מָה עֲשִׂיתָ), and Palestinian (e.g., מָה חֲרֹל). Second, there is evidence against the prosodic change of $a > e$ that applies to *enclitic* מה both in Jerome (*bamma* || בְּמָה) and Babylonian Hebrew (בְּמָה || בְּמָה, בְּמָה פְעָמִים || כְּמָה פְעָמִים). Third, it is unclear if there is evidence for the prosodic change of $a > e$ that applies to *independent* מה in Babylonian Hebrew. Finally, when Babylonian does not exhibit an $a > e$ change in certain prosodic conditions, it often demonstrates an $a > \bar{a}$ change instead. These observations are summarized below (✓ = evidence for, ✗ = evidence against, — = not enough evidence):

In light of the diachrony of מה in the various traditions, then, it is highly unlikely that the Secunda form μεββεσε corresponds to prosodically-conditioned מה in Tiberian Hebrew as BRØNNO suggests. Even if it were reasonable to reconstruct *mě* for the Hebrew of the Secunda, BRØNNO would have to assume that μεββεσε is a mixed form, since its vocalization would correspond to an independent form even though the following gemination would indicate that it is a proclitic form. While YUDITSKY's suggestion that με in μεββεσε should be interpreted as the negative particle cannot be disproven, it is highly unlikely for two reasons. First, all of the ancient translations (Aquila, Symmachus, LXX, Theodotion, Jerome, Targum) understand the word מה in the sequence מה בצע in Psalm 30:10 to be an interrogative. Second, there is no attestation anywhere else in Hebrew of a negative particle מה standing on its own with a vocalization other than that of the definite article.³⁵⁷ This leaves no other reasonable option but to interpret μεββεσε as the interrogative מה in the Secunda.

<i>Phonologically-Motivated Changes:</i>	<i>Secunda</i>	<i>Jerome</i>	<i>Tib.</i>	<i>Bab.</i>	<i>Pal.</i>
➤ (1) Proclitic מה: $a > e / _ G:\bar{a}$	×	×	✓	✓	✓
➤ (2) Proclitic מה: $a > \bar{a} / _ G:\check{v}_{[-open\ back\ long]}$	—	—	✓	✓	✓(?)
<i>Prosodically-Motivated Changes:</i>	<i>Secunda</i>	<i>Jerome</i>	<i>Tib.</i>	<i>Bab.</i>	<i>Pal.</i>
➤ (3) Enclitic מה(בכל): $a > \bar{a}$	—	—	✓	✓	—
➤ (4) Independent מה: $a > \bar{a}$	—	—	✓	✓	—
➤ (5) Enclitic מה(בכל): $a > e$	—	×	✓	×	—
➤ (6) Independent מה: $a > e$	—	—	✓	?	—

It seems clear from the chart that change (1) in *proclitic* מה occurred after the period of the transcriptions but still relatively early. It is likely that change (5) in enclitic מה only applies in Tiberian Hebrew. Although the evidence for change (6) is inconclusive, it makes the most sense to associate it with change (5) and assume that it applies only in Tiberian. There is no evidence for a *terminus ante quem* for changes (3) and (4), but they are probably as old as the reading tradition itself, since מה, disjoined from the following word, would not have brought about gemination of the following consonant.

357. In the examples YUDITSKY cites (אִמָּה and *dimme*), the negative particle is enclitic with a preposed particle. This is parallel to שְׁלֵמָה in Song of Songs 1:7. When מה does function as a non-enclitic negative particle in Biblical Hebrew, it is vocalized like the interrogative: e.g., וְיִמָּה אֶתְבּוֹן 'and I will not look' (Job 31:1). Interestingly, Symmachus, the LXX, and Theodotion translate מה in this verse as a negative (FIELD 1875, 2:54).

Because gemination is indicated, μεβ(βεσε) should be regarded as a proclitic form. The forms χαμμα, λαμα, and αδ·μα should be regarded as enclitic. The final attestation, αλ·μα·σαν, could be interpreted as either proclitic (i.e., 'on account of what vanity ... ?') or enclitic (i.e., 'on account of what ... vainly?'). Both interpretations are found in the ancient translations, most translating it as enclitic.³⁵⁸ The singleton σ supports an enclitic interpretation, but the fact that all three words are written on the same line with diacritics in between them (|αλ·μα·σαν|) and its proclitic status in the Tiberian vocalization support a proclitic reading in the Secunda. If αλ·μα·σαν does represent a proclitic form of מַם, it would support reading the ε in μεβ(βεσε) as representing /a/. The evidence, however, is inconclusive.

In sum, the ε in μεβ(βεσε) could be interpreted as either a sporadic instance of /a/ > /e/ in a closed unstressed syllable, attested nowhere else in Hebrew for this word, or, and more likely, the ε is merely an alternative representation of Hebrew /a/. YUDITSKY's claim that it is to be interpreted as a negative particle lacks supporting evidence.

6.4.3.2.2.3. ελ

In the phrase ελθαρακ קַח־לְךָ (Ps. 35:22), the negative particle לְךָ is rendered with an ε where we would expect /a/. The fact that this word is attested eight times in the Secunda, always as ελ, precludes any possibility of this being a scribal error.

BRØNNO, based on an article by BLAKE (1911), claims that the negative particle was originally just a vocalic /l/. A prosthetic vowel of varying quality was added, resulting in *ʔal* in Tiberian Hebrew but *ʔel* in Secunda Hebrew. He also suggests that /a/ might have shifted to /e/ in the proclitic word (1943, 213–14). YUDITSKY, drawing on the interchanges of לְךָ and

358. Symmachus (proclitic interpretation): ἢ ἐπὶ τίνι ματαίῳ ἔκτισας πάντας τοὺς υἱοὺς τῶν ἀνθρώπων 'On account of what vanity did you create all the sons of men?' Aquila (enclitic interpretation): ἐπὶ τί εἰκῇ ἔκτισας πάντας υἱοὺς ἀνθρώπων 'On account of what did you vainly create all the sons of men?' LXX (enclitic interpretation): μὴ γὰρ ματαίως ἔκτισας πάντας τοὺς υἱοὺς τῶν ἀνθρώπων 'For have you vainly (lit. 'for not vainly...?') created all the sons of men?' Theodotion (enclitic interpretation): ἐπὶ τί ματαίως ἔκτισας πάντας τοὺς υἱοὺς τῶν ἀνθρώπων 'On account of what did you vainly create all the sons of men?' Jerome (enclitic interpretation): *numquid enim vane constituisti omnes filios hominum?* 'For you have surely not vainly created all the sons of men?' Targum (enclitic interpretation): מַטְוִיל מַה לְבַטְלָא בְרִיתָא כּל בְּנֵי־נֶשָׁא 'On account of what did you vainly create all the sons of men?'

ֹלֹ in Tiberian and Babylonian (see below), suggests that the prohibitive particle might have had multiple allomorphs and that the Secunda reflects the /ʔel/ allomorph (2017, 216).

BRØNNØ's claim that a preceding vowel is not original can be rejected on the basis of comparative Semitic evidence. Negative ʔl is common in Semitic, attested in Geʿez ʔal, Sabaic/Qatabanic ʔl, Mehri əl (in the phrase əl ... lā), Ugaritic ʔal, Phoenician ʔl, Old Aramaic ʔl, and Hebrew ʔal (WENINGER 2011b, 170). According to SJÖRS, who argues that *ʔal was originally a "*prohibitor*" used to indicate negation and volition in Proto-Semitic, there is no persuasive reason to expect anything other than /a/ in Hebrew. He does, however, note that the vowel of *ʔal is usually /a/ in Semitic, but may raise or lower depending on the particular reflex of */l/ in a given language (e.g., ǎl in Modern South Arabian due to the velarized /l/) (2015, 86–89, 281–88, 303–309; pers. comm.).

The prohibitive particle is realized with an /a/ vowel (/ʔal/) in all of the main Hebrew reading traditions.³⁵⁹ There are a small number of exceptions in both Tiberian and Babylonian in which the negative particle ֹלֹ is pointed like the preposition ֹלֹ,³⁶⁰ but the fact that this interchange goes in both directions indicates that the exceptional vocalizations are *lexical* variants in the tradition—they substituted the word ʔel 'to' for ʔal 'not'—and not variants in pronunciation or vestiges of a tradition which realized *ʔal as ʔel. The regular vocalization of ֹלֹ as əl in the Secunda can hardly be compared with these extremely rare interchanges of ֹלֹ/ֹלֹ in Tiberian and Babylonian. In fact, there is no evidence that the negative particle ʔl was *regularly realized* as anything other than /ʔal/ in any tradition of Hebrew or Northwest-Semitic language.

359. The prohibitive particle is realized in Tiberian, Babylonian, and Palestinian as ʔal and in Samaritan as al (YEIVIN 1985, 1117; YAHALOM 2016b, 115–16; FLORENTIN 2016b, 73, 83).

360. In Tiberian, there are a few instances in which the negative particle ʔal is pointed as ʔel (Exod. 10:28, Deut. 2:9, Josh. 22:19, Jer 51:3 [2x]) and other instances in which the preposition ʔel is pointed as ʔal (Judg. 19:23, Jer. 47:6, Prov. 12:28). In Babylonian, there is at least one occasion in which the manuscripts vary between ʔal and the preposition ʔil (Jer. 47:6) (YEIVIN 1985, 1117).

In sum, there are a few options for interpreting the transcription $\epsilon\lambda$ in the Secunda. First, $\epsilon\lambda$ could represent an innovation in Secunda Hebrew found nowhere else in the Hebrew reading traditions or in Northwest Semitic. Second, $\epsilon\lambda$ may reflect an instance of the sporadic /a/ > /e/ shift in an unstressed closed syllable (BRØNNØ 1943, 214–15). Third, and the most likely, is that the ϵ in $\epsilon\lambda$ may simply be an alternative representation of the phoneme /a/, consistent with the rest of the reading traditions of Biblical Hebrew.

6.4.3.2.2.4. $\alpha\nu\nu\alpha/\epsilon\nu\nu\alpha$

Although it comes from an external source, we may also mention the various renderings of the long imperative ending with following \aleph . In Origen's Commentary on Matthew, Hebrew \aleph \aleph \aleph \aleph and \aleph \aleph \aleph (Ps. 118:25) are rendered by $\alpha\sigma\iota\lambda\alpha\nu\nu\alpha$ and $\omega\sigma\iota\epsilon\nu\nu\alpha$, respectively, presumably reflecting either α or ϵ for short /a/ in precisely the same context.

6.4.3.2.2.5. Summary

For each of these irregular transcriptions, multiple interpretive possibilities have been put forth, none of which is certain. In my view, the arguments for ϵ representing /a/ in the transcriptions $\beta\alpha\alpha\delta\alpha\rho\epsilon\theta$, $\mu\epsilon\beta\beta\epsilon\sigma\epsilon$, $\epsilon\lambda$, and $\epsilon\nu\nu\alpha$ are more compelling than those against it, which usually require the transcription to reflect a unique phenomenon particular to the Secunda. In light of the evidence of these four words, we should be open to the possibility that, at least on occasion, Greek ϵ may represent Hebrew /a/ in the Secunda.

6.4.3.2.3. Cross-Language Perception and Production of [æ], [a], and [ɑ]

That Greek ϵ [ɛ] might represent Hebrew /a/ is also supported by the linguistic typology of open vowels and studies on cross-language perception of [æ] and [a].

First, cross-linguistically, in vowel systems with both long /ā/ and short /a/, the short /a/ tends to be realized with a more front articulation and the long /ā/ tends to be realized with a more back realization (HOCK 1991, 144). (In traditional pronunciations of Geʿez among Amharic speakers, long /ā/ is realized as a low central [a] or [ɑ] while short /a/ is realized as a near open [æ] or [ä] (LAMB DIN 1978, 3).) In many modern Arabic dialects, short /a/ tends to have a higher second formant (correlating with vowel frontness) than long /ā/ (ROSENHOUSE,

AMIR, and AMIR 2014, 6). In Modern Persian, /a/ is realized as [æ] and /ā/ is realized as [ɑ:]. A more front realization of short /a/ is also the case in numerous dialects of German and in conservative French (HOCK 1991, 144).

Second, when /æ/ is absent from the vocalic inventory of a language that has /ε/ and /a/, it *may* be perceived as either /ε/ or /a/. We may take KIM's cross-linguistic study of Koreans' perception of English vowels as an example.³⁶¹ This study is particularly relevant because the participants essentially engaged in a transcription exercise, writing out English words that they heard in Korean orthography. English /æ/ was most frequently transcribed as Korean /ε/ (1972). In another perceptual study, it was found that when Spanish (Spanish vocalic inventory: /i, e, a, o, u/) speakers attempted to produce English /æ/, they were prone to misproduce it as /a/ and less frequently as /ε/ (FLEGE BOHN, and YANG 1997, 448). Another study found that English /æ/ was assimilated to Spanish /a/ 94% of the time and to Spanish /e/ only 6% of the time. However, in a discrimination task, /æ/ and /ε/ were regarded to be the same vowel about 80% of the time (JESKE 2012, 18). Finally, in a study of Salento Italian speakers' perception of English vowels, it was found that English /æ/ was perceived as Salento /a/ 54% of the time and as Salento /e/ 46% of the time (SISINNI, ESCUDERO, and GRIMALDI 2014, 716).

Third, an *a/e* interchange is also found in the Arabic-in-Latin-letters example cited earlier: *M-o-h-a-m-e-d*, *M-o-h-a-m-m-a-d* (THOMPSON-PANOS and THOMAS-RUŽIĆ 1983, 612).

6.4.3.2.4. The Damascus Psalm Fragment: Arabic /a/ = ε

We find a transcriptional parallel in an eighth-century CE fragment of an Arabic translation of the Psalms written in Greek script known as the Damascus Psalm Fragment. In this text, Arabic short /a/ is transcribed by Greek ε: e.g., γεβελ /gabal/ 'mountain', γανεμ /ḡanam/ 'goats', σεμα /samā(?)/ 'sky', and μεσκεν /maskan/ 'dwelling'. In the environment of back consonants, short /a/ is transcribed by α, though the distribution is not entirely clear. AL-JALLAD suggests that perhaps Arabic short /a/ had been raised to [æ] in "non-backed environments" and thus

361. The Korean vocalic system has /i, e, ε, y, ø, ʌ, ɑ, o, u, i/ (see 6.4.2.4).

both α and ε were regarded as appropriate transcriptions of this phoneme (2017, 15–16). Because the text is so much later than our period, it was excluded from chapter 5. However, since the pronunciations of Greek α and ε are quite similar from the end of the Koine period until Modern Greek, it is applicable for this specific case.

6.4.3.2.5. Greek Loanwords in the Mishnah: Greek ε = Hebrew /a/

While cross-linguistic perceptual studies and Arabic transcription demonstrate that it is theoretically possible that Hebrew /a/ could have been realized with a more front and/or raised pronunciation and thus equated with Greek ε on occasion, the vocalization of Greek loanwords in Mishnaic Hebrew provides direct evidence of such an equivalency.

In Greek loanwords in the Mishnah, ε is typically rendered by a *pataḥ* in Hebrew, usually in closed stressed syllables. HEIJMANS concludes on the basis of this fact that Greek ε had a rather open realization in contemporary Palestinian Greek (see 5.4.1.1.2). Thus, Hebrew /a/ was regarded as a better approximation of Greek ε than Hebrew /e/ would have been.

The fact that we are dealing with cross-language equivalencies and not sound changes is supported by a few points. First, in a minority of instances, Greek ε was realized in Hebrew with an /e/ vowel (5.4.1.1.3). Second, Greek η is usually reflected in Hebrew by /e/ vowels (usually *ṣere*) (5.4.1.1.3), thus demonstrating that Greek ε was more open than η and nearer to Hebrew /a/. Third, in a few Latin loanwords in the Mishnah, Latin *ĕ* [ɛ] is also rendered by Hebrew /a/ (e.g., *catella* קַטְלָה) (HEIJMANS 2013, 262). In sum, the evidence from Greek loanwords in the Mishnah seems to indicate that Hebrew short /a/ in Tannaitic Hebrew was of such a quality that it was nearer to Greek ε than Hebrew /e/ was.

6.4.3.2.6. Concluding Remarks

A survey of the evidence in the Secunda, cross-linguistic perceptual studies, the Damascus Psalm Fragment, and Greek loanwords in the Mishnah suggests that Hebrew /a/ may have been realized as something like [æ] and thus transcribed by Greek ε , at least in the case of βααδαρεθ, μεββεσε, ελ-, and -εννα. While previous scholars' presupposition that one

grapheme can only correspond with one phoneme may make an analysis of the transcriptions less troublesome, it is unrealistic and inconsistent with the data.

Having established the principle in a small number of words, we may also point to other potential instances in which Greek ϵ might correspond with Hebrew /a/ in the Secunda, such as the *pi^ʿel* imperative forms. While YUDITSKY argues that forms such as $\phi\epsilon\lambda\lambda\epsilon\tau\eta\nu\iota$ and $\sigma\upsilon\nu\epsilon\sigma\sigma\eta\mu$ prove that the *pi^ʿel* imperative had been formed in analogy to the past, the forms $\sigma\upsilon\beta\alpha\rho\epsilon\chi$ (α due to compensatory lengthening before /r/) and $\zeta\alpha\mu\mu\epsilon\rho\upsilon^*$ may very well indicate that the first vocalic phoneme in these forms was Hebrew /a/ and that α and ϵ are alternative representations of it. Thus, the transcription $\phi\epsilon\lambda\lambda\epsilon\tau\eta\nu\iota$ may represent Hebrew /palletēnī/ just as Greek $\sigma\acute{\epsilon}\lambda\lambda\alpha$ is rendered as /sallā/ in the Mishnah (HEIJMANS 2013, 262).

In sum, though we have made a strong case that Greek ϵ might represent Hebrew short /a/ in the Secunda on occasion, this only facilitates *phonemic* transcription. Determining the precise *phonetic* realization of Hebrew short /a/ is more difficult. However, a couple points can be made. First, if the realization of short /a/ in Secunda Hebrew was similar to that of Mishnaic Hebrew, then Greek ϵ was nearer to Hebrew /a/ than it was to Hebrew /e/. This probably indicates that Hebrew short /a/ was realized as either a front open [a] (like *pataḥ* in Tiberian Hebrew [KHAN 2013a, 95]) or a near-open front [æ]. Second, the phonetic quality of Hebrew short /a/ must have generally been nearer to Greek α than it was to Greek ϵ . This supports an open realization of /a/ as [a].

Understanding that Hebrew was a real language, we should not be surprised if short /a/ vacillated in its phonetic realization, having allophones of [a] and [æ]. We may compare this to the Neo-Aramaic dialect of the Assyrian Christians of Urmi, in which short /a/ vacillates in its realization between [a], [æ], and [ɛ] (and [ɑ] in emphatic words) (KHAN 2016, 64), or the oral production of modern Literary Arabic short /a/, which is typically realized between [a] and [æ] (and [ɑ] near emphatics) (MITCHELL 1990, 72–82).

When it comes to *phonetic* transcription, then, we will adopt a conservative but instructive approach. Hebrew short /a/ will be phonetically transcribed as a front unrounded open vowel [a], with the understanding that it may have had a slightly raised realization of [æ]. In those particular cases in which Hebrew short /a/ is represented by Greek ε, it will be represented in phonetic transcription by [æ], leaving the door open for understanding it as an allophone in a particular environment. Given the distribution, it would not be surprising if some raising/centralization occurred far from the stress³⁶² or before geminate consonants.³⁶³ In sum, the transcription conventions for Hebrew /a/ and /ā/ may be depicted as follows:

	Hebrew /a/	Hebrew /ā/
<i>Realized as ...</i>	[a]/[æ]	[ɔ:]
<i>Transcribed as ...</i>	α = [a]/[α], ε = [ε]	α = [a]/[α]

6.4.4. Potential Phonemes: /ē/ and /ε/

Various reconstructions of the development of the Hebrew vowels would require positing that ε represents the vocalic phonemes /ē/ and /ε/ in a number of transcriptions in the Secunda (see 6.4.4.1). First, what would be final ך in Tiberian Hebrew is rendered by ε, which represents an open-mid front vowel [ε] (or true mid [e]) in Roman Palestinian Koine (4.5.3.1.10):

μοσαυε	/mšawwē/	[mʊʃaw:ε:]	'making meet'	Ps. 18:34
μασε	/maḥsē/	[maḥsε:]	'a refuge'	Ps. 46:2
ιερε	/yerʔē/	[jɪrʔε:]	'he will see'	Ps. 49:10; 89:49
ζε	/zē/	[zε:]	'this'	Ps. 49:14

The parallel to pausal *seghol*, attested once in the Secunda, is also transcribed by Greek ε:

βεχι	/bēkī/	[ˈbε:χɪ:]	'weeping'	Ps. 30:6
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However, non-pausal כִּי, in which the first vowel would be short, is transcribed identically:

βεχι	/bkī/	[b(ə)χɪ:]	'weeping'	Ps. 30:6
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362. There is evidence that when α becomes reduced/centralized far from the stress in Greek, it is represented with ε (4.5.3.1.12; GIGNAC 1976, 278–93).

363. Note that Hebrew /e/ and /o/ may have raised allophones when they precede geminate consonants: e.g., γιβωρ (Isa. 9:5) and ακουββαει (Ps. 49:6).

In the context $_C_1C_2$, original short **a* and **i* are also sometimes transcribed with Greek ε:

ελλελθ	/hellelt/	[ħɪlːɪltʰ]	'you profaned'	Ps. 89:40
δερχ	/derk/	[dɪrkʰ]	'path'	Ps. 89:42

Finally, when epenthesis occurs in a non-II-guttural **qVtl* pattern, the epenthetic is usually ε:

μεββεσε	/meb-beʃs/	[mæbːɪtsʰɪs]	'what gain?'	Ps. 30:10
ιεθερ	/yetr/	[jɪθɪr]	'abundance'	Ps. 31:24

In section 6.4.1, we demonstrated that the transcriber prioritized *quality* over *historical quantity* when transcribing Hebrew sounds into Greek. This opens the door to a couple possibilities: First, Greek ε may have signified both short *and* long vowels. Second, if a Hebrew phoneme with the quality [ε(:)] existed in the Secunda, it would probably be transcribed by Greek ε [ε]. After a brief review of scholarship, I will argue that the orthography of the Secunda is consistent with the possibility, but not determinant, that both /ē/ and /ε/ were present.

6.4.4.1. Review of Scholarship

BRØNNO (1943, 12), JANSSENS (1982, 51), and YUDITSKY (2017, 17) interpret the vocalic system of the Secunda as having only two *e*-vowels: /e/, /ē/. This presumably reflects their view of the history of Hebrew and, in the case of BRØNNO and YUDITSKY, the presupposition that one letter should correspond with only one sound.³⁶⁴ BLAU, on the other hand, suggests that we should expect four *e*-vowels in Secunda Hebrew: /e/, /ē/, /ε/, /ē/ (BLAU writes: *ê, e, ê, ε* [1984, 77]). While /ē/ is represented by Greek η, the vowels /e/, /ē/, /ε/ are all represented by Greek ε (1984, 77). SUCHARD's interpretation of the development of the Hebrew vowels also requires four *e*-vowels (/e/, /ē/, /ε/, /ē/) at the time of the Secunda (2016, 276–79).³⁶⁵

The debate regarding the presence of a long /ē/ phoneme in the Secunda or lack thereof centers primarily around the reflex of the final triphthong *vyu#*/*vyi#* in both nominal and

364. YUDITSKY writes: "according to the basic assumption (הנחת היסוד), one letter reflects one sound" (my translation) (2007a, 2n13). It is not entirely clear if he means that one Greek letter has one default phonetic value or if he means that one Greek letter can only be used to represent one Hebrew sound. Regardless, the former claim is demonstrated to be false by the hundreds of spelling interchanges documented in chapter 4; the latter claim is unlikely on the basis of the various cross-language perception studies cited in this chapter.

365. It should be noted, however, that SUCHARD suggests that ē may simply have been an allophone of ē.

verbal forms: e.g., $\mu\alpha\sigma\epsilon$ מִשֶּׁמֶשׁ and $\iota\epsilon\rho\epsilon$ יָרָה. BRØNNO, JANSSENS, and YUDITSKY interpret these forms as ending in short /e/, but BLAU suggests that the final vowel in forms like $\mu\alpha\sigma\epsilon$ מִשֶּׁמֶשׁ and $\iota\epsilon\rho\epsilon$ יָרָה should be interpreted as /ē/ instead of /e/, for two reasons: First, in the LXX, in which quantitative transcription is the norm, these forms are transcribed with a final η: e.g., Μανασση מִשֶּׁמֶשׁ and Ιερωννη יָרָה. Second, this final vowel is written as η both in the construct (e.g., $\omega\sigma\eta$ עֶשֶׂה, but cf. $\kappa\alpha\sigma\epsilon$ הָצֵד) and in the imperative (e.g., $\epsilon\tau\tau\eta$ הָעֵת) (1984, 77). According to SUCHARD's interpretation of the history of Hebrew, there are at least two other forms in the Secunda in which final ε should be interpreted as reflecting long /ē/ instead of short /e/. First, the grapheme ε in the demonstrative $\zeta\epsilon$ הֵן, the development of which is reconstructed as $*\underline{d}i > *z\bar{i} > *z\bar{e} > *z\bar{e} > z\epsilon$ הֵן, should reflect a long /ē/: /zē/. Second, since SUCHARD finds evidence for what he terms "minor pausal lengthening" in the Secunda, ε in the form $\beta\epsilon\chi\iota$ בְּחִי should also reflect a long /ē/: /bēkī/ (2016, 138, 249).

If a short /ε/ existed in the Secunda, depending on one's reconstruction of the history of the Hebrew vowels, it might be found in the following forms: the non-pausal reflex of $*qaty$ patterns ($a > \epsilon / _Cy$) such as $\beta\epsilon\chi\iota$ /bēkī/(?) בְּחִי (Mal. 2:13, not Ps. 30:6), in contexts where Philippi's law operates ($\acute{e} > \acute{\epsilon} / _C_1C_2$) such as $\epsilon\lambda\lambda\epsilon\lambda\theta$ /hellēlt/(?) הִלַּלְתָּ (Ps. 89:40), in originally $*qatl/*qitl$ forms that correspond with $qetel$ in Tiberian such as $(\beta)\delta\epsilon\rho\chi$ /b-derk/(?) הִדְרָךְ (Ps. 32:8), $\lambda\alpha\nu\epsilon\varsigma$ /l-nēsh/(?) נִשְׁחַלְּתָּ (Ps. 49:10), and $\alpha\mu\mu\epsilon\lambda\chi$ ³⁶⁶ /ham-mēlk/(?) הִמְלִיךְ, and possibly also as the epenthetic vowel in forms like $\iota\epsilon\theta\epsilon\rho$ יָתֵר (Ps. 31:24) and $\beta\epsilon\sigma\epsilon$ בָּצַע (Ps. 31:2) (see LAMBDIN 1985; GARR 1989; HUEHNERGARD 2013; SUCHARD 2016, 276–79). In addition to these words, we may also add the second vowel in the reflex of רָשָׁע , which was probably at least phonetically realized as [ε] from an early period, perhaps as an allophone of /a/ (for the origins of רָשָׁע , see HUEHNERGARD 2006).

366. In Origen's commentary on Psalms, the form $\alpha\mu\mu\epsilon\lambda\chi$ is part of the name he transcribes for I/II Kings: $\text{Βασιλειῶν γ' δ' ἐν ἐνὶ Ουαμμελχδανιδ ὅπερ ἐστὶν βασιλεία Δαυίδ}$ 'and the third and fourth Book of Kingdoms [in our tradition], in [the Jewish tradition is found] in one [book, whose title is]: "And King David ...", which is, "The Kingdom of David"'. It corresponds with the first words of I Kings.

6.4.4.2. Evidence for Long /ē/ in the Secunda

There is no direct evidence in the Secunda regarding whether or not the final ε vowel in forms like *μασε* and *ιερε* is long or short. The interpretation of these forms depends on one's interpretation of the development of final */ē#/³⁶⁷ in Hebrew. Did it lower and shorten under the stress ($\bar{e} > \varepsilon / _ \#$) or merely lower ($\bar{e} > \bar{\varepsilon} / _ \#$)? The interpretation of these specific forms remains uncertain, but a number of points can be made. First, there may be clear evidence elsewhere in the Secunda that the grapheme ε at least *can* represent long [ε:]. Second, Greek ε transcribes long vowels in transcription of other languages. Third, and finally, interchanges of η and ε are attested in both the Secunda and contemporary Palestinian epigraphy.

6.4.4.2.1. Chrysostom's *ουαλεα*

In our discussion regarding "*qamaš*," we suggested that the transcription *ουαλεα*, if original, was evidence of $*\bar{e} > \bar{\varepsilon} / _ C^{\acute{}}$ (6.4.3.1.2.1). Such a transcription is also relevant for our present discussion, since it would prove that Greek ε could be used to indicate a long vowel in the Secunda. Because other parts of the paradigm indicate that this vowel was long (e.g., *ελωηνου* *עֲלֵיהֶם* [Ps. 18:42], *ουααρηεμ* *עֲלֵיהֶם* [Ps. 49:14]), we can assume that the ε in *ουαλεα* also indicates a long vocalic phoneme /ē/ or allophone [ε:]. On another note, if original, this form would also be significant because it would serve as the sole attestation of a 3fs suffix on a preposition with a plural base in the Secunda, demonstrating that it matched the Hebrew form rather than the Aramaic form. On this point, it should be noted that there are instances of the preposition *על* with the 3fs suffix being written as *עליהא* at Qumran in both biblical and non-biblical texts. In sum, then, confirming the validity of the reading *ουαλεα* would also confirm that ε, at least in some instances, may signify [ε:] in the Secunda.

367. Even though the final vowel in forms like *מִן* develops from the triphthong *vyu#*/*vyi#* and the final vowel in forms like *מִי* probably develops from *iyu#*, both of these forms are thought to shift to /ē#/ before they shifted to *seghol* in Tiberian Hebrew.

6.4.4.2.2. Greek ε for Long Vowels in Transcription of Other Languages

There does not seem to be any restriction on Greek ε representing long vowels in transcription of other languages. It is used, though far less frequently than η, to transcribe Latin *ē* during the Roman period (5.3.1.1.2). In the Damascus Psalm fragment, when long /ā/ has shifted to long /ē/, it is transcribed by ε: e.g., /kēn/ (* < /kāna/) (AL-JALLAD *forthcoming*, 17). Finally, in transcription of Phoenician-Punic, the plural construct ending -*ē* is transcribed sometimes by η and sometimes by ε: e.g., φενη and φανε for /panē/ 'face of' (5.3.5.1).

6.4.4.2.3. Interchanges of η and ε for Final [e:]/[ε:]

The interchange of final η/ε also occurs in both the Secunda and Palestinian epigraphy. In the Secunda, the final vowel of two construct forms from *vyu#/*vyi# are transcribed by η/ε:³⁶⁸

ωση	/ʕōsē/	[ʕo:se:]	'those who do'	Ps. 31:24
κασε	/qʕsē/	[kʕatsʕe:]	'the edge of'	Ps. 46:10

Based on the history of Hebrew, we would expect both of these transcriptions to end in η to represent long /ē/. Interchanges of η and ε are attested in Palestinian and Egyptian Koine both in word-final position and in the environment of σ (4.5.3.1.7; GIGNAC 1976, 242–49). There are also examples of final η and ε interchanging in Greek transcriptions of Hebrew names in Palestinian epigraphy from the Roman period. For example, the name 𐤍𐤕𐤓, which is vocalized regularly with *šere* in the Kaufmann MS of the Mishnah, is transcribed with either ε or η in Palestinian epigraphy: Ιωσε/Ιοσε/Ιωση (CIIP I/1, no. 46, 81, 573). Also, the final vowel in the name 𐤌𐤓𐤕 is transcribed with η: Μενασση (CIIP III, no. 2222). The rendering of this name in both the LXX (Μανασση) and Neo-Assyrian cuneiform texts (e.g., *mi-na-si-i*, *me-na-se-e*, *mi-in-se-e*, *mu-na-se-e*, *me-na-se-e*) indicates that the final vowel was long at an earlier stage of Hebrew (RÖLLIG 1960, 385–86; BAGG 2007, 342–45; MILLARD 2013, 839–40).

368. YUDITSKY discusses these forms as ωσε and κασε (2017, 145, 189–90), but the correct reading of the former word in the palimpsest, verified recently by spectral imaging, is ωση.

6.4.4.3. Evidence for Short /ε/ in the Secunda

Two of the categories in which short /ε/ might occur in the Secunda, namely, ε where Philippi's law operates and an initial ε in **qatl/*qitl* > *qetel* forms, are problematic. With respect to Philippi's law, both short /e/ and short /ε/ would be transcribed by ε in a transcription such as ελλεθ לֵלֶת (Ps. 89:40) or εκσερθ (Ps. 89:46). In the case of *segholate* forms from **qatl/*qitl*, there are no forms with ε in the Secunda that are unequivocally from **qatl*.³⁶⁹ The ε in originally **qitl* forms (e.g., χεσλ כֶּסֶל and σεθρ סֶתֶר), on the other hand, may simply reflect /e/ as the reflex of original **i/*.

The precise interpretation of Greek ε as the initial vowel in the non-pausal reflex of **qaty* nouns and as the epenthetic vowel in non-II-guttural *segholates* is difficult in each case for a similar reason. In the case of βεχι, it is not clear if ε represents a centralized *shewa*-type vowel or the quality of the short vowel, since both ε and α seem to be used to represent a *shewa*-type vowel in the Secunda (see 6.4.6) and ε may be used to represent a centralized vowel in Greek (4.5.3.1.12).³⁷⁰ In a transcription exhibiting a similar syllable structure, the initial *shewa*-type vowel is represented with an unetymological α (λαβανι /l-bnī/ [laβani:] 'to my son' [Hos. 11:1]; cf. βεν [Ps. 9:1]) (but see 6.5.1.3.2).

In the case of ιεθερ and βεσε, one could make the case that the epenthetic is simply a centralized [ə] vowel, though GARR argues that the *seghol* is the natural outcome of an original epenthetic [ə] in the *segholates*: e.g., **kálb* > **káləb* > **kéləb* > [kéləb] [(1989, 112–15). LAMBDIN (1985), on the other hand, who argues for the shift **kalb* > **kelb* before the insertion of an epenthetic vowel, claims that the epenthetic would have been [ε] initially because it matched the quality of the preceding vowel (see also HUEHNERGARD 2013). In sum, then, the

369. The only *segholate* forms with ε in the Secunda that seem to come from **qatl* in Tiberian Hebrew are δερχ and μελχ. In the case of δερχ, a good case can be made that it was originally a **qitl* form. In the case of μελχ, while it probably comes from **qatl* originally as in Aramaic, Akkadian, and Ugaritic, there may be evidence that in Phoenician and in some dialects of Hebrew it shifted to **qitl* (note LXX, etc.).

370. Note the evidence for an early **qaty* > **qity* change in Hebrew (HUEHNERGARD 2015, 37). The following forms could all be represented by βεχι in the Secunda: **/bəkī/* > [bɛχɪ:], **/bikī/* > [bɪχɪ:], **/bkī/* > [bəχɪ:].

second ε in $\iota\theta\epsilon\rho$ and $\beta\epsilon\sigma\epsilon$ could represent (1) a centralized vowel $[\ə] > [\varepsilon]$ (/yetr/ [jɪθəR] or [jɪθɛR]), (2) a vowel identical in quality to the preceding vowel /e/ [ɪ] (/yetr/ [jɪθɪR]), or (3) a vowel identical in quality to the preceding vowel *after segholization* (/yetr/ [jɛθɛR]).

Finally, the second ε in $\epsilon\sigma\epsilon\rho$ רָשָׁע (Ps. 31:8) almost certainly reflects either a neutral centralized $[\ə]$ or $[\varepsilon]$. Because of its realization in Tiberian (רָשָׁע) and Babylonian (רָשָׁע) (YEIVIN 1985, 112), it will be transcribed as $[\varepsilon]$. It is worth noting that, although unattested as a regular noun, a construct form of Hebrew רָשָׁע 'Asher' (meaning: 'happy one') could potentially result in a minimal pair contrasting with /ε/ in $\epsilon\sigma\epsilon\rho$ רָשָׁע .

6.4.4.4. Concluding Remarks

The evidence regarding the presence of the potential phonemes / $\bar{\epsilon}$ / and / ε / in the Secunda is quite scant. Positing these phonemes (or phones) in the Secunda largely depends on one's understanding of the development of the Hebrew vowels. What *can* be said is that the orthography in $\mu\sigma\sigma\alpha\upsilon\epsilon$, $\mu\alpha\sigma\epsilon$, $\iota\epsilon\rho\epsilon$, $\beta\epsilon\chi\iota$, $\epsilon\lambda\lambda\epsilon\lambda\theta$, $\delta\epsilon\rho\chi$, and $\iota\theta\epsilon\rho$ is entirely consistent with the possibility of the phonemes / $\bar{\epsilon}$ / and / ε / (or phones $[\varepsilon:]$ and $[\varepsilon]$) existing in the Secunda. While / ε / is more ambiguous, a strong case can be made that long $\bar{\epsilon}$, either as its own phoneme or as an allophone of / $\bar{\epsilon}$ /, was present in forms like $\mu\alpha\sigma\epsilon$ and $\iota\epsilon\rho\epsilon$.

For the sake of phonetic transcription convention, we will posit the following: First, because the final vowel was originally long in forms like nominal $\mu\sigma\sigma\alpha\upsilon\epsilon/\mu\alpha\sigma\epsilon$, verbal $\iota\epsilon\rho\epsilon$, and demonstrative $\zeta\epsilon$, we will transcribe ϵ in such forms as / $\bar{\epsilon}$ / $[\varepsilon:]$. Second, because SUCHARD's reconstruction of the development of pausal forms is convincing, ϵ in pausal $\beta\epsilon\chi\iota$ will also be transcribed as long / $\bar{\epsilon}$ / $[\varepsilon:]$: /békī/ ['bɛ:χɪ:].³⁷¹ Third, because of the parallel example $\lambda\alpha\beta\alpha\nu\iota$, in which "shewa" is represented with unetymological α , we will assume that ϵ in non-pausal $\beta\epsilon\chi\iota$ reflects a centralized *schwa* vowel: /bkī/ [bə'χɪ:]. Fourth, because there is no

371. Note also that בכי 'weeping' and חצי 'half' develop differently in pause in both Tiberian and Babylonian: בכי, בָּכִי with *seghol/patah* but חצי, חָצִי with *sere* (YEIVIN 1985, 875). This may indicate that when (minor) pausal lengthening occurred, there was a distinction in the vowel between בכי and חצי (i.e., $[\varepsilon]$ vs. $[\epsilon]$). We may also contrast pausal חצי with the imperative pausal form לָךְ 'go! (fs)', though the comparison with לָךְ may be irrelevant since imperative forms tend to have different phonotactics from nouns.

relevant evidence by which to determine if the second ε in forms like ελλελθ reflects a lower vowel quality than short /e/, these forms will be transcribed with short /e/ [ɪ] without any particular change: e.g., ελλελθ /ħellelt/ [ħɪl:ɪltʰ]. Fifth, because *segholization* is not general in the Secunda, seems to be a phonetic phenomenon, and is prone to vowel harmony, the ε in forms like ιεθερ and βεσε will be transcribed as [ɪ]: e.g., ιεθερ /yetr/ [jɪθɪɾ]. Sixth, and finally, εσερ will be transcribed as /ʔšer/ [ʔæʃɛɾ] for the reasons outlined above.

6.4.5. Etymological Long /ī/ = Greek ι, ει, and η

In the Secunda, etymological long /ī/ [i:] is usually transcribed by Greek ι (~240x) (6.4.2), which represents a close front vowel [i] in Roman Palestinian Koine (4.5.3.1.1):

δερχι	/derkī/	[dɪrkʰi:]	'my way'	Ps. 18:33
σαδδικιμ	/ʃaddīqīm/	[ʔʰad:i:kʰi:(m)]	'righteous ones'	Ps. 32:11
νηχιμ	/nēkīm/	[ne:χi:(m)]	'wretches'	Ps. 35:15

Less frequently (25x), long /ī/ in a stressed syllable (YUDITSKY 2017, 60–61) is transcribed by Greek ει, which also represents a close front vowel [i] in Roman Palestinian Koine (4.5.3.1.1). It occurs in 11 distinct words, usually, but not always, following a guttural:

θαιρ	/tʰāir/	[tʰ:ʔi:ɾ]	'you illuminate'	Ps. 18:29
ἔσει*	/yesī/	[jɪʃi:]	'my salvation'	Ps. 18:47
οζει	/ʕozzī/	[ʕʊz:i:]	'my strength'	Ps. 28:7 (+1x)
σελει	/selī/	[sɪlʃi:]	'my rock'	Ps. 31:4
βειρ	/b-ʕīr/	[bɪʃi:ɾ]	'in a city of'	Ps. 31:22
βεσαυει	/b-šaw(w)ī/	[bɪʃawʃi:]	'when I cried'	Ps. 31:23
ραειθ*	/rāʔīt/	[ɾʌ:ʔi:θ]	'you saw'	Ps. 35:22
ελωειμ	/ʔlōhīm/	[ʔɪlo:hī:(m)]	'God'	Ps. 36:2 (+6x)
εις	/ʔīš/	[ʔi:ʃ]	'man'	Ps. 49:3 (+2x)
αββωτειμ	/hab-bōt(ə)hīm/	[hab:o:tʰhī:(m)]	'those who trust'	Ps. 49:7
λδauειδ	/l-dōwīd/	[l(a)ðʌ:wi:ð]	'to David'	Ps. 89:36 (+5x)

Finally, there are also four instances in which *final* /ī#/ is transcribed by η, which represents a close-mid front vowel [e] in Roman Palestinian Koine (4.5.3.1.6–7). Two of the instances are after a nasal and two are after a pharyngeal (see YUDITSKY 2017, 84–85):

ουμαγεννη	/w-mōgennī/	[(ʔ)umʌ:ʕɪn:e:]	'and my shield'	Ps. 28:7
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δελλιθανη	/dellītōnī/?	[dɪl:i:θɔ:ni:]	'you drew me up'	Ps. 30:2
ρουη	/rūḥī/	[ru:hi:]	'my spirit'	Ps. 31:6
ουβσαλη	/w-b-ṣalṣī/	[(?)uβtsʰalʃe:]	'and in my stumbling'	Ps. 35:15

The question regarding the various representations of /ī/ in these forms is whether or not the transcriptions with ει and/or η represent a different phonetic reality than the transcriptions with ι. After a review of the Greek evidence and a review of scholarship, I will argue that the data must be explained in subsets (see 6.4.5.3), with some subsets having phonological explanations and others having orthographic explanations.

6.4.5.1. Greek Phonological, Orthographic, and Transcriptional Background

In Palestinian Koine of the Roman period, Greek ι represented the close front vowel [i] (4.5.3.1.1). In transcription, Latin and Semitic long /ī/ is most commonly transcribed by Greek ι. At the same time, Greek ι is also frequently used to transcribe short /i/ (5.3.1.1.3; 5.3.2.1.3; 5.3.3.1.2; 5.3.4.1; 5.3.5.1; 5.3.6). In Greek loanwords in the Mishnah, ι is usually rendered with **ḥiriq** in Hebrew (5.4.1.1.4).³⁷² Therefore, the use of the grapheme ι (= [i]) to represent Hebrew long /ī/ indicates a close front realization [i:] (see 6.4.2).

Greek ει also represented the close front vowel [i] in all phonetic environments in Palestinian Koine (4.5.3.1.1). The fact that ει represented [i] and not [e] during the Roman period is supported by the relative frequency of various spelling interchanges. While there are only four total instances of interchanges of ει with either η or ε datable to the Roman period (4.5.3.1.6),³⁷³ interchanges of ει and ι are found in abundance, with ει usually substituting for ι (4.5.3.1.1). Moreover, it is more common for η to interchange with ε than with ει during the Roman period (4.5.3.1.7). Therefore, it is clear that ει was identified with [i] and not [e].³⁷⁴ Only in the Byzantine period, when η (= [e]) shifts to [i], is ει identified with η (4.5.3.1.5–6).

372. There is reduction or centralization in closed unstressed syllables (5.4.1.1.4).

373. These interchanges occur in environments prone to vowel raising.

374. One could make the case that interchanges such as Γεωργιου (for Γεωργιου) support a lower realization of ει before a vowel (variation 20.3–4). However, it is more likely that ε had a raised allophone of [i] in this environment (see 6.3.7.2).

In Koine Greek of Asia Minor, *ε*ι was particularly associated with historically long vowels (BRIXHE 2010, 232). In transcription, Greek *ε*ι is usually associated with length, most frequently representing long /ī/ in both Latin and Semitic. Overall, however, Greek *ι* for long /ī/ occurs more frequently. On occasion, *ε*ι may also be used to represent short /i/ (5.3.1.1.3; 5.3.2.1.3; 5.3.3.1.2; 5.3.4.1; 5.3.5.1; 5.3.6). Only in Akkadian is long /ē/ transcribed by *ε*ι (5.3.2.1.2). In Greek loanwords in the Mishnah, *ε*ι is usually rendered with **ḥiriq** in Hebrew, though Yemenite manuscripts attest one example of *šere* for *ε*ι (5.4.1.1.4).

Greek *η*, on the other hand, represented the close-mid front vowel [e] in Palestinian Koine. The chronological distribution of the *η/ε*, *η/ι*, and *η/ε*ι interchanges indicate that *η* maintained its close-mid [e] realization during the Roman period and did not shift to a close [i] until the Byzantine period (4.5.3.1.6–7). In transcription, Greek *η* most frequently represents a long /ē/ vowel, though it may also represent a short vowel of similar quality. In Greek loanwords in the Mishnah, Greek *η* is usually rendered by a *šere*.

6.4.5.2. Review of Scholarship

With respect to *η* for /ī/, SPEISER (1925, 354) and BRØNNØ (1943, 253–54) tend to assume scribal error. JANSSENS, on the other hand, argues that the 1*cs* suffix /ī/ may be realized as [e:] after a guttural or sonorant (1982, 125). YUDITSKY likewise affirms that *η* represents lowering, explaining *ρουν* and *ουβσαλη* as the result of lowering after a guttural and *ουμαγεννη* and *δελλιθανη* as the result of a general rule of final /ī#/ lowering to [e:] similar to the phenomenon in XHev/S13 in which final /ī/ is written with a *ḥ*- (e.g., *ḥḥḥ* for *ḥḥḥ*) (84–85, 2017).

Contemporary Greek evidence also supports interpreting *η* as indicating a lower [e:], but two points are still in order. First, the lowering in *ρουν* and *ουβσαλη* is probably due to adjacent *pharyngeals* (/ħ/, /ʕ/) specifically, as is common in Semitic (McCARTHY 1994, 207–13), and not "gutturals" more generally. Second, while lowering in *ουμαγεννη* and *δελλιθανη* may reflect a general /ī#/ > [e:] rule, it is worth noting that it is common cross-linguistically for nasalization to result in the "centralization" of vowel height. That is, high vowels are low-

ered and low vowels are raised (GAHL 2015, 99). It is also possible that the use of η in these transcriptions is a Greek orthographic variant for $\bar{\iota}$. It is not uncommon for ι to interchange with η in the environment of a nasal in Greek (4.5.3.1.5). Even in transcription, we find examples such as $\Sigma\eta\mu\omega\nu$ and Βενιαμην (variation 26.1–2) already in the first century in Jerusalem. Nevertheless, because of the consistent correspondence of η and vowels of the [e] quality in the Secunda, it is likely that η reflects a lowered allophone [e:] in these words.

The variant forms with $\epsilon\iota$ are more difficult to explain. BRØNNØ suggests several explanations for the digraph $\epsilon\iota$ in these forms: ϵ is a helping vowel in the environment of the guttural, ϵ represents the guttural, or Hebrew $\bar{\iota}$ was realized as [ei] after a guttural (1943, 274–77). YUDITSKY claims that $\epsilon\iota$ reflects the lowering of $\bar{\iota}$ due to the influence of the guttural (or a general $\bar{\iota}/\#/ > [e:]$ rule, see above). In support of his theory, he cites those forms in the Secunda in which $\bar{\iota}$ is represented by η after a guttural (see above) (2017, 46, 60–61, 84–85, 103). However, it is not generally "gutturals" that effect lowering in Semitic but specifically pharyngeals (BUTCHER and AHMAD 1987; MCCARTHY 1994, 208–13; AL-ANI 2006; BROSELOW 2006), and there are multiple instances in which $\epsilon\iota$ occurs after non-pharyngeals (e.g., $\epsilon\iota\varsigma$, $\epsilon\lambda\omega\epsilon\iota\mu$). YUDITSKY's suggestion that $\epsilon\iota$ reflects the lowering of $\bar{\iota}/ > [e:]$ after a guttural is also problematic because not all of the examples occur in such an environment (e.g., $\lambda\delta\alpha\upsilon\epsilon\iota\delta$).

For further support, YUDITSKY also appeals to ALLEN (1974, 69) to suggest that Greek $\epsilon\iota$ did not totally merge with ι until the second century CE (2017, 46, 60–61, 84–85, 103). What ALLEN actually says, however, is that even though the interchange of ι and $\epsilon\iota$ is common already in the third century BCE, $\epsilon\iota$ seems to be pronounced with a mid quality up until the second century CE only *when preceding a vowel*, as shown by Latin renderings of Greek words (1974, 66–69). However, ALLEN is addressing Greek in general. In Palestinian Koine during the Roman period, the interchange of $\epsilon\iota$ and ι before a vowel is far more frequent (e.g., variation 1.50, 66, 71, 83, 89–96, 142, 150, 151, 169; 2.2, 11, 13, 22, 27, 36–28, 40, 46, 78) than the interchange of $\epsilon\iota$ and η before a vowel, which only occurs twice (variation 24.1, 10).

This indicates that even before a vowel, $\epsilon\iota$ was identified with ι and not η . Moreover, in no transcription above does the digraph $\epsilon\iota$ occur before another vocalic grapheme, thus negating the relevance of such an allophone even if it had existed in Roman Palestinian Koine. Therefore, unless the Secunda reflects a Greek pronunciation from centuries before, we can be fairly confident that $\epsilon\iota$, as a digraph, represented the vocalic quality [i] (see 6.4.5.1). It is always possible, however, for $\epsilon\iota$ to be read as ϵ [ε] + ι [i] (= $\epsilon\tilde{\iota}$), rather than as $\epsilon\iota$ [i].

6.4.5.3. Orthographic and Phonological Explanations

The data actually requires division into further subsets, with each subset having its respective explanation. Those transcriptions with η for $\bar{\iota}$ were already dealt with in the review of scholarship, and it was concluded that they indicate a lowered allophone of word-final $\bar{\iota}\#$. The remaining occurrences of $\epsilon\iota$ for $\bar{\iota}$ amount to eleven distinct words, which may be divided into the following categories: $\bar{\iota}$ after a non-guttural consonant (I), $\bar{\iota}$ after a guttural phonologically but after a vowel orthographically (II), $\bar{\iota}$ after a guttural phonologically but word-initial orthographically (III), and $\bar{\iota}$ after a guttural (/ʕ/) phonologically but after a consonant orthographically (IV) (G = guttural consonant, C = non-guttural consonant):

Phonology	Orthography	Transcriptions
$C_$	(I) $C_$	οζει /ʕozzī/, λδανειδ /l-dōwīd/
	(II) $V_$	θαειρ /tōʔīr/, βειρ /b-ʕīr/, ραιθ* /rōʔīt/, ελωειμ /ʔlōhīm/, αββωτειμ /hab-bōṭhīm/
$G_$	(III) $\#_$	εις /ʔiś/
	(IV) $\text{ʕ}_$	ιεσει* /yeśʕī/, σελει /selʕī/, βεσawei /b-šaw(w)ʕī/

Chart 22: Representation of Long $\bar{\iota}$ as $\epsilon\iota$ in the Secunda

In the following sections, I will argue that in group (I), the digraph $\epsilon\iota$ is merely an alternative spelling for long $\bar{\iota}$ as in contemporary Greek, in groups (II) and (III), $\epsilon\iota$ is as an orthographic variant of $\tilde{\iota}$ (note *trema* “), and in group (IV), $\epsilon\iota$ is to be read as $\epsilon + \iota$ (i.e., $\epsilon\tilde{\iota}$), ϵ being a perceptual approximation of the phonetic reality of the transition to /ʕ/ at the C-V boundary.

6.4.5.4. (I): Greek $\epsilon\iota$ as Common Orthographic Variant for $\bar{\iota}$

In group (I), $\epsilon\iota$ for $\bar{\iota}$ is simply an orthographic variant of $\epsilon\iota$ for ι . It only occurs in two words: οζει and λδανειδ. In the case of οζει, a phonetic argument could be made that the pharyngeal

/ɣ/ spreads across the whole word and causes the lowering of the suffix: [ʕʊzːɛː]. In the case of λδανειδ, one could argue that /ī/ lowers to [eː] in assimilation to the semivowel /w/. However, both of these explanations are rather unlikely. It seems more reasonable to suggest that ει simply represented a long vowel [iː] as it does often in Greek transcription. In fact, there are numerous instances of long /ī/ being represented by ει in external sources: e.g., Epiphanius has σαλωειμ (for σαλωσιμ/σαλωσειμ*) עֲשִׂיָּם (Gen. 5:5), εμμουνειμ עֲמוּנִים (Isa. 26:2), σααρειμ עֲרִיָּם (Isa. 26:2), and ωλεμειμ עוֹלָמִים (Isa. 26:4); the Syro-Hexapla indicates σειειμ/σειειν צִיִּים (Jer. 50:39);³⁷⁵ Chrysostom has σωσανειμ שׁוֹשָׁנִים (Ps. 45:1), Θαρσεις שׁרְשִׁים (Ps. 48:8), ιδαθει הִדְתִּי (Ps. 49:5), and ισουββουνει סוּבְּבִי (Ps. 49:6). The same phenomenon is also attested in Palestinian epigraphic transcriptions of Hebrew: e.g., Σειλωνει שִׁילֹנִי. In sum, phonetic explanations for lowering are somewhat *ad hoc* when contemporary Greek orthography routinely uses ει to signify [i] and there are numerous examples of ει for long /ī/ attested in the Secunda in external sources.

6.4.5.5. (II) and (III): Greek ει as an Orthographic Variant of ĩ = [i] / V_

The use of ει for /ī/ in group (II), like group (I), also constitutes a spelling variant, albeit a more sophisticated one. While the spelling variant described above constitutes ει for ι, the spelling variant exhibited in group (II) should be described as ει for ĩ (note *trema* "). When a guttural is followed by a long /ī/ and preceded by a non-/i/ vowel, its presence is indicated by means of a hiatus between vowels. However, because the following long /ī/ is normally represented by ι, the sequence of vowel (α, ε, ω) + ι could be mistaken as a digraph. Greek αι could be mistakenly read as [ɛ],³⁷⁶ ει as [i], and ωι as [o]. What the transcriber intended as two distinct vowels could be mistaken for one vowel, perhaps even of an inappropriate quality. Two orthographic conventions resolved this problem. First, one could write ι with *trema* ("), indicating that ĩ was to be pronounced separately from the preceding vocalic grapheme:

375. Note that the two consecutive digraphs ει + ει in σειειμ could reflect the following change: -iyγĩ- > -ĩγĩ-.

376. Note the dubious transcription βσαιμ עֲשִׂיָּם (Ps. 118:26) found in external sources.

ραῖθ	/rṣ̄ṭit/	[Rɔːʔiːθ]	'you saw'	Ps. 31:8
αῖρα	/hṣ̄ṭirṣ̄/	[hɔːʕiːRɔː]	'awaken!'	Ps. 35:23
συβανγαῖμ	/w-b-ngṣ̄ṭim/	[(ʔ)uβanɛɔːʕiː(m)]	'and with smittings'	Ps. 89:33

Alternatively, if one were not going to use *trema*, one could replace *ῖ* with *ει*. For example, in the Greek texts from the Judaean Desert, we find τροπαιεικον for τροπαῖκον (4.5.3.1.10). In Palestinian epigraphy, a similar convention for transcribing $VC_{[+guttural]}\bar{i}$ is attested when the Hebrew proper name יֵאִיר is rendered in Greek as Ιαειρος (*CIIP* I/1, no. 164, 400a–b, 401b). That *αῖ* and *αει*—more generally, *vowel* + *ῖ* and *vowel* + *ει*—were equivalent is also indicated by the alternative representations of הָאֵר: ραῖθ and ραειθ*.³⁷⁷ Moreover, the word אֶלֶיָּם, usually written as ελωειμ, is found in a Secunda quotation in Eusebius as ἐλωῖμ. Other examples of this phenomenon are also attested in external references to the Secunda: e.g., συαει* וְהָיָה (Gen. 5:5), αειρ הָעִיר (Gen. 28:9), αρβαειμ אֶרֶבָעִים (I Sam. 4:18) and ραφαειμ רַפָּאִים (Isa. 14:9). The distribution of the various transcriptions of the Hebrew noun עִיר 'city' may be particularly instructive. It occurs twice in the Ambrosiana palimpsest and once in external sources. After a vowel, long */ī/* is transcribed with *ει*: βειρ (Ps. 31:22) and αειρ (Gen. 28:19). When it occurs word-initially, */ī/* is transcribed by *ι* alone: ιρ (Ps. 46:5).

The pattern outlined for the word ιρ עִיר does not fit as nicely for group (III), which only contains the word εις אִישׁ. It occurs three times in the Secunda, always as *εις*. It should be noted, though, that the previous word always ends in a vowel, and in two out of the three instances, the preceding word is written on the same line. In external sources, the word אִישׁ 'man' is attested twice, once by itself and once after the definite article. By itself, it is transcribed as *ις* (Ps. 92:4). After the definite article, it is transcribed as *αῖς* with *trema* on *ι* (Ps. 1:1). A variant in the Vatican MS has *αεις* (Ps. 1:1). Like *ραῖθ/ραειθ**, the variant spellings *αῖς/αεις* support the idea that *αῖ* was a transcription convention equivalent to *αει*.

377. Though representing the diphthong */ay/* instead of the sequence $VC_{[+guttural]}\bar{i}$, the same equivalency of *αει* = *αῖ* is evidenced in the pair ακουββαει (Chrysostom) vs. ακοββαῖ (Ambrosiana) (Ps. 49:6).

Although the orthographic conventions for transcribing שׂי are not as neat as ιρ/αιρ, they do highlight the importance of taking into account orthographic tendencies and transmission history as a factor in explaining variant spellings. It should also be kept in mind that *trema* (¨) is easily dropped in transmission and there are likely places in the transmission of the Secunda where it should be restored. The alternative explanation, namely, that /ʔ/ caused the lowering of the high vowel /ī/ to [e:] in εις seems phonetically implausible and contrary to contemporary Greek orthography. In sum, then, although the data is not perfectly conformative, it seems preferable to posit an orthographic explanation for groups (II) and (III) over a phonetic explanation. That is, *vowel* + ει serves as an orthographic alternative to *vowel* + ĭ, both of which represent /ī/ [i:] after a guttural in groups (II) and (III).

That this phenomenon was merely an orthographic convention and not reflective of a phonetic reality is further supported by the fact that when word-medial long /ī/ follows a guttural consonant phonologically but follows a non-guttural consonant transcriptionally, long /ī/ is always represented with simple ι: θεριβ תְּרִיב (Ps. 18:37), εριμ הֶרְעִים (Ps. 29:3), συριβου וִיִּרְיִבו (Ps. 35:21). Were the digraph ει indicative of lowering following a pharyngeal, we would expect it to be present in these transcriptions as well.

6.4.5.6. (IV): Greek ει as an Orthographic Variant of εĩ = [εĩ]

Group (IV), on the other hand, which contains the words ἱεσει*, σελει, and βεσαι, has a different explanation, partially orthographic and partially phonetic. In each of these cases, ει follows a consonant *in transcription*. Assuming that *trema* could have been lost in transmission, or never written but conventionally assumed, we can read -ει in these forms as ε + ι. Good evidence for reading ει as ε + ι in βεσαι is actually found in the Hexapla palimpsest of Psalm 22 from the Cairo Genizah published in 1900. Because the second column is so fragmentary in this palimpsest, often containing only a few letters per line, it has generally been ignored in treatments of Origen's Secunda. However, on the seventh line down of the second folio, the final letters of the transcription of וְבִשְׁעָיו 'and in his crying' appear as ****]αυσεω,

probably to be restored as [ουβσ]αυεω. Apart from the restoration, however, the fact that this transcription concludes with εω indicates that the ε is either part of the syllable structure of the word (i.e., /w-b-šawweʃō/) or an approximation of the guttural sound in this context.

This same method is used in a couple words in the LXX: e.g., Συμεων יִשְׁמְעֵאל, Γεδεων יִגְדְּיָא, and φαραω פֶּרְעֹה. KNOBLOCH argues that the lack of direct representation of gutturals in transcription can cause the reader to syllabify the word incorrectly. The addition of a vowel helps ensure that the word is pronounced according to the original syllable structure. It is also possible, especially in the case of pharyngeals like /ʃ/, that the additional vowel actually approximates the guttural sound in a language that did not have it (1995, 219–224).

In light of these principles, then, there are three ways to read ε in βεσ ουει: first, it may actually reflect the syllable structure (i.e., /b-šawweʃi/ [bɪʃawwɪʃi:]), second, it may act as a placeholder to preserve the syllable structure though syncope had occurred (i.e., /b-šaw(w).ʃi/ [bɪ.ʃaw.'ʃi:]), or third, it may actually approximate the guttural sound perceptually (i.e., /b-šaw(w)ʃi/ [bɪʃawʃi:]). The first interpretation is unlikely for two reasons. First, the ει ending also occurs on the nouns ἱεσει* and σελαι, in which ε is unlikely to be part of the syllable structure, since *segholates* with a suffix have no need of a helping vowel.³⁷⁸ Second, syncope occurs in the same syllable structure elsewhere: ἱεσαουου /yšaw(w)ʃū/ [jɪʃawʃu:] (Ps. 18:42). It seems preferable, then, to posit that the ε in these forms either served to preserve the syllable structure or to approximate the sound of the guttural. The latter of these two explanations may be preferred for the very reason that the transition at the V-C boundary of /ʃ/, which happens to be the guttural present in all of these forms, also seems to be approximated by ε in at least a couple other transcriptions of Origen (see discussion in 6.3.6.2).

In sum, then, in light of the transcription [ουβσ]αυεω, it seems best to posit that final ει originally had a *trema* (εϊ), or at least was intended to be read as ε + ι, and that the ε before

378. Note also how the name יִשְׁעִי 'Ishi' is rendered in the LXX as Ισεϊ (I Chr. 4:20, 5:24) or Ιεσι (I Chr. 4:42). But cf. the transcription ἱεσεϋ יִצְרָיִל (Num. 26:49) and the effect of the SCL outlined in 6.5.1.5.1.

the final *ɪ* is an approximation of the relatively centralized vocalic quality of the transition at the V-C boundary of /ʃ/ and /i/ (see 6.3.6.2). This is not without precedent in contemporary transcription, since Latin *ē* is transcribed as *ei* in a second-century CE papyrus (5.3.1.1.2).

6.4.6. Summary

The suggested typical realizations of the vocalic phonemes in the Secunda are charted below:

	<i>Front</i>		<i>Back</i>	
<i>close</i>	ī [i:]			ū [u:]
<i>mid-close</i>	ē [e:]	e [ɪ]	o [ʊ]	ō [o:]
<i>mid-open</i>	(ē [ɛ:], ɛ [ɛ])		ō [ɔ:]	
<i>open</i>	a [a]/[æ]			

Chart 23: Phonetic Realization of the Vocalic Phonemes in the Secunda

<i>Phoneme</i>	<i>Phone</i>	<i>Greek Grapheme</i>	<i>Written Word</i>	<i>Pronunciation</i>
/ī/	[i:]	ι = [i]	σῖρ	[ʃi:R]
/ē/	[e:]	η = [e]	νηχαρ	[ne:χɔ:R]
/e/ (< */i/)	[ɪ]	ε = [ɛ]	δερχ	[dɪrk ^h]
(/ē/)	[ɛ:]	ε = [ɛ]	μασε	[mahsɛ:]
(/ε/)	[ɛ]	ε = [ɛ]	εσερ	[ʔæʃɛR]
/a/	[a]	α = [a]/[ɑ]	σαμθ	[samt ^h]
	[æ]	(ε = [ɛ])	(μεββεσε)	([mæb:ɪsʔɪʃ])
/ō/	[ɔ:]	α = [a]/[ɑ]	ωδω	[jɔ:ðo:]
/o/ (< */u/)	[ʊ]	ο = [ɔ]	χολ	[k ^h ʊl]
/ō/	[o:]	ω = [ɔ]	κωλ	[kʔo:l]
/ū/	[u:]	ου = [u]	σουρ	[ʃʔu:R]

Chart 24: Vocalic Phonology, Phonetics, and Orthography in the Secunda

6.5. SHEWA AND SYLLABLE STRUCTURE

Unlike our interpretation of Tiberian Hebrew, for which medieval sources provide additional information, our interpretation of syllable structure in the Secunda depends almost entirely on the transcriptions themselves. As with any reading tradition of Biblical Hebrew, a description of syllable structure in the Secunda depends to a large extent on the nature of *shewa* in the tradition reflected therein. This section, which addresses both *shewa* and syllable structure in

the Secunda, is divided into two main parts. The first part (6.5.1) addresses the phonetic and phonemic status of *shewa* and the nature of word-initial and word-medial consonant clusters. The second part (6.5.2) addresses final consonant clusters mainly through the lens of *segholate* nouns. My analysis of both *shewa* and syllable structure in the Secunda follows, to a large degree, KHAN's work on *shewa* and syllable structure in Tiberian and Babylonian (1987; 2013a, 98–107; 2013b; 2013h) and KIPARSKY's work on syllables and moras in Arabic (2003).

6.5.1. Shewa

In the Secunda, the parallel of Tiberian vocalic *shewa* is usually left unrepresented:

βδαμι	/b-dōmī/	[b(a)ðo:mi:]	'in my blood'	Ps. 30:10
φλαγαν	/plōgaw/	[p ^h (a)lo:ɣaw]	'its streams'	Ps. 46:5
βνη	/bnē/	[b(a)ne:]	'the sons of'	Ps. 89:48

Less frequently, it is represented with Greek α:

νακαμωθ	/n(a)qōmōt/	[nak ^ʔ o:mo:θ]	'vengeances'	Ps. 18:48
βαφιευ	/b-pīhem(m)/	[baφi:hi(m)]	'with their mouth'	Ps. 49:14
χαμω	/k(a)mō/	[k ^h amo:]	'like'	Ps. 89:47

Still less frequently, it is represented with Greek ε:

σερουφα	/ʃrūpō/	[ʃ ^ʔ aru:fo:]	'refined'	Ps. 18:31
σεμω	/šmō/	[ʃamo:]	'his name'	Ps. 29:2
λεβουσι	/lbūšī/	[ləbu:ʃi:]	'my clothing'	Ps. 35:13

It may also assimilate to the vowel of a following guttural:

μηηρα	/mhērō/	[mehe:ro:]	'speedily'	Ps. 31:3
βεεζδαχ	/b-ḥesdōk/	[biḥizdo:χ]	'in your mercy'	Ps. 31:8
μεεθθα	/mḥettō/	[miḥit ^h :o:]	'a terror'	Ps. 89:41

The issues regarding *shewa* in the Secunda range from the question of its very existence to its phonetic realization and phonemic status. In this section, we will begin with a general review of the concept of *schwa* in modern linguistics and *shewa* in Biblical Hebrew. Here I should note that I follow the convention of the *Encyclopedia of Hebrew Language and Linguistics* by using the term "*schwa*" to refer either to the vowel of neutral quality (represented in the IPA by [ə]) or to the concept of *schwa* in modern linguistics and the term "*shewa*" to refer

specifically to the concept of *shewa* in the Biblical Hebrew reading traditions. Following our review of the concept of *schwa/shewa*, we will continue with a review of scholarship specifically on *shewa* in the Secunda. Subsequently, we will deal with the phonetic realization of vocalic *shewa*, the nature of complex onsets, the vowel syncope rule with its resulting clusters, and the behavior of the conjunction *waw* and the inseparable prepositions in the Secunda.

6.5.1.1. The Concept of Schwa/Shewa: Linguistics and the Hebrew Reading Traditions³⁷⁹

Because Hebrew *shewa* is viewed through the lens of *niqqud* and often misunderstood, it is necessary to define what exactly we mean when we refer to the existence of *shewa* in the Secunda. In modern linguistics, the term *schwa* refers to either a vowel of "neutral" quality (IPA [ə])³⁸⁰ or a vowel that interchanges with zero as a result of the historical processes of epenthesis or deletion. Because it is often the "neutral" vowel [ə] that is deleted or epenthesized, these two meanings tend to overlap (VAN OOSTENDORP 2013). It should also be noted that it has become increasingly common for linguists to describe the phonetic quality of *schwa* as variable, changing according to its immediate phonological context (see 6.5.1.6).

In the Hebrew reading traditions, vocalic *shewa* is similarly the product of deletion and subsequent epenthesis. In its earliest stages, the Hebrew vowel system was made up of short and long vocalic phonemes (/a/, /i/, /u/, /ā/, /ī/, /ē/, /ō/, /ū/). At some point in the history of the language, etymological */i/ and */u/ underwent reduction in a number of environments. Eventually, all short vowels in open syllables at least two places from the stress underwent reduction or deletion. As a result, consonant clusters at the onset of a syllable, at least at an underlying phonological level, were created (e.g., **yiktubū* > **yiktbū*; **dabārīm* > **dbārīm*).

379. In this section, I make a terminological distinction between *schwa*, which refers to the general concept of *schwa* as it is discussed in modern linguistics, and *shewa*, which refers specifically to *shewa* in the Hebrew reading traditions. There is a high degree of overlap between these two concepts, but they are not identical.

380. It should be noted, however, that [ə] is actually used for a variety of "non-peripheral" vowels that could potentially be signified by other IPA symbols (VAN OOSTENDORP 2013).

The various Hebrew reading traditions deal with these clusters in different ways. Tiberian tends to introduce an epenthetic short vowel after the first consonant to break up the cluster, usually of the quality [a] (e.g., **yiktbū* > [jiχtavu:]). This vowel, which was phonetically no shorter than a *pataḥ* in an unstressed closed syllable (e.g., דַּבַּרְתָּ 'you will speak' is realized as [taðabːeːR]), is what is referred to as "vocalic *shewa*." Babylonian, on the other hand, does not always have a vocalic segment where Tiberian has vocalic *shewa* (e.g., **yiktbū* > [jiχtvu:]), thus exhibiting a different degree of tolerance for clusters. Regardless of its phonetic realization ([a] or Ø), however, this "*shewa* slot" is equivalent to phonological zero. This is the reason that both vocalic and quiescent *shewa* are indicated by the same sign (,) in Tiberian Hebrew (KHAN 2013h, 543–48; 2013b, 674; 2013f, 981).

With respect to the Secunda, then, we must examine trends of reduction, deletion, and epenthesis in the transcriptions in order to understand the nature of vocalic *shewa*, namely, a short vowel that functions as an allophone of zero. After a brief review of scholarship, these and other issues will be addressed.

6.5.1.2. Review of Scholarship

MARGOLIS, who was among the first to conduct research on the hexaplaric transcriptions, made a number of observations and hypotheses about the behavior of *shewa* in the Secunda. Before a guttural, the vocalic quality of the *shewa* often assimilates to the following vowel as in the rules outlined by the medieval Hebrew grammarians. Elsewhere, *shewa* tends to be represented by either ε or α. Nevertheless, it is more often left unrepresented in the transcriptions. The inconsistency in the representation of *shewa* indicates that its phonetic quality was unstable. If *shewa* was not represented in transcription, it was not pronounced (1909).

BRØNNO, who compares the Tiberian forms with those of the Secunda, finds that vocal *shewa* is rendered by Ø 126 times, by α 43 times, by ε 33 times, and by o 5 times. On the basis of pairs like βανη || βνη יְנִי, he suggests that *shewa* may still have been pronounced even when it was not transcribed. The phonetic value of vocal *shewa* was /ə/. Etymological corre-

spondences such as $\epsilon\phi\phi\omicron\lambda\upsilon$ יִפּֿוּל ($< *yippul\bar{u}$) are attributed to interference from other forms (i.e., $**\epsilon\phi\phi\omicron\lambda$) (1943, 327, 329, 333). JANSSENS affirms the presence of *shewa* in the Secunda, transcribing it as a short / ϵ /. Though often unrepresented, it was still pronounced (e.g., $\beta\kappa\omega\lambda\omega$ / $b^\epsilon q\bar{o}l\bar{o}$ /) (1982, 89–110). BLAU suggests that α/ϵ for *shewa* in the Secunda indicates a phonetic quality of [æ] and affirms the phenomenon of assimilation before a guttural (1984).

YUDITSKY denies that there is any evidence in the Secunda for a so-called (vocalic) "*shewa*" vowel, which he refers to as "a short vocalic entity whose quality is unclear."³⁸¹ Every instance of apparent *shewa* is actually a short vowel corresponding in quality to that of the etymological vowel. When the vowel quality differs from the historical vowel, it may be explained on the basis of phonetically conditioned changes due to the immediate consonantal environment. The reason vocalic "*shewa*" is left unrepresented in transcription so frequently is because it was especially short, presumably even shorter than a short vowel. These points may be illustrated with the preposition ב 'in' in the Secunda: the historical Hebrew vowel for the preposition ב is /a/ (e.g., $\beta\alpha\mu\epsilon\theta\gamma\epsilon$ בְּמֶתֶן), but it may be raised in the environment of a sibilant (e.g., $\beta\epsilon\sigma\omicron\chi\chi\alpha$ בְּסֶחֱךָ) and is usually omitted (e.g., $\beta\kappa\omega\lambda\omega$ בְּקִלּוֹ) (2005).

Finally, the most accurate description of *shewa* in the Secunda, though brief, is that of KHAN. He regards the representation of *shewa* with ϵ in the Secunda as indicative of a quality resembling that of Palestinian *shewa*, and most examples of α for *shewa* as preserving a historical $*\text{/a/}$ vowel (KHAN 2013h, 550–51).

Though YUDITSKY has made a significant contribution for how we understand "*shewa*" in the Secunda and its relationship to the diachronic development of Hebrew, two of his conclusions are in need of refinement. First, at least in Tiberian, it is not entirely accurate to regard *shewa* as "a short vocalic entity whose quality is unclear." Phonetically, in terms of vowel quality, vocalic *shewa* is realized as [a] generally, [i] before *yod*, and as the quality of the

381. מִהוּת תְּנוּעֵי קֶצֶר שְׁאִיכֹתָהּ אֵינָה בְּרוּרָה (YUDITSKY 2005, 138).

following vowel when preceding a guttural.³⁸² Phonologically, vocalic *shewa* is equivalent to phonological zero (see above). Second, while there seems to be truth in the claim that the vocalic representation parallel to Tiberian *shewa* in the Secunda often coincides with the quality of the etymological vowel, this does not apply in all instances. While etymological */a/ is often preserved at a distance from the stress and thus represented with α , it seems that many of the instances of ϵ , which YUDITSKY interprets as representing etymological */i/, are actually better explained as signifying a reduced *schwa* vowel. These points will be elaborated in the following sections.

6.5.1.3. The Phonetic Realization of Vocalic Shewa

We noted earlier that in modern linguistics the term *schwa* can refer either to a vowel that interchanges with zero (i.e., phonological zero) or to a "neutral" mid-central vowel (i.e., phonetic [ə]) (6.5.1.1). However, linguists are prone to suggest even finer nuances with regard to the phonetic quality of *schwa*.

According to FLEMMING, in addition to a "neutral" mid-central vowel [ə], there is also a variable *schwa*, whose quality changes according to context. While both types of *schwa* can be the result of reduction, mid-central *schwa* ([ə]) constitutes a "moderate reduction" whereas variable *schwa* constitutes an "extreme reduction" and strong assimilation to the immediate phonological context (FLEMMING 2007, 2).

Another approach is outlined by VAN BERGEM, who makes a distinction between the *phonetic description* of vowel reduction, which he terms "acoustic reduction," and the *phonological description* of vowel reduction, which he terms "lexical reduction." Acoustic reduction occurs as a result of speakers relaxing the articulators when pronouncing vowels in "less informative parts of an utterance"; as a result, vowels are shortened and (usually) pronounced

382. YUDITSKY himself acknowledges these rules at the beginning of his article (2005, 121n4).

closer to the acoustic center [ə]. Lexical reduction occurs when a full vowel is phonologically replaced by a *schwa* vowel (or another vowel easier to pronounce) (1991).

In this section, I will argue that some of the confusion in previous scholarship regarding the phonetic value of *shewa* in the Secunda can actually be cleared up by making a distinction between mid-central and variable *schwa*, on one hand, and between acoustic reduction and lexical reduction, on the other.³⁸³ I will demonstrate that (1) a reduced centralized vowel (i.e., vocalic *shewa*) was generally realized as [ə] or [ɛ] in the Secunda, (2) assimilatory tendencies in vocalic *shewa* also point towards a variable realization in certain contexts, and (3) the preservation of historical /a/ in "*shewa*-vowel" slots is best understood as a "snapshot" during the transition process from mere acoustic reduction to lexical reduction.

6.5.1.3.1. Vowel Reduction and Centralization in the Secunda: Greek ε for [ə] or [ɛ]

When the parallel of Tiberian vocalic *shewa* is represented in transcription, if not a preservation of a historical /a/ (see below 6.5.1.3.3), it is usually represented by ε in the Secunda:

γεδουδ	/gdūd/	[gəðu:ð]	'a troop'	Ps. 18:30
ζερουθαῖ	/zrōʃōtay(y)/	[zəru:ʃo:θaj]	'my arms'	Ps. 18:35
σεμαχ	/šmōk/	[ʃəmo:χ]	'your name'	Ps. 31:4

In Palestinian Koine Greek, centralized reduced vowels may be represented by ε: e.g., Πτελεμ[αικ]ου (for Πτολεμαϊκοῦ), ηπομενοντες (for ὑπομένοντος), and possibly δεσδεκαλλου/δεσκαλου (for διδασκάλου) (variations 88, 90). At the same time, there may be instances in which α is used to reflect centralization: e.g., αδαλφου (for ἀδελφοῦ) and ενανηκοντα (for ἐνενήκοντα) (4.5.3.1.12). While the same is true of Egyptian Koine regarding α and ε, the fact that centralized Greek ο tends to interchange with Greek ε may indicate that ε was ultimately the most favorable grapheme for transcribing a centralized reduced vowel (GIGNAC 1976, 278–93).

383. It should be noted that FLEMMING's mid-central *schwa* and the result of VAN BERGEM's "acoustic reduction" are more or less the same entity. However, acoustic reduction does often but not always result in a vowel near the value of [ə] (VAN BERGEM 1991, 3).

In Greek transcription of Phoenician-Punic, a reduced /a/ may be represented by Greek ε, as can be seen from the transcription φενη Βαλ as opposed to the regular φανε Βαλ/ φανηβαλος /panē baʕl/ 'face of Baal'. In Greek transcription of Aramaic, vocalic *shewa* is usually transcribed by α, though the only attestations are in the inseparable prepositions, the relative ܕ, and before a guttural: βανισαν ܕܢܝܣܢ 'in Nisan', λαμαν ܕܡܢ 'to whom', δαελαα ܕܐܠܗܐ 'that God', and δααβ ܕܗܒ 'gold'.

In Greek transcriptions of Biblical Hebrew from Nikolaos of Otranto in the 12th/13th centuries CE, vocalic *shewa* is usually transcribed by Greek ε: βερεσιθ ܒܪܐܫܝܬ (Gen. 1:1), βεεθ ܒܐܝܬ (Gen. 1:1), νεχικοθ ܢܚܝܩܝܬ (Song 1:2) (*Disputatio contra Judaeos*, 5.11, 245.18).³⁸⁴ Although it is far removed from the Secunda both geographically and chronologically, its data regarding *shewa* are applicable here, provided they are understood within their linguistic context. At the time of Nikolaos, Greek ε represented a true-mid front vowel [ɛ] (PETROUNIAS 2007c, 604–605; HORROCKS 2014, 167), hardly different from the realization of ε during the time of the Secunda. However, Greek η had since become a high front [i], merging with ι and ει. Medieval Hebrew manuscripts from Italy indicate that vocalic *shewa* was usually pronounced as /e/ (= *šere/segħol*) in the vocalization tradition there (RYZHIK 2008, 61–64; 2013, 365), which Greek ε [ɛ] adequately approximated. If vocalic *shewa* in the Secunda was phonetically similar to the Sephardic *shewa*, then, it would probably be represented with ε.

In sum, the use of Greek ε to represent vocalic *shewa* in the Secunda indicates that vocalic *shewa* was realized either as a centralized *schwa* vowel [ə] or a front vowel more in the region of [ɛ] or [e]. It is unlikely that it reflects [e], for which the grapheme η would have been utilized (see the discussion regarding βηηκτ in 6.4.1.3). Such a realization of *shewa* aligns Secunda Hebrew more with Palestinian than Tiberian (see KHAN 2013h, 549–51). It is also worth noting that centralized vowels in the region of [ə] or [ɪ] tend to move to peripheral

384. Note also the curious transcription of Greek χ for Hebrew /š/ in νεχικοθ ܢܚܝܩܝܬ, which reflects the medieval Greek pronunciation of χ as [ç] / *_i,e* (BRIXHE 2010, 235; for χ = /š/ in Arabic, see AL-JALLAD [forthcoming, 50]).

qualities, especially [ɐ] or [e] when they undergo lengthening.³⁸⁵ This may help explain the diachronic relationship between Secunda *shewa* and Palestinian *shewa* (see 6.5.1.3.4).

The description of *shewa* here is not exhaustive of all reduced vowels in the Secunda. Rather, it corresponds to what FLEMMING calls "mid-central *schwa*" ([ə]), arising due to what VAN BERGEM calls "acoustic reduction." At the same time, if the reduced vowel represented by ε actually constituted its own phoneme and not merely a reduction of other historical vowels—this would be the case if the frequent, but not unfailing, preservation of historical /a/ in the same contexts was regarded as phonemic—then by contrasting with /a/ in these environments it would also constitute an example of what VAN BERGEM regards as "lexical reduction."

6.5.1.3.2. Variable Schwa in the Secunda: Assimilatory Tendencies of Vocalic Shewa

In the Secunda, there are a number of instances in which a vowel that may interchange with zero exhibits assimilation to its immediate context. These are best attributed to the category of variable *schwa*. Assimilatory tendencies of *shewa* are found (assimilation bolded):

1) before gutturals (6.4.1.3) (see also YUDITSKY 2017, 86–89):

μῆρα	/mhērō/	[mehe :rō:]	'speedily'	Ps. 31:3
λοομ	/lham/ or /lhom/	[l ʰh ō(m)]	'do battle!'	Ps. 35:1
μεεθθα	/mḥettō/	[m ih t ^h :ō:]	'a terror'	Ps. 89:41

That the first vowel in a pattern like μεεθθα (< *CaCiCCā) may interchange with zero is demonstrated by the fact that such a vowel is not transcribed in the form θελαθαχ תֵּלָאָח (< *CaCiCCā + *suffix*) (Ps. 35:28). The form θελαθαχ is elucidated, in terms of both the unrepresented *shewa* and the lack of gemination, by alternations in Greek transcription of the Hebrew name תֵּלָאָח in Palestinian epigraphy, in which the initial *shewa* vowel alternates with zero: e.g., Θενας, Θεννας, and Θεεννας (*CIIP* I/1, no. 22, 323, 427).

2) when originally silent *shewa* becomes vocalic:

εμαραθ	/ʔemrat/	[ʔ ima ræθ]	'the word of'	Ps. 18:31
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385. Note also the discussion of etymological */i/ [ɪ] lengthening to [e:] in the history of Hebrew (see 6.4.2.1). In the NENA dialects, /ə/ also tends to shift to /e/ when lengthened (e.g., see KHAN 2008b, 66, 77).

εφικιδ	/ʔepqīd/	[ʔiʔikʔi:ð]	'I entrust'	Ps. 31:6
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Alternation with zero in these patterns is demonstrated by parallels such as αρφαθ פתח־ק (*< *qVlat*) (Ps. 89:51) and εσχλεχ עֲשִׂי־עֲשִׂי (Ps. 32:8).

3) when, synchronically, a vocalic *shewa* is inserted to block syncope due to the Syllable Contact Law (SCL) (for an explanation of the SCL, see 5.3.2.1.5; 6.5.1.5.1):

ουανουαθαχ	/w-ʕanwōt̪k/	[(ʔ)uʕanawō:θɔ:χ]	'and your humility'	Ps. 18:36
βααδαραθ	/b-hadrat/	[bahaðaræθ]	'in raiment of'	Ps. 29:2

Alternation with zero in these patterns is shown by the parallel βσεδκαθαχ עֲשִׂי־עֲשִׂי (Ps. 31:2).

4) when, synchronically, a vocalic *shewa* is inserted to block syncope due to the OCP:

αμμιμ	/ʕam(ə)mīm/	[ʕamimĩ:(m)]	'peoples'	Ps. 18:48
ερωμεμεχ	/ʔrōm(ə)mek(k)/	[ʔIRO:mimikʰ]	'I will exalt you'	Ps. 30:2
λααραρι	/l-har(ə)rī/	[laharari:]	'for my mountain'	Ps. 30:8

The form αμμιμ is either from original **qalalīm* having undergone syncope (**qalalīm* > **qal(ə)līm*) or from influence of the Aramaic form עֲמִימִי. Alternation with zero may be shown by the near-parallels αλμωθ and αρβωθ, for which the same development is posited (see 6.5.1.4.1), though it should be noted that αλμωθ and αρβωθ are not from geminate roots.

The only exceptions to (4), in which assimilation of *shewa* does not seem to occur, are the forms θσωβαβηνι עֲשִׂי־עֲשִׂי (Ps. 32:7) and ισωβαβεννου עֲשִׂי־עֲשִׂי (Ps. 32:10), in which *shewa* is realized as a non-historical /a/ vowel (see KHAN 2013h, 550; YUDITSKY 2017, 156). One possible explanation of how variable *schwa* might be realized with a lower pronunciation in such an environment lies in what is called the "trough effect" in modern phonetics. When a labial stop is adjacent to high vowels, the tongue body actually lowers during the production of the labials; thus, *schwa* might assimilate to the lower position of the tongue body in the articulation of the labials rather than the high vowels. The degree to which the first formant

(F1) of *schwa* is higher (i.e., the vowel is lower) than the surrounding high vowels also increases when the *schwa* is between two labials instead of just one (FLEMMING 2007, 14–15).³⁸⁶

5) in the theme vowel of *qal* prefix verbal forms that have undergone reduction:

αασαβου	/yahšbū/	[jahʃaβu:]	'they think'	Ps. 35:20
ἄεζεβου	/yeʃzbū/	[jɛʃzəβu:]	'they will abandon'	Ps. 89:31

Alternation with zero in these patterns is shown by the parallel ουῖφρου וְיִתְּפְרוּ (Ps. 35:26) and ιεμρου וְיִתְּמְרוּ (Ps. 46:4)—but note that ουῖφρου is III-/r/ and ιεμρου is II-/m/ and III-/r/.³⁸⁷

However, because two consonants intervene between the vowel to which *shewa* is supposed to assimilate, it is also possible that ε and α here simply reflect reduction and centralization.

Finally, it should be noted that all the instances in the Secunda in which a *shewa* vowel changes quality in assimilation to an adjacent consonant could also potentially reflect an assimilatory tendency of variable *schwa* (for the various effect of consonants on vowels, see section 6.3 and YUDITSKY [2017, 86–98]).

From external sources, in this case Cod. 86 of the LXX, we may also add the transcription λαβανι לְבָנִי, in which *shewa* is realized as a non-historical /a/. Though the lack of syncope is a separate issue—we would expect **λβνι, **λαβνι, or **λεβνι—it is possible that *shewa* assimilated to the previous /a/ vowel of the preposition /l-/.

Postulating the existence of a variable *schwa* in the Secunda is also supported by other contemporary Hebrew evidence. Assimilation of *shewa* to a following vowel, even across non-guttural consonants, is attested in the LXX (e.g., Σοδομα δὸς and Γοδολιας וְיִתְּלִיָּהּ), the Dead Sea Scrolls (e.g., סודום || δὸς and עומרָה || וְיִתְּמְרָהּ), and Mishnaic Hebrew (e.g., || בְּסִיד

386. But cf. *methnosasoth* מְתִנּוֹסָסוֹת (Zech. 9:16) in Jerome, in which case this explanation would not work.

387. See 6.5.1.3.2. YUDITSKY argues that these forms should be vocalized with an epenthetic between the first and second radicals: i.e., ουῖφρου = *wyīhiprū* and ιεμρου = *yīhemrū/yīh^emrū* (2017, 47, 121–22). However, there are at least two arguments against YUDITSKY's interpretation. First, the prothetic epenthesis to which he appeals, characteristic of the Babylonian tradition, does not occur for the root חפ"ר in Babylonian Hebrew (YEIVIN 1985, 458). Second, the only other instance of a I-/h/ and II-/sonorant verb in the Secunda does not exhibit prothetic epenthesis: וְיִתְּפְרוּ וְיִתְּמְרוּ (Ps. 18:46). It seems more conservative with the data, then, to assume that ουῖφρου and ιεμρου do not exhibit any irregular syllabification patterns.

ביסיד (KHAN 2013h, 550–51). Aquila and Theodotion, roughly contemporaries of Origen, transcribe כְּסִילִיָּהּ (Isa. 13:10) as χισιλεεμ. Since כְּסִיל is an Aramaic loan and thus inherited with an initial *shewa* vowel—it was originally **qatīl*—this form is especially instructive; the unusual quality ɪ, as opposed to more regular ε, can only be explained by assimilation. Finally, Jerome's transcription *nifilim* נִפְלִים (< **napīlīm*) (Gen. 6:4), like χισιλεεμ, can only be explained by assimilation of the *shewa* across the non-guttural consonant to the following /ī/.

It is also worth noting that although the medieval Hebrew grammarians discuss the assimilation of *shewa* only before gutturals and *yod*, medieval Judaeo-Arabic texts with Tiberian vocalization reflect the assimilation of *shewa* to a following vowel also across non-guttural consonants (at least in the Arabic *fuṣūl* pattern): e.g., Classical Arabic الملوك *al-mulūk* 'the kings' is rendered in Hebrew script as אַלְמֻלֻךְ and الشرور *al-šurūr* 'the evils' as אֶלְשֻׁרִיר. Note, however, that Classical Arabic short /u/ is represented with *qibbuṣ* in other words: e.g., محب *muḥibb* 'loving' is rendered as מְחִב. Spellings such as אַלְמֻלֻךְ and אֶלְשֻׁרִיר were likely formed by analogy with the pronunciation of *shewa* in forms like כְּעוֹלָה [buʔu:lɔ:] (Isa. 54:1) and כְּהוֹט [kuhu:tʰ] (Song 4:3), in which assimilation does occur due to the guttural (KHAN 1992, 110).

6.5.1.3.3. Acoustic and Lexical Reduction in the Secunda: Historical Vowels and Shewa

Several scholars (e.g., YUDITSKY 2005; KHAN 2013h, 550) have pointed out that there is a tendency for a historical /a/ vowel that is parallel to vocalic *shewa* in Tiberian to be preserved (transcribed as α) in the Secunda. Preservation of historical /a/ is most commonly found:³⁸⁸

1) in the inseparable prepositions (see YUDITSKY 2017, 224–29):

λαχολ	/l-kol(1)/	[laχɔl]	'to all'	Ps. 18:31
βακααλ	/b-qḏhāl/	[baqɔ:hɔ:l]	'in a congregation'	Ps. 35:18
χασων	/k-šō(?)n/	[kʰatsʔo:n]	'like flocks'	Ps. 49:15

Alternation with zero is shown by the fact that /b-/ , /k-/ , and /l-/ are often transcribed without a vowel: e.g., λμαωλ לְמַחֲוֹל (Ps. 30:12), βκαωλ לְקוֹלוֹ (Ps. 46:7), and χσεδκαχ* כְּצִדְקָה (Ps.

388. The transcription ιουχαλου יִיכָלִי (Ps. 18:39) was not included in any category since it has no parallels.

35:24). Acoustic reduction may occur in the form *λεριβι** לְרִיבִי (Ps. 35:23), and, in external sources, *βεγεβουροθau* בְּגִבּוֹרֶתָיו (Ps. 150:2) and *λεβνη* לְבָנִי (Ps. 11:9).³⁸⁹

2) in the *qatālīm/qatālōt* (and more generally, *qatv̄līm/qatv̄lōt*) plural pattern:³⁹⁰

νακαμωθ	/n(a)qāmōt/	[nakʰa:mo:θ]	'vengeances'	Ps. 18:48
σαβαωθ	/s(a)bāʔōt/	[tsʰaβo:ʔo:θ]	'hosts'	Ps. 46:8, 12
λσαχηναυ	/l-š(a)kēnaw/	[l(ɪ)ʃaxe:naw]	'to his neighbors'	Ps. 89:42

The attestations of *qatālīm/qatālōt* in external sources also preserve the initial /a/ vowel: e.g., *ραφαιμ* רַפָּאִים (Isa. 14:9) and *σαραιμ* שַׁרְיָם (Isa. 26:2). The preservation of /a/ in these patterns is also well-attested in other contemporary Hebrew transcriptional evidence: e.g., the LXX has *Ναβαιωθ* נְבִיּוֹת (Isa. 60:7), *Καδημωθ* קְדָמוֹת (I Chr. 6:64), and *ναθινυ* נְתִינִים (Ezra 2:70); Theodotion has *σαβαχωθ* שַׁבְּחוֹת (II Chr. 4:12) and *καδησιμ* קְדָשִׁים (Judg. 5:21); Jerome has *cadosoth* קְדָשׁוֹת (Hos. 4:14), *sababim* שַׁבְּבִים (Hos. 8:6), and *saridim* שַׁרִידִים (Joel 3:5).

Although the /a/ vowel is usually preserved in transcription, there is evidence of both reduction and alternation with zero. Reduction is demonstrated in the following transcription:

αδδεβαρειμ	/had-dbōrīm/	[had:əβo:ri:(m)]	'the words'	Deut. 1:1
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Greek ε likely reflects centralization and thus an example of acoustic reduction. Alternation with zero in *qatālīm/qatālōt* is demonstrated by parallels such as *αρσαιμ* רַשָּׁעִים (Ps. 1:1) and *φλαγau* פְּלָגָיו (Ps. 46:5), in which no vowel at all is transcribed in the initial vowel slot—but note the variant *φαλαγau*.

3) in the initial vowel of the *pi^el* participle.³⁹¹

389. The ε in *λεριβι** may indicate assimilation to /i/ and thus variable *schwa* (see also YUDITSKY 2017, 228).

390. We could perhaps also add the suffixed form *ιασουαθ* יְשׁוּעָתִי (Ps. 89:27) to this category, for which an alternation with zero may be demonstrated by *ισουωθ* יְשׁוּעוֹת (Ps. 28:8) and *θβουνωθ* תְּבוּנוֹת (Ps. 49:4).

391. YUDITSKY argues that the prefix vowel of the *pi^el* participle was /a/ (i.e., **maqattel*) in ancient Hebrew on the basis of transcriptions in the Secunda, the LXX (e.g., *Μανασση* מְנַשֶּׁה), Jerome (*manaem* מְנַחֵם), and a number of peculiar vocalizations in the reading traditions (YUDITSKY 2005, 128–29; 2017, 150). While the evidence he cites probably indicates that during the Second Temple period **maqattel* was a common vocalization of the participle, it is unlikely that **maqattel* was the original form. In cuneiform transcription of Hebrew, proper names formed from the *pi^el* participle usually exhibit a prefix vowel of /e/ or /i/ into the Late Babylonian period: e.g., *me-ni-ḥi-im-me* and *mi-na-aḥ-ḥe-e-mu* for מְנַחֵם; *me-na-se-e* and *mi-na-si-i* for מְנַשֶּׁה (MILLARD 2013, 840, 843). There is, however, one instance in which the prefix vowel is /a/ (*ma-na-si-i*? מְנַשֶּׁה), which KHAN

αμμααζερηνι	/ham-mʔazzerēnī/	[ham:aʔaz:ire:ni:]	'the one who girds me'	Ps. 18:33
μαλαμμεδ	/m(a)lammed/	[malam:ið]	'training'	Ps. 18:35
ουμασαννεαῖ	/w-m(a)śanneʔay(y)/	[(ʔ)umasan:iʔaj]	'and those who hate me'	Ps. 18:41
λαμανασση	/l(am)-m(a)naššēh/	[lam(:)anats'e:h]	'to the choirmaster'	Ps. 31:1 (+3x)

While there are no clear instances in which the initial vowel of the *pi^el* participle is omitted, it is possible that alternation with zero occurs in the transcription αμμιαλιμ מִיָּלִיִּם (Ps. 31:25). Alternatively, the *ι* could be interpreted as representing the sequence [ij], in which case the initial vowel would have assimilated to the following *yod*. Assimilation of the initial vowel (to the preceding labial) is also attested in the transcription μοςαννε מִשָּׁנֵי (Ps. 18:34). The preservation of /a/ in these forms may be due to the fact that the vowel occurs in a prefix. Cross-linguistically, *schwa* tends to be longer in a prefix; thus, the degree of shortening and reduction is curtailed (HANIQUE, SCHUPPLER, ERNESTUS 2010).

4) in the construct pattern of **qatē/*qalē*:

φανη	/pnē/	[p ^h ane:]	'the face of'	Ps. 18:43
βανη	/bnē/	[bane:]	'sons of'	Ps. 18:46
κασε	/qṣē/	[k ^ʔ ats'e:]	'the edge of'	Ps. 46:10

Alternation with zero is demonstrated by βνη בְּנֵי (Ps. 29:1 + 4x) and μνη מְנֵי (Ps. 89:46).

5) in the construct pattern of **qatōl* (including the infinitive construct):

χαβωδ	/k(a)bōd/	[k ^h aβo:ð]	'the honor of'	Ps. 29:2
καρωβ*	/q(a)rōb/	[k ^ʔ aro:β]	'coming near'	Ps. 32:9
σαλωμ	/š(a)lōm/	[ʃalo:m]	'the peace of'	Ps. 35:27

Alternation with zero is demonstrated by the form λφνωθ לִפְנוֹת (Ps. 46:6).

Two other miscellaneous forms in the Secunda also demonstrate that historical short /a/ was not always preserved propretonically, but could undergo acoustic reduction:

ιελεδεθεχ*	/yledtek(k)/ (< <i>*yaladtika</i>)	[jəlīðəθɪk ^h]	'I have begotten you'	Ps. 110:3
βελιαλ	/bīyaʕl/ (< <i>*balīyaʕl</i>)	[bəli:jaʕl]	'worthlessness'	Prov. 16:27

suggests may reflect assimilation to the following vowel (2013h, 552).

In each case, original */a/ is represented by Greek ε, which likely indicates reduction.

Before we proceed to interpret what these data mean for the realization of *shewa*, it is also worth noting that there are a few instances in which historical */u/ is preserved where we might expect reduction in the Secunda:

θεσοδηνι	/tesʒ(o)dēnī/	[tʰisʒoðe:ni:]	'(it) supports me'	Ps. 18:36
ιεφφολου	/yepp(o)lū/	[jɪpʰ:ʊlu:]	'they will fall'	Ps. 18:39
ουϊερογου	/w-yehʁ(o)gū/	[(ʔ)uʝiʁʊʁu:]	'and they will tremble'	Ps. 18:46

To this list we may also add the form ακκοδασιμ (II Kgs. 23:7) from external sources.³⁹² Both alternation with zero and acoustic reduction for the theme vowel in the verbal forms ιεφφολου and ουϊερογου is demonstrated by category (5) in 6.5.1.3.2.

We have demonstrated that historical /a/ (rarely /u/) is often preserved in the Secunda in environments where we would expect vocalic *shewa*. At the same time, there is also evidence that it reduces and interchanges with zero in those very same environments.

This inconsistency can be explained in light of VAN BERGEM's work on vowel reduction. According to VAN BERGEM, the *phonetic process* of acoustic reduction and the *phonological process* of lexical reduction should be seen as a linear diachronic development. In the first place, acoustic reduction occurs when speakers are *aiming for* the quality of a particular vocalic phoneme, but due to factors like distance from stress, they undershoot and centralize it to some degree, sometimes even pronouncing it as [ə]. Nevertheless, regardless of its phonetic realization at this stage, its phonological status is still that of a full vowel. In the second place, after acoustic reduction has rendered the vowel void of any clear quality—note FLEMING's concept of variable *schwa*—it is then replaced *permanently* and *lexically* with a *schwa* vowel or another vowel whose quality facilitates articulation with little effort. Because it is a diachronic process, instances of acoustic reduction may increase and affect more and more speakers until the reduced vowel is finally made a "permanent part of the lexical system."

392. Note also χωμαρεμ קְמָרִים (Zeph. 1:4) in Theodotion.

However, during such a period of linguistic change, there would be *two lexical variants* for the same word, one with the original historical full vowel and one with *schwa* (1991).

The data from the transcriptions indicate that, at the time of the Secunda, historical /a/ in certain contexts was passing through this period of linguistic change from acoustic reduction to lexical reduction. While some speakers probably pronounced פלגיו 'its streams' as [p^halɔːɣaw] with historical /a/ [a], others pronounced it as something more like [p^həɫɔːɣaw] or even [p^hɪɫɔːɣaw]. Variation could have even been an element of speech speed or register. For example, HERCUS has shown that in a language where vowels reduce and are regularly realized as [ə], the distinct quality of the vowel might still be pronounced when the word is said carefully (HERCUS 1986; CROSSWHITE 2001, 4). For this reason, a sacred reading tradition might be more prone to maintain historical vowels. The fact that there was a lag for the reduction of historical /a/, which is more sonorous than /i/ and /u/, has parallels in other Semitic languages. In Arabic consonantal orthography, for example, the accusative case (with /a/) is represented while the nominative (with /u/) and genitive (with /i/) are not: e.g., كتاب 'book (acc.)', but cf. كتاب 'book (nom. or gen.)'. Moreover, in Ge'ez, the Proto-Semitic vowels */i/ and */u/, but not */a/, have become /ə/ (WENINGER 2011c, 1128).

6.5.1.3.4. Concluding Remarks: Variation in Shewa at the Time of the Secunda

In sum, we can make the following generalizations about the results of vowel reduction evidenced in the Secunda: (1) in some contexts, a reduced vowel behaved like variable *schwa*, assimilating in quality to its immediate context, (2) in other contexts, acoustic reduction led to a more centralized realization of [ə] (or perhaps [ɛ]), and finally, (3) a historical /a/ vowel was preserved in many of the same environments in which reduction occurred in the previous two groups. The precise realization of all three of these principles probably varied by speaker and other factors. It is out of such a variegated linguistic situation that the more regular *lexical* realizations of vocalic *shewa*, such as [a] in Tiberian and [e] in Palestinian, developed.

At this point, VAN BERGEM's work on lexical reduction is especially helpful when considered in light of the history of the development of *shewa* in the various Hebrew traditions. It is important to note that when VAN BERGEM discusses lexical reduction, he does not stipulate that the acoustically reduced vowel must be replaced only by the /ə/ phoneme. Rather, the reduced vowel can also be lexically replaced by another vowel in the system that entails a particularly low-effort articulation. In the case of Tiberian, we may suggest that the historical [a] vowel preserved in "*shewa*-vowel slots" became the lexically substituted vowel for the reduced [ə]/[ɛ] and variable *schwa* elsewhere, whereas in Palestinian, the vowel /e/, somewhat near centralized [ə] or [ɛ], became the lexically substituted vowel for both the reduced vowels and the historical /a/ vowels, which presumably had first undergone centralization. Because lexical reduction entails replacement by another vowel of *low articulatory effort*, the different phonetic realizations of *shewa* in Tiberian and Palestinian may be caused by different bases of articulation in each tradition. Finally, remnants of variable *schwa* are still preserved in the behavior of vocalic *shewa* before gutturals and *yod* in both traditions.

6.5.1.4. Complex Onsets

6.5.1.4.1. Frequency of Sonorants and Sibilants in Complex Onsets

Complex onsets ((C).CCv) are often broken up by the insertion of an epenthetic in the Secunda (see 6.5.1.3.1).³⁹³ There are, however, numerous instances in which a complex onset is represented in transcription without an intervening vowel. These are listed below; onsets with gutturals, onsets with *yod*, and complex onsets beginning with the prepositions /b-/ , /k-/ , and /l-/ have been excluded, since each of these categories seems to have special conventions.³⁹⁴

σμα, σμαε*	/šmaʕ/	[ʃmaʕ]	'listen!'	Ps. 28:6, 30:11
βνη	/bnē/	[b(a)ne:] ³⁹⁵	'sons of'	Ps. 29:1 (+4x)

393. The tendency of Hebrew/Aramaic phonotactics to resolve an initial consonant cluster may be demonstrated by the fact that the normal initial cluster χθ in the name Χθουσιων is resolved by an epenthetic in the form Χαθουσιωνος (for Χθουσιωνος) in 5/6 Hev 15.

394. Instances of $C_1C_2C_3C_4 > C_1C_2(C_3)C_4$ are interpreted as reflecting degemination on the post-lexical level (see 6.3.8.6).

395. In some cases, I have enclosed a vowel in parentheses in my phonetic transcription (e.g., [(a)]). This is because there is evidence from parallel forms that a vowel may have been pronounced in such an environment,

μσουδωθ	/mšūdōt/	[mʰsʷu:ðo:θ]	'fortresses'	Ps. 31:3
εργλαϊ	/reglay(y)/ > /rglay(y)/	[ərglaj]	'my feet'	Ps. 31:9
λσωνωθ	/lšōnōt/	[lʃo:no:θ]	'tongues'	Ps. 31:21
θσωβαβηνι	/tsōb(ə)bēnī/	[tʰ(ɪ)so:βaβe:ni:]	'you surround me'	Ps. 32:7
ισμου*	/šmḥū?/	[ismḥu:]	'rejoice!'	Ps. 32:11
σφτηνι*	/šptēnī?/	[ʃəftʰe:ni:]	'judge me!'	Ps. 35:24
ουϊφρου	/w-yehprū/	[(ʔ)ujihpʰru:]	'let them be ashamed'	Ps. 35:26
σμη	/šmēhē/	[sme:ḥe:]	'those who rejoice in'	Ps. 35:26
ιερου	/yehmrū/	[jihmrū:]	'they will foam'	Ps. 46:4
φλαγαν	/plōgaw/	[pʰ(a)lɔ:kaw]	'its streams'	Ps. 46:5
μσ'χνη	/mašknē/	[m(i)ʃkʰne:]	'the dwellings of'	Ps. 46:5
ουεζρα	/w-yeʕzrō(h)/	[(ʔ)ujɪʕzɾɔ:(h)]	'and he will help her'	Ps. 46:6
λχου	/lkū/	[lχu:]	'come!'	Ps. 46:9
θβουνωθ	/tbūnōt/	[tʰβu:no:θ]	'understandings'	Ps. 49:4
χσιλ*	/ksīl/	[(ə)kʰsi:l]	'a fool'	Ps. 49:11
βχωρ	/bkōr/	[bχo:r]	'firstborn'	Ps. 89:28
σφωθαϊ	/špōtay(y)/	[sɸo:θaj]	'my lips'	Ps. 89:35
βριθ(ι)	/brīt/; /brītī/	[bri:θ]; [bri:θi:]	'covenant of'; 'my ...'	Ps. 89:35, 40
μσιαχ	/mšīḥōk/	[m(i)ʃi:ḥo:χ]	'your anointed'	Ps. 89:39, 52
ζχορ, ηζχορ	/zkor/	[zχoɾ]	'remember!'	Ps. 89:48, 51

Even a brief glance at this list is sufficient to underscore the fact that almost all of the complex onsets involve at least one sonorant or sibilant consonant:

(C).C ₁ C ₂	C ₁ [+sonorant]	C ₁ [+sibilant]	C ₁ [-sonorant, -sibilant]
C ₂ [+sonorant]	1	4	6
C ₂ [+sibilant]	3	0	1
C ₂ [-sonorant, -sibilant]	2	3	2

Chart 25: Sonorants and Sibilants in Complex Onsets in the Secunda

Statistically, a sonorant (blue) or a sibilant (yellow) is present as *either* C₁ or C₂ in 91% of transcribed complex onsets, with either a sonorant or a sibilant present in *both* C₁ and C₂ (depicted in green) in 36% of complex onsets. Transcribed complex onsets without either a

but may also have undergone reduction and deletion.

sonorant or a sibilant (depicted in gray) account for only 9% of all transcribed complex onsets. It is possible, then, that complex onsets may have been more permissible when one of the consonants was either a sonorant or a sibilant.

To the list above we may add the examples of complex onsets in quotations of the Secunda from external sources:

βρησιθ	/b-rē(?)šīt/	[bre:ʃi:θ]	'in the beginning (of)'	Gen. 1:1
σμωνθ	/šmōt/	[ʃmo:θ]	'names of'	Ex. 1:1
αρσαειμ	/ršṣĩm/	[ʔarʃɔ:ʃi:(m)]	'wicked ones'	Ps. 1:1
ουθασρηου	/w-taḥsrēhū/	[(ʔ)uθaḥsre:hu:]	'and you made him lower'	Ps. 8:6
ιερχθη	/yerktē/	[jɪrkʰte:]	'uttermost parts of'	Ps. 48:3
φθοου	/ptohū/	[ptʰʊhu:]	'open!'	Isa. 26:2
σμοωχ(!)	/smūk/?	[smu:χ]?	'steadfast'	Isa. 26:3

In five out of seven transcriptions listed above, the complex onset contains either a sonorant or a sibilant, and in four out of these five instances the complex onset contains *both* a sonorant and a sibilant.³⁹⁶ We may also add the quotation of the Secunda's rendering of הַשְׁמִינִית (Ps. 12:1) in Chrysostom. Though it is transcribed as ασεμινιθ, a variant reading has ασμενιθ. Moreover, in one of the two transcriptions without a sonorant or a sibilant in the complex onset, ιερχθη, the complex onset is directly preceded by /r/, exhibiting a similar syllable structure to εργλᾱ above. If the word-medial $-C_1C_2C_3-$ sequence in ιερχθη is permitted because of the presence of the sonorant /r/ as C_1 , we might compare such a phenomenon to instances in Mishnaic Hebrew in which כפ"ד בג"ד consonants after ר with silent *shewa* are *rafeh* as in בְּמַרְבֵּק 'in the elbow' (BAR-ASHER 2015, 100–102; see also the weakening of /r/ in Modern Hebrew [BOLOZKY 2013, 390]). In each case (ιερχθη and בְּמַרְבֵּק), syllable-final /r/ would have weakened so that כ (= χ) and פ would have been virtually post-vocalic, exhibiting features otherwise restricted to post-vocalic environments. If, alternatively, it is not the sonorant that makes the cluster permissible, then ιερχθη may be taken as evidence that in the Secunda, se-

396. Note also Jerome's *amsuchan* אַמְסֻכָּן, where even degemination of /m/ seems to occur.

quences of three consecutive moras were tolerated, with the second consonant being extra-syllabic:

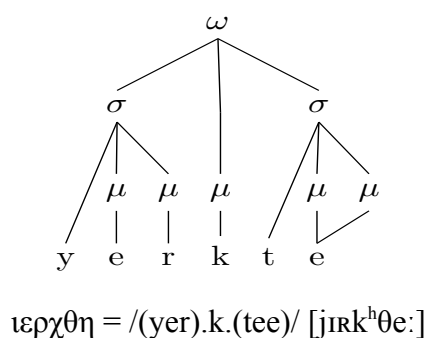


Figure 23: Moraic Representation of ιερχθην

Regardless of our interpretation of ιερχθην, however, the external attestations of complex onsets in the Secunda also support a correlation between complex onsets and sibilants/sonorants.

The retention of complex onsets when one or both of the consonants are sibilants or sonorants may be compared to the Neo-Aramaic dialects of Qaraqosh and Sulemaniyya/Ḥal-abja, in which complex onsets are not broken up by an epenthetic if a sibilant is the first consonant and/or a sonorant continuant is the second consonant (KHAN 2002, 64; 2004, 58).

At the same time, there are a number of instances in which potential clusters with sonorants and sibilants *are* broken up by the insertion of an epenthetic as in other contexts in the Secunda, even in patterns and words identical with some of those above:

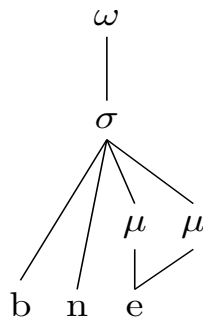
σερουφα	/ʃrūpɔ̃/	[ʔʰʁu:ɸɔ:]	'refined'	Ps. 18:31
ζερουωθαῖ	/zrōʃōtay(y)/	[zʁu:ʃo:θaj]	'my arms'	Ps. 18:35
βανη (cf. βνη)	/bnē/	[bane:]	'sons of'	Ps. 18:46
μεσιω (cf. μσιαχ)	/mšīhō/	[mjī:ho:]	'his anointed'	Ps. 28:8
σεμω (cf. σμωθ)	/šmō/	[ʃəmo:]	'his name'	Ps. 29:2
φαλαγαν (cf. φλαγαν)	/plɔ̃gaw/	[pʰalɔ:ɣaw]	'its streams'	Ps. 46:5 (Chrys.)

There are essentially two ways of interpreting such transcription-doublets as βνη | βανη, μσιαχ | μεσιω, σμωθ | σεμω, and φλαγαν | φαλαγαν. First, the inconsistency in the Greek transcription reflects inconsistency in the Hebrew vocalization tradition. Second, the variation in the Greek transcription reflects diverse conventions of transcribing the same Hebrew sounds and structure; thus, the Hebrew vocalization is not inconsistent but rather the Greek

conventions for representing it are. Both explanations are possible, and we should allow for language-internal variation and inconsistency, yet the Greek evidence may support the latter.

Inconsistent transcription of the same phonetic reality, resulting from the transcriber perceiving the Hebrew sounds differently as they were mapped onto the Greek graphemic-phonemic system, could arise in a couple specific ways. First, it is possible that the short centralized epenthetic vowel was perceived as part of the sibilant or the sonorant, partly due to the transcriber's Greek accent. Cross-linguistically, a sequence of $\nu C_{[+sibilant]}$ or $C_{[+sibilant]}\nu$ may be perceived merely as $C_{[+sibilant]}$, a phenomenon also attested elsewhere in the Secunda (6.3.2). According to SILVERMAN, due to its short duration and high coarticulatory nature, "schwa may be confused with its absence" (2011, 629; 6.5.1.6). In Palestinian epigraphy, Greek $\iota\sigma\chi\acute{\iota}\omega\nu$ is attested as $\sigma\chi\acute{\iota}\omega\nu$, spelled with a complex onset (4.5.3.1.20). On the other hand, it is also common for a prosthetic vowel to develop before $\sigma + \text{consonant}$ in Egyptian Koine (GIGNAC 1976, 312). Finally, vowel deletion in both Palestinian and Egyptian Koine is especially common in the environment of sonorants (4.5.3.1.20).

Second, it is also possible that the transcriber was inconsistent in his representation of Hebrew, occasionally conceiving of the Hebrew words phonemically instead of phonetically. Native speakers do tend to conceive of their own language in terms of its "phonemic structure" rather than its "phonetic reality" (DIRVEN and VERSPOOR 2004, 115). This is especially true for those trained in literacy and spelling. These doublets, then, can be explained by positing that vocalic *shewa* was phonemically zero but phonetically realized as a short vowel. When the Hebrew phones were mapped onto the Greek graphemic-phonemic system, unsurprisingly, the transcriber vacillated between representing the phonemic structure and the phonetic reality. A transcription like $\beta\nu\eta$, then, reflects the phonemic structure $/bn\bar{e}/$ from the perspective of the transcriber's Hebrew accent, whereas a transcription like $\beta\alpha\nu\eta$ reflects the phonetic reality $[bane:]$ from the perspective of his Greek accent:



βανη, βνη = /(bnee)/ [bane:]

Figure 24: Moraic Representation of βνη

The inconsistency in transcribing phonological consonant clusters that are realized phonetically with an epenthetic vowel may be compared to doublets in Tiberian, in which a non-guttural consonant is pointed with the regular *shewa* sign (.) in one form and with a *ḥateph* vowel in an identical form elsewhere: e.g., נִלְכְּדֵנוּ [ne:la'χɔ:nnɔ:] 'let us go!' (II Kgs. 6:2), but נִלְכְּדֵנוּ [ne:la'χɔ:nnɔ:] (Ex. 3:18) (see KHAN 2013a, 101).

It should be noted, however, that aside from these doublets, there is evidence that in particular instances sonorants actually occasioned a distinct syllable structure in a word and were not merely perceived differently. This phenomenon will be examined below.

6.5.1.4.2. The Effect of Sonorants and Sibilants on Syllable Structure

When complex onsets are resolved by the insertion of an epenthetic in the Secunda, the epenthetic is usually inserted *between* the consonants of the initial cluster (.CC > .CvC). However, several scholars have pointed out that if the first consonant in the cluster is a sonorant, especially /r/, the epenthetic may be inserted *before* the complex onset (.CC > v.CC) (KHAN 2013b, 674–75; YUDITSKY 2017, 75–76). This occurs especially in verbal forms:

יִקְרֹסוּ	/yeqršū/	[jikʔartsʔu:]	'they will wink'	Ps. 35:19
יִסְמְחוּ*	/yeśmhū/	[jisumħu:]	'let them rejoice'	Ps. 35:19
יִסְמְחוּ	/yeśmhū/	[jisimħu:]	'let them rejoice'	Ps. 35:24
וַיִּסְמְחוּ	/w-yeśmhū/	[wijisimħu:]	'and let them rejoice'	Ps. 35:27

These forms probably indicate that, at an underlying phonological level, the sonorant of the second radical was extra-syllabic (see KHAN 2013b, 675):

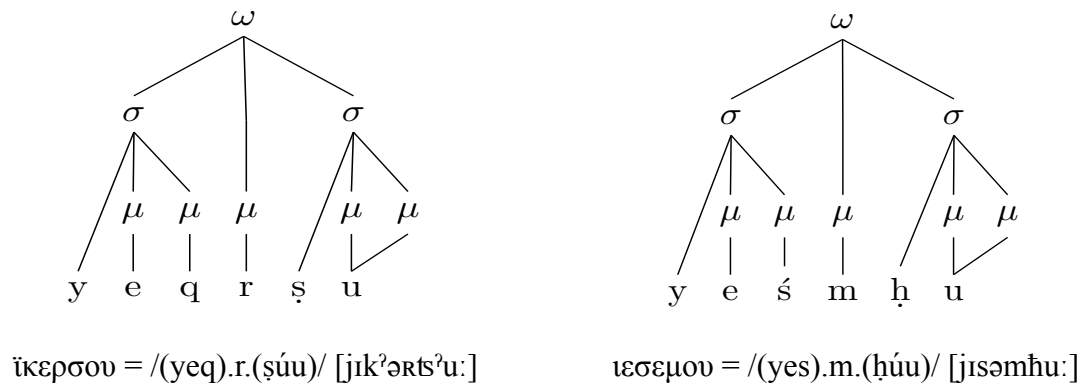


Figure 25: Moraic Representation of ἱκερσου and ἔσεμou

It may be that an alternative spelling, ἔσεμου (𐤅𐤰𐤌𐤍?, cf. MT 𐤅𐤰𐤌𐤍 [Ps. 46:5]), reflects either a misperception based on the transcriber's Greek accent or a phonemic representation. There are also a couple nominal forms in which an initial /r/ in a complex cluster seems to engender the insertion of an epenthetic before the consonant cluster:

αρσαειμ	/ršṣĩm/	[ʔarʃɔ:ĩ:(m)]	'wicked ones'	Ps. 1:1
εργλαῖ	/reglay(y) > rglay(y)/	[ərglaɪ]	'my feet'	Ps. 31:9

The epenthetic being inserted before the consonant cluster in αρσαειμ probably indicates that the initial /r/ is regarded as extra-syllabic at an underlying phonological level:

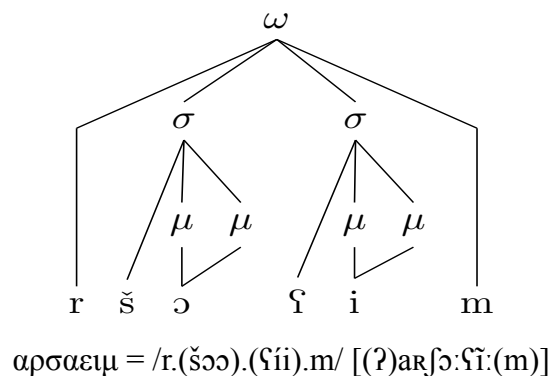
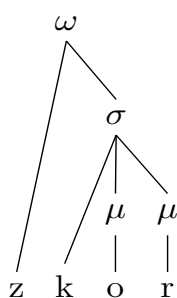


Figure 26: Moraic Representation of αρσαειμ

The transcription αρσαειμ is especially significant because the pattern **qatalīm* is almost always transcribed with the preservation of the historical **/a/* vowel after the first consonant.

The only clear example of a sibilant occasioning a different syllable structure is in the imperative form 𐤅𐤰𐤌𐤍 𐤅𐤰𐤌𐤍 (Ps. 89:48) listed above. Although the quality of η is unexpected for a prosthetic vowel, which may reflect that an epenthetic was at least occasionally realized more like *šere* [e], it has been argued that there is at least one instance in Judaeen Hebrew in

which a prosthetic \varkappa is added before a *qal* imperative (MOR 2015, 148–49).³⁹⁷ If $\eta\zeta\chi\omicron\rho$ is an original reading, it would indicate that the initial sibilant /z/ of the cluster is extra-syllabic:



$\eta\zeta\chi\omicron\rho = /z.(k\acute{o}r)/$ [(?)ezχϞR]

Figure 27: Moraic Representation of $\eta\zeta\chi\omicron\rho$

Additionally, the transcription $\iota\sigma\mu\omicron\upsilon$ cited above, if not a scribal error (** $\sigma\iota\mu\omicron\upsilon > \iota\sigma\mu\omicron\upsilon$), would also indicate prothesis. Finally, the Aramaic loan $\chi\sigma\iota\lambda$ $\chi\sigma\iota\lambda$ ($< *qat\tilde{l}$) (Ps. 49:11) may also be evidence of a different syllable structure. In the previous word, $\iota\alpha\alpha\delta\epsilon$ $\eta\eta$, an inexplicable ϵ is added word-finally, despite no apparent phonetic cause. The final ϵ may be a helping vowel to facilitate the pronunciation of the initial cluster: i.e., $\iota\alpha\alpha\delta\epsilon$ $\chi\sigma\iota\lambda$ [jaħað ək^hsi:l].³⁹⁸ As a final note, it is worth mentioning that prosthetic vowels may exhibit assimilatory features like variable *schwa* (see 6.5.1.3.2): the prosthetic is ϵ before /k/ (e.g., $\iota\alpha\alpha\delta\epsilon$ $\chi\sigma\iota\lambda$), but raised to η or ι before a sibilant (e.g., $\iota\sigma\mu\omicron\upsilon$ and $\eta\zeta\chi\omicron\rho$) and lowered to α before /r/ (e.g., $\alpha\rho\sigma\alpha\epsilon\iota\mu$).

The phenomenon of *prothetic* epenthesis in the Secunda has been compared to the epenthetic inserted in Babylonian verbal forms with a sonorant second radical such as תְּקַרְבִּי (KHAN 2013b, 674–75). Although less frequently cited, it should also be mentioned that along with the sonorants מ , נ , ל , ר , YEIVIN also cites ז , צ , ש as consonants for which an epenthetic is inserted prothetically (1985, 388–89).³⁹⁹ These Secunda transcriptions are significant because

397. On this point, it is worth considering whether the initial vowel transcribed in *qal* imperatives with initial gutturals such as $\epsilon\zeta\alpha\kappa$ $\eta\eta$ (Ps. 31:25), $\epsilon\zeta\omicron\upsilon$ * $\eta\eta$ (Ps. 46:9), and $\alpha\eta\eta$ $\eta\eta$ (Ps. 30:11) may actually reflect prothetic epenthesis rather than anaptyctic epenthesis. Babylonian also behaves differently than Tiberian on this point, tending to introduce epenthetics before the guttural rather than after when it is preceded by the conjunction *waw*: e.g., וְהָיָה , וְהָיָה , וְהָיָה (YEIVIN 1985, 482–84). It is also worth noting that the transcription $\epsilon\zeta\omicron\upsilon$ * actually reads $\epsilon\zeta\omicron\upsilon$ in the manuscript, perhaps indicating /ħzū/ [(?)əħzu:] (see 6.3.6.2).

398. Compare the Mishnaic Hebrew rendering אֲכַסְנִיָּה of the Greek loanword $\xi\epsilon\nu\acute{\alpha}$ (ROSEN 1963, 69).

399. Compare the fact that Greek loanwords with initial clusters beginning with σ are often resolved by prothetic epenthesis when rendered in Hebrew: e.g., אִיזְמִל $\sigma\mu\acute{\iota}\lambda\eta$, אִי־סִטָּה $\sigma\tau\acute{\alpha}\varsigma\iota\varsigma$, אִי־סִפְלִינִי $\sigma\pi\lambda\acute{\iota}\nu\iota\omicron\nu$, and אִי־טְרוֹבֵל $\sigma\tau\acute{\epsilon}\rho\beta\lambda$.

they demonstrate that, when the first consonant of a complex onset was highly sonorous (see also 6.5.1.3.3) or perhaps a sibilant, the first consonant of the cluster was not always syllabified with the following *Cv* sequence as in Tiberian, but sometimes regarded as extra-syllabic as in Babylonian, thus prompting an epenthetic to be inserted before the complex onset.

6.5.1.4.3. The Effect of /y/ on Syllable Structure

Like complex onsets whose first radical is either /r/ or /m/ (*.rC* or *.mC*), there may be evidence that complex onsets beginning with *yod* (*.yC*) also prompt the insertion of a *prosthetic* rather than *anaptyctic* vowel. However, because ı is used in the Secunda to signify [i:], [i], [ji(:)], and [j], it is not always clear how to interpret complex onsets beginning with ı. Some of the possible instances of #*yC* > #*vy.C* are listed below:

Nouns:

ισουωθ	/yšūʕōt/	[(?)i(:)fu:ʕo:θ]	'salvations'	Ps. 28:8
ιριβαῖ ⁴⁰⁰	/yriḃay(y)/	[(?)i(:)ri:βaj]	'those who contend with me'	Ps. 35:1
ἱδαθι	/yhīdʕt/	[jihi:ðo:θi:]	'my only one'	Ps. 35:17
μινω	/ymīnō/	[(?)i(:)mi:no:]	'his right hand'	Ps. 89:26
μιν	/ymīn/	[(?)i(:)mi:n]	'the right hand of'	Ps. 89:43
μη	/ymē/	[(?)i(:)me:]	'the days of'	Ps. 89:46

Verbs:

ἰζαμμερεχ	/yzammerek(k)/	[(?)i(:)zammiri:k ^h]	'I will sing to you'	Ps. 30:13
ἰδαββερ	/ydabber/	[(?)i(:)ðab:ir]	'(it) will speak'	Ps. 49:4
ἰαλληχουν	/yhallēkūn/	[(?)i(:)hal:e:χu:n]	'they will walk'	Ps. 89:31
ἰαλληλου	/yhallēlū/	[(?)i(:)hal:e:lu:]	'they will profane'	Ps. 89:32
μαλλετ	/ymallet/	[(?)i(:)mal:itʔ]	'he will rescue'	Ps. 89:49

A transcription like *μη* can be interpreted in essentially three different ways, all determined based on the reading of the initial ı. First, if the ı represents only /y/ [j], then the word should be read with an initial cluster beginning with /y/ [j]: *μη* = /ymē/ [jme:]. Second, if the ı represents only the vowel /i/ [i], then the word should be read as beginning with a vowel: *μη* =

στρόβιλος (HEIJMANS 2013, 26–31). Note also ἡντιν στάδιον cited in ROSEN (1963, 69).

400. Note that spectral imaging of the manuscript has revealed that there is probably no ı after the β (i.e., *ιριβαῖ*) as others have read it. The correct reading is *ιριβαῖ*.

/ymē/ [(?)i(:)me:]. KHAN suggests that such is the case at least for the transcription $\mu\eta$, positing the following development: $ymē > iymē > īmē$ (2013h, 551). Third, and finally, if the ι represents both /y/ *and* a following short high vowel (i.e., [jɪ] or [ji]), then the word should be read with an anaptyctic vowel: /ymē/ [jime:] or [jime:] (see YUDITSKY 2017, 32–33, 96–98).

There is insufficient evidence to determine with certainty how the initial ι in these transcriptions should be read, but a case can be made that in many of these instances, word-initial ι should be read as a simple vowel ([i], [i:], or [ʔi(:)]). If the transcriber intended to represent [jɪ] (or [ji]), he would have been more likely to write ι with a vowel (ɛ/ɛ̄) or perhaps ι with *trema* (̄). This point can be illustrated by comparing the rendering of the 3*m* prefix /y(e)-/ in *qal* and *pi^εel* verbs (forms with a prefixed *waw* or an /a/ prefix vowel are excluded):

	ι	$\iota / _ \sigma$	$\ddot{\iota} / _ \kappa$	ɛ̄	̄ɛ̄	Total
<i>Pi^εel/Polel:</i>	6 (75%)	1 (12.5%)	0	0	1 (12.5%)	7
<i>Qal:</i>	0	2 (9%)	2 (9%)	13 (59%)	5 (23%)	22

Chart 26: Greek Representation of the Pi^εel and Qal 3ms Verbal Prefix in the Secunda

The distribution of transcription conventions between the *pi^εel* and *qal* prefixes clearly cuts against the idea that they both were phonologically realized as /ye-/ and phonetically realized as [jɪ]/[ji]. In the *qal* prefix, transcription conventions favoring a *consonant* + *vowel* realization (ɛ̄, ̄ɛ̄, ̄) are implemented, whereas in the *pi^εel* prefix, conventions favoring a *vowel* realization (ι) are implemented. Only before σ or κ , environments in which vowels tend to raise in the Secunda (see 6.3.2; 6.3.3.1), does the representation of the *qal* prefix resemble that of the *pi^εel*. YUDITSKY attributes the use of ι in the *pi^εel*—instead of ɛ̄/̄ɛ̄ as in the *qal*—to the raising of /e/ in the environment of *yod*: i.e., (*ye* >) *yi* (> *ʔi*) (2017, 96–97; 150–53), but this does not explain the large disparity in the representation of the /y(e)-/ prefix between the *pi^εel* and *qal* stems, both of which begin with *yod*.

Because YUDITSKY does not acknowledge the presence of *shewa* in the Secunda, the implication of his theory must be that *e* > *i* / *y*_ occurred far more often in the *pi^εel* than in the

qal for some reason. However, if we affirm that *shewa* did exist in the phonology of the Secunda, we may explain the disparity between the *piʿel* and *qal* prefix forms by assuming a complex onset in the *piʿel* stem. Just as the highly sonorous /r/ and /m/ engendered the insertion of an epenthetic vowel *before* the cluster, so did the even more sonorous /y/ at least on some occasions. Accordingly, we may suggest that word-initial *yod* in these forms was an extra-syllabic semisyllable, assuming the same sort of development that KHAN posits for Secunda $\mu\eta$ (see above) and Babylonian ܝܫܕ (*ysōd* > *iysōd* > *īsōd*) (KHAN 2013h, 551; see also YEIVIN 1985, 269–82): i.e., ܝܕܒܒܝܪ = *ydabber* > *iydabber* > *īdabber/idabber*:

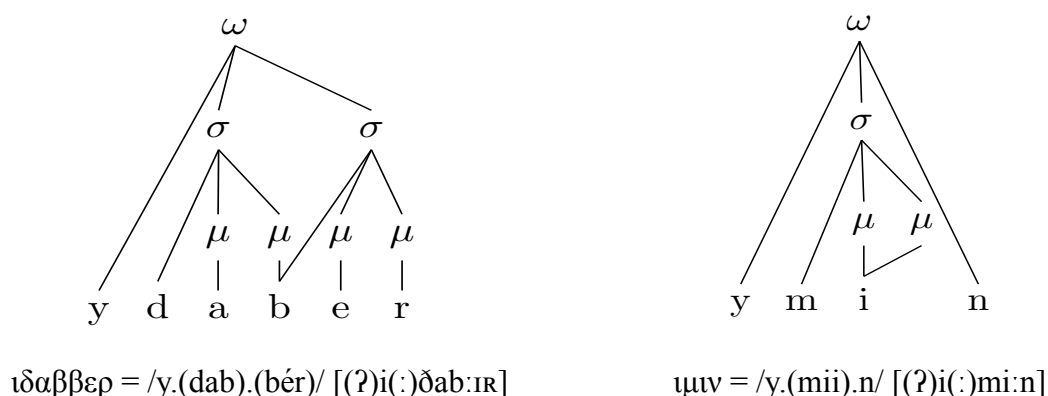


Figure 28: Moraic Representation of ܝܕܒܒܝܪ and ܝܡܝܢ

On the other hand, it should not be ruled out that the epenthetic may have been inserted in between the consonants of the complex onset and was realized as [i] due the preceding /y/, which subsequently elided: *ydabber* > *yidabber* > *(?)idabber*. This same phenomenon, before elision, occurs in the Neo-Aramaic dialect of the Jews of Urmi (e.g., *ytāwli* [ji'tɪβli] 'I sat down') (KHAN 2008a, 44), and, after elision, in the Neo-Aramaic dialect of the Jews of Arbel (e.g., **yilple* > [ʔi:'li'ple:] 'he learnt') (KHAN 1999, 65). Note also the Syriac forms ܝܬܒ *īteb* 'sat' and ܝܕܐܝܢ *īdaʿ* 'knew', and ܝܩܐܪܐ *īqārā* 'honor' (NÖLDEKE 1904, 27). In modern Arabic, it is common for VC- dialects to realize the reflex of **yukallimū* as *ikállmu* with an initial vowel, presumably deriving from an initial cluster **ykallmu* (KIPARSKY 2003, 148). However, it should be noted that there is not always such a sharp distinction between *#yC* and *#iC* phonetically. For example, ERWIN notes that in Iraqi Arabic the quality of an initial /y/ in a complex onset is more "vowel-like" (i.e., [i:]) than "consonant-like" (2004, 31).

There is, in fact, evidence that such variant forms (i.e., *yidabber*) may have existed at least side-by-side with those suggested above (i.e., *idabber/īdabber*). For example, at least in some instances and/or in some forms, a word-initial phonological cluster beginning with *yod* was realized phonetically with a vowel (epenthetic or historical) *after* the *yod*:

ἱεσαυου	/yšaw(w)ʕū/	[jɪʃawʕu:]	'they will cry out'	Ps. 18:42
ἱασουαθι	/yšūʕʕtɪ/	[jaʃu:ʕʕθi:]	'my salvation'	Ps. 89:27

YUDITSKY argues that the ε in ἱεσαυου represents the etymological prefix for *piʕel* (2017, 150–52), but it is better interpreted as an epenthetic even here. In the case of ἱασουαθι, on the other hand, the α does seem to reflect the preservation of a historical vowel. It should also be noted that the *trema* on the initial ι in ἱδαθι (see above) probably indicates a consonantal *yod*.

Consonantal *yod* is also preserved after the conjunction ו and the preposition ל:

ουεμιναχ	/w-ymīnʕk/	[(ʔ)u(j)imi:nʕχ]	'and your right hand'	Ps. 18:36
ουἱεδαββερ	/w-ydabber/	[(ʔ)ujɪðab:ɪR]	'and he will speak/subdue'	Ps. 18:48
λε'ρηαχ	/l-yrēʔʕk/	[lɪj(i)Rɛ:ʔʕχ]/[lɔj(i)Rɛ:ʔʕχ]	'for those who fear you'	Ps. 31:20

In the case of ουεμιναχ, the lack of ι in transcription may reflect the weakening of the semivowel, in which case the ε would represent a vowel following the weakened *reflex* of consonantal *yod* [wəʔimi:nʕχ]. Alternatively, the transition from ου to ε may be an unconventional attempt to signify /y/ [j] (6.3.7.2). In the case of ουἱεδαββερ, assuming it is a *w* + *yiqtol* form,⁴⁰¹ it provides another example in which consonantal *yod* is preserved. In the case of λε'ρηαχ, the digraph ει could be an example of ει for long /ī/, but this is unlikely since ει for long /ī/ in the Secunda normally occurs only on the main stress of the word. Therefore, λε'ρηαχ should be read as λε + ρηαχ, in which case it would also indicate a consonantal *yod*. Finally, there is one transcription from external sources in which consonantal geminated *yod*

401. That ουἱεδαββερ is a *w* + *yiqtol* form is supported by Aquila, Symmachus, Theodotion, the Vulgate, and Targum Onkelos. If the form ουἱεδαββερ is actually a *wayyiqtol* form, then it bears a similar syllable structure to the form μειδχημ (i.e., *CVyyVCV*) and indicates that geminated *yod* was typically preserved before *shewa*.

with *shewa* seems to be preserved after the preposition מן, contrary to most reading traditions of Hebrew (see YUDITSKY 2017, 96):

μειδηχεμ /mey-ydēkem(m)/ [mɪj:iðe:χɪm] 'from your hands' Mal. 2:13

At the same time, however, the consonantal pronunciation of *yod* does not seem to be maintained in the plural construct of the word יום after the inseparable prepositions (cf. YUDITSKY 2017, 63, 181–82, 228):

βυμη	/b-ymē/	[bi:me:]	'in the days of'	Ps. 49:6
χυμη	/k-ymē/	[kʰi:me:]	'like the days of'	Ps. 89:30

The transcriptions βυμη and χυμη are more consistent with the general behavior of *yod* with *shewa* in such an environment in other Hebrew traditions. In both Tiberian and Babylonian, *yod* in these circumstances is normally elided: e.g., מִיָּמֵי, בִּיָּדָי, וִיכָפֹר; מִיָּמֵינָה, מִיָּדֶיכֶם, וִידְבָר, לִירְאֵיךָ (YEIVIN 1985, 525, 773, 891, 1157). There are, however, a number of rare vocalizations, mostly in Middle and Late Babylonian, in which the *yod* is pronounced: e.g., וִישָׁחֵק, וִימִינֶךָ (normal for MB and LB) (525, 1154, 1157). Even in Old Babylonian, *yod* at the beginning of a word-initial complex onset was not always pointed with *hiriq*, sometimes being left without *niqqud* and sometimes being pointed with *hitfa* (i.e., vocalic *shewa*). One example of inconsistency is that there is a greater tendency for word-initial *yod* to be pointed with a *hiriq* when there is only one syllable that follows it in the word (e.g., יָסוֹד) (YEIVIN 1985, 269–71).

In sum, just as in the case of the sonorants /r/ and /m/, highly sonorous /y/ at the beginning of a complex onset in the Secunda seems to bring about a different sort of syllable structure, namely, the insertion of an epenthetic vowel prior to the consonant cluster. This approach to epenthesis is shared with the Babylonian tradition. At the same time, however, a number of counterexamples in the Secunda seem to indicate that this might not have been the only way that these forms developed in the tradition(s) and pronunciation(s) upon which the transcriber drew. After all, even in Old Babylonian, there is a degree of inconsistency with respect to the vocalization of these forms (YEIVIN 1985, 271–75).

6.5.1.5. Vowel Syncope and Consonant Clusters: CvCvCv(C) > CvCCv(C)
6.5.1.5.1. Short + Short: CvCvCv̄(C) > CvCCv̄(C)

In a series of two consecutive short (or *shewa*) vowels in open syllables, there is a tendency for the second vowel to undergo syncope: $v > \emptyset / C\check{v}C_C\check{v}(C)$. Aside from a small number of exceptions (see below), this phenomenon is general in the Secunda:⁴⁰²

Nouns:

λαβλωμ	/l-blōm/ (< * <i>la-balōm</i>) ⁴⁰³	[laβlo:m]	'to curb'	Ps. 32:9
λαμσω	/l-mšō(?)/ (< * <i>la-mašō?</i>)	[lamts'o:]	'to find'	Ps. 36:3
βαρσωνω	/b-ršōnō/ (< * <i>ba-rašōnō</i>)	[barts'o: no:]	'in his favor'	Ps. 30:6
ουαλσωνι	/w-lšōnī/ (< * <i>wa-lašōnī</i>)	[walʃo:ni:]	'and my tongue'	Ps. 35:28
δαβρη	/dabrē/ (< * <i>dabarē</i>)	[daβre:]	'words of'	Ps. 35:20
λαμαλχη	/l-malkē/ (< * <i>la-malakē</i>)	[lamalxe:]	'to the kings of'	Ps. 89:28
βαλβαβαμ	/b-lbāam(m)/ (< * <i>ba-libābamm</i>)	[balβo:βā(m)]	'in their heart'	Ps. 35:25
χαβημωθ	/k-bhēmōt/ (< * <i>ka-bahimōt</i>)	[k ^h aβhe:mo:θ]	'like cattle'	Ps. 49:13
ουβανγαϊμ	/w-b-ngōšīm/ (< * <i>wa-ba-nigāšīm</i>)	[(?)uβankɔ:ʃi:(m)]	'and by smittings'	Ps. 89:33
βσεδκαθαχ	/b-šedqōtāk/ (< * <i>ba-šadaqātāk</i>)	[b(ɪ)ʃɪ ^h ðk ^h ɔ:θɔ:χ]	'in your righteousness'	Ps. 31:2
ουθφελλαθι	/w-tpellōtī/ (< * <i>wa-tapillātī</i>)	[(?)uθp ^h ɪl:ɔ:θi:]	'and my prayer'	Ps. 35:13

Verbs:

ουαρημ	/w-ršēm/	[warʃe:m]	'and shepherd them!'	Ps. 28:9
ουαδου	/w-dʃū/	[waðʃu:]	'and know!'	Ps. 46:11

There are, however, a number of exceptional cases in which this syncope rule does not apply.

First, when syncope would result in a consonant cluster of identical or homorganic consonants, they are broken up by an epenthetic *shewa* vowel:

αμιμιμ	/ʃam(ə)mīm/	[ʃamimĩ:(m)]	'peoples'	Ps. 18:48
λααραρι	/l-har(ə)rī/	[laharari:]	'for my mountain'	Ps. 30:8

The lack of syncope in these forms may be attributed to the OCP, which states that consonant clusters are not allowed for identical or homorganic consonants (see McCARTHY 1981; 1986;

402. Note that KHAN states that in the Secunda "there is sometimes no vowel where the *shewa* is silent in the Tiberian reading tradition, e.g., in the middle of a word after a short vowel" (2013h, 551).

403. We cannot determine with certainty whether the infinitive construct should be reconstructed as **qutul* or **qatōl*. However, the infinitive construct seems to be attested as *qatōl* elsewhere in the Secunda (e.g., καρωβ קָרַב [Ps. 32:9]). At least synchronically, then, the forms λαβλωμ and λαμσω reflect syncope of **la-qatōl* > *laqtōl*.

SCHWARZWALD 2013) and are consequently broken up by an epenthetic. This differs from Tiberian, in which such sequences are geminated unless the first vowel is long: e.g., הָרַרִי [har:i:] but לָקַקוּ [lɔ:qaqu:] (KHAN 2013h, 545). In Middle Babylonian, the first *resh* has a vocalic segment in similar forms: e.g., הָרַרִי (YEIVIN 1985, 798). In two examples, one in the palimpsest and one in external sources, the OCP may block expected syncope (see 6.3.1.3):

$\beta\rho\epsilon\delta\epsilon\theta\iota$	/b-redtī/	[bəRɪðɪθi:]	'when I go down'	Ps. 30:10
$\iota\epsilon\lambda\epsilon\delta\epsilon\theta\epsilon\chi^*$	/yledtek(k)/	[jəlɪðəθɪk ^h]	'I have begotten you'	Ps. 110:3

Diachronically, these forms derive from **ba-ridtī* and **yaladtīkā*. Synchronically, the forms presumably derive from **redt* + *ī* and **yaladt* + **ek*. At the post-lexical level, the final consonant cluster in the non-suffixed forms **redt* and **yaladt* would have been resolved by an epenthetic and likely realized as something like [Rɪðɪθ] and [jɔ:ləðəθ]. When the pronominal object suffix was added to the verb, the series of C_vC_vC_v at the end of the word should have resulted in syncope: **ρεδεθ* + **ι* > ***ρεδθι*; **ιελεδεθ* + **εκ* > ***ιελεδθεχ*. It seems that syncope was blocked by the homorganic articulation of /d/ and /t/ according to the OCP.⁴⁰⁴

Second, in two construct forms from original **qatalat*, in which we would expect syncope in light of the principles outlined above, a medial /a/ is present:

$\sigma\upsilon\alpha\nu\alpha\nu\alpha\theta\alpha\chi$	/w-ʕanwɔ̄tɔ̄k/	[(?)uʕanawɔ:θɔ:χ]	'and your humility'	Ps. 18:36
$\beta\alpha\alpha\delta\alpha\rho\epsilon\theta$	/b-hadrat/	[bahaðaræθ]	'in raiment of'	Ps. 29:2

The only other construct form from original **qatalat* in the Secunda ($\beta\sigma\epsilon\delta\kappa\alpha\theta\alpha\chi$) exhibits syncope. Previous scholars have explained the lack of syncope in $\sigma\upsilon\alpha\nu\alpha\nu\alpha\theta\alpha\chi$ and $\beta\alpha\alpha\delta\alpha\rho\epsilon\theta$ as indicative of either the preservation of the original vowel or the derivation of the form from a variant pattern (see YUDITSKY 2017, 191–93). There is, however, a more likely explanation. According to the Syllable Contact Law (SCL), which has been found to be valid for Hebrew in two studies of ה"פ verbs (DeCAEN 2003; ALVESTAD and EDZARD 2009, 51), a fall in sonority is preferred in the transition from the end of one syllable to the beginning of another.

404. Compare also the Modern Hebrew form *lamádeti* לְמַדְתִּי (cf. *patáxti* פָּתַחְתִּי) (SCHWARZWALD 2013, 573).

When there is an increase in sonority, the cluster may be resolved by means of contact anaptyxis, as in English *thatway* > *thataway* (DeCaen 2003, 38–39). The rise in sonority in the syllables [ʃan.wɔ:] and [hað.ræθ], then, might have been resolved by means of contact anaptyxis. This explanation is further supported by the fact that anaptyxis seems to occur in a pattern without an original medial vowel (i.e., **qitlat*)⁴⁰⁵ but with rising sonority at the onset of the second syllable:⁴⁰⁶

εμαραθ /ʔemrat/ [ʔimaræθ] 'the word of' Ps. 18:31

The same sort of phenomenon is attested in Palestinian Greek epigraphy, probably also due to the SCL: e.g., Απερος (for Ἄπερος), Δυστερου (for Δύστρου) (variations 93–94), and Ιανουαριαις (for Ιανουαριας) (5/6Hev 11). In Egyptian Koine and Modern Greek, epenthetics also often arise in similar environments: e.g., Egyptian Koine has δραχαμας (for δραχμάς), πραγμαματος (for πράγματος), and μενήμ[ης] (for μνήμης); Modern Greek has καπινός (for καπνός) (GIGNAC 1976, 311–12).

These forms may also be compared to such Tiberian forms as אֶמְרֹת [ʔi.ma'ro:θ] (for **אֶמְרוֹת* [ʔim'ro:θ]; Ps. 12:7) and הַתְּמָלִיךְ [haθi.ma'lo:χ] (for הַתְּמָלִיךְ [haθim'lo:χ]; Jer. 22:15) (see KHAN 2013a, 102). In multiple sonority scales suggested for Tiberian, ר and ל are both more sonorous than מ and נ (see DeCaen 2003, 38; ALVESTAD and EDZARD 2009, 49). We may also compare the transcription αβανηθ אֶבְנֵי found in Josephus (Antiq. 3:156), απαδανω אֶפְדָּנוּ (Dan. 11:45) and σατανηζ שָׂטָנְךָ (Lev. 19:19) in Theodotion, ιεσερι יֶצְרִי (Num. 26:49) and Νινευη נִינְוָה (Gen. 10:11) in the LXX (cf. Νινυα נִינְוָה in Josephus and *Ninua* in Akkadian), and *asamath* אֶשְׁמַת (Am. 8:14) in Jerome.

Third, in a few instances after ל, כ, ב, and the conjunction ו, syncope does not occur:

συμασαννεαῖ /w-m(a)śanneʔay(y)/ [(ʔ)umasan:ɪʔaj] 'and those who hate me' Ps. 18:41

405. The form אֶמְרֹת does not derive from אֶמְרוֹת but is a **qitl* biform of אֶמֶר (**qutl*) attested only in the construct state. A **qitl* biform of **qutl* is also found in בָּקָרוֹ for typical בָּקָר with a suffix (Fox 2003, 109, 153).

406. The OCP may also be relevant for interpreting the transcription αχαμωθ הַחֲמוּת 'wisdom' (Ps. 49:4).

βσεβωθαμ	/b-šmōtam(m)/	[b(ɪ)ʃəmo:θā(m)]	'by their names'	Ps. 49:12
λσαχηναυ	/l-š(a)kēnaw/	[l(ɪ)ʃaχe:naw]	'to his neighbors'	Ps. 89:42

According to the rules outlined above, we would expect these forms to be transcribed as ου(α)μσαννεαί**, β(α)σμωθαμ**, and λ(α)σχηναυ**. The explanation for these forms is unclear, but it is noteworthy (1) that in two out of three instances the second consonant is /š/ and (2) that the syllabic sequence normally prompting syncope occurs across a morpheme boundary. It may be that the prefixed conjunction or preposition and the subsequent lexeme were conceived apart from their relationship to one another. Thus, both the affixed word (i.e., the conjunction *waw* or the preposition) and the following word were pronounced as they were generally. This may be compared to how speakers of Israeli Hebrew generalize the pronunciation of *waw* as *ve-* in all contexts, even before initial clusters: e.g., וְשָׂרִים וְשָׂרִים *esrím ve-shtáyim* (COFFIN and BOLOZKY 2005, 179–180). Note that similar variation also occurs in both the Leningrad Codex (L) and the Aleppo Codex (A), reflecting non-standard Tiberian features: e.g., בְּשִׁפְתֹתָיִךְ in L (cf. בְּשִׁפְתֹתָיִךְ in A) and כְּמִטָּיִל in A (cf. כְּמִטָּיִל in L) (BLAPP 2016).⁴⁰⁷

Finally, when an inseparable preposition is attached to a word beginning with a guttural (e.g., βααλωθαμ), syncope does not often occur.

Before concluding the section, we must also mention that there are a number of words in which syncope ($CvCvCv(C) > CvCCv(C)$) occurs in the Secunda but *not* in Tiberian:

αλμωθ	/ʕalmōt/	[ʕalmo:θ]	'Alamoth'	Ps. 46:1
εσδαχ	/ħesdōk/	[ħisðɔ:χ]	'your mercies'	Ps. 89:50
αβδαχ	/ʕabdāk/	[ʕaβðɔ:χ]	'your servants'	Ps. 89:51
γαδρωθαυ*	/gadrōtaw/	[gaðro:θaw]	'his walls'	Ps. 89:41

407. It is likely, however, that the examples בְּשִׁפְתֹתָיִךְ and כְּמִטָּיִל do not represent a phonetic phenomenon, but merely a graphical one. They may be compared to instances in L and other Tiberian manuscripts in which a *shewa* represents a short vowel in a closed syllable: e.g., וְהָרָגָהּ [vaharax'nu:hu:] (Judg. 16:2) (DOTAN 1985; KHAN 2013h, 548). However, instances of *shewa* substituting for *patah* in forms like וְהָרָגָהּ should be regarded as an extension of the use of the *shewa* sign (,) to indicate short [a], which was the phonetic value of vocalic *shewa* in the Tiberian tradition. It is not clear, however, if such a comparison is relevant for בְּשִׁפְתֹתָיִךְ, in which the *shewa* sign is actually substituting for *hiriq*.

To this list we may add the quotation of the Secunda $\alpha\rho\beta\omega\theta$ תַּרְבֹּות (Ps. 9:7) found in Chrysostom's commentary on the Psalms. YUDITSKY explains these forms by positing two plural allomorphs, $*qVtal\bar{im}/*qVtal\bar{o}t$ and $*qVtl\bar{im}/*qVtl\bar{o}t$, as original to Hebrew (2017, 193–94).

In the case of $\alpha\lambda\mu\omega\theta$ עֲלָמוֹת, $\epsilon\sigma\delta\alpha\chi$ חֲסָדִים, and $\alpha\beta\delta\alpha\chi$ עֲבָדִים, however, /a/ insertion in the plural forms is a feature inherited from Proto-Semitic and attested everywhere in Northwest Semitic (HUEHNERGARD 1991, 284; 2013); thus, the absence of it can only be explained as the result of syncope.⁴⁰⁸ Moreover, the regular plural pattern with /a/ insertion is attested in non-suffixed non-construct forms more frequently in the Secunda: e.g., $\nu\alpha\kappa\alpha\mu\omega\theta$ נִקְמוֹת, $\sigma\alpha\beta\alpha\omega\theta$ עֲבָאוֹת. The syllable structure of these words in the Secunda is more similar to that of construct forms (e.g., $\epsilon\sigma\delta\alpha\chi$, $\alpha\beta\delta\alpha\chi$).⁴⁰⁹ We might explain this similarity by positing that vowel syncope occurred in these forms before pretonic lengthening was operative, thus aligning them with the construct forms, in which pretonic lengthening of the second vowel never occurred because the word was unstressed. However, it is unlikely that a different pattern of syncope would occur only in these words. Rather, these forms may be explained as the result of the influence of Aramaic, in which the regular plural base of $*qVtl$ and $*qatil$ is $*qVtl-$. Aramaic forms might also have been more prone to be used when pronominal suffixes were attached to a noun. Note that two of the forms under discussion ($\epsilon\sigma\delta\alpha\chi$, $\alpha\beta\delta\alpha\chi$) have the Aramaic form of the 2ms suffix for a plural noun. Finally, it is worth noting that $\alpha\lambda\mu\omega\theta$ may not necessarily correspond with עֲלָמוֹת.⁴¹⁰

The Secunda form $\gamma\alpha\delta\rho\omega\theta\alpha\upsilon$ is actually more consistent with the general phonotactics of Hebrew than Tiberian גְּדֻרָתִי. Synchronically, a *šere* that is not the result of compen-

408. Note the spirantized *kaf* in the Aramaic plural מְלָכִין, which indicates an originally post-vocalic consonant.

409. YUDITSKY cites the Babylonian construct form גְּדֻרָת for comparison (YUDITSKY 2017, 193), but aside from the initial /a/ vowel, which would be expected in Babylonian, there is no difference from the Tiberian construct form גְּדֻרָת. In both traditions, the plural form with an addition exhibits a similar syllable structure: e.g., גְּדֻרָתִי and גְּדֻרָתֵם (place name in Josh. 15:36) (YEIVIN 1985, 921).

410. Note how in the superscription to Psalm 9, the Masoretic phrase עֲלָמוֹת לְבָן is rendered in the Secunda as Αλμωθ βεν or Αλμωθ βεν and interpreted as עַל 'concerning' + מָוֶת 'death' in Eusebius (*Generalis elementaria introductio*, 75.19–22).

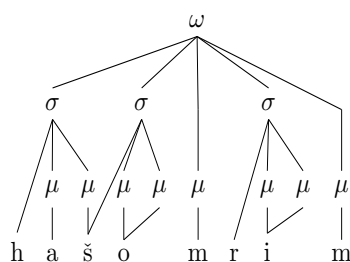
satory lengthening or the collapse of a diphthong is normally reduced to *shewa* in pretonic position: e.g., זְקֵנִים but זְקֵנִהֶם. Diachronically, the *šere* in the absolute form גְּדֹרֹת is the result of pretonic lengthening operating on etymological */i/. Thus, instead of the expected form **גְּדֹרֹתִי, the Tiberian form גְּדֹרֹתִי has been formed based on analogical restoration of the pattern (HUEHNERGARD 2015, 43–44). The Secunda form γαδρωθαι, on the other hand, exhibits the expected development of such forms. As YUDITSKY points out, similar variants exist in Tiberian and Babylonian as well, such as לְחַצְרוֹתִי (Ps. 96:8) over against חַצְרוֹתִי (Ps. 100:4) (2017, 193). The fact that both of these developments are attested in multiple traditions indicates that they have ancient roots.

6.5.1.5.2. Long + Short: CvvCvCvv > CvvCCvv

Vowel syncope also occurs frequently in a short open syllable between *long* vowels:⁴¹¹

μεῖωρδη	/mey-yōrdē/ (< *yōridē)	[mij:o:Rðe:]	'from those who go down'	Ps. 30:4
ταμνου	/t̪mnū/ (< *t̪āmanū)	[tʰɔ:mnu:]	'they hid'	Ps. 31:5
ασσωμριμ	/haš-šōmrīm/ (< *haš-šōmirīm)	[haʃ:o:mri:(m)]	'those who keep'	Ps. 31:7
ἰωμρου	/yō(?)mrū/ (< *yōmirū)	[jo:mrɯ:]	'they will say'	Ps. 35:25
ηρφου	/hērpū/ (< *hēripū)	[hɛ:Rɸu:]	'reproached'	Ps. 89:52

These transcriptions are important because they demonstrate that *CVVC* syllables were tolerated at least on the post-lexical level. In light of the variation in this pattern (see below), however, the second consonant was probably licensed as a semisyllable (see KHAN 1987; 2 013b, who bases his semisyllable analysis on KIPARSKY 2003):



$$\alpha\sigma\sigma\omega\mu\rho\iota\mu = /(\text{ha}\check{s}).(\check{s}\text{o}\text{o}).\text{m}.(\text{r}\check{\text{i}}).\text{m}/ \quad [\text{haʃ:o:mri:m}]$$

Figure 29: Moraic Representation of ασσωμριμ

411. For the reduction of vowels in this context, see SUCHARD 2016 (112, 115, 137).

There are a number of exceptions to this rule. First, the plural forms of אֹיֵב 'enemy' with suffixes do not necessarily exhibit syncope: (ου)οἰεβαῖ אֹיְבֵי (Ps. 18:38, 41), οἰεββαῖ אֹיְבֵי (Ps. 30:2), ωεβη אֹיְבֵי (Ps. 35:19), and οἰβαχ אֹיְבֵי (Ps. 89:52) (see YUDITSKY 2017, 126, 128).⁴¹² It is actually possible, however, that a Hebrew form with syncope lies behind these transcriptions, yet the transition from /y/ [j] to [β] was perceived by the Greek accent as a short vowel. On the other hand, a sophisticated linguistic explanation may not be necessary. It is possible that two patterns of the *qal* plural participle existed side-by-side. The Sephardic communities, for example, differentiate between the biblical pronunciation *šomerím* and the Mishnaic pronunciation *šómrím* (KHAN 2013h, 549). Moreover, though a word like שָׁמְרוּ was normally realized as *šōmrū* in Tiberian, early masoretic sources indicate that there may have been variation from reader to reader, some pronouncing it as *šōmrū* and others as *šōmarū* (KHAN 1987, 56–57).

Second, as above, when syncope would result in a cluster of identical or homorganic consonants, they are broken up by an epenthetic *shewa* vowel according to the OCP:

ερωμεμεχ	/ʔrōm(ə)mek(k)/	[ʔIRO:mimik ^h]	'I will exalt you'	Ps. 30:2
θσωβαβηγι	/tsōb(ə)bēnī/	[t ^h (i)so:baβe:ni:]	'you surround me'	Ps. 32:7
ισωβαβεννου	/ysōb(ə)bennū/	[(ʔ)i(:)so:baβm:u:]	'(it) will surround him'	Ps. 32:10

A similar phenomenon occurs in Tiberian as well, in which the first of two consecutive *shewa*s on two identical consonants *after a long vowel* is realized as vocalic *shewa*: e.g., קִוְרִים [so:raRi:m] (Isa. 30:1) with *shewa*, but סִוְרִים [so:raRi:m] (Ps. 68:7) with *ḥaṭef-pataḥ*.

Third, syncope is blocked if the following onset marks a significant rise in sonority:

ιουχαλου*	/yūk(a)lū/	[ju:χalu:]	'they will be able'	Ps. 18:39
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YUDITSKY interprets the α in this form as indicating the preservation of etymological short */a/ in an open unstressed syllable (2017, 70, 134–35). This is indeed probably the case, since it is the only instance of etymological */a/ in this environment in the Secunda, yet there may be

412. In the last case, ῑ may be interpreted as representing [ji] or [ji].

another factor that facilitated its preservation. As in the case of *αναυαθαχ*, *βααδαρεθ*, and *εμαραθ* (see above), there is a rise in sonority from the end of the first syllable to the onset of the second. Therefore, syncope may have been blocked according to the SCL (see above). This may be compared to certain Tiberian forms: e.g., *תאכלנו* [to:χa'le:n:u:] 'you will eat it' (Num. 18:10), but cf. *תאכלנו* [to:χa'le:n:u:] (Deut. 12:24); *הוֹטֵל* [hu:ta'lu:] (Jer. 22:28).

Finally, if the vowel expected to undergo syncope is next to a pharyngeal, syncope does not occur: e.g., *לואמאִי מִי־הָ* [Ps. 35:1]; *αββωτεειμ הַהִיבְּ* [Ps. 49:7]).

6.5.1.6. The Conjunction *waw* and the Inseparable Prepositions

Because a vowel is not typically transcribed after the conjunction *waw* or the inseparable prepositions, they should be interpreted as *shewa* and represented phonemically as /w-/ , /b-/ , /k-/ , and /l-/ . Their precise phonetic realizations and relationship to syllable structure will be examined below.

6.5.1.6.1. Conjunction *waw*: *ou* = /u/

In the Secunda, the conjunction *waw* /w-/ is usually represented only by *ou* (99x):

ουλω	/w-lō(?)/	[(?)ulo:]	'and not'	Ps. 18:38
ουγιλου	/w-gīlū/	[(?)uki:lu:]	'and rejoice!'	Ps. 32:11
ουβαρουχ	/w-bōrūk/	[(?)uβɔ:ru:χ]	'and blessed'	Ps. 18:47

Aside from those instances in which it is prefixed to a *vayyiqtol* past-tense form (e.g., *ουαִיאלֵז* *רָחֵם* [Ps. 28:7]; *ουαθθεμας* *דַּחֲמֵה* [Ps. 89:39]), the conjunction *ou* /w-/ is only followed by a vowel in eight instances, which can essentially be categorized into two groups (see YUDITSKY 2017, 230–32).⁴¹³ First, *ou* is transcribed with a vowel when /w-/ is followed by a word with an initial consonant cluster:

ουαρημ	/w-rʕēm/	[warʕe:m]	'and shepherd them!'	Ps. 28:9
ουαλσωνι	/w-lšōnī/	[walʃo:ni:]	'and my tongue'	Ps. 35:28
ουαδου	/w-dʕū/	[waðʕu:]	'and know!'	Ps. 46:11
ουεβροβ	/w-b-rob(b)/	[wɪβrɔb]/[wəβrɔb]	'and in the abundance of'	Ps. 49:7

413. YUDITSKY concludes that the vowel in *wa-*, while typically not transcribed, is indicated in pre-tonic position in pause and before a consonant cluster (2017, 231). My analysis of the data leads to similar conclusions.

This reflects the syncope rule $v > \emptyset / C\check{v}C_C\check{v}(C)$ outlined in 6.5.1.5.1. While it is normal for the vowel preceding the cluster to be /a/ (e.g., $\lambda\alpha\mu\sigma\omega$ [$< *lama\check{s}\bar{o}(?)$], $\delta\alpha\beta\eta$ [$< *dabar\bar{e}$]), the ε in $\sigma\upsilon\epsilon\beta\rho\sigma\beta$ may reflect a resolution of the initial cluster similar to Babylonian Hebrew, in which *waw* before a cluster is usually pointed with *hiriq* (e.g., וְיִיִם). There is variation, however, even in Babylonian, with examples of *waw* + *pataḥ* before a cluster in the *Safra* (e.g., וְבַמִּשׁוֹר) (YEIVIN 1985, 1152). It is also possible that the ε reflects a centralized epenthetic [ə].

Second, *ou* has a vowel when it precedes a stressed syllable in monosyllabic nouns:

$\sigma\upsilon\alpha\rho\epsilon\sigma\nu$	/wō-resn/	[wɔːRɪʃn]	'and a bridle'	Ps. 32:9
$\sigma\upsilon\alpha\delta\omega\rho$	/wō-dōr/	[wɔːðoːR]	'and generation'	Ps. 49:12

In each case, the noun is the second item in a fixed phrase and would have a disjunctive accent in Tiberian ($\beta\alpha\mu\epsilon\theta\gamma\epsilon \sigma\upsilon\alpha\rho\epsilon\sigma\nu$ $\text{בְּמַתְגָּ וְרִסָּן}$ 'with bit and bridle'; $\lambda\delta\omega\rho^* \sigma\upsilon\alpha\delta\omega\rho$ לְדֹר וְדֹר 'to generation and generation'). In these sorts of contexts, the conjunction *waw* exhibits pretonic lengthening in both Tiberian (לְחֵם וַיֵּין) and Babylonian Hebrew (e.g., לֶחֶם וַיֵּין) (YEIVIN 1985, 1154–55; for pretonic lengthening of *waw*, see KHAN 2013j, 228). Accordingly, the vowel should be transcribed as long (on /w-/ + vowel, see YUDITSKY 2017, 230–32).

The only other two potential examples of the conjunction *waw* with a vowel that are not in a *wayyiqtol* context are $\sigma\upsilon\epsilon\iota\epsilon\sigma\sigma\omicron\mu\omicron\varsigma$ וַיִּשְׁמְחוּ (Ps. 35:27) and $\sigma\upsilon\alpha\alpha\rho\eta\epsilon\mu^*$ וְאַחֲרֵיהֶם 'and after them' (Ps. 49:14). In the first example ($\sigma\upsilon\epsilon\iota\epsilon\sigma\sigma\omicron\mu\omicron\varsigma$), the preceding word ends in a long unstressed /ū/ ($\text{וַיִּשְׁמְחוּ וַיִּשְׁמְחוּ}$ וַיִּשְׁמְחוּ) and thus the conjunction /w-/ might not have been realized phonetically if it was not consonantal (cf. the distribution of /w-/ as [u-] and [w-] in Syrian Arabic below). In the second example ($\sigma\upsilon\alpha\alpha\rho\eta\epsilon\mu^*$), it is not clear if the transcription should be read as $\sigma\upsilon + \alpha\rho\eta\epsilon\mu$ or $\sigma\upsilon\alpha + \rho\eta\epsilon\mu$ (see YUDITSKY 2017, 215, 230). Because /w-/ is nowhere else transcribed with a vowel when preceding a guttural (e.g., $\sigma\upsilon\alpha\delta\alpha\mu$ וְאַחֲרֵיהֶם [Ps. 49:13]; $\sigma\upsilon\alpha\theta$ וְאַחֲרֵיהֶם [Ps. 89:39]), the first interpretation should be favored.

In sum, the conjunction *waw* /w-/ (excluding instances when it is prefixed to a verbal form in *wayyiqtol*) is transcribed as *ou* unless it precedes a consonant cluster or is lengthened

historically before the stress in fixed phrases. Attestations of the conjunction *waw* both in external quotations of the Secunda and in Jerome also support this distribution. In external sources, it is transcribed without a vowel generally (e.g., וַחֲמֵר [Hos. 3:2]; וַחֲמֵר [Ps. 49:4]), with a vowel in some instances of *wayyiqtol* (e.g., וַחֲמֵר [Gen. 5:3]; וַחֲמֵר [Ps. 44:19]), and with a vowel once before a monosyllabic noun potentially in a fixed phrase (וַחֲמֵר [Gen. 5]).⁴¹⁴ A seldom-quoted Latin transcription of Genesis 14:18–20 in Jerome also exhibits a similar, and fairly consistent, distribution:

*umelchisedech melech salem hosi lehem uaiain, uhu cohen lehel helion: uaibarcheu uaiomer baruch abram lehel helion: cone samaim uares: ubaruch hel helion eser maggen sarach biadach uaiethen lo maaser mecchol.*⁴¹⁵

In the passage above, the conjunction /w-/ is realized as *u* in general (*umelchisedech*, *uhu*, *uares*, *ubaruch*), as *ua* regularly in *wayyiqtol* forms (*uaibarcheu*, *uaiomer*, *uaiethen*), and as *ua* once before the second part of a pair in a fixed phrase (*lehem uaiain*). While it is always possible that such transcriptions are the result of later emendation, a strong case for the authenticity of this passage can be made on the basis of a number of features that are characteristic of both contemporary Hebrew transcriptions and specifically Jerome.⁴¹⁶

Aside from special cases in which /w-/ precedes a consonant cluster or a stressed syllable, then, the conjunction is regularly transcribed as *ou* with no additional vocalic grapheme in the Secunda. While *ou-* could represent a number of different phonetic realizations (e.g., [w-], [wa-], [wə-], [wu-], [(?)u(:)]), the essential question is whether or not *ou-* represents the

414. The transcription ουαθεσα is found in construct in the following phrase in Epiphanius (*Mensuris et Ponderibus*, 22–23): ουαει Αδαμ σαλωειμ σανα ουαθεσα μηωθ σανα, presumably parallel to וַחֲמֵר אָדָם שְׁלֹשִׁים שָׁנָה and וַחֲמֵר מֵאוֹת שָׁנָה. The problem, however, is that Epiphanius's text seems to have conflated Gen. 5:3 and Gen. 5:8. Moreover, there are variant readings of ουαθεσα that do not have a vowel. Nevertheless, even though it is in construct, because it is the second half of a number pair (e.g., שְׁלֹשִׁים וְשֵׁשׁ), it could be conceived of as a fixed phrase and thus the preceding *waw* could undergo lengthening.

415. Gen. 14:18–20: וַיִּבְרַכְהוּ וַיֹּאמְרוּ בְרוּךְ אַבְרָם לֹאֵל עֲלִיּוֹן קִנָּה שְׁמַיִם and וַיִּבְרַכְהוּ וַיֹּאמְרוּ בְרוּךְ אַבְרָם לֹאֵל עֲלִיּוֹן קִנָּה שְׁמַיִם. The problem, however, is that Epiphanius's text seems to have conflated Gen. 5:3 and Gen. 5:8. Moreover, there are variant readings of ουαθεσα that do not have a vowel. Nevertheless, even though it is in construct, because it is the second half of a number pair (e.g., שְׁלֹשִׁים וְשֵׁשׁ), it could be conceived of as a fixed phrase and thus the preceding *waw* could undergo lengthening.

416. First, the gutturals are often transcribed by *h* (e.g., *lehel*, *helion*, *hel*). Second, the *2ms* suffix on both plural and singular nouns is *-ach* (*sarach*, *biadach*). Third, the relative particle is *eser* (cf. εσερ). Fourth, the *pi'el* form of מָגַן, contra the MT, resembles an Aramaic *pa'el* form (*maggen*). Fifth, gemination is not always represented (e.g., *uaiethen*; cf. ιαθεν). Sixth, the *r* in the *pi'el* stem is degeminated, resulting in syncope of the following vowel (*uaibarchehu*; cf. ηρφου).

consonant [w] or the vowel [u]. The evidence of Greek transcription of other languages favors the latter interpretation, which also finds parallels in modern Semitic languages.

In other Greek transcription traditions, a short vowel following word-initial [w] is almost always represented in transcription. In transcription of Latin, words beginning with consonantal *v* followed by a short vowel in an unstressed open syllable are represented by *ou* + *vowel*: e.g., ονοκ[ατιω] *vōcātĩō* (1st CE, P.Berol. 21246) and ονοκαβουλωρουμ *vōcābūlōrūm* (2nd CE, P.Oxy. XLIX.3452).⁴¹⁷ In Greek transcription of Arabic, the conjunction *waw* is represented with *ou/ω/o* + *vowel* both in the third-century CE inscription from north-eastern Jordan (e.g., αουα ειραυ /wa-yirʕaw/, ωα βαναα /wa-Bannāʔa/) (AL-JALLAD 2015b, 52–53) and in the Damascus Psalm fragment (e.g., οα ρυγζ /wa-rugz/) (AL-JALLAD forthcoming, 32, 118). This evidence from transcription of Arabic, in which the conjunction was presumably pronounced as [wa-], seems to indicate that it was actually the *transition* from a back rounded vowel ([u], [o]) to another vowel (or vice versa) that approximated [w] and not the digraph *ou* itself (see 6.3.7.1). This is especially clear from the presence of an initial *α* in the transcription αουα [wa]. Had *ou* by itself been sufficient to indicate [w], there would have been no need for the preceding *α*. In lieu of an adjacent vowel, Greek *ou* would merely represent [u] as in contemporary Greek orthography (4.5.3.1.17). There is one possible exception in Greek transcription of Phoenician-Punic, in which the singular occurrence of the conjunction *waw* is transcribed by *ou*: ου λυ ρυβαθων /w-l-rabbaton/ 'and to our lady'. However, since Latin transcriptions of Punic often render the conjunction /w-/ with only *u* (FRIEDRICH and RÖLLIG 1999, 185), this may reflect an internal-Phoenician sound change of *wa-* > *w(u)-* > *u-*. We may assume, then, that /w-/ in the Secunda was generally realized vocally as [u], but, before a cluster, was

417. Note, however, two exceptions: Latin *Vespasianus* and *veteranus* are usually transcribed as Οὔεσπασιανός and οὔετρανός, but there are variants of each in the Egyptian papyri without a vowel following *ou*: e.g., Οὔεσπασανός (3rd CE) and οὔετρανοῦ (261 CE) (GIGNAC 1976, 305–6, 356). However, in light of the abundance of examples of *ou* + *vowel* (with various vowels), these exceptions may actually reflect an isolated development in substandard Egyptian Latin ([we-] > [wu-] > [u]) rather than a common variant orthography.

prone to be realized consonantly as [wa-]. Instances of pre-tonic lengthening (e.g., ουαρῆσιν) are distinct in that the following long vowel was phonemic: /wōresn/.

Such a hypothesis finds parallels in both modern Arabic dialects and Neo-Aramaic dialects. In Palestinian Arabic, for example, roughly the same distribution obtains for the conjunction /w-/ (< */wa-/), which is realized as [u-] before #V and #CV, but as [wə-]/[wɛ-] before #CCV: e.g., *u-ana qāʿed* 'and I (was) sitting', *il-yōm u-bukra* 'today and tomorrow', but *bēt ʿmrattab w-ʿndīf* 'a clean and tidy house' (ELIHAY 2012, 611, 614, 772). In Syrian Arabic, /w-/ is normally realized as [u-] between a word ending in a consonant and one beginning with a single consonant, but as [w-] everywhere else: e.g., *təffāh u-mōz* 'apples and bananas', but *w-mōz kamān* 'and bananas too' and *ʔalam w-ʔktāb* 'a pencil and a book'. COWELL does note, however, that there is a good deal of variation between *u-* and *w-/w-ʔ* among speakers due to the phonetic similarity between the two. Moreover, this distribution only applies in "close phrasing" (2005, 21, 392). Finally, in Iraqi Arabic, the quality of initial /w-/ is more like that of a vowel (i.e., [u:]) than a consonant (ERWIN 2004, 31, 307).

In the Neo-Aramaic dialect of the Jews of Arbel, the conjunction *w-* typically shifts to *ʔu-* before a word beginning with a consonant, reflecting assimilation to an epenthetic (i.e., *wi* > *wu* > *ʔu*), though *wi-* is occasionally maintained: e.g., *ʔu-gozè* 'and nuts' but *wi-bābèu* 'and his father' (KHAN 1999, 65). The same realization of the conjunction /w-/ is attested in the Neo-Aramaic dialect of Qaraqosh (e.g., *ʔu-mānhə* 'and from them') and in the dialect of Sulemaniyya and Ḥalabja (e.g., *ʔu-xadrīwa* 'and they became') (KHAN 2002, 65; 2004, 59).

6.5.1.6.2. Inseparable Prepositions: β, χ, λ

As a default convention, the prepositions /b-/, /k-/, and /l-/ are transcribed without a vowel:

βδαμι	/b-dōmī/	[b(a)ðo:mi:]	'in my blood'	Ps. 30:10
χφαρδ*	/k-pard/	[k ^h (a)ʔard]	'like a mule'	Ps. 32:9
λδωρ*	/l-dōr/	[l(a)ðo:r]	'for generation'	Ps. 49:12

The clearest indication that the default form of the inseparable prepositions was vowelless is the fact that, when prefixed to the tetragrammaton, no vowel is represented (e.g., ליהוה [Ps. 30:5]). There are, however, a number of environments in which a vowel may be represented.

First, as a rule, with a few explicable exceptions, a vowel is transcribed preceding a guttural. The vowel of the preposition typically assimilates to that of the following guttural:⁴¹⁸

βααφω	/b-ʔappō/	[baʔap ^h :o:]	'in his anger'	Ps. 30:6
λααραρι	/l-har(ə)rī/	[laharari:]	'for my mountain'	Ps. 30:8
χεεβλ	/k-ʔebl/	[k ^h ɪʔɪbl]	'like the mourning of'	Ps. 35:14
βααμ	/b-ʕam(m)/	[baʕã(m)]	'in/among a people'	Ps. 35:18
βηηκι	/b-hēqī/	[behe:k ^ʔ i:]	'in my breast'	Ps. 89:51

Aside from the fact that vocalic *shewa* often assimilates to the vowel following a guttural (6.5.1.3.2), this may be merely an orthographic phenomenon. Since gutturals are only explicitly indicated by hiatus, failing to transcribe a vowel after the preposition could lead to incorrect syllabification of the word (see KNOBLOCH 1995, 219–224). For example, while a transcription like βααμ is clearly to be parsed as βα + αμ 'in/among' + 'a people', a spelling like βαμ would actually be identical to the transcription βαμ בָּ 'in them' (Ps. 49:15).⁴¹⁹ At the same time, however, it is entirely possible that the gutturals actually occasioned the insertion of an epenthetic (cf. Neo-Aramaic below). As YUDITSKY points out, exceptions occur when /ʔ/ has elided (e.g., χαϊαλωθ [k^haj:ɔ:lo:θ] תִּלְיָאָה [Ps. 18:34], λαηριμ [la:he:ri:m] לְאֶרְיָם [Ps. 49:11], βαμουναθι [ba:mu:ɔ:θi:] מִנְתָּהּ [Ps. 89:34]), when the guttural, being between back rounded vowels, is not conspicuous (e.g., λωλαμ [loʕo:lɔ:m] לְעֹלָם [Ps. 30:7]), and due to the syncope rule (see 6.5.1.5.2) (e.g., ουβελωαῖ [ʔu:βʔilo:haj] וְבִאֲלֵהֶּי [Ps. 18:30]) (2017, 225).⁴²⁰

418. YUDITSKY also notes the presence of a vowel before gutturals and numerous instances of assimilation before gutturals (2017, 228, 231). For his treatment of /b-/, /k-/, /l-/, see YUDITSKY (2017, 224–29).

419. We could also cite a number of other transcriptional minimal pairs: e.g., χααφαρ כָּפָר 'like dust' vs. hypothetical **χααφαρ כָּפַר 'he covered', βααλωθαμ מְלִיחָה 'in their sickness' vs. hypothetical **βααλωθαμ מְלִיחָה 'wearing them out', λααβδ לְעַבְדָּה 'to the servant of' vs. λαβδ 'Lamed' (see 6.5.2.3), and χεεβλ כָּבֵד 'like mourning of' vs. hypothetical **χεεβλ כָּבֵד 'fetter'.

420. Note, however, that YUDITSKY does not cite βαμουναθι as an example, since he reads it as βαεμουναθι. The correct reading of the manuscript, however, is βαμουναθι. In light of the transcription βαεμουναθαχ מִנְתָּהּ (Ps.

Second, a vowel is indicated when the preposition precedes an initial cluter:

λαβλωμ	/l-blōm/	[laβlo:m]	'to curb'	Ps. 32:9
βαλβαβαμ	/b-lbāam(m)/	[baβo:βã(m)]	'in their heart'	Ps. 35:25
χαβημωθ	/k-bhēmōt/	[k ^h aβhe:mo:θ]	'like cattle'	Ps. 49:13

This reflects the syncope rule $v > \emptyset / C\check{v}C_C\check{v}(C)$ outlined in 6.5.1.5.1. This phenomenon is characteristic of both Tiberian and Babylonian, in which the epenthetic is usually *hiriq*. Before /h/ in Babylonian, however, the preposition has *pataḥ*: e.g., לִּבְהֵמוֹת (YEIVIN 1985, 1151).

Third, when the initial consonant of the following word is homorganic or has a similar articulation to that of the preposition, a vowel is often transcribed:

βαμεθγε	/bō-metg/	[bo:miθgə]	'with a bit'	Ps. 32:9
λανεγδ	/l-negd/	[lanikd]	'in front of'	Ps. 36:2
ουβομωτ	/w-b-mōt/	[(?)uβomo:tʔ]	'and in the shaking of'	Ps. 46:3
βαφιευ	/b-pīhem(m)/	[baφi:hi(m)]	'with their mouth'	Ps. 49:14
λαμαλχη	/l-malkē/	[lamalxe:]	'to the kings of'	Ps. 89:28

This phenomenon accounts for a substantial number of transcriptions with a vowel after /b-/ , /k-/ , /l-/ before a non-guttural consonant. It is best explained according to the OCP and supports the notion that vocalic *shewa* was an epenthetic vowel inserted on the post-lexical level. Such an interpretation is especially favored by the third transcription in the list (ουβομωτ), since a preposition after the conjunction /w-/ typically closes a syllable in the Secunda in such environments⁴²¹ according to the syncope rule (6.5.1.5.2). It is not clear how many transcriptions can be explained in this way, but we might also add initial sequences such as λασωλ לִשְׁוֹל (alveodental nasal + alveodental fricative in Greek) (Ps. 49:15) and λεριβι* לִרְיָבִי (alveodental liquid lateral + alveodental liquid trill in Greek) (Ps. 35:23).

89:50), this demonstrates internal variation.

421. See also ουβελωαῖ וְבִלְוֵי (Ps. 18:30), ουλμαν וְלִמָּן (Ps. 31:4), ουβσαλη וְבִצְלֵי (Ps. 35:15), ουεβροβ וְבִרְבּוֹ (Ps. 49:7), and ουβμεσφατι וְבִמְשָׁפְטִי (Ps. 89:31). However, when at an underlying phonological level a word begins with CCC, the epenthetic is inserted between the last two consonants: ουβαναρωθ וְבִנְהָרוֹת (Ps. 89:26) and ουβανγαῖμ וְבִנְגַּעִים (Ps. 89:33).

While these three categories (before gutturals, syncope rule, homorganic consonants) account for most of the data, the remaining instances of a vowel indicated after a preposition can be grouped roughly into four categories: when it precedes a monosyllabic word (e.g., $\lambda\alpha\chi\omicron\lambda \text{ לַלַּיְלָה}$ [Ps. 18:31]), when it precedes *yod* (e.g., $\beta\iota\alpha\delta\alpha\chi \text{ יוֹד}$ [Ps. 31:6]), when its quality is other than /a/ due to assimilation to the following consonant (e.g., $\beta\epsilon\sigma\omicron\chi\chi\alpha \text{ הַיְיּוֹם}$ [Ps. 31:21]), and when the vowel of the following consonant is /a/⁴²² (e.g., $\beta\alpha\kappa\alpha\alpha\lambda \text{ הַיְיּוֹם}$ [Ps. 35:18]).

In sum, what initially seems to be an inconsistent transcription system can actually be explained to a large degree by two simple principles. As the default realization, the inseparable prepositions are represented without a vowel. Before gutturals, a vowel is indicated to prevent mispronunciation and preserve syllable structure. Other than these two principles, most of the data can be explained by the same sort of principles that operate elsewhere in the Secunda (syncope rule, the OCP, assimilation, etc.). The fact that when a vowel is indicated, it is typically represented by α , probably points to the preservation of historical */a/ as the phonetic realization ([a]) of vocalic *shewa* in these instances (6.5.1.3.3).

As a final observation, it is worth noting how the behavior of the inseparable prepositions has parallels in living Semitic languages. For example, in the Neo-Aramaic dialect of the Jews of Arbel, the preposition /b-/ is normally, but not always, prefixed to the noun without an epenthetic: e.g., *b-lelè* 'in the night'. Before pharyngeals, /b-/ is followed by a short epenthetic [a]: e.g., *ba-ʕIrāq* 'in Iraq'. Before laryngeals, /b-/ is followed by a short epenthetic assimilated in quality to the following vowel: e.g., *bě-ʔelà* 'during the festival'. Sometimes an initial /ʔ/ may be elided after /b-/: e.g., *b-immá* 'in a hundred' (< *ʔimma). Finally, before a consonant cluster, an epenthetic intervenes between /b-/ and the cluster: e.g., *badéniwa bi-xlulá* 'they began the wedding' (KHAN 1999, 186–87).

422. This final categorization (i.e., when the following vowel is /a/) is quite possibly merely a statistical coincidence, but it is worth considering that a following /a/ vowel may be more prone to encourage the preservation of a historical /a/ vowel in light of the fact that vocalic *shewa* is prone to assimilate.

6.5.2. Final Consonant Clusters

Up until this point, our analysis has only dealt with various features of word-initial and word-medial consonant clusters. This is because consonant clusters behave similarly at the beginning of a word and in the middle of a word. In the present section, we will analyze the phonotactics of final consonant clusters by primarily focusing on the *segholate* nominal pattern.

6.5.2.1. Segholates (*qVtl)

In the Secunda, the nominal pattern **qVtl* is usually transcribed without an epenthetic vowel:

κοδς	/qodš/	[kʰɔðʃ]	'holiness'	Ps. 29:2
σεθρ	/setr/	[sɪθR]	'a hiding place'	Ps. 32:7
αρς	/ʔars/	[ʔartsʔ]	'land'	Ps. 35:20

The main question regarding these forms is diachronic. It is not entirely clear why the typologically more archaic forms without epenthesis (i.e., *qVtl*) are characteristic of the Secunda, while the more innovative forms with epenthesis (i.e., *qVtvl*) are characteristic of the LXX, which was composed a few centuries prior to the Secunda: e.g., Τοφολ טָפֹל, Σερεδ סֶרֶד, φαρς פָּרֶץ (see KNOBLOCH 1995, 193). After a brief review of scholarship, it will be argued that the lack of representation of an epenthetic in the Secunda indicates a phonetic reality and thus a higher toleration for final consonant clusters than in other traditions of Hebrew.

6.5.2.1.1. Review of Scholarship

The disparity in the representation of *segholates* between the Secunda and the LXX is generally explained in one of two ways. The first explanation argues that the forms in the Secunda and the forms in the LXX reflect different orthographic conventions for representing the same phonetic reality. According to BLAU, when final short vowels were elided in Hebrew, epenthesis immediately arose in a portion of the *segholates* due to phonetic constraint. Nevertheless, although epenthesis resulted in a bisyllabic phonetic realization of (certain) *segholates*, they remained monosyllabic morphophonemically. The LXX transcriptions, then, reflect a phonetic realization, whereas the Secunda transcriptions reflect a morphophonemic realization (1998b, 102–103). That is, both Κορε (LXX) and κορ (Secunda) (MT קֹרַה [Ps.

45:1]) represent the *same phonetic reality*, albeit by means of a *different transcription convention*. The second explanation contends that the transcriptions in the Secunda reflect a different dialect (or register) in which final consonant clusters were tolerated; thus, the difference in transcription does indeed reflect a different phonetic reality (YUDITSKY 2017, 178).

There are two problems with BLAU's argument. First, although it is almost certainly correct that the *segholates* were monosyllabic at an underlying phonological level (see also MALONE 1971; 1993; GREENSTEIN 1992; COETZEE 1999; KHAN 2013l), it is not necessarily true that a portion of **qVtl* forms would require epenthesis as soon as final short vowels were elided (see BLAU 1998b, 102). In modern Arabic dialects, for example, in which final short vowels have also elided, the phonotactics of final consonant clusters vary from dialect to dialect. Some dialects tolerate final *-CC#* clusters without restriction (e.g., Moroccan), others insert an epenthetic vowel according to the Sonority Sequencing Principle (SSP) (e.g., most Levantine dialects), and still others resolve *all* final *-CC#* clusters with an epenthetic (e.g., Baghdad Christian Arabic) (KIPARSKY 2003, 149; WATSON 2007, 339). Moreover, in the Neo-Aramaic dialect spoken by the Jews of Arbel, *the same words* are sometimes realized with an epenthetic and sometimes without: e.g., *ḥàwiš* || *ḥàwš* 'enclosure' and *waxit* || *wáxt* 'time' (KHAN 1999, 67–68). It would not only be possible, then, but actually expected, to find similar variation in the ancient dialects of Hebrew.⁴²³

The second problem with BLAU's argument is that it ignores the fact that an epenthetic vowel *is* inserted in not a small number of forms in the Secunda, most of which can be explained phonetically (see below). According to YUDITSKY, the fact that epenthetics tend to

423. Such variation may actually be attested in cuneiform transcriptions of Hebrew names from the first millennium BCE. On one hand, *-CC/-CC#* consonant clusters seem to be tolerated (note that a final *-u* in Akkadian is merely an orthographic necessity and does not represent a final short vowel in Hebrew): e.g., *ab-di-mil-ku* for אֲבִידִּימֶלֶךְ and *pa-la-as-tú* for פֶּלִּישְׁתִּי. On the other hand, sometimes *-CC* is broken up by an epenthetic: e.g., *ši-di-iq-yá-ma* שִׁדִּיקְיָמָה (MILLARD 2013, 839, 842, 844).

arise in the environment of gutturals in **qVtl* forms indicates that the lack of a transcribed epenthetic in other forms must represent a phonetic reality (2013, 817).

6.5.2.1.2. Conditions for Epenthesis in **qVtl* in the Secunda

A number of trends can be identified regarding the insertion of an epenthetic in **qVtl* forms in the Secunda. Epenthetics tend to be present in III-/ʕ/ roots, absent in II-/ʕ/ and III-/ħ/ roots, and intermittent in II-/ħ/ roots (cf. YUDITSKY 2017, 30–31, 77–79, 180–81, 185, 213–14).⁴²⁴

	<i>C_Cʕ#</i>		<i>C_ħC#</i>		<i>C_ʕC#</i>		<i>C_Ch#</i>	
<i>ø > v</i> :	ρεγε	רַגַע	φααδ	פָּחַד	ουβααρ	וְבַעַר		
	μεββεσε	מְהִבֵּצַע	ασσααθ/ σααθ	תַּחַת(ה)	(see below)			
	φεσα	פְּשַׁע	ιααδ/ε	יָחַד				
			μεσσααρ	מִשְׁחָר				
<i>ø > ø</i> :			βσак	בִּשְׁחַק	βαρ	בָּעַר	κορ	קָרַח
			μηρεμ	מְרַחֵם	βαχας	בִּכְעַס	λανες	לִנְצַח
			θεθ	תַּחַת	λαμαν/ ουλμαν	לָמַעַן(ו)		
			ουλακεθ	לְקַחַת	νερ	נָעַר		
					βαβαλ	בִּבְעַל		

Chart 27: Epenthesis in Segholate (**qVtl*) Forms in the Secunda

The distribution of these forms may indicate that in the Hebrew tradition reflected in the Secunda, /ʕ/ was a more sonorous consonant with weaker consonantality and /ħ/ was a less sonorous consonant with stronger consonantality. This hypothesis is consistent with the fact that /ħ/ is susceptible to (virtual) doubling in the Secunda (e.g., σεωθι Ψῶθι [see KHAN 2013d, 502–503]), whereas /ʕ/ is not (e.g., μηεμω* מְעֵמוּ). Although these are only trends and not rules, it would be difficult to argue that phonetic conditioning was not a significant factor in determining whether an epenthetic was transcribed.

Other instances of epenthesis in **qVtl* forms in non-guttural environments further support the significance of sonority in determining epenthesis. For example, according to the

424. While YUDITSKY recognizes the difference in behavior between III-/ʕ/ and III-/ħ/ roots, he does not point out the fact that there is also a marked difference in the distribution of epenthetics between II-/ʕ/ and II-/ħ/ roots.

SSP, a significant rise in sonority from C_2 to C_3 seems to occasion the insertion of an epenthetic vowel in the following transcription (6.3.5.2) (note perhaps also $\text{ou}\beta\alpha\alpha\text{p}$ above).⁴²⁵

$\text{ι}\epsilon\theta\epsilon\rho$	/yetr/	[jɪθɪr]	'abundance'	Ps. 31:24
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Finally, there is one case of *paragogic* epenthesis in the $*qVtl$ pattern in the Secunda:

$\beta\alpha\mu\epsilon\theta\gamma\epsilon$	/bɔ̄-metg/	[bɔ̄:miθgə]	'with a bit'	Ps. 32:9
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The nature of epenthesis in $\beta\alpha\mu\epsilon\theta\gamma\epsilon$ cannot be accounted for on the basis of BLAU's theory, which assumes a regular untranscribed epenthetic in the *segholates* in the Secunda. Rather, the insertion of a word-final epenthetic can only be explained by assuming a $/-tg\#$ cluster.

6.5.2.2. Verbal and Participial Forms

A survey of the phonotactics of final $-CC\#$ clusters in verbal and participial forms also demonstrates the significance of phonetic factors in determining epenthesis. In general, final $/-Ct\#$ in the suffix conjugation is preserved without an epenthetic:

$\alpha\varphi\alpha\chi\theta$	/hɔ̄pakt/	[hɔ̄:ʔaχtʰ]	'you turned'	Ps. 30:12
$\epsilon\lambda\lambda\epsilon\lambda\theta$	/ħellelt/	[ħɪl:ɪltʰ]	'you profaned'	Ps. 89:40
$\epsilon\kappa\sigma\epsilon\rho\theta$	/heqsert/	[hɪkʰʔsʰɪrtʰ]	'you cut short'	Ps. 89:46

Because $/t/$ is lowest on the Hebrew sonority scale and paradigmatic pressure would encourage a consistent shape throughout the verbal suffix conjugation, it is not surprising that there is generally no epenthesis in these forms.

However, the OCP seems to explain a couple instances of epenthesis in the system. In III- $/d/$ roots, for example, epenthesis may occur between the final radical and the suffix $/-t/$.⁴²⁶

$\epsilon\epsilon\mu\epsilon\delta\epsilon\theta$	/heʕmedt/	[hɪʕɪmiðɪθ]	'you established'	Ps. 30:8
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This principle is also present in a transcription of the feminine *nif'al* participle:

$\nu\epsilon\epsilon\mu\alpha\nu\alpha\theta$	/neʕmant/	[nɪʕɪmanaθ]	'is faithful'	Ps. 89:29
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Though the final cluster $/-nt\#$ is permitted according to the SSP, the alveolar realization of both $/n/$ and $/t/$ might have occasioned the epenthetic. That epenthesis was not regular in par-

425. But cf. $\sigma\epsilon\theta\rho$ וְיָרַח (Ps. 32:7).

426. But cf. $\sigma\upsilon\varphi\alpha<\kappa\alpha>\delta\theta\iota$ וְיִפְקְדֵהוּ (Ps. 89:33). Note also the discussion in 6.3.1.3.

ticipial forms with similar sonority sequencing is demonstrated by the transcription Κωελθ קְוֶלֶת (Qoh. 1:1) found in Origen's list of biblical books. Finally, it should be noted that in final *CC#* forms resolved by an epenthetic, the quality of the vowel is typically identical to that of the preceding vowel (see YUDITSKY 2017, 79–80), as is especially clear from νεεμαναθ.

6.5.2.3. Concluding Remarks: Dialectal Variation

The fact that most instances of epenthesis in the Secunda can be explained on the basis of phonetic principles further supports our hypothesis that what distinguishes the *segholates* in the Secunda from the *segholates* in the LXX is not transcription convention but dialect. Accordingly, we must assume that both *qVtl#* and *qVtvl#* existed side-by-side at least from the time of the LXX onwards, differing from dialect to dialect and from phonetic environment to phonetic environment within a particular dialect.

While it is difficult to isolate pairs of cognate transcriptions of the *segholates* across various transcription traditions, a potential illustration of ancient dialectal variation is found in the transcription of the Hebrew letters, five of which derive from **qVtl* patterns: **ʔalp*, **giml*, **dalt/*dilt*, **lamd*, and **samk*. These letters are found transcribed in lists of the names of the letters among the church fathers (Eusebius and Epiphanius) as well as in the sectional headings of the acrostic Psalm 119 in the LXX (Catenae and P. Codex Oriental 5000) (clusters in **red** and epenthetics in **green**):

	Eusebius (4 th c.)	Epiphanius (4 th c.)	Catenae (5 th c.)	LXX MS: P. Codex Oriental 5000 (6 th /7 th c.)
<i>*ʔalp</i>	α λ φ	αλ ε φ	α λ φ	α λ φ
<i>*giml</i>	γ ι μ ε λ	γ ι μ η λ	γ ι μ λ	γ ι μ α λ
<i>*dalt</i>	δ ε λ θ	δ ε λ ε δ	δ α λ ε θ	δ ε λ θ
<i>*lamd</i>	λ α β δ	λ α μ ε δ	λ α μ δ	λ α β δ
<i>*samk</i>	σ α μ χ	σ α μ ε χ	σ α μ χ	σ α μ χ

Chart 28: Various Greek Transcriptions of the Segholate Letter Names

Transmission history no doubt plays a significant role in bringing about variants, but the sort of differences exemplified above probably have origins in real linguistic variation. For exam-

ple, epenthesis most commonly occurs in **giml*, the only final cluster with rising sonority. In light of the comparison with the Arabic dialects above, we might suggest that the dialect tradition underlying Catenae generally tolerated *-CC#* (assuming $\delta\alpha\lambda\epsilon\theta$ is from a different source), that of Epiphanius did not tolerate *-CC#*, and those of Eusebius and P. Codex Oriental 5000 tolerated *-CC#* according to the SSP. Such a description is obviously an oversimplification of a complicated web of linguistic development, textual transmission, and correction, but the principle is likely valid. In ancient times, there were probably a number of different dialects of Hebrew, each with its own particular phonotactics for dealing with final *-CC#*. It is also worth noting that the analogy to modern Arabic and Neo-Aramaic dialects suggests variation even within the same phonetic environments in the same dialect.

7. CONCLUSION

This dissertation has demonstrated that, in order to best understand the phonology and orthography of the second column of Origen's Hexapla, it is necessary to approach it contextually within the Hellenistic/Roman Near East and analyze it linguistically in light of Roman Palestinian Koine Greek phonology and orthography. In chapter 2, I argued on the basis of Origen's own writings that he lacked the requisite Hebrew proficiency to compose the *Secunda* himself. In chapter 3, on the basis of comparative texts in the Hellenistic Near East and the social and linguistic setting in Palestine, I argued that the Greek transcriptions underlying the *Secunda* text were originally composed with a didactic or scholarly purpose for the Jewish community in Caesarea sometime in the second or third century CE. In chapter 4, on the basis of a thorough analysis of spelling interchanges in Palestinian Greek epigraphy, the phonology of Roman Palestinian Koine Greek was reconstructed. In chapter 5, roughly contemporary examples of Greek transcription of other languages were summarized and analyzed.

In the final substantial chapter (6), the findings of the preceding chapters (4 and 5) were utilized to elucidate the phonemic and phonetic values of the consonants, vowels, and *shewa* as well as the syllable structure of the Hebrew reflected in the *Secunda*. While this analysis resembled previous analyses of the *Secunda* in that it approached the transcriptions from the perspective of historical Hebrew linguistics and a comparison with other reading tra-

ditions, it differed from previous treatments of the phonology of the Secunda primarily in three respects. First, the *orthography* of the Secunda transcriptions was approached in light of an in-depth study of contemporary Palestinian Greek pronunciation and orthography and roughly contemporary Greek transcription conventions. Second, the *process* of transcription was viewed in light of theoretical models of cross-language perception, namely, the *PAM*, the *PAM-L2*, and the *SLM*. Third, the *phonology* of the Secunda was analyzed from the perspective of moraic theory, with a clear distinction being made between the underlying phonological representation of a word and the post-lexical surface realization of a word.

While the main contribution of this dissertation is producing both a phonemic and phonetic transcription of Secunda Hebrew that is grounded in contemporary Greek pronunciation and orthography, applying these new approaches to the Secunda in chapter 6 has also yielded a number of other helpful insights. For example, I argued that the transcriber prioritized quality over historical quantity when transcribing the Hebrew vowels. This led to the hypothesis that the Hebrew short vowels were realized phonetically with a more lax or centralized realization than the long vowels. Another product of this hypothesis was that Greek ε can represent a long [ε:] in the Secunda. One potential attestation of this, ουαλεα for אִי־לֵוִי, may prove the existence of "qamaṣ" /ō/ [ɔ:] in the vocalic system of Secunda Hebrew. A sensitivity to Greek phonology and orthography also proved helpful in disentangling the various representations of Hebrew etymological long /ī/ (as ι, ει, η), explaining some instances as reflecting phonological change and others as mere orthographic variants. Finally, I have argued that a "shewa" vowel *should* be posited for the Secunda, yet understood as somewhat variable in its phonetic realization and, in numerous contexts, undergoing the transition from being the result of acoustic reduction to being the result of lexical reduction.

It should also be noted that, as a recurring theme throughout chapter 6, many of the linguistic phenomena reflected in the Secunda were found to be paralleled by similar phenomena in contemporary Hebrew/Aramaic and by modern living languages such as Arabic

and Neo-Aramaic. This likely indicates that the Hebrew reflected in the Secunda cannot be totally divorced from its connection to the living language(s) of second-century CE Palestine.

The scope of this dissertation has been limited to addressing the phonology of the Hebrew reflected in the Secunda in light of contemporary Greek pronunciation and orthography. However, there are a number of issues that this dissertation has left unexamined as well as a number of promising areas for further study for which the present work has laid a foundation.

First, not all of the words of the Secunda or issues of grammar such as morphology have been addressed in the present work. The application of the methodology utilized here may be expanded to analyze the Secunda comprehensively. Second, it is not entirely clear how exactly the process of transcription was carried out, whether it involved one bilingual transcriber or a dictator and a transcriber. I expect that a more in-depth application of the principles of the *PAM*, the *PAM-L2*, and the *SLM* may help elucidate this issue. Third, while it was lightly touched on in this dissertation, it is not entirely clear to what degree contemporary spoken Hebrew or Aramaic might have influenced the reading tradition. Advancements in the modern linguistic discipline of language contact may be applied to the Secunda to further address this point. Fourth, it is unclear how the Hebrew tradition reflected in the Secunda relates to other Hebrew reading traditions such as Tiberian, Babylonian, and Palestinian. The innovative features of the Hebrew tradition reflected in the Secunda may be systematically compared with other Hebrew traditions to better understand this relationship. Fifth, and finally, it should be noted that similar methodologies might be applied to other instances of Greek and Latin transcription of Hebrew. For example, in analyzing Jerome, one might conduct a thorough analysis of contemporary Latin pronunciation in 4th CE Palestine. Additionally, one might explore how the principles of the *PAM(-L2)* and the *SLM* might be reflected in Jerome's transcriptions, which actually reflect the product of L2 learning. While I plan to address these issues in future publications, the present work has laid an adequate foundation.

8. APPENDIX A: PALESTINAN GREEK SPELLING INTERCHANGES

Spelling interchanges are tabulated and presented in four columns. The first column contains the word,⁴²⁷ the second column contains the reference (either inscription number in the *CIIP* or the name of the manuscript from the Judaean Desert), the third column contains the date,⁴²⁸ and the fourth column contains the location.

1	ει > ι		
1 επ<ε>ι	Mur115	124 CE	Judaean Desert
2 θαρσι	1515	2 nd CE-3 rd CE	Caesarea
3 θαρσι	749	3 rd CE-4 th CE	Jerusalem
4 ουδισ	2437	4 th CE	South Coast
5 β(οηθ)ι	804	Late Roman	Jerusalem
6 θαρσι	924	2 nd CE-5 th CE	Jerusalem
7 ουδισ	924	2 nd CE-5 th CE	Jerusalem
8 βο(η)θι	2080	410 CE	Caesarea
9 θαρσι	2564	411 CE	South Coast
10 ουδισ	2564	411 CE	South Coast
11 ταξι	1197	465-467 CE	Caesarea
12 εκλαβιν	1197	465-467 CE	Caesarea
13 υπερτεθισαν	1197	465-467 CE	Caesarea
14 διαφερι	1197	465-467 CE	Caesarea

427. It should be noted that, especially in formulae, various abbreviations are quite common in inscriptional Greek. Therefore, it is not always clear whether a spelling interchange might also be explained as an abbreviation. This means that sometimes whether a spelling interchange is present is dependent on the editors' judgment and/or my judgment. In the *CIIP*, the following diacritical marks are used: () for resolution of an abbreviation; [] for restoration of missing text; < > for correction of a mistake or omission; { } for superfluous text; [] for text erased in antiquity; [...] for missing text with relatively certain numbers of letters; [-] for missing with uncertain number of letters; ' ' correction of a letter by the editor, . a dot beneath indicates an uncertain reading (*CIIP* 1/1, xxv). In inscriptions from the Judaean Desert, the following diacritical marks are used: [] for empty space with no writing; . a dot beneath indicates a probably reading; < > indicates a modern editor's correction; {{ }} indicates various deletions such as erasure and scribal marks; [] indicates a reconstructed letter; () indicates solutions for symbols and abbreviations (ABEGG, BOWLEY, and COOK 2016, xvi).

428. If the inscription or text is undated, it is marked with a question mark (?). However, it should be noted that undated texts from the Judaean Desert are most likely from the first or second century CE, undated texts from Jerusalem numbered 1–704 are most likely from the first century CE or earlier, undated texts from Jerusalem numbered 705–783 from the Roman period, undated texts from Jerusalem numbered 784–1087 from the Byzantine period, and undated texts from Caesarea from the Byzantine period.

15 δια[φ]ερι	1197	465-467 CE	Caesarea
16 βασιλια	2477	474 CE	South Coast
17 ποιμενι	2327	493/494 CE	South Coast
18 μνημιον	983	5 th CE	Jerusalem
19 μνημιον	2190	3 rd CE-6 th CE	South Coast
20 κιτε	2190	3 rd CE-6 th CE	South Coast
21 Αλεξανδριας	2196	3 rd CE-6 th CE	South Coast
22 κιτε	2206	3 rd CE-6 th CE	South Coast
23 Ισας	2193	3 rd CE-6 th CE	South Coast
24 διαφερι	2228	3 rd CE-6 th CE	South Coast
25 ιρηνη	2231	3 rd CE-6 th CE	South Coast
26 μνημιον {ν}	1123	4 th CE-6 th CE	Caesarea
27 υγια	1419	5 th CE-6 th CE	Caesarea
28 κιτε	2477	541 CE	South Coast
29 ευτυχ<ε>ι	802	6 th CE	Jerusalem
30 νοσοκομιου	967	6 th CE	Jerusalem
31 βοηθι	1178	4 th CE-7 th CE	Caesarea
32 κιτε	1462	4 th CE-7 th CE	Caesarea
33 βοηθι	2113B	4 th CE-7 th CE	Caesarea
34 βοηθι	2119	4 th CE-7 th CE	Caesarea
35 ορφαν<ο>τροφιω	1168	5 th CE-7 th CE	Caesarea
36 υγια	796	6 th CE-7 th CE	Jerusalem
37 απολανσ<ε>ιας	796	6 th CE-7 th CE	Jerusalem
38 κατακιτε	978	6 th CE-7 th CE	Jerusalem
39 φοβισθαι	1335	6 th CE-7 th CE	Caesarea
40 βοηθι	1336	6 th CE-7 th CE	Caesarea
41 υγια	2513	6 th CE-7 th CE	South Coast
42 κιτ(αι)	875	7 th CE	Jerusalem
43 βοηθια	2457	732 CE	South Coast
44 βοηθι	1339	Byz	Caesarea
45 ευτυχι	1343	Byz	Caesarea
46 υγια	1125	Byz?	Caesarea
47 αυξι	2334	Late Antique	South Coast
48 αυξι	2334	Late Antique	South Coast
49 βοηθι	795	?	Jerusalem
50 [β]ασιλια	809	?	Jerusalem
51 βασιλι	810	?	Jerusalem
52 πνεισι	810	?	Jerusalem
53 εγ<ε>ιρας	842.1	?	Jerusalem
54 [βοηθ]ι	842.8	?	Jerusalem
55 βοηθι	842.27	?	Jerusalem
56 γεροκομιον	859	?	Jerusalem
57 ταπινων	859	?	Jerusalem
58 βασιλευι	862	?	Jerusalem
59 μνημιον	896	?	Jerusalem
60 κιτε	949	?	Jerusalem
61 θαρσι	950	?	Jerusalem
62 β(ση)θι	960	?	Jerusalem
63 κιται	1004	?	Jerusalem
64 κοιμηθισα	1004	?	Jerusalem
65 ιρηνη	1004	?	Jerusalem
66 νοσοκομιου	1008	?	Jerusalem
67 διακιμενου	1008	?	Jerusalem
68 πεινας	1021	?	Jerusalem
69 γινοςκι	1084	?	Jerusalem
70 βοηθι	1177	?	Caesarea
71 [μ]νημιον	1569	?	Caesarea
72 εξουσιαζιν	1613	?	Caesarea
73 βοηθι	1682	?	Caesarea
74 βοηθι	1686	?	Caesarea
75 βοηθια	1689	?	Caesarea
76 ευψυχ(ε)ιτωσαν	2255	?	South Coast
77 αυξιτω	2310	?	South Coast
78 θαρσι	2343	?	South Coast
79 γινοςκις	2356	?	South Coast
80 αυξι	2395	?	South Coast
81 αιπαρθ[ενου]	2451	?	South Coast
82 κιται	2489	?	South Coast
83 πρεσβιες	2531	?	South Coast
84 κιτη	2575	?	South Coast
85 χ<ε>φος	Mur122	?	Judean Desert
86 χ[ι]ρογραφων	5/6Hev5	?	Judean Desert
87 οφ[ι]ληματος	5/6Hev5	?	Judean Desert

88	δ[α]νιου	5/6Hev5	?	Judaeen Desert
89	τροφια	5/6Hev13	?	Judaeen Desert
90	τρ]οφια	5/6Hev13	?	Judaeen Desert
91	τροφια	5/6Hev15	?	Judaeen Desert
92	ασφαλιας	5/6Hev15	?	Judaeen Desert
93	τροφιων	5/6Hev15	?	Judaeen Desert
94	υπατιας	5/6Hev16	?	Judaeen Desert
95	γυναικιαν	5/6Hev18	?	Judaeen Desert
96	γυναικιαν	5/6Hev18	?	Judaeen Desert
97	χαιριν	5/6Hev20	?	Judaeen Desert
98	ις	5/6Hev20	?	Judaeen Desert
99	ις	5/6Hev20	?	Judaeen Desert
100	γιτνεουουσιν	5/6Hev20	?	Judaeen Desert
101	γιτονων	5/6Hev20	?	Judaeen Desert
102	ις	5/6Hev20	?	Judaeen Desert
103	γιτονες	5/6Hev20	?	Judaeen Desert
104	κατεχis	5/6Hev21	?	Judaeen Desert
105	λεγις	5/6Hev21	?	Judaeen Desert
106	<ο>φιλης	5/6Hev21	?	Judaeen Desert
107	οφιλης	5/6Hev22	?	Judaeen Desert
108	δωσις	5/6Hev22	?	Judaeen Desert
109	σταθισα	5/6Hev22	?	Judaeen Desert
110	οφιλουσα	5/6Hev22	?	Judaeen Desert
111	π[α]ρην[γ]ιλεν	5/6Hev23	?	Judaeen Desert
112	διακρατις	5/6Hev23	?	Judaeen Desert
113	υ]πατιας	5/6Hev23	?	Judaeen Desert
114	παρηνγiλεν	5/6Hev23	?	Judaeen Desert
115	διακρατις	5/6Hev23	?	Judaeen Desert
116	παρεδρευν	5/6Hev23	?	Judaeen Desert
117	υπατιας	5/6Hev23	?	Judaeen Desert
118	επιδη	5/6Hev24	?	Judaeen Desert
119	αποδιξε	5/6Hev24	?	Judaeen Desert
120	διακ[ρ]ατις	5/6Hev24	?	Judaeen Desert
121	απι[θiς	5/6Hev24	?	Judaeen Desert
122	αποδιξε	5/6Hev24	?	Judaeen Desert
123	δ[ια]κρατις	5/6Hev24	?	Judaeen Desert
124	απ[i]θiς	5/6Hev24	?	Judaeen Desert
125	επιδη	5/6Hev25	?	Judaeen Desert
126	συνεξελθιν	5/6Hev25	?	Judaeen Desert
127	διακρατις	5/6Hev25	?	Judaeen Desert
128	παρε[δ]ρευν	5/6Hev25	?	Judaeen Desert
129	υφε]ξις	5/6Hev25	?	Judaeen Desert
130	παρηνγιλες	5/6Hev25	?	Judaeen Desert
131	αποκριθουσα	5/6Hev25	?	Judaeen Desert
132	[π]αρε[δ]ρευν	5/6Hev25	?	Judaeen Desert
133	παρανγιλε	5/6Hev25	?	Judaeen Desert
134	συνεξελθιν	5/6Hev25	?	Judaeen Desert
135	παρεδρ]ευν[ν	5/6Hev25	?	Judaeen Desert
136	υφεξις	5/6Hev25	?	Judaeen Desert
137	πα[ρ]ηνγιλες	5/6Hev25	?	Judaeen Desert
138	[απο]κριθουσα	5/6Hev25	?	Judaeen Desert
139	εχις	5/6Hev25	?	Judaeen Desert
140	παρεδρευν	5/6Hev25	?	Judaeen Desert
141	εχις	5/6Hev25	?	Judaeen Desert
142	υπατιας	5/6Hev25	?	Judaeen Desert
143	παρηνγiλεν	5/6Hev26	?	Judaeen Desert
144	παρεδρευν	5/6Hev26	?	Judaeen Desert
145	παρηνγiλα	5/6Hev26	?	Judaeen Desert
146	εχιν	5/6Hev26	?	Judaeen Desert
147	χαιρι[v]	5/6Hev27	?	Judaeen Desert
148	ις	5/6Hev27	?	Judaeen Desert
149	τρ]οφιων	5/6Hev27	?	Judaeen Desert
150	τελιων	5/6Hev27	?	Judaeen Desert
151	ερμηνια {ς}	5/6Hev27	?	Judaeen Desert
152	ις	5/6Hev27	?	Judaeen Desert
153	τρ[ο]φιων	5/6Hev27	?	Judaeen Desert
154	τρις	5/6Hev27	?	Judaeen Desert
155	[τρ]ις	5/6Hev27	?	Judaeen Desert
156	επι	5/6Hev30	?	Judaeen Desert
157	[ε]χις	5/6Hev32a	?	Judaeen Desert
158	προκιμενου	5/6Hev34	?	Judaeen Desert
159	επιδη	5/6Hev52	?	Judaeen Desert
160	ις	5/6Hev52	?	Judaeen Desert

161 χαίρι[v]	XHev/Se60	?	Judaean Desert
162 υπατιαν	XHev/Se60	?	Judaean Desert
163 προκιμενης	Xhev/Se62	?	Judaean Desert
164 προκιμενης	Xhev/Se62	?	Judaean Desert
165 γυναικας	Xhev/Se65 = 5/6Hev37	?	Judaean Desert
166 γυ[ναι]κιοις	Xhev/Se65 = 5/6Hev37	?	Judaean Desert
167 δ]εδανισμενοι	Xhev/Se66	?	Judaean Desert
168 δεδανικοτι[--]	Xhev/Se66	?	Judaean Desert
169 ξυλιας	Xhev/Se67	?	Judaean Desert
2	ι > ει		
1 Νεικανορος	98	1 st BCE-1 st CE	Jerusalem
2 Ειφγενειας	105	1 st BCE-1 st CE	Jerusalem
3 Ιαειρος	164	1 st BCE-1 st CE	Jerusalem
4 Σαφειρα	398	1 st BCE-1 st CE	Jerusalem
5 Ιαειρος	400	1 st BCE-1 st CE	Jerusalem
6 Ιαειρος	400	1 st BCE-1 st CE	Jerusalem
7 Ιαειρου	401	1 st BCE-1 st CE	Jerusalem
8 Σκυθοπολειτης	411	1 st BCE-1 st CE	Jerusalem
9 Σκυθοπολειται	412	1 st BCE-1 st CE	Jerusalem
10 Αφρειακος	416	1 st BCE-1 st CE	Jerusalem
11 Φουλειος	416	1 st BCE-1 st CE	Jerusalem
12 Αφρειακος	421	1 st BCE-1 st CE	Jerusalem
13 Φο<υ>λεια	423	1 st BCE-1 st CE	Jerusalem
14 Αφρειακα	423	1 st BCE-1 st CE	Jerusalem
15 Φουλεια	424	1 st BCE-1 st CE	Jerusalem
16 Αφρειακα	424	1 st BCE-1 st CE	Jerusalem
17 [Τειμει]σειων[ος]	497	1 st BCE-1 st CE	Jerusalem
18 Τει[μει]σειωνος	497	1 st BCE-1 st CE	Jerusalem
19 Τει[μει]σειωνος	497	1 st BCE-1 st CE	Jerusalem
20 [Τει]μεισειωνος[ς]	497	1 st BCE-1 st CE	Jerusalem
21 Εισμαηλ	526	1 st BCE-1 st CE	Jerusalem
22 Σαλλαμσειων	588	1 st BCE-1 st CE	Jerusalem
23 Ιουδειθ	590	1 st BCE-1 st CE	Jerusalem
24 Λευεις	354	1 st CE	Jerusalem
25 πολειτην	2336	1 st CE	South Coast
26 Εισιδοτη	2162	1 st CE-2 nd CE	South Coast
27 τοπαρχειας	Mur115	124 CE	Judaean Desert
28 νυνει	Mur115	124 CE	Judaean Desert
29 γεινομεν[ης]	Mur115	124 CE	Judaean Desert
30 Ανεινας	Mur89	100-135 CE	Judaean Desert
31 κρε(ιθ]ς)	Mur91	100-135 CE	Judaean Desert
32 κρε(ιθ]ς)	Mur91	100-135 CE	Judaean Desert
33 κρε(ιθ]ς)	Mur91	100-135 CE	Judaean Desert
34 κρε(ιθ]ς)	Mur91	100-135 CE	Judaean Desert
35 κρε(ιθ]ς)	Mur91	100-135 CE	Judaean Desert
36 Μαλχειων	Mur91	100-135 CE	Judaean Desert
37 Πανδειων	Mur91	100-135 CE	Judaean Desert
38 Μαλ]χειων	Mur91	100-135 CE	Judaean Desert
39 Σειλωνει	Mur92	100-135 CE	Judaean Desert
40 Φελειου	Mur94	100-135 CE	Judaean Desert
41 Ανναβ	Mur94	100-135 CE	Judaean Desert
42 Ελιεζρο[ς]	Mur95	100-135 CE	Judaean Desert
43 Ααβαι	Mur103	100-135 CE	Judaean Desert
44 πεινομε[--]	Mur112	100-150 CE	Judaean Desert
45 δισχειλια	Mur116	100-150 CE	Judaean Desert
46 Στατειλιου	Mur114	171 CE	Judaean Desert
47 επεκτη[σωμαι]	Mur114	171 CE	Judaean Desert
48 γεινεσθω	Mur117	185 CE	Judaean Desert
49 Α]ντωνει {νει}ν[ου]	2337	187/188 CE	South Coast
50 Πρεισκε	1531	1 st CE-3 rd CE	Caesarea
51 Οσειρις	1531	1 st CE-3 rd CE	Caesarea
52 Οσειρις	1531	1 st CE-3 rd CE	Caesarea
53 Λειο[υιος]	1195	2 nd CE-3 rd CE	Caesarea
54 Εισιω[v]ος	2621	2 nd CE-3 rd CE	South Coast
55 ημιλειτριν	2616	3 rd CE	South Coast
56 Εισιδωρου	934	3 rd CE-4 th CE	Jerusalem
57 Λευειτης	2182	3 rd CE-6 th CE	South Coast
58 Ειλασιου	2185	3 rd CE-6 th CE	South Coast
59 Εισακ	2186	3 rd CE-6 th CE	South Coast
60 Ειακω	2192	3 rd CE-6 th CE	South Coast
61 Λευει	2194	3 rd CE-6 th CE	South Coast
62 Νεικομηδου	2225	3 rd CE-6 th CE	South Coast
63 Ειοπιτων	2227	3 rd CE-6 th CE	South Coast

64 Εισακιου	2236	3 rd CE-6 th CE	South Coast
65 Ζοειλος	2245	3 rd CE-6 th CE	South Coast
66 Απολλωνειδου	1015	4 th CE-6 th CE	Jerusalem
67 δουκει	784	492 or 507 CE	Jerusalem
68 βειου	2490	541 CE	South Coast
69 ειερηω[v]	1504	3 rd CE-7 th CE	Caesarea
70 Βαεισηου	1460	4 th CE-7 th CE	Caesarea
71 Δειονυσει.	1343	Byz	Caesarea
72 Δειονυσει.	1343	Byz	Caesarea
73 πασειν	2355	?	South Coast
74 Σαβει[νου]	2423	?	South Coast
75 Εισα	2537	?	South Coast
76 Νεικανορ[--]	Mur120	?	Judaean Desert
77 Σαλουνειδη[νου]	5/6Hev5	?	Judaean Desert
78 επαρχειας	5/6Hev5	?	Judaean Desert
79 χειλια	5/6Hev5	?	Judaean Desert
80 τειμης	5/6Hev5	?	Judaean Desert
81 τειμης	5/6Hev5	?	Judaean Desert
82 τειμης	5/6Hev5	?	Judaean Desert
83 τε[i]μης	5/6Hev5	?	Judaean Desert
84 μεικρου	5/6Hev5	?	Judaean Desert
85 πατρει	5/6Hev5	?	Judaean Desert
86 χειλ[i]ον	5/6Hev5	?	Judaean Desert
87 Μανειου	5/6Hev11	?	Judaean Desert
88 Ακειλιου	5/6Hev11	?	Judaean Desert
89 μειλιαριας	5/6Hev11	?	Judaean Desert
90 Μανειου	5/6Hev11	?	Judaean Desert
91 Ακειλιου	5/6Hev11	?	Judaean Desert
92 μειλιαριας	5/6Hev11	?	Judaean Desert
93 Ιουστεινου	5/6Hev11	?	Judaean Desert
94 Αφροδεισιω	5/6Hev12	?	Judaean Desert
95 Αφροδεισιω	5/6Hev12	?	Judaean Desert
96 Ακειλιου	5/6Hev12	?	Judaean Desert
97 Ακυλεινου	5/6Hev14	?	Judaean Desert
98 Ακυλεινου	5/6Hev15	?	Judaean Desert
99 επαρχειας	5/6Hev15	?	Judaean Desert
100 ομειλιαν	5/6Hev15	?	Judaean Desert
101 υμειν	5/6Hev15	?	Judaean Desert
102 απειθαρ]χε[i]ας	5/6Hev15	?	Judaean Desert
103 τροφιων	5/6Hev15	?	Judaean Desert
104 υμειν	5/6Hev15	?	Judaean Desert
105 ηγεμωνε[ιας]	5/6Hev15	?	Judaean Desert
106 απειθαρχειας	5/6Hev15	?	Judaean Desert
107 ενει	5/6Hev15	?	Judaean Desert
108 Ατειλιου	5/6Hev16	?	Judaean Desert
109 επαρχειας	5/6Hev16	?	Judaean Desert
110 Φλωρεντεινου	5/6Hev16	?	Judaean Desert
111 κρειθης	5/6Hev16	?	Judaean Desert
112 μειγματος	5/6Hev16	?	Judaean Desert
113 κρειθης	5/6Hev16	?	Judaean Desert
114 γεινομενων	5/6Hev16	?	Judaean Desert
115 κρειθης	5/6Hev16	?	Judaean Desert
116 κρειθης	5/6Hev16	?	Judaean Desert
117 Πρεισκος	5/6Hev16	?	Judaean Desert
118 Πουπλειου	5/6Hev17	?	Judaean Desert
119 Μετειλιου	5/6Hev17	?	Judaean Desert
120 επαρχειας	5/6Hev17	?	Judaean Desert
121 επαρχειας	5/6Hev17	?	Judaean Desert
122 γ]εινεσθαι	5/6Hev17	?	Judaean Desert
123 διατετειμημενην	5/6Hev18	?	Judaean Desert
124 τειμογραφιαν	5/6Hev18	?	Judaean Desert
125 γεινομενης	5/6Hev18	?	Judaean Desert
126 γεινεσθαι	5/6Hev18	?	Judaean Desert
127 Που[π]λει[ο]υ	5/6Hev18	?	Judaean Desert
128 Μετειλι[ου]	5/6Hev18	?	Judaean Desert
129 επαρχειας	5/6Hev18	?	Judaean Desert
130 διατετει<μη>μενην	5/6Hev18	?	Judaean Desert
131 τειμογ[ρ]αφιαν	5/6Hev18	?	Judaean Desert
132 γεινομενης	5/6Hev18	?	Judaean Desert
133 γεινεσθαι	5/6Hev18	?	Judaean Desert
134 Με]τε[ι]λιου]	5/6Hev19	?	Judaean Desert
135 ειδιας	5/6Hev20	?	Judaean Desert
136 ειδιας	5/6Hev20	?	Judaean Desert

137 Κρισπεινα	5/6Hev20	?	Judaean Desert
138 Κοειντου	5/6Hev21	?	Judaean Desert
139 Κοειντου	5/6Hev22	?	Judaean Desert
140 νυνει	5/6Hev25	?	Judaean Desert
141 υπ]ατίας	5/6Hev26	?	Judaean Desert
142 Αυγορεινου	5/6Hev27	?	Judaean Desert
143 κατακρειν[α]τωσαν	5/6Hev28	?	Judaean Desert
144 μεχρει	5/6Hev29	?	Judaean Desert
145 κατακρεινατωσαν	5/6Hev29	?	Judaean Desert
146 τειμην	XHev/Se60	?	Judaean Desert
147 [Π]ερειτιου	XHev/Se60	?	Judaean Desert
148 Πρεισκος	XHev/Se61	?	Judaean Desert
149 επαρχειας	Xhev/Se62	?	Judaean Desert
150 αποτειμησησεως	Xhev/Se62	?	Judaean Desert
151 Φλωρεντεινο[υ]	Xhev/Se62	?	Judaean Desert
152 Σιμω[ο]ς	Xhev/Se62	?	Judaean Desert
153 κρειθης	Xhev/Se62	?	Judaean Desert
154 κρε[ι]θη[ς]	Xhev/Se62	?	Judaean Desert
155 κ]ρειθης	Xhev/Se62	?	Judaean Desert
156 τ[ε]λουν	Xhev/Se62	?	Judaean Desert
157 --]χελανης	Xhev/Se62	?	Judaean Desert
158 Σεδαλλου	Xhev/Se62	?	Judaean Desert
159 κρειθης	Xhev/Se62	?	Judaean Desert
160 κρειθης	Xhev/Se62	?	Judaean Desert
161 Ληουει	Xhev/Se63	?	Judaean Desert
162 Λ]ηουει	Xhev/Se63	?	Judaean Desert
163 Ληουει	Xhev/Se63	?	Judaean Desert
164 Δειου	Xhev/Se64	?	Judaean Desert
165 Ληουειου	Xhev/Se64	?	Judaean Desert
166 φοινεικωνος	Xhev/Se64	?	Judaean Desert
167 Ληουειου	Xhev/Se64	?	Judaean Desert
168 φοινεικωνων	Xhev/Se64	?	Judaean Desert
169 φοινεικος	Xhev/Se64	?	Judaean Desert
170 Ρουφεινου	Xhev/Se65 = 5/6Hev37	?	Judaean Desert
171 επαρχειας	Xhev/Se65 = 5/6Hev37	?	Judaean Desert
172 τειμογ[ρ]αφιν	Xhev/Se65 = 5/6Hev37	?	Judaean Desert
173 γεινεσθαι	Xhev/Se65 = 5/6Hev37	?	Judaean Desert
174 φ[οι]νεικωνω[v]	Xhev/Se68	?	Judaean Desert
175 Ζειφηνης	Xhev/Se69	?	Judaean Desert
176 Φειλωνος	IMish2	?	Judaean Desert
177 Ανεινας	34Se4	?	Judaean Desert
178 Αλεξειμ[αχος--]	34Se4	?	Judaean Desert
179 ημιλιτρε[ιον]	Mas741	?	Judaean Desert
180 Λειτρον	Mas802	?	Judaean Desert
181 Λειτρο(ν)	Mas817	?	Judaean Desert
182 Επαφρ]ωδειτω	1389	?	Caesarea
183 Αντειχουον	2122	?	Caesarea
184 επεισκ(οπου)	920	?	Jerusalem
185 Ευλαριου	921	?	Jerusalem
186 Βειθυνικη	944	?	Jerusalem
3	ιει > ει		
1 π(ι)ειν	395	1 st BCE	Jerusalem
4	ι > ιε		
1 Ιαιερε	452	1 st BCE-1 st CE	Jerusalem
5	ι > ιι		
1 Ιουλι {ι}α	5/6Hev20	?	Judaean Desert
6	ιο > ε		
1 Θεσιδεν	1650	4 th CE-7 th CE	Caesarea
7	ιο > ει		
1 Ερωταρειν	322	1 st BCE-1 st CE	Jerusalem
2 Ερωταρειν	322	1 st BCE-1 st CE	Jerusalem
8	ιο > ι		
1 Ιουδιν	550	1 st BCE-1 st CE	Jerusalem
2 ημιλιτριν	2597	2 nd CE-3 rd CE	South Coast
3 ημιλιτριν	2623	2 nd CE-3 rd CE	South Coast
4 [ημιλ.]ιτρ[ι]ν	2624	2 nd CE-3 rd CE	South Coast
5 ημιλειτριν	2616	3 rd CE	South Coast
6 ημιλιτριν	2642	2 nd CE-4 th CE	South Coast
7 Αρπαγι(ο)ς	936	4 th CE	Jerusalem
8 ενγονιν	2240	4 th CE	South Coast
9 Σωσεβις	2492	587 CE	South Coast
10 Ευσεβις	987	599 CE or 614 CE	Jerusalem
11 πλακι(ο)ν	997	6 th CE-7 th CE	Jerusalem

12 [Av]αστασι<ο>ς	1005	6 th CE-7 th CE	Jerusalem
13 εγ]γονιν	2321	605-606 CE	South Coast
14 Λεοντακις	2528	6 th CE-8 th CE	South Coast
15 δηναριν	5/6Hev15	?	Judaean Desert
16 Θαδαις	5/6Hev15	?	Judaean Desert
17 Θα[δ]αδαις	5/6Hev23	?	Judaean Desert
18 πιττακιν	5/6Hev25	?	Judaean Desert
19 πιττακιν	5/6Hev25	?	Judaean Desert
20 ΥΙΣ	KhQ_Arch25	?	Judaean Desert
21 Ευσεβι<ο>ς	842.12	?	Jerusalem
22 Ποπι<ο>ς	842.19	?	Jerusalem
23 Ιανο[υα]ρι<ο>ς	842.26	?	Jerusalem
24 Μακαρις	842.43	?	Jerusalem
25 Ευσταθι<ο>ν	842.58	?	Jerusalem
26 Ευφρονι<ο>ν	842.61	?	Jerusalem
27 κλιβαναρι<ο>ς	949	?	Jerusalem
28 Βαρωχι<ο>ς	976	?	Jerusalem
29 μιμορι<ο>ν	979	?	Jerusalem
30 Ζηνοβις	2571	?	South Coast
9	ιω > η		
1 Παρηγορης	2226	?	South Coast
10	ια > ι		
1 διφεροντων	848	?	Judaean Desert
2 Ιουλινου	2210	3 rd CE-6 th CE	South Coast
11	ιω > ο		
1 υ(ι)ος	2193	3 rd CE-6 th CE	South Coast
2 υος	1140	5 th CE-6 th CE	Caesarea
3 δηνάρο[ν	5/6Hev11	?	Judaean Desert
4 δ[η]ναρον	5/6Hev11	?	Judaean Desert
5 Βελλικ<ι>ου	5/6Hev12	?	Judaean Desert
6 Σαλου(ι)ος	1723	?	Caesarea
12	ιω > ω		
1 αγ(ι)ω	2321	605-606 CE	South Coast
2 δηνά[ρ]ων	5/6Hev11	?	Judaean Desert
3 δη[να]ρων	5/6Hev11	?	Judaean Desert
4 κυρ(ι)ω	2264	?	South Coast
13	εω > ω		
1 αντλημψως	848	?	Jerusalem
14	ια > α		
1 η[μ]ιωρ<ι>αν	Xhev/Se64	?	Judaean Desert
2 ημιωρ<ι>αν	Xhev/Se64	?	Judaean Desert
15	ια > ιεα		
1 Μαριαμη	451	1 st BCE-1 st CE	Jerusalem
16	ι > αε		
1 Μαρκαεος	23	1 st BCE-1 st CE	Jerusalem
17	ε > ι		
1 Βινιαμιν	419	1 st BCE-1 st CE	Jerusalem
2 λεγιωνος	2335	65 CE	South Coast
3 ετελι[ωθη	1871	2 nd CE-3 rd CE	Caesarea
4 Εζικιαν	2186	3 rd CE-6 th CE	South Coast
5 Ειζικια	2194	3 rd CE-6 th CE	South Coast
6 Ηζικια	2196	3 rd CE-6 th CE	South Coast
7 ικ	784	492 or 507 CE	Jerusalem
8 ετελιωθη	2313	512 CE	South Coast
9 θεωφαιστατου	2448	530 CE	South Coast
10 Εμισ(ης)	1760	6	Caesarea
11 επιτροπευ[σ]α	5/6Hev16	?	Judaean Desert
12 τελισοις	5/6Hev22	?	Judaean Desert
13 ετελιωθη	2427	?	South Coast
18	ι > ε		
1 δεσδεκαλλου	212	1 st BCE-1 st CE	Jerusalem
2 δεσκαλου	214	1 st BCE-1 st CE	Jerusalem
3 Μαρκεος	23	1 st BCE-1 st CE	Jerusalem
4 Δομετ[υ]λ	924	2 nd CE-5 th CE	Jerusalem
5 Δομετ[ι]ανος	2471	5 th CE	South Coast
6 Ελεου	1504	3 rd CE-7 th CE	Caesarea
7 Εληνεστι	5/6Hev52	?	Judaean Desert
8 Εβραεστι	5/6Hev52	?	Judaean Desert
9 Σισεννιο[υ]	931	?	Jerusalem
10 παππας	959	?	Jerusalem
11 Δομετ(ιανου)	1414	?	Caesarea
12 Μελτιαδου	2310	?	South Coast
13 Γε[ων]	2449	?	South Coast

14 Δομετιου	825	?	Jerusalem
19	ει > ε		
1 παταξε	451	1 st BCE-1 st CE	Jerusalem
2 ες	2227	3 rd CE-6 th CE	South Coast
3 χερος	XHev/Se60	?	Judaean Desert
4 χερος	Xhev/Se69	?	Judaean Desert
5 ες	1021	?	Jerusalem
6 ες	1036	?	Jerusalem
7 θαρσε<ι>	2094	?	Caesarea
8 ερινη	2562	?	South Coast
20	ε > ει		
1 παρεισχημ[ενων]	2267	163 BCE	South Coast
2 Ειζικια	2194	3 rd CE-6 th CE	South Coast
3 Γειωργιου	2143	?	Caesarea
4 Γειωργιου	2143	?	Caesarea
5 ειπι	2458	?	South Coast
21	η > ε		
1 Ιωσε	46	1 st BCE-1 st CE	Jerusalem
2 Μαρες	48	1 st BCE-1 st CE	Jerusalem
3 Ιοσε	81	1 st BCE-1 st CE	Jerusalem
4 Ιεσουα	295	1 st BCE-1 st CE	Jerusalem
5 Ιεσους	247	1 st CE	Jerusalem
6 Ιεσους	247	1 st CE	Jerusalem
7 Τελε(μαχος)	768	2 nd CE	Jerusalem
8 ναικε	1701	3 rd CE-4 th CE	Caesarea
9 Γηθσεμανις	986	4 th CE-5 th CE	Jerusalem
10 μενι	2487	467 CE	South Coast
11 εμων	2477	474 CE	South Coast
12 σωτε[ριας]	803	5 th CE	Jerusalem
13 μεμοριον	1456	3 rd CE-6 th CE	Caesarea
14 Ιβερω[v]	1000	5 th CE-6 th CE	Jerusalem
15 σωτεριας	1143	5 th CE-6 th CE	Caesarea
16 προσενηγκαμεν	2460	509 CE	South Coast
17 μενι	2444	528 CE	South Coast
18 ανεπαε	2492	587 CE	South Coast
19 σωτερ(ιας)	2321	605-606 CE	South Coast
20 σωτερ(ιας)	2321	605-606 CE	South Coast
21 Ελεου	1504	3 rd CE-7 th CE	Caesarea
22 μεμο[ριον]	1653	4 th CE-7 th CE	Caesarea
23 επερωτημενης	5/6Hev20	?	Judaean Desert
24 επερωτημε[v]ης	5/6Hev20	?	Judaean Desert
25 επερωτημενης	5/6Hev21	?	Judaean Desert
26 επερωτημενης	5/6Hev22	?	Judaean Desert
27 ενενοχ[ε]ναι	Xhev/Se64	?	Judaean Desert
28 σωτεριας	864	?	Jerusalem
29 θετε	933	?	Jerusalem
30 μνεμειον	959	?	Jerusalem
31 Ιβερον	977	?	Jerusalem
32 Ελιας	1021	?	Jerusalem
33 Ιβερω[v]	1078	?	Jerusalem
34 μεμοριον	1488	?	Caesarea
35 μεμ[οριον]?	1978	?	Caesarea
36 Ιεσου	2424	?	South Coast
37 αμεν	2486	?	South Coast
38 αποθεμενε	2489	?	South Coast
39 αμεν	2501	?	South Coast
40 ανεπαε	2507	?	South Coast
41 θεκε	2575	?	South Coast
22	ε > η		
1 Ευγηνια	59	1 st BCE-1 st CE	Jerusalem
2 δοτη	1091	1 st CE	Jerusalem
3 μησου	Jer4	132-135 CE	Judaean Desert
4 [τρ]αφησηται	Mur116	100-150 CE	Judaean Desert
5 Γηθσεμανις	986	4 th CE-5 th CE	Jerusalem
6 Ηαρ[ινη]	1332	post 450 CE	Caesarea
7 Νε]ημιας	1479	3 rd CE-6 th CE	Caesarea
8 Ηζικια	2196	3 rd CE-6 th CE	South Coast
9 προσενηγκαμεν	2460	509 CE	South Coast
10 κατετηθη	2498	563 CE	South Coast
11 εγενητω	2542	576 CE	South Coast
12 εθιμελιοθη	2432	6 th CE	South Coast
13 ειερηω[v]	1504	3 rd CE-7 th CE	Caesarea
14 Γιοργιας	1460	4 th CE-7 th CE	Caesarea

15 κατετηθη	2495	602 and 609 CE	South Coast
16 κατετηθη	2495	602 and 609 CE	South Coast
17 Ηνγαδη[νο]ς	5/6Hev19	?	Judaean Desert
18 Ηνγαδης	5/6Hev19	?	Judaean Desert
19 Ηνγαδηνος	5/6Hev20	?	Judaean Desert
20 Ηνγαδηνη	5/6Hev20	?	Judaean Desert
21 Ηνγαδοις	5/6Hev20	?	Judaean Desert
22 Ηνγαδηνος	5/6Hev20	?	Judaean Desert
23 Ηνγαδηνη	5/6Hev20	?	Judaean Desert
24 Ην[γ]αδηνου	5/6Hev20	?	Judaean Desert
25 Ηνγαδοις	5/6Hev20	?	Judaean Desert
26 Ην[γαδην]ος	5/6Hev23	?	Judaean Desert
27 Ηνγαδην[ο]ς	5/6Hev23	?	Judaean Desert
28 Ηνγαδηνη<ν>	5/6Hev26	?	Judaean Desert
29 Ηνγαδηνη	5/6Hev34	?	Judaean Desert
30 Ηληονα	857	?	Jerusalem
31 ευσηβηστατος	959	?	Jerusalem
32 ευσηβηστατος	959	?	Jerusalem
33 ημοι	960	?	Jerusalem
34 Μαρηαβδηνου	2479	?	South Coast
23	η > ει		
1 [Τει]μεισειωνο[ς]	497	1 st BCE-1 st CE	Jerusalem
2 Σειλωνει	Mur92	100-135 CE	Judaean Desert
3 Σαμουειλου	1543	3 rd CE-6 th CE	Caesarea
4 ει	2478	548 CE	South Coast
5 πνεισι	810	?	Jerusalem
6 συν]ειργη[σε	1012	?	Jerusalem
24	ει > η		
1 Ηδηα	243	1 st CE	Jerusalem
2 ηρηνη	2223	3 rd CE-6 th CE	South Coast
3 η(ς)	2295	4 th CE-6 th CE	South Coast
4 η[ρ]ηνη	2167	6 th CE-7 th CE	South Coast
5 φυλαξη	801	?	Jerusalem
6 ησοδ[ον]	810	?	Jerusalem
7 ηρινης	856	?	Jerusalem
8 ταπηνος	1082	?	Jerusalem
9 ηρινη	1189	?	Caesarea
10 ηερα[τ]ηου	2318	?	South Coast
11 βοηθη	2472	?	South Coast
12 τηχος	2476	?	South Coast
25	η > ι		
1 Νατανιλου	255	1 st CE	Jerusalem
2 ενγονιν	2240	4 th CE	South Coast
3 Γηθσεμανις	986	4 th CE-5 th CE	Jerusalem
4 κομιτος	2151	4 th CE-5 th CE	Caesarea
5 φροντιστι	2196	3 rd CE-6 th CE	South Coast
6 Παριγοριο[υ]	2221	3 rd CE-6 th CE	South Coast
7 Παριγοριου	2227	3 rd CE-6 th CE	South Coast
8 ανεθικαμεν	2234	3 rd CE-6 th CE	South Coast
9 μιμοριων	2236	3 rd CE-6 th CE	South Coast
10 αδε]λφισ	2246	3 rd CE-6 th CE	South Coast
11 μ]νισθι	2295	4 th CE-6 th CE	South Coast
12 μ]νισθι	2295	4 th CE-6 th CE	South Coast
13 κωνχις	2468	4 th CE-6 th CE	South Coast
14 Φαρβεθιτις	2290	5 th CE-6 th CE	South Coast
15 σπουδι	800	549/550 CE or 564/565 CE	Jerusalem
16 Βερνικι	1176	4 th CE-7 th CE	Caesarea
17 μνιμιν	1453	4 th CE-7 th CE	Caesarea
18 μνιμιν	1453	4 th CE-7 th CE	Caesarea
19 θηκι	1465	4 th CE-7 th CE	Caesarea
20 Εζινωβιας	1473	4 th CE-7 th CE	Caesarea
21 Σεβιρου	1556	4 th CE-7 th CE	Caesarea
22 πεδαρικι	1565	4 th CE-7 th CE	Caesarea
23 μιμορ[ιον]	1656	4 th CE-7 th CE	Caesarea
24 θικι	997	6 th CE-7 th CE	Jerusalem
25 θικι	997	6 th CE-7 th CE	Jerusalem
26 αυτις	997	6 th CE-7 th CE	Jerusalem
27 μνιστιτη	904	7 th CE-8 th CE	Jerusalem
28 μνιστιτη	904	7 th CE-8 th CE	Jerusalem
29 τις	2108	Byz?	Caesarea
30 κωμις	2108	Byz?	Caesarea
31 ταυτις	2108	Byz?	Caesarea
32 ιγουμ[ενου]	2394	Late Antique	South Coast

33 βοηθισον	798	?	Jerusalem
34 προσκυνισομεν	810	?	Jerusalem
35 ιμων	810	?	Jerusalem
36 βοιθος	810	?	Jerusalem
37 φοβιθισομε	810	?	Jerusalem
38 φοβιθισομε	810	?	Jerusalem
39 βοιθος	810	?	Jerusalem
40 τιν	810	?	Jerusalem
41 [μν]μιν	819	?	Jerusalem
42 εψιφωθ[η]	854	?	Jerusalem
43 ηρινης	856	?	Jerusalem
44 κοιμτος	856	?	Jerusalem
45 μνησθιτι	867	?	Jerusalem
46 θηκι	883	?	Jerusalem
47 Ονισ(ιμου)	888	?	Jerusalem
48 οσιωτατι	909	?	Jerusalem
49 χαρατι	909	?	Jerusalem
50 θικη	912	?	Jerusalem
51 τι	966	?	Jerusalem
52 (πεντη)κοστι	966	?	Jerusalem
53 μιμορι<ο>ν	979	?	Jerusalem
54 Προβατι{σ}κις	980	?	Jerusalem
55 τις	980	?	Jerusalem
56 θηκι	998	?	Jerusalem
57 Γεβαλινου	1021	?	Jerusalem
58 κοιμ[τος]	1024	?	Jerusalem
59 ηρινη	1189	?	Caesarea
60 μιμ[οριον]	1553	?	Caesarea
61 μν]ισθητι	1870	?	Caesarea
62 [θη]κι?	1918	?	Caesarea
63 βοηθισον	2143	?	Caesarea
64 Σωτιριχου	2143	?	Caesarea
65 καταργισον	2356	?	South Coast
66 βοη[θ]ισον	2424	?	South Coast
67 ερινη	2562	?	South Coast
26	ι > η		
1 Σημων	210	1 st BCE-1 st CE	Jerusalem
2 Βενιαμιν	523	1 st BCE-1 st CE	Jerusalem
3 Γησχα· δαν[--]	Mur92	100-135 CE	Judean Desert
4 αρχησυν[αγωγος]	1001	3 rd CE-6 th CE	Jerusalem
5 Λεοντηου	1499	3 rd CE-6 th CE	Caesarea
6 Σησηνιου	1499	3 rd CE-6 th CE	Caesarea
7 Σησηνιου	1499	3 rd CE-6 th CE	Caesarea
8 Ησηδωρου	2204	3 rd CE-6 th CE	South Coast
9 Ησηδωρου	2204	3 rd CE-6 th CE	South Coast
10 Ησσης	2230	3 rd CE-6 th CE	South Coast
11 διαφ[ερ(ουσα)]	993	5 th CE-6 th CE	Jerusalem
12 Κλεοντηου	993	5 th CE-6 th CE	Jerusalem
13 κτηστη	2148	5 th CE-6 th CE	Caesarea
14 Ασκα]λουνητης	2292	516-526 CE	South Coast
15 Αρτεμησιου	2478	548 CE	South Coast
16 κτησμα	861	6 th CE	Jerusalem
17 διαφεροντα	967	6 th CE	Jerusalem
18 ινδηκτ(ιωνος)	2432	6 th CE	South Coast
19 Βαισιηου	1460	4 th CE-7 th CE	Caesarea
20 διαφεροσα	1533	4 th CE-7 th CE	Caesarea
21 επι	1141	6 th CE-7 th CE	Caesarea
22 μηνι	875	7 th CE	Jerusalem
23 ψηφοσης	2109	7	Caesarea
24 μνιστιη	904	7 th CE-8 th CE	Jerusalem
25 Σηλβανου	1150	Byz	Caesarea
26 Χρηστιανων	842.42	?	Jerusalem
27 Συρης	842.47	?	Jerusalem
28 αμαρτηων	903	?	Jerusalem
29 Αγηου	1785	?	Caesarea
30 ηερα[τ]ηου	2318	?	South Coast
31 ηερ[εως]	2319	?	South Coast
32 φιλοχρηστων	2428	?	South Coast
33 επι	2476	?	South Coast
34 πιστης	2562	?	South Coast
27	η > ηι		
1 βουλη{ι}	2335	65 CE	South Coast
2 Ιωανη{ι}ς	5/6Hev31	?	Judean Desert

28	η > η		
1 Ησους	5/6Hev15	?	Judaeen Desert
29	η > ι		
1 Ισουος	2460	509 CE	South Coast
30	αι > α		
1 θαμα	508	1 st BCE-1 st CE	Jerusalem
2 κα	Jer5a	132-135 CE	Judaeen Desert
3 κα	Jer5b	132-135 CE	Judaeen Desert
4 κα(ι)	1548	3 rd CE-6 th CE	Caesarea
5 μελαναν	5/6Hev21	?	Judaeen Desert
6 μελαναν	5/6Hev22	?	Judaeen Desert
7 κρινα<ι>	933	?	Jerusalem
8 κα<ι>	2172	?	South Coast
31	αι > η		
1 Ωρηα	326	1 st CE	Jerusalem
2 Ωρηα	326	1 st CE	Jerusalem
3 Ωρηα	326	1 st CE	Jerusalem
4 Ωρηα	326	1 st CE	Jerusalem
5 Ωρηα	326	1 st CE	Jerusalem
6 Ηλιονα	857	?	Jerusalem
7 κιτη	2575	?	South Coast
32	η > αι		
1 Ωσαιας	588	1 st BCE-1 st CE	Jerusalem
2 σωταιριας	2451	?	South Coast
33	αι > ε		
1 ηριθμημε	Mur114	171 CE	Judaeen Desert
2 κε	1134	1 st CE-3 rd CE	Caesarea
3 κε	1457	3	Caesarea
4 περετερω	1197	465-467 CE	Caesarea
5 περεωθισης	1197	465-467 CE	Caesarea
6 πε]ρετερ[ω]	1197	465-467 CE	Caesarea
7 Πουσεου	1197	465-467 CE	Caesarea
8 ποιμενι	2327	493/494 CE	South Coast
9 Κεσαριου	932	5 th CE	Jerusalem
10 αποκερδεν[εσθαι]	784	492 or 507 CE	Jerusalem
11 πρεποσιτους	784	492 or 507 CE	Jerusalem
12 κε	2179	3 rd CE-6 th CE	South Coast
13 κιτε	2190	3 rd CE-6 th CE	South Coast
14 κε	2192	3 rd CE-6 th CE	South Coast
15 κε	2192	3 rd CE-6 th CE	South Coast
16 κε	2201	3 rd CE-6 th CE	South Coast
17 κ<ι>τε	2203	3 rd CE-6 th CE	South Coast
18 κιτε	2206	3 rd CE-6 th CE	South Coast
19 κε	2241	3 rd CE-6 th CE	South Coast
20 κε	1485	4 th CE-6 th CE	Caesarea
21 κε	1485	4 th CE-6 th CE	Caesarea
22 κε	999	5 th CE-6 th CE	Jerusalem
23 κε	1185	5 th CE-6 th CE	Caesarea
24 Φαρβεθιτις	2290	5 th CE-6 th CE	South Coast
25 Υβερβερετεου	2499	505 CE	South Coast
26 προς]δεξς	2447	528-530 CE	South Coast
27 προσδεξε	2445	529-530 CE	South Coast
28 Δεσιω	2493	539 CE	South Coast
29 κιτε	2477	541 CE	South Coast
30 μηνια	1196	6 th CE	Caesarea
31 Καλοκερια	1347	6 th CE	Caesarea
32 πεδαρικη	1514	6 th CE	Caesarea
33 κε	1417	4 th CE-7 th CE	Caesarea
34 κιτε	1462	4 th CE-7 th CE	Caesarea
35 κε	1506	4 th CE-7 th CE	Caesarea
36 κε	1506	4 th CE-7 th CE	Caesarea
37 κε	1506	4 th CE-7 th CE	Caesarea
38 κε	1520	4 th CE-7 th CE	Caesarea
39 κε	1521	4 th CE-7 th CE	Caesarea
40 κε	1528	4 th CE-7 th CE	Caesarea
41 κε	1534	4 th CE-7 th CE	Caesarea
42 πεδαρικι	1565	4 th CE-7 th CE	Caesarea
43 κ(ε)	1574	4 th CE-7 th CE	Caesarea
44 κ(ε)	1574	4 th CE-7 th CE	Caesarea
45 κε	1639	4 th CE-7 th CE	Caesarea
46 κε	1670	4 th CE-7 th CE	Caesarea
47 κατακιτε	978	6 th CE-7 th CE	Jerusalem
48 ευξετε	978	6 th CE-7 th CE	Jerusalem

49 Δικεοσυνη	2153	6 th CE-7 th CE	Caesarea
50 Δεσιου	2350	600 CE	South Coast
51 εὐ]φρενομ[ένων	Mur156	1000-1100 CE	Judaean Desert
52 τεζ	5/6Hev15	?	Judaean Desert
53 προγεγραμμενες	5/6Hev15	?	Judaean Desert
54 ερεσασιν	5/6Hev15	?	Judaean Desert
55 παλεαν	5/6Hev19	?	Judaean Desert
56 δικεωμα	5/6Hev20	?	Judaean Desert
57 συνκεχωρηκενε	5/6Hev20	?	Judaean Desert
58 λημψωμε	5/6Hev21	?	Judaean Desert
59 προγεγραπτε	5/6Hev22	?	Judaean Desert
60 προγεγραπτε	5/6Hev22	?	Judaean Desert
61 δικεον	5/6Hev24	?	Judaean Desert
62 αποδιξε	5/6Hev24	?	Judaean Desert
63 αποδιξε	5/6Hev24	?	Judaean Desert
64 παραγγιλε	5/6Hev25	?	Judaean Desert
65 ενγισε	5/6Hev26	?	Judaean Desert
66 ξεν[ο]κριτε	5/6Hev30	?	Judaean Desert
67 πεμσε	5/6Hev52	?	Judaean Desert
68 χερειν	Xhev/Se64	?	Judaean Desert
69 φοβιθισομε	810	?	Jerusalem
70 εποψομε	810	?	Jerusalem
71 κε	842	?	Jerusalem
72 κε	842.42	?	Jerusalem
73 γυνεκων	859	?	Jerusalem
74 κε	884	?	Jerusalem
75 Ρωμεας	900	?	Jerusalem
76 γυνεκων	901	?	Jerusalem
77 κε	903	?	Jerusalem
78 κιτε	949	?	Jerusalem
79 Βατανεας	952	?	Jerusalem
80 κε	979	?	Jerusalem
81 [κει]τε	984	?	Jerusalem
82 κε	1008	?	Jerusalem
83 κερον	1021	?	Jerusalem
84 δεχομε	1080	?	Jerusalem
85 προσδεξε	1084	?	Jerusalem
86 κε	1349	?	Caesarea
87 Κ]εσαρεω[--]	1586	?	Caesarea
88 Χερομενην	1682	?	Caesarea
89 κε ?	1972	?	Caesarea
90 κε ?	1972	?	Caesarea
91 κ(ε)	2082	?	Caesarea
92 ευχεζ	2531	?	South Coast
93 πρεσβιεζ	2531	?	South Coast
94 Φεδρα	2568	?	South Coast
95 Φεδρα	2568	?	South Coast
34	ε > αι		
1 υπομενονταις	1142	6 th CE-7 th CE	Caesarea
2 Αιγασδδων	5/6Hev16	?	Judaean Desert
3 Αιγασδηνος	5/6Hev17	?	Judaean Desert
4 Α[ιγασ]δ[ηνος]	5/6Hev17	?	Judaean Desert
5 Αιγασδων	5/6Hev18	?	Judaean Desert
6 θεαι	842.42	?	Jerusalem
7 εθος	1019	?	Jerusalem
8 αναπαυσαι(ως)	2454	?	South Coast
35	αι > ι		
1 Ιοδιου	552	1 st BCE-1 st CE	Jerusalem
2 Δισιου	987	599 CE or 614 CE	Jerusalem
36	ι > αι		
1 Αναινας	99	1 st BCE-1 st CE	Jerusalem
2 ναικε	1701	3 rd CE-4 th CE	Caesarea
37	αι > αιει		
1 τροπαιεικον	5/6Hev15	?	Judaean Desert
2 τροπαι]εικόν	5/6Hev15	?	Judaean Desert
38	αι > ση		
1 Ιηνναη	2208	3 rd CE-6 th CE	South Coast
39	υ > ι		
1 αυριχωρον	5/6Hev19	?	Judaean Desert
2 Αιδα	947	?	Jerusalem
3 λιχν(απτης)	966	?	Jerusalem
40	ι > υ		
1 κηρυκου	977	?	Jerusalem

41	υ > η		
1 προσσυλητου	1456	3 rd CE-6 th CE	Caesarea
2 <σ>ηβιου	2322	6 th CE-7 th CE	South Coast
3 ηπομενοντες	903	?	Jerusalem
4 πρεσβητ(ερου)	959	?	Jerusalem
42	η > υ		
1 κυμυσεως	2477	474 CE	South Coast
2 υμων	2487	467 CE	South Coast
3 προσσυλητου	1456	3 rd CE-6 th CE	Caesarea
43	υι > υ		
1 υ(ι)ου	452	1 st BCE-1 st CE	Jerusalem
2 υ(ι)ος	548	1 st BCE-1 st CE	Jerusalem
44	υ > υι		
1 ενγυιου	5/6Hev21	?	Judaean Desert
2 ενγυιου	5/6Hev21	?	Judaean Desert
45	υι > ι		
1 ιου	1481	2 nd CE-5 th CE	Caesarea
46	υι > υει		
1 υειος	2224	3 rd CE-6 th CE	South Coast
2 υειου	2243	3 rd CE-6 th CE	South Coast
47	υι > ουι		
1 ουιος	2178	3 rd CE-4 th CE	South Coast
2 ουιου	2229	3 rd CE-6 th CE	South Coast
48	οι > ο		
1 [π]ο(ι)ησουσιν	833	?	Jerusalem
49	οι > ου		
1 αδελφου	452	1 st BCE-1 st CE	Jerusalem
50	ου > οι		
1 εγμισθοιν	5/6Hev11	?	Judaean Desert
51	οι > ω		
1 εξωκιζω(ν)τον	440	1 st BCE-1 st CE	Jerusalem
52	ω > οι		
1 αποδοι	5/6Hev17	?	Judaean Desert
53	οι > υ		
1 υ	451	1 st BCE-1 st CE	Jerusalem
2 τυς	452	1 st BCE-1 st CE	Jerusalem
3 ανυγηναι	986	4 th CE-5 th CE	Jerusalem
4 κυμυσεως	2477	474 CE	South Coast
5 υκονομων	2469	580 CE	South Coast
6 τεκνυς	1476	4 th CE-7 th CE	Caesarea
7 τεκνυς	1560	4 th CE-7 th CE	Caesarea
8 τε]κνυς	1581	4 th CE-7 th CE	Caesarea
9 τεκ]νυς	1598	4 th CE-7 th CE	Caesarea
10 τεκν]υς	1599	4 th CE-7 th CE	Caesarea
11 ηνυγμενα	5/6Hev20	?	Judaean Desert
12 ηνυγμενον	5/6Hev20	?	Judaean Desert
13 πweis	810	?	Jerusalem
14 μυ	810	?	Jerusalem
15 συ	889	?	Jerusalem
16 τυς	892	?	Jerusalem
17 τεκνυς	1487	?	Caesarea
18 τεκν]υς	2069	?	Caesarea
54	υ > οι		
1 Σοιμωνος	2224	3 rd CE-6 th CE	South Coast
55	οι > αι		
1 πανταιοις	5/6Hev19	?	Judaean Desert
56	οι > ε		
1 κυρε	452	1 st BCE-1 st CE	Jerusalem
57	η > οι		
1 οι	Mur156	1000-1100 CE	Judaean Desert
2 οικουματων	5/6Hev19	?	Judaean Desert
3 οικουματων	5/6Hev19	?	Judaean Desert
4 οικουμα[των	5/6Hev19	?	Judaean Desert
5 τελισοις	5/6Hev22	?	Judaean Desert
6 οικουματα	Xhev/Se64	?	Judaean Desert
7 οικουματα	Xhev/Se64	?	Judaean Desert
58	οι > ει		
1 ει	1142	6 th CE-7 th CE	Caesarea
59	οι > ι		
1 ινοπρατου	1563	4 th CE-7 th CE	Caesarea
2 ζωοπ<ο>ιω	Mur156	1000-1100 CE	Judaean Desert
3 δομησιων	5/6Hev20	?	Judaean Desert
60	ι > οι		

1 Φλανοιου	5/6Hev20	?	Judaean Desert
2 Φλανοιου	5/6Hev20	?	Judaean Desert
61	οι > οοι		
1 προοικος	5/6Hev21	?	Judaean Desert
2 προοικος	5/6Hev22	?	Judaean Desert
62	ευ > ε		
1 θε(υ)μν<α>τος	214	1 st BCE-1 st CE	Jerusalem
2 Ζεξιπ(που)	1530	4 th CE-7 th CE	Caesarea
63	υ > ευ		
1 πρεσβευτηο	2151	4 th CE-5 th CE	Caesarea
64	ευ > εου		
1 ιερεους	2178	3 rd CE-4 th CE	South Coast
65	ευ > εθ		
1 εθλογια	2355	?	South Coast
66	εο > ευ		
1 Κλευπα<τ>ρους	594	1 st BCE-1 st CE	Jerusalem
67	αυ > α		
1 εατων	2336	1 st CE	South Coast
2 Α<υ>τοκρατορ(ος)	2639	117-138 CE	South Coast
3 αναπα<υ>σαμενη	985	?	Jerusalem
68	αυ > αου		
1 αουτου	1554	3 rd CE-6 th CE	Caesarea
69	αυ > αουου		
1 αυουτης	1548	3 rd CE-6 th CE	Caesarea
70	αουυ > αουου		
1 Φλανουιου	5/6Hev21	?	Judaean Desert
2 Φλ[α]υουιου	5/6Hev22	?	Judaean Desert
71	αυ > ω		
1 Ωλον	2335	65 CE	South Coast
72	αυ > ο		
1 οτου	2491	?	South Coast
73	ου > υ		
1 θεοδωρ<ο>υ	436	1 st BCE-1 st CE	Jerusalem
2 Μαρυλλα	486	1 st BCE-1 st CE	Jerusalem
3 Ανεμ<ο>υ	550	1 st BCE-1 st CE	Jerusalem
4 μ<ο>υλος	765	Late Roman	Jerusalem
5 Συλλα	2193	3 rd CE-6 th CE	South Coast
6 Ιυδας	2208	3 rd CE-6 th CE	South Coast
7 Μιμυλλα	1015	4 th CE-6 th CE	Jerusalem
8 Μα]χυθ[α	5/6Hev5	?	Judaean Desert
9 Ελαζαρ<ο>υ	5/6Hev11	?	Judaean Desert
10 [α]κολ<ο>υθως	Xhev/Se69	?	Judaean Desert
11 λυτρου	825	?	Jerusalem
74	υ > ου		
1 βουργος	1261	500 CE	Caesarea
2 μουλον	1044	7 th CE	Jerusalem
3 μουλον	1045	7 th CE	Jerusalem
75	ο > υ		
1 Πτυλεμαικη	331	1 st CE	Jerusalem
76	υ > ο		
1 Ορκανος	236	1 st BCE-1 st CE	Jerusalem
77	ου > ει		
1 υψειν	5/6Hev19	?	Judaean Desert
78	ου > ο		
1 Σαολος	269	1 st BCE-1 st CE	Jerusalem
2 Φο<υ>λεια	423	1 st BCE-1 st CE	Jerusalem
3 Ιοδιου	552	1 st BCE-1 st CE	Jerusalem
4 Μεταβορο<υ>	562	1 st BCE-1 st CE	Jerusalem
5 Ορσιλας	577	1 st BCE-1 st CE	Jerusalem
6 το<υ>	1728	44 th CE-5 th CE4 CE	Caesarea
7 Ινστοληιον	2335	65 CE	South Coast
8 Αρριστοβολα	325	1 st CE	Jerusalem
9 Ιοδα	2200	3 rd CE-5 th CE	South Coast
10 πρεσβευτηο	2151	4 th CE-5 th CE	Caesarea
11 δηαφεροσα	1533	4 th CE-7 th CE	Caesarea
12 δολω	1181	Byz	Caesarea
13 Αυγορεινου	5/6Hev27	?	Judaean Desert
14 Ποπι<ο>ς	842.19	?	Jerusalem
15 Ποπιηνο(ς?)	842.33	?	Jerusalem
16 δο<υ>[λ]ους	842.56	?	Jerusalem
17 ωλο<υ>	1021	?	Jerusalem
18 Κυρικο	2575	?	South Coast
79	ο > ου		

1 τουπου	452	1 st BCE-1 st CE	Jerusalem
2 Εντουλιου	1466	4 th CE-7 th CE	Caesarea
3 Πουπλιου	5/6Hev27	?	Judaeen Desert
4 δο<υ>[λ]ους	842.56	?	Jerusalem
80	ου > οε		
1 θεωδωροε	1143	5 th CE-6 th CE	Caesarea
81	ω > ο		
1 Βερνικεος	20	1 st BCE-1 st CE	Jerusalem
2 Ιορ	24	1 st BCE-1 st CE	Jerusalem
3 Ιοσε	81	1 st BCE-1 st CE	Jerusalem
4 Ιοσ(ηφ)	318	1 st BCE-1 st CE	Jerusalem
5 Σιμον	391	1 st BCE-1 st CE	Jerusalem
6 Νισον	431	1 st BCE-1 st CE	Jerusalem
7 Νισον	431	1 st BCE-1 st CE	Jerusalem
8 εξωκιζω(ν)τον	440	1 st BCE-1 st CE	Jerusalem
9 πολεος	579	1 st BCE-1 st CE	Jerusalem
10 Πολεος	1732	1 st BCE - 1 st CE	Caesarea
11 Έξομολ[ογ]ήσα[το]	Mur115	124 CE	Judaeen Desert
12 σ[υ]νβιωσσεος	Mur115	124 CE	Judaeen Desert
13 ανανεωσσεος	Mur115	124 CE	Judaeen Desert
14 πραξεος	Mur115	124 CE	Judaeen Desert
15 πολεος	2584	148/149 CE	South Coast
16 πολεος	2585	2 nd CE-4 th CE	South Coast
17 πολεος	2587	2 nd CE-4 th CE	South Coast
18 σκηνομα	986	4 th CE-5 th CE	Jerusalem
19 Αλεξανδρεος	2180	3 rd CE-6 th CE	South Coast
20 ιερεος	2202	3 rd CE-6 th CE	South Coast
21 Ιοση	2206	3 rd CE-6 th CE	South Coast
22 γναφεος	2212	3 rd CE-6 th CE	South Coast
23 Ιακοβ	2229	3 rd CE-6 th CE	South Coast
24 εγο	2234	3 rd CE-6 th CE	South Coast
25 Συμονος	2236	3 rd CE-6 th CE	South Coast
26 Αλεξανδρεος	2243	3 rd CE-6 th CE	South Coast
27 Ζοειλος	2245	3 rd CE-6 th CE	South Coast
28 ζης	1015	4 th CE-6 th CE	Jerusalem
29 ευχαριστον	2468	4 th CE-6 th CE	South Coast
30 Ιονα	991	5 th CE-6 th CE	Jerusalem
31 μακαριοτατου	2499	505 CE	South Coast
32 Ζηνονος	2499	505 CE	South Coast
33 μακαριο(τατου)	2497	529 CE	South Coast
34 μοναζον	2445	529-530 CE	South Coast
35 ημον	2448	530 CE	South Coast
36 οσιοτατου	2450	549 CE	South Coast
37 αγιοτατου	2450	549 CE	South Coast
38 Σαλαονος	2455	594 CE	South Coast
39 οδε	2455	594 CE	South Coast
40 τον	858	6 th CE	Jerusalem
41 αρτοκοπον	880	6 th CE	Jerusalem
42 εος	1034	6 th CE	Jerusalem
43 εθιμελιοθη	2432	6 th CE	South Coast
44 εψηφοθη	2432	6 th CE	South Coast
45 Γηοργιας	1460	4 th CE-7 th CE	Caesarea
46 Συμον[ος]	1556	4 th CE-7 th CE	Caesarea
47 ετο[ν?]	1447	5 th CE-7 th CE	Caesarea
48 τον	796	6 th CE-7 th CE	Jerusalem
49 σον	796	6 th CE-7 th CE	Jerusalem
50 τον	796	6 th CE-7 th CE	Jerusalem
51 Σολομον	1005	6 th CE-7 th CE	Jerusalem
52 ανο	1022	6 th CE-7 th CE	Jerusalem
53 Βικτορος	2369	6 th CE-7 th CE	South Coast
54 Φροντονος	2376	6 th CE-7 th CE	South Coast
55 ζοην	2321	605-606 CE	South Coast
56 σοματ(ος)	2480	616 CE	South Coast
57 Λοο	2480	616 CE	South Coast
58 Λοο	2480	616 CE	South Coast
59 Οκτοβριω	875	7 th CE	Jerusalem
60 οσιω(ατ)ω	879	7 th CE	Jerusalem
61 ψηφοσης	2109	7 th CE	Caesarea
62 χαμωψηφοσσεος	2456	732 CE	South Coast
63 χαμωψηφοσσεος	2456	732 CE	South Coast
64 Νονιας	1150	Byz	Caesarea
65 το	Mur156	1000-1100 CE	Judaeen Desert
66 Μα]ριο	KhQ_Arch40	?	Judaeen Desert

67	Ισιονι	Jer19	?	Judaean Desert
68	αποδοσο	EinGedi1	?	Judaean Desert
69	αποδοσο	EinGedi1	?	Judaean Desert
70	δυσεος	5/6Hev11	?	Judaean Desert
71	δυσεος	5/6Hev11	?	Judaean Desert
72	Θεωδορος	5/6Hev11	?	Judaean Desert
73	ανθομολογημενης	5/6Hev20	?	Judaean Desert
74	ανθομολογημενης	5/6Hev20	?	Judaean Desert
75	ανθομολογημενη[ς]	5/6Hev21	?	Judaean Desert
76	ανθομολογημενης	5/6Hev22	?	Judaean Desert
77	οκτοκαιδεκα[τη]	Xhev/Se62	?	Judaean Desert
78	γειτωναες	Xhev/Se64	?	Judaean Desert
79	γει[τ]ωνες	Xhev/Se64	?	Judaean Desert
80	γειτωναες	Xhev/Se64	?	Judaean Desert
81	γειτωναες	Xhev/Se64	?	Judaean Desert
82	γειτωναες	5/6Hev19	?	Judaean Desert
83	Αντονιου	795	?	Jerusalem
84	προσκυνισομεν	810	?	Jerusalem
85	προσπεσομεν	810	?	Jerusalem
86	αυτό	810	?	Jerusalem
87	το	810	?	Jerusalem
88	εγο	810	?	Jerusalem
89	εος	810	?	Jerusalem
90	τον	810	?	Jerusalem
91	τον	829	?	Jerusalem
92	θεοδορας	856	?	Jerusalem
93	τον	856	?	Jerusalem
94	Δορο[θεου]	872	?	Jerusalem
95	τον	909	?	Jerusalem
96	Ιοα(ννου)	959	?	Jerusalem
97	Γεοργιου	962	?	Jerusalem
98	Παχομιος	966	?	Jerusalem
99	θυρορ[ων]	968	?	Jerusalem
100	Ιβερων	977	?	Jerusalem
101	Βενετον	1026	?	Jerusalem
102	τριον	1076	?	Jerusalem
103	γινοςκι	1084	?	Jerusalem
104	θεοδο[--]	1785	?	Caesarea
105	Αρτεμονος	2143	?	Caesarea
106	Αριστον	2262	?	South Coast
107	οσιωτατου	2320	?	South Coast
108	γινοςκις	2356	?	South Coast
109	ανα[παυ]σεος	2451	?	South Coast
110	ανενηοθη	2476	?	South Coast
111	κα]λλοπισεν	2561	?	South Coast
82 ο > ω				
1	εξωκιζω(ν)τον	440	1 st BCE-1 st CE	Jerusalem
2	δεκ[α]δυω	Mur114	171 CE	Judaean Desert
3	δυω	Mur114	171 CE	Judaean Desert
4	υιω(ς)	2464	3 rd CE-5 th CE	South Coast
5	μηνοριων	1548	3 rd CE-6 th CE	Caesarea
6	διαφερων	2218	3 rd CE-6 th CE	South Coast
7	μιμοριων	2236	3 rd CE-6 th CE	South Coast
8	κωνχις	2468	4 th CE-6 th CE	South Coast
9	θεωδωροε	1143	5 th CE-6 th CE	Caesarea
10	θεωδοτης	2497	529 CE	South Coast
11	μωναζων	2446	528-530 CE	South Coast
12	θεωφαιστατου	2448	530 CE	South Coast
13	ωσιωτατου	2542	576 CE	South Coast
14	θεωφιλ(ε)στατου	2542	576 CE	South Coast
15	παραμωναριου	2542	576 CE	South Coast
16	εγενητω	2542	576 CE	South Coast
17	καρποφωριας	794	6 th CE	Jerusalem
18	Εζνωβιας	1473	4 th CE-7 th CE	Caesarea
19	Γρηγω[ριου]	1590	4 th CE-7 th CE	Caesarea
20	θεωδ[--]	1658	4 th CE-7 th CE	Caesarea
21	[--]αμως(?)	1447	5 th CE-7 th CE	Caesarea
22	κωμερκιαριος	978	6 th CE-7 th CE	Jerusalem
23	ορθωδοξους	1182	6 th CE-7 th CE	Caesarea
24	ενδοξωτ(ατου)	1263	6 th CE-7 th CE	Caesarea
25	ενδοξω(τατου)	1331	6 th CE-7 th CE?	Caesarea
26	χαμωψηφοσεος	2456	732 CE	South Coast
27	τωπος	1490	Byz?	Caesarea

28	θεοδωρου	1490	Byz?	Caesarea
29	δω	5/6Hev5	?	Judaeen Desert
30	δω	5/6Hev5	?	Judaeen Desert
31	Θεωδορος	5/6Hev11	?	Judaeen Desert
32	δω	5/6Hev13	?	Judaeen Desert
33	ηγεμωνος	5/6Hev14	?	Judaeen Desert
34	ήγ[ε]μων[εί]ας	5/6Hev15	?	Judaeen Desert
35	ήγεμωνε[ίας]	5/6Hev15	?	Judaeen Desert
36	ηγεμωνος	5/6Hev15	?	Judaeen Desert
37	επιτροπων	5/6Hev15	?	Judaeen Desert
38	λημψωμε	5/6Hev21	?	Judaeen Desert
39	δω	5/6Hev21	?	Judaeen Desert
40	δω	5/6Hev21	?	Judaeen Desert
41	δω	5/6Hev21	?	Judaeen Desert
42	δω	5/6Hev22	?	Judaeen Desert
43	δω	5/6Hev22	?	Judaeen Desert
44	δω	5/6Hev25	?	Judaeen Desert
45	δω	5/6Hev26	?	Judaeen Desert
46	αποδω[σεως]	Xhev/Se69	?	Judaeen Desert
47	τω	848	?	Jerusalem
48	θεοδοσια	878	?	Jerusalem
49	διαφερων	892	?	Jerusalem
50	Πωντου	931	?	Jerusalem
51	ω	1021	?	Jerusalem
52	ωλο<υ>	1021	?	Jerusalem
53	[θε]ωδωρ[ου]	1061	?	Jerusalem
54	θεοδωσιος	1082	?	Jerusalem
55	ελπιζωντων	1348	?	Caesarea
56	Επαφρ]ωδειτω	1389	?	Caesarea
57	Βωτρυς	1396	?	Caesarea
58	τοπως	1567	?	Caesarea
59	ωλης	2318	?	South Coast
60	ω	2507	?	South Coast
61	ωσιου	2546	?	South Coast
83	ω(ι)ο > οο			
1	υπερων	Xhev/Se64	?	Judaeen Desert
2	υπερων	Xhev/Se64	?	Judaeen Desert
84	ω > ου			
1	Ασκα]λουνητης	2292	516-526 CE	South Coast
2	τοπου	2167	6 th CE-7 th CE	South Coast
3	σουτηριαν	2422	?	South Coast
85	ου > ω			
1	Κυρω	2291	5 th CE-6 th CE	South Coast
2	Κυρω	2291	5 th CE-6 th CE	South Coast
3	υω	2422	?	South Coast
4	Νωμ[--]ς	842.42	?	Jerusalem
5	Βαρωχι<ο>ς	976	?	Jerusalem
6	υω	2422	?	South Coast
86	ω > υ			
1	Ιυσης	2211	3 rd CE-6 th CE	South Coast
87	ε > α			
1	αδαλφου	452	1 st BCE-1 st CE	Jerusalem
2	παραγενετ[ο]	2490	541 CE	South Coast
3	ερεσασιν	5/6Hev15	?	Judaeen Desert
4	αυριχωρον	5/6Hev19	?	Judaeen Desert
5	μεθαξει	5/6Hev19	?	Judaeen Desert
6	ενανηκοντα	Xhev/Se65 = 5/6Hev37	?	Judaeen Desert
7	Αγλα	Xhev/Se69	?	Judaeen Desert
88	α > ε			
1	δεσδεκαλλου	212	1 st BCE-1 st CE	Jerusalem
2	δεσκαλου (cited elsewhere)	214	1 st BCE-1 st CE	Jerusalem
3	Σελασιων	500	1 st BCE-1 st CE	Jerusalem
4	Ανεστασια	2477	474 CE	South Coast
5	Ανεστασια	2477	474 CE	South Coast
6	τεσερεσκαιδεκατου	Xhev/Se69	?	Judaeen Desert
7	Αβιδελλα	842.15	?	Jerusalem
8	βρεκαριω	898	?	Jerusalem
89	α > η			
1	Ιηνναη	2208	3 rd CE-6 th CE	South Coast
90	ο > ε			
1	Πτελεμ[αικ]ου	2246	3 rd CE-6 th CE	South Coast
2	ηπομενοντες	903	?	Jerusalem
91	α > ο			

1 Ζοορων	5/6Hev20	?	Judaeen Desert
2 Ζοορων	5/6Hev20	?	Judaeen Desert
3 Ζοορων	5/6Hev21	?	Judaeen Desert
4 Ζοορων	5/6Hev25	?	Judaeen Desert
5 Ζοορων	5/6Hev27	?	Judaeen Desert
6 Γροπτι	Xhev/Se64	?	Judaeen Desert
92	o > α		
1 αγαρα	5/6Hev20	?	Judaeen Desert
2 καθαραποιουντος	5/6Hev22	?	Judaeen Desert
93	θ > α		
1 Χαθουσιωνος	5/6Hev15	?	Judaeen Desert
94	θ > ε		
1 Θεενας	5/6Hev15	?	Judaeen Desert
2 Δυστ{ε}ρου	5/6Hev17	?	Judaeen Desert
3 Δυστ{ε}ρου	5/6Hev17	?	Judaeen Desert
4 Θεενας	5/6Hev17	?	Judaeen Desert
5 Θεενας	5/6Hev18	?	Judaeen Desert
6 Απερος	5/6Hev20	?	Judaeen Desert
7 Απερος	5/6Hev20	?	Judaeen Desert
95	α > θ		
1 θε(υ)μν<α>τος	214	1 st BCE-1 st CE	Jerusalem
2 αιων<α>ς	2487	467 CE	South Coast
3 Ραββαθμωβοις	5/6Hev16	?	Judaeen Desert
4 Βαβθα	5/6Hev16	?	Judaeen Desert
96	ε > θ		
1 [-- ο]ντερανός	Mur113	100-150 CE	Judaeen Desert
2 (ε)κηδευσεν	2576	3 rd CE-5 th CE	South Coast
3 θεωφιλ(ε)στατου	2542	576 CE	South Coast
4 <ε>το(υς)	2536	586 CE	South Coast
5 <ε>ξοδ[ον]	826	?	Jerusalem
6 Ευθηρι<ε>	950	?	Jerusalem
97	η > θ		
1 μνμα	2186	3 rd CE-6 th CE	South Coast
2 Κορν<η>λιας	1464	4 th CE-7 th CE	Caesarea
3 σωττ(αι)ριας	2458	?	South Coast
98	ο > θ		
1 ορφαν<ο>τροφιω	1168	5 th CE-7 th CE	Caesarea
2 <ο>φύλης	5/6Hev21	?	Judaeen Desert
99	ι > θ		
1 (ι)σχιων	1702	2 nd CE-6 th CE	Caesarea
2 (ι)σχιων	1703	3 rd CE-5 th CE	Caesarea
3 <ι>νδι(κτιωνος)	2497	529 CE	South Coast
4 (ι)σχιων	2156	?	Caesarea
100	υ > θ		
1 ευδαμοσ<υ>νης	2482	3 rd BCE	South Coast
101	π > φ		
1 ενφ	1163	Byz	Caesarea
102	φ > π		
1 Σαπιρα	208	1 st BCE-1 st CE	Jerusalem
2 Ίωσηπ	Mur90	100-135 CE	Judaeen Desert
3 Ιωσηπ	Mur94	100-135 CE	Judaeen Desert
103	φθ > πθ		
1 πθονε	1420	?	Caesarea
104	ππ > π		
1 παπος	117	1 st BCE-1 st CE	Jerusalem
2 Καπαδοκος	2192	3 rd CE-6 th CE	South Coast
3 Καπαδοκων	2203	3 rd CE-6 th CE	South Coast
4 Ειοπιτων	2227	3 rd CE-6 th CE	South Coast
5 παπου	5/6Hev20	?	Judaeen Desert
6 π]απου	5/6Hev20	?	Judaeen Desert
105	π > ππ		
1 απαν[τα]	Xhev/Se64	?	Judaeen Desert
106	β > π		
1 πολ<υ>ποτων	977	?	Jerusalem
107	π > β		
1 βουργος	1261	500 CE	Caesarea
2 Υβερβερετεου	2499	505 CE	South Coast
108	ββ > β		
1 Σαβατις	330	1 st CE	Jerusalem
2 Ραβι	2200	3 rd CE-5 th CE	South Coast
3 αβα	1564	4 th CE-7 th CE	Caesarea
4 Σαβατιω	2113B	4 th CE-7 th CE	Caesarea
109	μβ > β		

1 <σ>ηβιου	2322	6 th CE-7 th CE	South Coast
110	μπ > π		
1 Λαπαδιου	896	?	Jerusalem
111	μσ > σ		
1 Σελασιων	500	1 st BCE-1 st CE	Jerusalem
112	μ > μμ		
1 α]ν[ο]ιωγμενον	Xhev/Se64	?	Judaean Desert
2 ανοιωγμμ[ενο]ν	Xhev/Se64	?	Judaean Desert
113	μμ > μ		
1 Αμια	361	1 st BCE-1 st CE	Jerusalem
2 κωμερκιαριος	978	6 th CE-7 th CE	Jerusalem
114	μ > ν		
1 Σαλων	591	1 st BCE-1 st CE	Jerusalem
2 μηγοριων	1548	3 rd CE-6 th CE	Caesarea
3 Ναρκελ[λα]	2424	?	South Coast
115	μβ > νβ		
1 Νοενβριων	Mur115	124 CE	Judaean Desert
2 συνβιον	Mur115	124 CE	Judaean Desert
3 σ[υ]νβιωσεος	Mur115	124 CE	Judaean Desert
4 συνβιου	1554	3 rd CE-6 th CE	Caesarea
5 συνβιου	2192	3 rd CE-6 th CE	South Coast
6 ενβολου	2543	578 CE	South Coast
7 Κινβερ	5/6Hev20	?	Judaean Desert
8 Κινβερ	5/6Hev20	?	Judaean Desert
9 Δ]εκενβρι[ων	5/6Hev23	?	Judaean Desert
10 Δεκενβριων	5/6Hev23	?	Judaean Desert
11 συνβιου	1586	?	Caesarea
116	μβ > νμβ		
1 Παρε{ν}μβολης	2240	4 th CE	South Coast
117	μπ > νπ		
1 Πονπηια	709	2 nd CE	Jerusalem
2 συνπαροντος	5/6Hev16	?	Judaean Desert
3 συνπαροντ[ος]	5/6Hev17	?	Judaean Desert
4 συνπαρ[ο]ντος	5/6Hev17	?	Judaean Desert
5 συνπαν	5/6Hev20	?	Judaean Desert
6 συνπαροντος	Xhev/Se64	?	Judaean Desert
118	μσ > μψ		
1 Σ[ελα]μψιωνην	5/6Hev18	?	Judaean Desert
2 Σελαμψιωνη<ν>	5/6Hev18	?	Judaean Desert
3 Σελαμψιους	5/6Hev18	?	Judaean Desert
4 Numerous other instances of Σελαμψιων			
119	μπτ > μτ		
1 πεμτου	5/6Hev20	?	Judaean Desert
2 πεμτου	5/6Hev20	?	Judaean Desert
3 πεμτου	5/6Hev21	?	Judaean Desert
4 πε]μ[τ]ου	5/6Hev22	?	Judaean Desert
120	μ > ο		
1 Μαναηου	5/6Hev21	?	Judaean Desert
121	ντ > τ		
1 εξωκιζω(ν)τον	440	1 st BCE-1 st CE	Jerusalem
2 Α<ν>τιγονα	513	1 st BCE-1 st CE	Jerusalem
3 διαφορο(ν)τα	1548	3 rd CE-6 th CE	Caesarea
4 προ[σ]ηνεγκο(ν)τος	2463	6 th CE	South Coast
5 διαφορο(ν) την	968	?	Jerusalem
122	νθ > θ		
1 ει(ν)θα[δε]	958	5 th CE-6 th CE	Jerusalem
123	ν > νν		
1 Βεννιαμιν	2193	3 rd CE-6 th CE	South Coast
2 Ιωανην	2445	529-530 CE	South Coast
3 ερμην{ν}εια	XHev/Se61	?	Judaean Desert
4 εν{ν}	5/6Hev20	?	Judaean Desert
124	νν > ν		
1 θενου	21	1 st BCE-1 st CE	Jerusalem
2 θενας	22	1 st BCE-1 st CE	Jerusalem
3 Ιωανας	64	1 st BCE-1 st CE	Jerusalem
4 [Ιω]ανης	179	1 st BCE-1 st CE	Jerusalem
5 Ιωανηου	267	1 st BCE-1 st CE	Jerusalem
6 Ιωανης	333	1 st BCE-1 st CE	Jerusalem
7 Ιωανης	333	1 st BCE-1 st CE	Jerusalem
8 Ιωανης	362	1 st BCE-1 st CE	Jerusalem
9 Ιωανης	362	1 st BCE-1 st CE	Jerusalem
10 Ιωανης	362	1 st BCE-1 st CE	Jerusalem

11	Ιωανου	400	1 st BCE-1 st CE	Jerusalem
12	Ανις	417	1 st BCE-1 st CE	Jerusalem
13	Ιωανας	447	1 st BCE-1 st CE	Jerusalem
14	Ιωανου	Mur115	124 CE	Judaean Desert
15	Ἰω]άν[ο]υ	Mur115	124 CE	Judaean Desert
16	Ἰωάν[ο]υ	Mur115	124 CE	Judaean Desert
17	[Ἰωά]γου	Mur115	124 CE	Judaean Desert
18	Ιωανης	Jer16	?	Judaean Desert
19	Ιωανης	Jer16	?	Judaean Desert
20	Ιωανη[ς]	Jer19	?	Judaean Desert
21	Numerous other instances of Ἰωάνης			
22	Θεενας	5/6Hev15	?	Judaean Desert
23	Θεενας	5/6Hev17	?	Judaean Desert
24	Θεενας	5/6Hev18	?	Judaean Desert
25	Ανιανον	842.52	?	Jerusalem
26	δεκαενεα	964	?	Jerusalem
27	Ιωανης	989	?	Jerusalem
125	v > μ			
1	διακομου	2458	?	South Coast
126	v# > ο			
1	αυτό(v)	451	1 st BCE-1 st CE	Jerusalem
2	εριο(v?)	673	1 st BCE-1 st CE	Jerusalem
3	αυτό(v)	986	4 th CE-5 th CE	Jerusalem
4	Μενιαμι(v)	2223	3 rd CE-6 th CE	South Coast
5	[B]OHOΨΣO<N>	Fesh_Arch4	?	Judaean Desert
6	προκειμενω<v>	5/6Hev12	?	Judaean Desert
7	προκειμενω<v>	5/6Hev12	?	Judaean Desert
8	ἐμαρτυροποιησάμη<v>	5/6Hev15	?	Judaean Desert
9	Σελαμψιωνη<v>	5/6Hev18	?	Judaean Desert
10	συνγρα[φ]η<v>	5/6Hev18	?	Judaean Desert
11	το<v>	5/6Hev20	?	Judaean Desert
12	ε<v>	5/6Hev20	?	Judaean Desert
13	το<v>	5/6Hev21	?	Judaean Desert
14	το<v>	5/6Hev22	?	Judaean Desert
15	Μαωζηνη<v>	5/6Hev23	?	Judaean Desert
16	Μαωζηνη<v>	5/6Hev23	?	Judaean Desert
17	αυτη<v>	5/6Hev25	?	Judaean Desert
18	αυτη<v>	5/6Hev25	?	Judaean Desert
19	Ηνγαδηνη<v>	5/6Hev26	?	Judaean Desert
20	Λειτρο(v)	Mas817	?	Judaean Desert
21	ημω(v)	825	?	Jerusalem
22	βοηθησο(v)	842.55	?	Jerusalem
23	βοηθω(v)	2355	?	South Coast
24	μοχθω(v)	2504	?	South Coast
127	τ > θ			
1	θαφος	959	?	Jerusalem
2	[γ]ρυθο[πωλου]	1552	?	Caesarea
128	θ > τ			
1	Βερουτος	293	1 st BCE-1 st CE	Jerusalem
2	Νατανιλου	255	1 st CE	Jerusalem
129	τ > ττ			
1	Απολ.]λοδοτ{τ}ου	2337	187/188 CE	South Coast
2	σωττ(αι)ριας	2458	?	South Coast
130	ττ > τ			
1	πιτακιου	5/6Hev16	?	Judaean Desert
2	πιτακιου	5/6Hev16	?	Judaean Desert
131	τρ > ρ			
1	Κλευπα<τ>ρους	594	1 st BCE-1 st CE	Jerusalem
132	θθ > θ			
1	Μαθεθ<ο>ς	5/6Hev20	?	Judaean Desert
133	σθ > στ			
1	ευφραινεστε	395	1 st BCE	Jerusalem
2	μνιστιτη	904	7 th CE-8 th CE	Jerusalem
134	vθ > vτ			
1	επληθυντησαν	1173	5	Caesarea
135	δδ > δ			
1	Θαδαιος	5/6Hev14	?	Judaean Desert
2	Θαδαις	5/6Hev15	?	Judaean Desert
3	Θαδαιου	5/6Hev15	?	Judaean Desert
4	Θαδαι[ο]ς	5/6Hev20	?	Judaean Desert
5	θαδαιου	5/6Hev20	?	Judaean Desert
6	Θα[δ]αδαις	5/6Hev23	?	Judaean Desert

7 Θ[αδ]αιου 136	5/6Hev23 δ > δδ	?	Judaeen Desert
1 Αιγυαδδων 137	5/6Hev16 δ > τ	?	Judaeen Desert
1 τρυφακτου 138	2 σσ > σ	23 BCE-70 CE	Jerusalem
1 ιερησης	297	1 st BCE-1 st CE	Jerusalem
2 τεσερεσκαιδεκατου	Xhev/Se69	?	Judaeen Desert
3 Αππιος	Mas788	?	Judaeen Desert
4 Βεσα 139	962 σ > σσ	?	Jerusalem
1 προσσυλητου	1456	3 rd CE-6 th CE	Caesarea
2 εξεσστω 140	Xhev/Se66 σ > σ(σ)τ	?	Judaeen Desert
1 Εμεσ{τ}ηνου	2176	3 rd CE-6 th CE	South Coast
2 Ιστραηλ	2231	3 rd CE-6 th CE	South Coast
3 Ιστρα[ε]λ	2167	6 th CE-7 th CE	South Coast
4 Ιστραηλ 141	2509 στ > τ	?	South Coast
1 Αρι<σ>των(ος)	308	1 st BCE-1 st CE	Jerusalem
2 Ιουτου	1140	5 th CE-6 th CE	Caesarea
3 ωτε 142	1156 σθ > θ	?	Caesarea
1 [μν]η<σ>θητ[ι]	842.60	?	Jerusalem
143	στ > σ		
1 Χρισ<τ>ος	976	?	Jerusalem
144	σ# > ο		
1 προ<ς> (/ _σ)	3	18-17 BCE	Jerusalem
2 αυτή<ς>	566	1 st BCE-1 st CE	Jerusalem
3 υω(ς)	2464	3 rd CE-5 th CE	South Coast
4 η(ς)	2295	4 th CE-6 th CE	South Coast
5 τοι<ς>	5/6Hev12	?	Judaeen Desert
6 Αβδοοβδα<ς>	5/6Hev13	?	Judaeen Desert
7 ενο<ς>	5/6Hev16	?	Judaeen Desert
8 πρε<σ>βεντου	5/6Hev26	?	Judaeen Desert
9 πρωτη<ς>	5/6Hev27	?	Judaeen Desert
10 ετου<ς>	5/6Hev27	?	Judaeen Desert
11 αδερφο(ς) 145	2575 σ > ο	?	South Coast
1 [ε]λεη<σ>ον 146	842.3 σ > ζ	?	Jerusalem
1 πρεζβεντου	2177	3 rd CE-5 th CE	South Coast
2 αγοραζματος	5/6Hev22	?	Judaeen Desert
3 αμφιαζμου	5/6Hev27	?	Judaeen Desert
4 αμφιαζμου 147	5/6Hev27 ζ > σ	?	Judaeen Desert
1 Εσκιας 148	389 ζ > ζζ	1 st BCE-1 st CE	Jerusalem
1 τευχιζζει 149	5/6Hev19 ζζ > θζ	?	Judaeen Desert
1 Α{θ}ζαν 150	2235 κ > κκ	3 rd CE-6 th CE	South Coast
1 Ιακωβου	1481	2 nd CE-5 th CE	Caesarea
2 Ιακωβ[ου--]	34Se4	?	Judaeen Desert
3 [περδι]κ{κ}ες 151	1019 κκ > κ	?	Jerusalem
1 εκλ[(ησιας)]	785	533-565 CE	Jerusalem
2 εκλ[ησι?]	905	?	Jerusalem
3 εκλησιας	2318	?	South Coast
4 εκλησια 152	2427 κχ > χχ	?	South Coast
1 Βαχχιου 153	Xhev/Se66 χχ > χ	?	Judaeen Desert
1 Ζαχαι 154	2209 χ > κ	3 rd CE-6 th CE	South Coast
1 Μικαηλ 155	2154 κ > χ	?	Caesarea
1 Αντειχουον 156	2122 χ > κκ	?	Caesarea
1 Ζακκαριας 157	959 κ > σκ	?	Jerusalem
1 αντισκινησ(ας?)	451	1 st BCE-1 st CE	Jerusalem
2 Προβατι{σ}κις	980	?	Jerusalem

158	κ > γ		
1 εγ	2482	3 rd BCE	South Coast
2 εγδω	Mur116	100-150 CE	Judaean Desert
3 εγ	Mur114	171 CE	Judaean Desert
4 εγ	Jer4	?	Judaean Desert
5 εγδικα[--]	Mur120	?	Judaean Desert
6 εγ	Mur120	?	Judaean Desert
7 εγμισθοιν	5/6Hev11	?	Judaean Desert
8 εγδικησωμεν	5/6Hev20	?	Judaean Desert
9 εγ	2172	?	South Coast
159	γ > γγ		
1 ζυγγ(ων)	1196	6	Caesarea
160	γγ > γ		
1 εγ<γ>εγραμμενον	5/6Hev12	?	Judaean Desert
2 Λογινος	1577	?	Caesarea
161	γ > δ		
1 ηδορακα	Mur122	?	Judaean Desert
2 ηδορακα	Mur122	?	Judaean Desert
162	γγ > νγ		
1 παρανγει...	Mur115	124 CE	Judaean Desert
2 ενγιστα	Mur114	171 CE	Judaean Desert
3 ενγονιν	2240	4 th CE	South Coast
4 συngenικης	2227	3 rd CE-6 th CE	South Coast
5 E]νγαδα	EinGedi2	?	Judaean Desert
6 ενγυ[η]	5/6Hev5	?	Judaean Desert
7 Ενγαδοις	5/6Hev11	?	Judaean Desert
8 Ενγαδηνος	5/6Hev11	?	Judaean Desert
9 Ενγαδοις	5/6Hev11	?	Judaean Desert
10 Ενγαδοις	5/6Hev11	?	Judaean Desert
11 ενγιστα	5/6Hev14	?	Judaean Desert
12 παρηνγει[λεν	5/6Hev14	?	Judaean Desert
13 παρανγελλω	5/6Hev14	?	Judaean Desert
14 παρήν[γ]ελλέ	5/6Hev15	?	Judaean Desert
15 παρηνγειλα	5/6Hev15	?	Judaean Desert
16 συγγραφην	5/6Hev17	?	Judaean Desert
17 συνγρα[φ]η<ν>	5/6Hev18	?	Judaean Desert
18 Αινγαδων	5/6Hev18	?	Judaean Desert
19 συγγραφην	5/6Hev18	?	Judaean Desert
20 παρ]αν[γ]ει<λ>ει	5/6Hev19	?	Judaean Desert
21 Ηνγαδη[νο]ς	5/6Hev19	?	Judaean Desert
22 Ηνγαδης	5/6Hev19	?	Judaean Desert
23 ενγυς	5/6Hev19	?	Judaean Desert
24 παρανγειλει	5/6Hev19	?	Judaean Desert
25 Ηνγαδηνος	5/6Hev20	?	Judaean Desert
26 Ηνγαδηνη	5/6Hev20	?	Judaean Desert
27 Ηνγαδοις	5/6Hev20	?	Judaean Desert
28 Ηνγαδηνος	5/6Hev20	?	Judaean Desert
29 Ηνγαδηνη	5/6Hev20	?	Judaean Desert
30 Ην[γ]αδηνου	5/6Hev20	?	Judaean Desert
31 Ηνγαδοις	5/6Hev20	?	Judaean Desert
32 ενγυιου	5/6Hev21	?	Judaean Desert
33 ενγυιου	5/6Hev21	?	Judaean Desert
34 π[α]ρην[γ]ιλεν	5/6Hev23	?	Judaean Desert
35 Ην[γαδηνο]ς	5/6Hev23	?	Judaean Desert
36 παρηνγυλεν	5/6Hev23	?	Judaean Desert
37 Ηνγαδην[ο]ς	5/6Hev23	?	Judaean Desert
38 παρανγελλω	5/6Hev24	?	Judaean Desert
39 [π]αρανγελλω	5/6Hev25	?	Judaean Desert
40 παρηνγυλες	5/6Hev25	?	Judaean Desert
41 παρανγελλω	5/6Hev25	?	Judaean Desert
42 παρανγυλε	5/6Hev25	?	Judaean Desert
43 παρανγελλω	5/6Hev25	?	Judaean Desert
44 πα[ρ]ηνγυλες	5/6Hev25	?	Judaean Desert
45 παρηνγυλεν	5/6Hev26	?	Judaean Desert
46 Ηνγαδηνη<ν>	5/6Hev26	?	Judaean Desert
47 παρηνγυλα	5/6Hev26	?	Judaean Desert
48 ενγισε	5/6Hev26	?	Judaean Desert
49 Ηνγαδηνη	5/6Hev34	?	Judaean Desert
50 ενγυ[ς]	1613	?	Caesarea
163	γκ > νκ		
1 μετενενκη	385	1 st CE (before 70)	Jerusalem
2 ασυνκριτε	1515	2 nd CE-3 rd CE	Caesarea
3 συνκται	2644	3 rd CE-5 th CE	South Coast

4 εγκληματικων	1197	465-467 CE	Caesarea
5 Συνκλητικην	2234	3 rd CE-6 th CE	South Coast
6 εγκληματι	5/6Hev17	?	Judaean Desert
7 συνκεχωρηκεναι	5/6Hev20	?	Judaean Desert
8 { {παρα} } συνκεχωρηκεναι	5/6Hev20	?	Judaean Desert
9 συνκεχωρηκεναι	5/6Hev20	?	Judaean Desert
10 ενκαλουν[τος	5/6Hev28	?	Judaean Desert
11 ενκαλουμε[νου	5/6Hev28	?	Judaean Desert
12 ενκαλουντος	5/6Hev29	?	Judaean Desert
13 ε]ν[κ]αλ[ο-]υν[τος]	5/6Hev30	?	Judaean Desert
14 ενκαλουμεν[ου]	5/6Hev30	?	Judaean Desert
164	γχ > νχ		
1 κωνχης	2468	4 th CE-6 th CE	South Coast
2 εντυνχανω	5/6Hev34	?	Judaean Desert
3 εντυνχ[ανω]	5/6Hev34	?	Judaean Desert
165	γ > ο		
1 γιν[ωσκει]	869	7 th CE	Jerusalem
2 γινωσκει	1152	1150 CE	Caesarea
3 [γι]νωσκει	5/6Hev24	?	Judaean Desert
4 γινωσκει	5/6Hev25	?	Judaean Desert
5 γινοσκι	1084	?	Jerusalem
6 γινοσκις	2356	?	South Coast
166	λλ > λ		
1 Κυριλη	296	1 st BCE-1 st CE	Jerusalem
2 Καλ(λ)ωνος	372	1 st BCE-1 st CE	Jerusalem
3 Σαλλαμσειων	588	1 st BCE-1 st CE	Jerusalem
4 αλως	5/6Hev52	?	Judaean Desert
5 Εληνεστι	5/6Hev52	?	Judaean Desert
6 Απολιναριων	901	?	Jerusalem
167	λ > λλ		
1 δεσδεκαλλου	212	1 st BCE-1 st CE	Jerusalem
168	ρ > λ		
1 Φουλειος	416	1 st BCE-1 st CE	Jerusalem
2 Φο<υ>λεια	423	1 st BCE-1 st CE	Jerusalem
3 Φουλεια	424	1 st BCE-1 st CE	Jerusalem
4 Γληγοριας	2210	3 rd CE-6 th CE	South Coast
5 λιβλαριος	5/6Hev15	?	Judaean Desert
6 λιβλαριος	5/6Hev17	?	Judaean Desert
7 λιβλαριος	5/6Hev18	?	Judaean Desert
8 λιβλαριος	5/6Hev20	?	Judaean Desert
9 [λ.]ιβλαριου	5/6Hev21	?	Judaean Desert
10 λιβλαριου	5/6Hev22	?	Judaean Desert
169	λ > ρ		
1 θεοφιρος	2575	?	South Coast
2 αδερφο	2575	?	South Coast
170	λ > ο		
1 αδερφου	1547	?	Caesarea
2 α<λ>υπε	2577	?	South Coast
171	ρ > ρρ		
1 Αρριστοβου[λα]	325	1 st CE	Jerusalem
2 Αρριστοβολα	325	1 st CE	Jerusalem
3 [θεο]δορ{ρ}ω	1051	?	Jerusalem
172	ρ > ο		
1 πρεσβευτηο	2151	4 th CE-5 th CE	Caesarea
173	λ > ο		
1 παρ]αν[γ]ει<λ>ει	5/6Hev19	?	Judaean Desert
174	ψ > μψ		
1 λημψωμε	5/6Hev21	?	Judaean Desert
2 λημψ[ει]	5/6Hev22	?	Judaean Desert
3 αντλημψως	848	?	Jerusalem
4 αντλημψεως	856	?	Jerusalem
175	μψ > μσ		
1 αντλημσεως	2428	?	South Coast
176	μψ > μσ		
1 επεμσα	5/6Hev52	?	Judaean Desert
2 πεμσε	5/6Hev52	?	Judaean Desert
3 [επε]μσα	Mas741	?	Judaean Desert

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