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Iotacism and the Pattern of Vowel Leveling in Roman to Byzantine Era Manuscripts: Perspectives from the Thomas Gignac Corpus

Craig Meister

Abstract

After centuries of debate surrounding the change of the Greek simple vowels and diphthongs ι, υ, η, οι, and ει into the phoneme /i/, the process known as iotacism (sometimes referred to as itacism) has become not only an anomaly of philological analysis, but the phonetic reality of this vowel shift and leveling from the phonemes /i/, /oi/, /e:/, /y/, and /ei/ to /i/ have yet to be linguistically analyzed successfully within various systems of linguistic modeling. In order to fill this important gap within the history of the Greek language, this research seeks to use the use the Roman and Byzantine period papyri corpus of Francis Thomas Gignac (see Gignac, 1976) and review the data according to η>ι, ι>η, υ>ι, ι>υ, and οι>ι orthographic shift instances in order to outline the statistical parameters, within which Greek iotacism began to become more widespread throughout the Greek literature. Through mapping these parameters, this paper aims to more precisely outline the process of iotacism leveling in terms of its possible phonological origins and its diffusion throughout the Ancient Greek vowel system as a product of phonological change as well as acknowledge the need for supplemental manuscript and theoretical studies in order to present a more holistic model of iotacism.

Introduction and Problem

For centuries of Greek and Latin philological study, a plethora of intrigue and confusion has surrounded the historic phonological phenomenon of Greek iotacism, or the leveling of the vowels /i/, /oi/, /e:/, /y/, and /ei/ to /i/. This vowel shift has often been dubbed by centuries of classicists the “Byzantine pronunciation” or the “modern pronunciation,” as it indeed does represent the pronunciation of the modern Greek vowels ι, οι, η, υ, and ει as /i/. This Byzantine/Modern Greek pronunciation together with the manuscript interchangeability of the above vowels observed by Renaissance-era philologists served as a catalyst for the investigation of their hypothesized “classical pronunciation.” The details of the formation of this reconstructed classical pronunciation has its roots with Desiderius Erasmus’s *De recta Latini Graecique Sermonis Pronunciatione*, which outlined Erasmus’s argument concerning the pronunciation of the ι, οι, η, υ, and ει as /i/, /oi/, /e:/, /y/, and /ei/ respectively. This work by Erasmus, while it does indeed hold a basis in various classical grammarians such as Dionysius Thrax, Dionysius of Halicarnassus, and Apollonius Dyscolus, fails to systematize and quantitatively organize the manuscript confusion of ι, οι, η, υ, and ει from which the original argument made by Erasmus for the classical pronunciation of these vowels came. Ultimately while Erasmus’s assertions concerning the pronunciation of the classical Greek vowels have become a pervasive normality throughout classical language study, the work towards more precisely mapping the manuscript evidence of this vowel shift remains evasive among the classical linguist academic community. Noted linguists in classical studies, such as W. Sidney Allen, Chrys Caragounis, and T.C. Snow have submitted both theoretical and empirically based approaches, all arguing both “for” and “against” the Erasmian pronunciation in some way or another.

Allen's *Vox Graeca* (1968), for example, both represents one of the most foundational works within classical pedagogy and widely summarizes the 19th and early 20th century western Indo-European scholarship with acknowledge to the evidence of sound changes from inscriptions, but focuses on an introduction to the linguistic aspects of Ancient Greek phonology with little systematized and wide-ranging evidence supporting his assertions, but referencing accepted Indo-European etymology through Gothic, Old Iranian, Sanskrit, and Latin together with comparisons to current European phonetic systems such as French, German, Italian, and English. Ultimately, Allen openly appeals to pedagogical practicalities and theoretical backing therefore as the motivations for his conclusions rather than wide-ranging, evidence-based reconstruction aims. In short, Allen's evidence is compelling, comprehensive, and deserving of the respect it has been granted over the decades; However, the variety of methodologies used to come to his conclusions on Greek pronunciation require categorized and more comprehensive investigations of his claims, thus, bringing about a greater systematization to his evidence presentation

Caragounis's analysis on the other hand, in his paper "The Error of Erasmus and the Un-Greek Pronunciations of Greek," (Caragounis, 1995) openly presents an array of evidence, mostly inscriptional, while also appealing to practical pedagogical practice for the use of the Byzantine, or "Modern Greek" pronunciation. The tone throughout his work directly correlates with his overwhelming desire to prove the validity of the Modern Greek pronunciation through chronologically far-reaching evidence. Caragounis's motivation for writing comes out prevalently during the opening paragraph of his essay: Namely, in proving the illegitimacy of the Erasmian pronunciation and its perpetuation in the classroom pedagogy. Caragounis's evidence, however, brings forth a similar problem as seen in Allen's *Vox Graeca*: unsystematic and narrow evidence presentation- however valid that evidence may be.

Snow, in his *On the Pronunciation of Ancient Greek* (Snow, 1890), preceded the above two authors, but exemplifies the pervasive methodology of many classicists today: the comparative analysis of Indo-European languages in order to account for the Erasmian commonalities in pronunciation. Snow differs fundamentally in methodology from the aforementioned works in that he employs a comparative analysis, using Sanskrit, Latin, Gothic, and comparative modern language equivalents together with citations of Dionysius Thrax with references to other grammarians in order to hypothesize concerning inscription and historical anomalies in the phonetics of the language. Snow eventually comes to similar Erasmian conclusions concerning post-5th century Attic Greek, but maintains a refreshingly progressive perspective on the realities behind the development of the phonetics, citing empirical evidence with little reference to pedagogical relevance.

Ultimately, these three articles collectively synthesize three main difficulties in methodology, which has plagued classicists addressing linguistic concerns. Firstly, they represent an attempt at finding empirical evidence to support a theory rather than developing a theory from empirical evidence. Secondly, these works use a variety of methods simultaneously in order to prove their theory, rather than categorized and comprehensive methods. Finally, these works assume a preconceived validity or invalidity of the Erasmian pronunciation.

In order to address these three concerns simultaneously, this work aims to firstly, allow the manuscript evidence to speak for itself rather than attempt to prove or disprove a given theory. Secondly, this work (as an intended beginning to a much larger, future work) will employ one method of statistical analysis of manuscripts in order to begin to form a theory of vowel dispersion and (ultimately as a product of future work) come to

conclusions concerning the realities of the pronunciation of the vowels in question. Thirdly, this study will only utilize the Erasmian pronunciation as a reference and beginning point for analysis in order to map possible shifts. Such a reference assumes no validity or invalidity, rather it merely uses common reference in order to track shifts rather than proving or disproving the starting or beginning points (original vowel and orthographic variation). Furthermore, in addressing the problem of the validity of the Erasmian pronunciation, this study does not assume phonetic shift as direct causation for orthographic variance, rather as a correlation between a known shift and its orthographic manifestations, which would naturally vary in cause due to the conditions under which any given author would be working who composed the orthographic variant, - a cause, which would be nearly impossible to track statistically. The Gignac corpus provides a feasible means to begin such correlative statistical tracking.

Methodology

In addressing the manuscript information concerning such long-held habits within the European classical studies community, the reader should be aware that this article does not aim to make an argument evaluating the validity of the use of the Erasmian pronunciation. Rather, this article and its methods aim to present empirically supported facts within related manuscripts so as to provide organized information for future linguistic inquires. Given this spirit of the present work, this research firstly involves the selection of manuscripts containing prevalent orthographic instances of the above-mentioned vowel interchanges. In order to secure such orthographic variants, manuscripts from the transitional Hellenistic to Roman and Roman to Byzantine period will be utilized. Thus, the Thomas Gignac corpus represents a statistically significant number of occurrences in order to observe the distribution of these orthographic errors. In order to do so, this research will perform a statistical analysis of the five orthographic variant distribution patterns (where > signifies the direction of the orthographic variation) $\eta > \iota$, $\iota > \eta$, $\upsilon > \iota$, $\iota > \upsilon$, and $\omicron\iota > \iota$, however the Gignac Corpus indeed covers the other orthographic variants seen in the manuscripts from this era represented in this chart:

original vowel	Orthographic variants
$\eta = /e:/$	$\epsilon\iota, \upsilon, \omicron\iota, \iota$
$\iota = /i/$	$\omicron\iota, \upsilon, \eta$
$\upsilon = /y/$	$\eta, \iota, \epsilon\iota$
$\omicron\iota = /oi/$	$\epsilon\iota, \iota, \eta$

This work chooses to present the five above-mentioned variants due to the need for statistical reliability according sample sizes. Thus, due to the negligible number of instances for orthographic vowel variants like $\omicron\iota > \epsilon\iota$ or $\upsilon > \eta$, the five above-mentioned variants were selected.

In order to create a significant statistical overview of these five variants, the following three statistical analyses will be utilized in order to map the patterns for orthographic variations within the manuscripts during the Hellenistic, Roman, and Byzantine transition periods (from the first century BC to the eighth century AD):

1. Syllable to error occurrence correlation coefficient
2. Percentage of errors occurring on a given syllable-placement type (first syllable, antepenult, penult, ultima)
3. Percentage of errors occurring within a given lexico-syntactic category

As stated, these three criteria aim at serving as specifications for outlining the trends associated with the vowel shift represented in the manuscripts. Criteria such as these provide quantifiable evidence alluding to the place and manner of the vowel shift through outlining parameters which often exist as correlative indicators and media of vowel shift and analogical process (see Skousen, 1989; de Guyter, 2000).

Results

In order to obtain the necessary data for the above three criteria, the orthographic vowel variants within the Gignac Corpus were organized according to the vowel variant type, the syllable where the vowel variant occurred, the syntactical category of the lexical item where the vowel variant occurred, and the frequency of each vowel variant occurrence within the above-included criteria. The results from each category were thus¹:

$\eta > \iota$

3 syllables or less		Correlation Coefficient - Syllables in word/ occurrences			
	total occurrences	Percentage	-0.522148276		
64		77	0.831168831		
	ultimate	penultimate	antepenultimate	first	
number	41	16	10	9	
percentage	0.532467532	0.207792208	0.12987013	0.116883117	
	article/clitic	verb/participle	noun/adjective		
number	16	16	39		
percentage	0.207792208	0.272727273	0.519480519		

Within this data set for the original η is changed with ι , the highlighted areas show firstly over 83% of the orthographic variants occurring in words 3 syllables or less. In establishing the validity of this prevalent statistic, the correlation coefficient (r) between the number of syllables in each word and the occurrences of errors in those words was shown to be a moderate $r = -0.522148276$. Similarly, a stark 53.2% of the $\eta > \iota$ vowel variations represented in the manuscripts were on the ultima syllable. This suggests a high correlation, by nature of the ultima syllable in Greek, to the morphology of Greek. Complementing this indicator concerning the ultima syllables on three syllable-words, stands the strong 51.9% of the noun/adjective syntactic category. Nearly double the number of such errors in comparison to the verb/participle and article-clitic categories occurring in the $\eta > \iota$ vowel variation type creates a clearer picture of the nature of this

¹ Note that a complete chart of all orthographic variants for each vowel interchange is represented on the charts in the appendix

vowel leveling. **Thus, the $\eta > \iota$ vowel change seems to affect predominately ultima syllables, which are on nouns 3 syllables or less.** Furthermore, the $\eta > \iota$ change is, by far, the most prevalently represented orthographic vowel variant seen in the corpus. Such a prevalence supports the long-standing observation that Greek vowel leveling generally centered around the $\eta > \iota$ and $\iota > \eta$ interchange during the Roman era. In fact, out of the total 225 vowel variations observed in this study, 125 dealt with the $\eta > \iota$ and $\iota > \eta$ interchange, or 55% of the total vowel variations.

$\iota > \eta$

					Correlation Coefficient - Syllables in word/ occurrences
3 syllables or less					
number	total occurrences	Percentage			-0.207704646
	32	48	0.666666667		
number	ultimate	penultimate	antepenultimate	first	
	12	26	6	2	
percentage	0.25	0.541666667	0.125	0.041666667	
number	article/clitic	verb/participle	noun		
	9	3	36		
percentage	0.1875	0.0625	0.75		

This data represents the ι interchange to the η in the manuscript orthography. In contrast to the above $\eta > \iota$ data, the $\iota > \eta$ change shows a significant drop in the percentage of vowel variations under 3 syllables to only 66%. This difference does not represent a drastic drop in apparent significance that the $\iota > \eta$ change, like the $\eta > \iota$ change, tended towards 3 syllable words. However, the correlation coefficient between the number of syllables in the word and the number of occurrences indicates a weak correlation. In contrast, significance arises in the 54% of vowel variations occurring on the penultimate syllable. While significant, it does not imply the same type of possible morphological connection rather a noun root correlation - the prevalence of connection to noun roots evinced from the 75% percentage of vowel variations within the noun lexico-syntactic category. Thus, while the number of syllables in the $\iota > \eta$ vowel variation is not statistically significant, the change remains prevalent among penultimate syllables on nouns.

$\upsilon > \iota$

					Correlation Coefficient - Syllables in word/ occurrences
3 syllables or less					
number	total occurrences	Percentage			-0.317871461
	13	43	0.302325581		
number	ultimate	penultimate	antepenultimate	first	
	3	7	7	29	
percentage	0.069767442	0.162790698	0.162790698	0.674418605	
number	article/clitic	verb/participle	noun		
	1	4	38		
percentage	0.023255814	0.093023256	0.88372093		

The υ replacement with ι shows similar lack of correlation between the number of syllables in a word and the number of $\upsilon > \iota$ vowel variations in comparison with the $\iota > \eta$ vowel variation. The distribution across syllable placement type, however, is significantly more prevalent with 67.4% falling on the first syllable of the word. This statistic however seems to be skewed by the fact that 21 of the 43 vowel variances occurred across various manuscripts within the word $\beta\acute{\iota}\beta\lambda\omicron\varsigma$ (bible) with its disputed variant. This instance, while it does indeed show the tendency towards the first syllable of the word and the noun as indicated by the 67.4% of occurrences falling on the first syllable of the word and the 88.4% falling on the nouns, this particular corpus can attribute a great statistical portion of those representations to the single word $\beta\acute{\iota}\beta\lambda\omicron\varsigma$ being often interchanged orthographically with " $\beta\acute{\upsilon}\beta\lambda\omicron\varsigma$." However, while the circumstances surrounding the distribution of these vary in weight on given words, the principle of concentrated areas of given vowel variant patterns remains the same: the variation pattern tend towards given words and/or word patterns in terms of syllable placement, number of syllables, and lexico-syntactic category.

$\iota > \upsilon$

3 syllables or less		Correlation Coefficient - Syllables in word/ occurrences			
number	total occurrences	Percentage			
28	34	0.823529412	-0.097273027		
	ultimate	penultimate	antepenultimate	first	
number	1	11	22	0	
percentage	0.029411765	0.323529412	0.647058824	0	
	article/clitic	verb/participle	noun		
number	1	1	32		
percentage	0.029411765	0.029411765	0.941176471		

A similar trend as seen in the $\upsilon > \iota$ vowel variation is seen in this $\iota > \upsilon$ variation; This $\upsilon > \iota$ variation centers around the lexical item $\eta\mu\iota\sigma\acute{\upsilon}$ (half; singular, neuter, nominative/accusative), where it is written $\eta\mu\sigma\acute{\upsilon}$. Thus, a prevalent 83% of $\iota > \upsilon$ variations occurred in 3 syllables or less, 64% on the antepenult syllable, and 94.1% in nouns/adjectives. Such a trend points towards, again, a general tendency of vowel shifts stemming from or gravitating towards particular words.

$\omicron\iota > \iota$

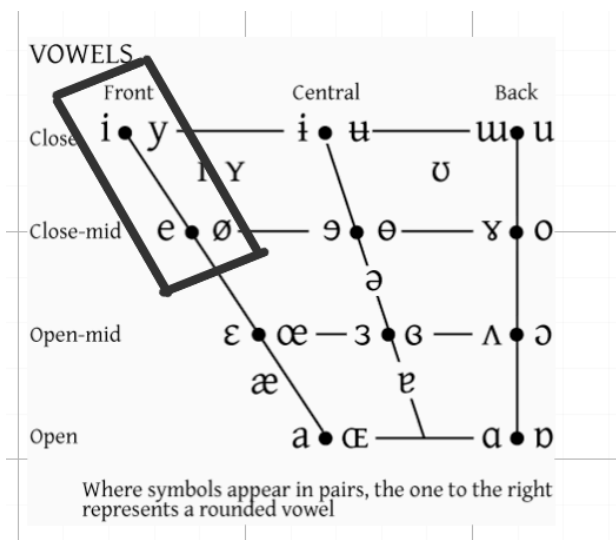
3 syllables or less		Correlation Coefficient - Syllables in word/ occurrences			
number	total occurrences	Percentage			
12	24	.50	-0.112225035		
	ultimate	penultimate	antepenultimate	first	
number	8	14	0	0	
percentage	0.333333333	0.583333333	0	0	
	article/clitic	verb/participle	noun		
number	1	9	14		
percentage	0.041666667	0.375	0.583333333		

Results from the $\text{o} \text{I} > \text{I}$ vowel variation show not only an equal distribution between words with 3 syllables or less and those above three syllables, but reinforced the idea that the distribution according to syllable was insignificant due to the low correlation coefficient of .11. The syllable placement of the $\text{o} \text{I} > \text{I}$ variant of 58.33% also indicated a slight tendency towards the penultimate syllable in distribution, but did not indicate necessarily a strong correlation. Similarly, 58.33% of $\text{o} \text{I} > \text{I}$ variants occurred on nouns.

Discussion

The seemingly disarray of information here and inconclusive nature of some variation sets in fact lead to cohesive conclusions in combination.

1. The manuscripts indicate a stark gravitation towards the η and I interchange as shown through the 55.3% of the given vowel variations within these variation sets.
2. Given the principles of analogical process in historical phonology (see Elvira, 1998) such as innovation and constraint systems (Kiparsky, 2000), distribution tends to originate from a given phonological environment and spread throughout the phonology given particular constraints such as this case limited to front middle vowels in the case of the $\eta < > \text{I}$. While more from future studies of the above data empirical data would certainly be needed to further support such a claim, the above characteristics surrounding the $\eta > \text{I}$ interchange would suggest that the $\eta > \text{I}$ interchange started in the morphological affixations, most likely focusing on nouns of three syllables or less.
3. The stronger relationships seen between the $\text{I} < > \text{v}$ vowel variants and root words (indicated by the focus on the penultima, antepenultima, and the first syllable) point to a gravitation of the phonological change towards I within the roots of the lexical items rather than the morphology as seen in the $\eta < > \text{I}$ interchange. A similar gravitation can be inferred from the $\text{o} \text{I} > \text{I}$ emphasis on the penultima. Furthermore, the $\text{I} < > \text{v}$ interchange, in light of the initial interchange $\eta < > \text{I}$ (vowel shift focusing on front mid vowels shifting towards front high vowels), the constraint systems seem to have expanded from unrounded vowels to rounded vowels, thus including the /y/ or v and excluding the \emptyset (as it does not exist in Greek), represented in the following chart focusing on the outlined boundaries of the phonological change:



4. The negligible number of errors from the other vowel combinations represented on Table 1 and not represented by the six vowel combinations seen in the above-examined, given the principle of innovation combined with a shrinking constraint system, would indicate the lack of widespread orthographic variants such as the combinations $\omicron\iota > \epsilon\iota$, $\omicron\iota > \upsilon$, or $\eta > \upsilon$ as shown above.

5. We could, thus, conclude that the spreading of the phonological phenomenon, iotacism, from the transition period of the Hellenistic to Roman era moving through the Byzantine era, as far as the manuscripts denote, centered on the $\eta < > \iota$ orthographic interchangeabilities, mostly likely centering on the morphology of nouns containing η . Given the principles of analogical modeling the change then spread to other phonemes encompassing the principle of analogical change through including rounded vowels, then most likely moving to diphthongs gliding towards front high unrounded vowel such as $\omicron\iota$ and $\epsilon\iota$ causing the subsequent orthographic variations seen in the Gignac manuscripts. While these changes may have happened in relative chronological proximity to each other (as evident from the observable simultaneous presence of the variants in the dated manuscripts), the origin of the change may be indicated from the statistically significant concentration of the $\eta < > \iota$ interchange throughout the corpus.

Concerns and Future Work

A natural inclination in addressing corpus linguistics is to question the validity concerning the representation of the given corpus data. Firstly, one may question the Gignac corpus as a true representation of the Greek phonological system during the Roman and early Byzantine period. While this line of inquiry is certainly well-based, this research recognizes the somewhat limited predictive scope of orthographic errors, especially within transitions periods of the phonetics and phonology of a language. Such a debate has surrounded the distinction between isophones and isographs as seen in Fisiak (1982). The discussion surrounding this debate remains pervasive; however, as Fisiak points out, the use of orthography and observable variants should be considered as variables aiding in the reconstruction, reinforcing given theoretical approaches, and supplementing additional quantitative or qualitative research. In short, the trends and data observed in this study from the Gignac corpus serve as one component in the evaluation and reconstruction of the ancient Greek vowel system and its level process undergone throughout the Hellenistic, Roman, and Byzantine era as represented in the manuscripts of that time.

Future work concerning the use of the above-mentioned era manuscripts would involve using other corpora in order to establish or refute the types of trends seen in the Gignac corpus. Such work would indeed provide more quantitative data in order to assess the statistical accuracy of the centuries' claims and provide a clearer picture of the historical linguistic processes, which brought about the phenomena observed in the manuscripts of yesteryear and the mouths of the Greeks today. Furthermore, this type of data could be combined with other analysis, theoretical or otherwise, in order to form more synthesized theories as to the phonetic value of these shifts and its origins as well as more holistic overviews of the shift as a whole.

Appendix

Raw data for each vowel change combination:

η > ι		occurrences	syllable accent	syllable total in word	verb-participle/nouns/clitic-article
αὐρήλος	αὐρίλιος x1	1	pen	4	noun
ἐπιτροπὴν	ἐπιτροπίν x1	1	ult	4	noun
βουληθῆς	βουλιθῆς x1	1	pen	3	verb
δῆλα	δῖλα x1	1	pen	2	noun
καμήλων	καμίλων x2	2	pen	3	noun
ἐφήκασιν	ἐφίκασιν x1	1	antpen	4	noun
αἰρήσης	ἐρίσης x1	1	pen	3	verb
ποιῖσαι	ποιῆσαι x1	1	pen	3	verb
ἐλυπήθην	ἐληπίθην x1	1	pen	4	verb
συνομολογήσω	συνομολογίσω x1	1	pen	6	verb
τιμῆς	τιμῖς x2	2	ult	2	noun
λήμματος	λίμματος x1	1	antepen	3	noun
ἥμισυ	ῖμισυ x2	2	antepen	3	noun
ἠπιτητῆ	ἠπιτῖ x1	1	ult	3	noun
τῆ	τῖ x4	4	ult	1	article
ἀρετῆ	ἀρετί x1	1	ult	3	noun
μή	μί x12	12	ult	1	article
αὐλητής	αὐλιτής x1	1	pen	3	noun
ληστάς	λιστάς x2	2	pen	2	noun
ἀπηλιώτη	απιλιώτι x1	1	antepen	4	noun
δημοσίου	διμμωσίου x2	2	(first)	4	noun
ἐκκλησίας	ἐκκισίας x1	1	antepen	4	noun
ὁμογνησίου	ὁμογνισίου x1	1	antepen	5	verb
ἀδελφώτηταν	ἀδελφώτιταν x1	1	pen	5	noun
βοήθησον	βοήθισον x1	1	pen	4	verb
μελισάτω	μελισάτω x1	1	antepen	4	verb
κελεύσις	κελεύσης x2	2	pen	3	verb
ὠμίλησα	ὠμείλισα x1	1	pen	4	verb
ἡμερησίως	ἡμερισειῶς x1	1	antpen	5	noun
ληκύθιον	λικύθην x1	1	antepen	3	noun
σημειοφόρω	σιμιαφόρω x1	1	(first)	5	noun
μηχανήν	μιχανήν x4	4	(first)	3	noun
ἡμικολλίου	ἱμικολλίου x2	2	(first)	5	noun
ἐγράφη	ἐγράφι x4	4	ult	3	verb
μαρτυρήσει	μαρτυρήσι x1	1	ult	4	verb
ἔχη	ἔχι x1	1	ult	2	verb
παραίτηση	παραιτήσι x2	2	ult	4	verb
φερούση	φερούσι x1	1	ult	3	verb
πάση	πάσι x8	8	ult	2	noun
δεσπότη	δεσπότι x2	2	ult	3	noun
ἠγησαμένη	ἠγησαμένι x1	1	ult	5	verb

ι > η		occurrences	syllable accent	syllable total in word	verb-participle/nouns/clitic-article
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ιδιοτικῶν > x2	ἡδιοτικῶν	2	ult	5	noun
ιδίου > x2	ἡδίου	2	pen	3	noun
ιδίοις > x2	ἡδίοις	2	pen	3	noun
ιδίοχηρον > x1	ἡδίοχηρον	1	(first)	5	noun
βασιλική > x1	βασιληκή	1	pen	4	noun
ψηλούς > x1	ψηλούς	1	pen	2	noun
πρᾶσιν > x1	πρᾶσιν	1	ult	2	noun
ἔκτισιν > x2	ἔκτισιν	2	pen	3	noun
κατεχώρισα > x1	κατεχώρησα	1	pen	5	verb
ἄχρις > x3	ἄχρης	3	ult	2	article-clitic
ἰμάτια > x1	ἡμάτια	1	first	4	noun
ἦμισυ > x1	ἦμισυ	1	pen	3	noun
τις > x3	της	3	ult	1	article-clitic
δεξιάν > x1	δεξηάν	1	pen	3	noun
διαγραφῆς > x1	δηαγραφῆς	1	(first)	4	verb
ἀρχιυπερετου > x1	ἀρχηυπερετου	1	(second)	6	noun
γνώσις > x2	γνώσης	2	ult	2	noun
μικρῶν > x1	μηκρῶν	1	pen	2	noun
τιμήν > x1	τημήν	1	pen	2	noun
μισθόν > x1	μησθόν	1	pen	2	noun
μισθοῦ > x1	μησθοῦ	1	pen	2	noun
χάριτι > x1	χάρητι	1	pen	3	noun
ἴσασι > x1	ἦσασει	1	antepen	3	verb
χρίματος > x1	χρήματος	1	pen	3	noun
ἴνα > x3	ἦνα	3	pen	2	article-clitic
κομίσης > x1	κομήσης	1	pen	3	noun
ὕμῖν > x1	ὕμῃν	1	ult	2	noun
ῥῆγος > x1	ῥῆγος	1	pen	2	noun
νομίσματι > x3	νομήσματι	3	antepen	4	noun
μακαρίου > x1	μακαρήου	1	pen	4	noun
οἰκίδιον > x2	οἰκήδιον	2	pen	4	noun
χίλιαι > x1	χήλιαι	1	antepen	3	noun
φοινίκων > x1	φοινήκων	1	pen	3	noun
ἀποκρίσεως > x1	ἀποκρήσεως	1	antepen	5	noun

		occurrences	syllable accent	syllable total in word	verb-participle/nouns/clitic-article
U > I					
ἦμισυ	ἦμισι	3	ult	3	noun
συνπεφωνεμένη	σινπέφωνημένη				
ὑάλου	ιάλου	1	first	6	verb
νύνι	νινεί	2	first	3	noun
ὑπέρ	ἰπέρ	1	pen	2	noun
ὑπέρ	ἰπέρ	1	first	2	article
γλυκυτάτην	γλικυτάτην	1	antepen	4	noun
κυρίου	κιρίου	1	antepen	3	noun

πεπλυμένας	πεπλιμένας	1	antepen	4	verb
κυαθίων	κιαθίων	1	first	4	noun
χρυσοῦ	χρισοῦ	1	pen	2	noun
Ἵξυρύγγων	Ἵξυρίγγων	2	pen	4	noun
Εὐροσύνην	Εὐροσίνην	1	pen	4	noun
συγχύσει	συχίσει	1	pen	3	verb
δύναμαι	δίναμαι	1	first	3	verb
πρεσβύτερος	προσβίτερος	1	antepen	4	noun
ἀλληλεγγύου	ἀλληλεγγίου	1	pen	5	noun
σύστατις	σίστασις	1	first	3	noun
βίβλος	βύβλος	21	first	2	noun
συνόλη	σινόλη	1	first	3	noun

I > U

		occurrences	syllable accent	syllable total in word	verb-participle/ nouns/clitic- article
σιαγόνη	суαγόνη	2	pen	4	noun
φιάλη	φυάλη	1	pen	3	noun
κιβαρίου	κυβαρίου	1	pen	4	noun
κρίθων	κρυθῶν	1	pen	2	noun
καταξιοῦσα	καταξυοῦσα	1	pen	5	verb
σφυριδίων	σφυρυδίων	1	pen	4	noun
τιμίου	τυμίου	1	pen	3	noun
Χριστοῦ	Χρυστοῦ	1	ult	3	noun
μυλιαρίσιον	μυλιαρίσιν	1	antepen	7	noun
ἦμισυ	ἦμυς	19	antepen	3	noun
ἐρίφια	ἐρύφια	1	antepen	3	noun
σφυρίδιον	σφυρύδιν	1	antepen	3	noun
κυρῦο	κυρίω	1	pen	3	noun
καυσίμων	καυσύμων	1	pen	3	noun
ἶνα	ῦνα	1	pen	2	article

OI > I

		occurrences	syllable accent	syllable total in word	verb-participle/ nouns/clitic- article
πλοῖον	πλῖον	3	pen	2	noun
οἶδα	ἶδα	1	pen	2	verb
μοι	μι	2		1	noun
βοηθοῖς	βοηθῖς	1	ult	3	verb
ὁμοίως	ὁμίος	1	pen	3	noun
λοιπόν	λπόν	1	ult	2	article
ποιῶ	πιῶ	1	ult	2	verb
ἀνοικοδομουμένοις	ἀνικοδομουμένις	1	pen	7	verb
φοινικίων	φινικίων	1	pen	4	noun
στοικεῖ	στιχῖ	5	ult	2	verb
οἶνον	ἶνον	1	pen	2	noun
ἐτοίμως	ἐτίμως	1	pen	3	noun
κάστροις	κάστρις	1	pen	2	noun
ἐνοικίου	ἐνικίου	4	pen	4	noun

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