A Genealogical History of the Greek Text of the New Testament

Volume 16

A Genealogical History of the Greek Text of the Second Epistle to Timothy

By

James D. Price

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PREFACE

My interest in textual criticism was first aroused when I studied the subject in seminary in the 1950s, and my interest in tree-diagraming (also called *stemmatics*) was first awakened when, in the 1960s, I learned to apply it to grammatical analysis and to computer aids for translation. I learned that the method works best when applied always to the most deeply imbedded unanalyzed element—that is, the element at the lowest hierarchic level. When I began using tree-diagraming techniques to teach Hebrew grammar and syntax in the 1970s, it occurred to me that the same analytic principles would logically apply to textual criticism, and that just as these principles could be implemented by computer programs for grammatical and syntactical analysis of language, so also, they could be implemented for the genealogical analysis of textual criticism. So began a lifetime of research and experimentation to create a computer program for reconstructing the genealogical history of an ancient text based on genealogical principles and tree-diagraming.

Earlier textual scholars had determined that the key to the genealogical history of a text lies in those places in the text where its manuscript copies differ, and that the percentage of agreement between two manuscript copies at those places of variation is a measure of their genealogical affinity. I call that percentage of agreement *quantitative affinity*. Gradually over time I realized that the variant readings in a manuscript are a record of its genealogical history; its variant readings are the accumulation of the inherited genetic mutations of all its ancestor exemplars, and its variants constitute a kind of genetic DNA code. One must learn to read the history of a manuscript from its genetic code. Quantitative affinity was one of the leading principles guiding my earlier research and computer implementation.

Eventually I also realized that a manuscript inherits the unique mutant variants of its parent exemplar and only its sibling sister manuscripts share those same variant readings. That collection of variants peculiar to sibling sister manuscripts serves as their genetic marker—a kind of sibling gene. Every manuscript has a marker by which its sister manuscripts may be identified. For lack

of a better term, I call that marker a *sibling gene*. Now I am not naïve enough to suppose that in a collection of extant manuscripts every *sibling gene* marks real sister manuscripts, although it often does; but what it actually marks are nearest relative manuscripts having a recoverable nearest common ancestor exemplar. The presence of the sibling gene assures true genetic relationship and a consistent line of genealogical descent.

This work brings together both quantitative affinity and the sibling gene, working in harmony with tree diagraming methodology, to reconstruct parent exemplars one at a time, always for the most remote unreconstructed branch—that is, the most deeply imbedded branch, being at the lowest hierarchy or the most recent generation—to reconstruct the genealogical history of the text of an ancient document one branch at a time. The principles and analytical methods of this theory have been implemented and tested on computer software which I call Lachmann-10. That is what this work is all about.

James D. Price

Chattanooga, TN

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CHAPTER 1
INTRODUCTION

This book is the sixteenth in a series of studies regarding the genealogical history of the text of the Greek New Testament. Volume 1 provided the genealogical history of the Greek text of the Gospel of Matthew; this volume does the same for the Second Epistle to Timothy. The first volume provides an introduction to textual criticism, a review of the various textual critical theories and methodologies, a description of a genealogical theory of textual criticism along with its methodology. Readers not familiar with that volume should read at least the first four chapters of that study before going further, because this work presumes the reader has that informed background. What follows is a brief summary of those chapters.

Textual Criticism

Textual criticism is the branch of literary science which studies surviving copies of ancient literature[1] with the intent of determining the original form of a literary composition.[2] The problem is that surviving copies of a composition differ because of scribal errors accumulated during the copying history of the composition. At certain places in the text of a composition, existing copies may differ, one having this reading, another having that reading, and yet another having the reading originally written by the author. Such places are called places of variation, and such differing readings are called textual variants. Every place of variation has at least two textual variants.

Because every manuscript is a copy of some earlier copy (exemplar), intuitively one imagines the history of the manuscripts of a composition to be like a family tree. So initially textual scholars of classical literature took this approach with some measure of success. However, when it came to the text of the Greek New Testament, scholars despaired and regarded the genealogical

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[1] Literature composed before the invention of printing, copies of which exist only in handwritten documents. A handwritten copy is referred to as a manuscript.

[2] The original text of a composition, that is, the actual words written by the hand of its author, is referred to as its autographic text.

approach as much too complex because of the large number of manuscripts and large number of variants. So, various theories and methodologies were developed to work with the variants at each place of variation to decide which one is more likely original. But with the development of high-speed computers, the complex data processing is no longer a problem; all that is needed is a viable genealogical theory together with its associated programable methodology. That's where this project came on the scene.

The present genealogical theory is based on several known facts about the relationship of manuscripts and variant readings. (1) It is a fact that the variants in a manuscript consist of all the uncorrected scribal errors of its ancestral exemplars;[3] this collection of variants may be regarded as the genealogical history of the manuscript, and may be likened to its DNA code. In addition, the variants introduced by the parent exemplar of a manuscript may be regarded as its sibling gene. So, every manuscript has its own DNA and sibling gene, and these data are recoverable from the manuscript database. (2) Sibling manuscripts may be identified by mutual sibling genes, or by greatest quantitative affinity,[4] or by both. (3) Sibling manuscripts are daughters of the same parent exemplar the readings of which may be recovered from the consensus of its daughters' readings, except where no consensus exists. Sibling daughter manuscripts inherit all the readings of their parent exemplar except where their own scribes initiate a new one. In case of ambiguity (where no consensus exists), one variant will have been inherited and the other will have been newly initiated. Inherited variants have history and may be identified by the principle of delayed ambiguity,[5] whereas newly initiated variants have no history and fail the test of delayed ambiguity. (4) A reconstructed exemplar may stand in place of all its descendants in the database, and function as their representative in that stage of reconstructing the genealogical history. (5) Iteration of the above steps will converge genealogical stemma into a single exemplar representing the autographic text. The actual methodology as described in the first volume is more complex than the above, but the above is sufficient to describe the basic principles.

The Problem of Mixture

Mixture occurred when a scribe copied from more than one exemplar. Critics of the genealogical method assert that mixture creates an irresolvable complication. But, as it turned out, as far as the reconstructing procedure is concerned, a reading copied from a secondary exemplar is

[3] An exemplar is a manuscript from which other manuscripts were copied.

[4] Quantitative affinity is a measure of how similar two manuscripts are to one another.

[5] The principle of delayed ambiguity says that the inherited variant will be a reading of a sister exemplar when it develops.

no different than a variant newly initiated by the scribe either by mistake or intent. Both are uninherited from the primary exemplar; the only difference is that a newly initiated variant has no history, whereas a variant borrowed by mixture has a history, but a history outside the genealogical descent of the primary exemplar. So, mixture is not a problem for the reconstruction methodology described above. The sources of mixture in genealogical history may be of interest in some cases. A separate algorithm of the software finds the most likely source of every variant introduced by mixture rather than by scribal error or intent.

The Database Used

The database used in this project is derived from an expansion of the Nestle-Aland 27th edition of the *Greek New Testament*[6] hereafter referred to as NA-27. The variations of the text are listed at the bottom of each page, providing the verse number where the variation occurs, the associated symbol indicating the kind of variation, the alternate readings that occur there, and a list of witnesses[7] that contain the given alternate reading. The list of witnesses is provided in compressed form in order to avoid as much repetition as possible. This compressed form is useful for conserving paper and ink, and is relatively easy for scholars to follow. But the computer software must have every item of data explicitly recorded, that is, there must be a record of every witness to the text under study, and a record of which variant reading each witness has at every place of variation. This necessity requires the NA-27 database to be unpacked and expanded. Until recently the NA-27 database existed only in printed form, and expanding the data into the form needed by the genealogical software was a complex and time-consuming task.[8] However, the database is now available in digital electronic form in the *Stuttgart Electronic Study Bible*.[9] That form of the database is capable of being expanded and unpacked electronically.

The expanded database consists of two separate files, one containing a list of every witness together with its name, date, language, and content. The second file is a list of every place of variation in the NA-27 database, the chapter and verse number where the variation occurs, the Greek text of each variant at that place of variation, along with a list of witnesses containing the given variant.

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[6] *Novum Testamentum Graece* (Stuttgart: Deutsche Bibelgesellschaft, 1997).

[7] The witnesses consist of individual manuscripts, translations, and patristic quotations.

[8] All my prior research with the genealogical software was done with data manually extracted from the already expanded database in the United Bible Society's *Greek New Testament*.

[9] Christof Hardmeier, Eep Talstra, and Bertram Salzmann, *The Stuttgart Electronic Study Bible* (Stuttgart, Germany: The German Bible Society, 2004); used with permission.

The present program, called Lachmann-10 herein, is written in the Turbo Pascal 7.0 programming language intended for IBM compatible machines with extended memory. The size of the problems it can handle is flexible and is limited only by the amount of RAM available and the speed of the machine [up to a maximum of 2,000 variation units and 2,000 manuscripts]. Large problems require a reasonable amount of time to converge on a solution. The next chapter describes the genealogical history of the extant witnesses to the Greek text of the Second Epistle to Timothy.

CHAPTER 2
WITNESSES TO THE TEXT OF 2 TIMOTHY

The witnesses[1] to the text of the Book of 2 Timothy used in this study are those derived from the electronic form of the textual apparatus of the NA-27 edition of the Greek New Testament as contained in the *Stuttgart Electronic Study Bible*[2] as edited and modified for the purposes of this project. They consist of 90 existing witnesses[3] of various types:

(1) Papyrus manuscripts	0
(2) Uncial manuscripts	20
(3) Minuscule manuscripts	33
(4) Lectionary manuscripts	2
(5) Latin Versions	11
(6) Egyptian Versions	4
(7) Syriac Versions	2
(8) Greek Church Fathers	6
(9) Latin Church Fathers	4
(10) Printed Editions	8[4]

The witnesses to the text of an ancient document must have several characteristics before a reasonably reliable reconstruction of its genealogical history can be made. Among these are (1)

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[1] I use the term *witness* because the reconstruction of genealogical history derives evidence not only from extant manuscripts but also from ancient translations and quotations from church fathers. In addition, a few printed editions are involved although not for reconstruction purposes.

[2] Christof Hardmeier, Eep Talstra, and Bertram Salzmann, *The Stuttgart Electronic Study Bible* (Stuttgart, Germany: The German Bible Society, 2004).

[3] Appendix A lists all the extant witnesses by name, date, language, content, number of readings, and percentage of completeness.

[4] Four editions of the Latin Vulgate: vg^cl, cg^s, vg^st, and vg^ww; Scrivener's TR; Hodges-Farstad HF; Robinson-Pierpont's RP; and NA-27. These do not contribute to reconstructing the stemma.

number of witnesses, (2) date, (3) completeness, (4) limited variableness, (5) commonness of text, and (6) genealogical affinity. These characteristics of the available witnesses to the text of 2 Timothy are discussed below and are shown to be suitable for a reasonable reconstruction of its textual history.

Number of Witnesses

Contrary to the number of available witnesses to the texts of ancient classical literature, there are approximately 2,328 existing Greek manuscripts of the Gospels, including about 178 fragments.[5] This does not include the witnesses of the ancient translations and church fathers. This study makes use of the 90 witnesses to the Book of 2 Timothy recorded in the NA-27 apparatus which includes all the ancient papyri witnesses and most of the existing manuscripts dating before the ninth century and a good sample of those from later times. This number includes the consensus witness of the many manuscripts of the text used in the Greek speaking Byzantine churches together with a number of manuscripts related to the Byzantine text. Also, it contains the consensus witness of the many manuscripts of the Latin Vulgate and the individual witness of four different printed editions of the Vulgate. The various Old Latin translations also are represented by a consensus of a number of manuscripts of each of these individual translations. Consequently, the consensus witnesses bring many additional manuscripts indirectly into the reconstruction process. There is good reason to believe that there are sufficient witnesses to the text of the Book of 2 Timothy to reconstruct its genealogical history.

Date

While it is possible to reconstruct the genealogical history of a text without the benefit of dates, they are very helpful for accurately locating scribal activity in real history. The dates of the witnesses to 2 Timothy range from the third to the twentieth century.[6] Table 2.1 and its associated graph display the reasonably good distribution of the witnesses by date.

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[5] Aland, Kurt, and Barbara Aland. *The Text of the New Testament*, trans. by Erroll F. Rhodes. (Grand Rapids: Wm. B. Eerdmans Publishing Co., 1987), p. 83.

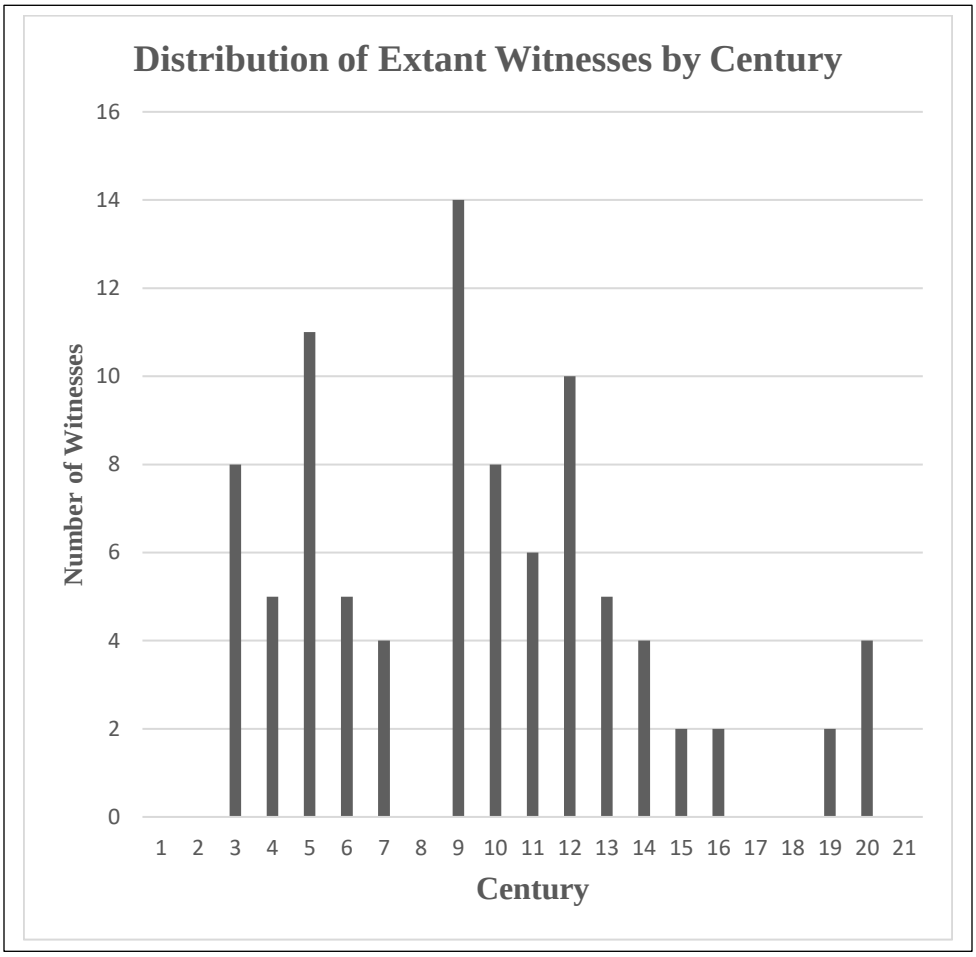
[6] The witnesses in the 19th to the21st centuries are printed editions that do not contribute to the reconstruction of the genealogical history.

Completeness

Many of the witnesses are fragmentary, not all their text having survived the passage of time. Only 52 of the 90 witnesses have 96-100% of their text complete, and only 54 have a text 80% or more complete; thus, completeness is significant for this study. Table 2.2 and its associated graph display the distribution of completeness for the witnesses used in this study.

Table 2.1:
Distribution of Extant Witnesses by Century:

Century	Number of Witnesses
1	0
2	0
3	8
4	5
5	11
6	5
7	4
8	0
9	14
10	8
11	6
12	10
13	5
14	4
15	2
16	2
17	0
18	0
19	2
20	4
21	0

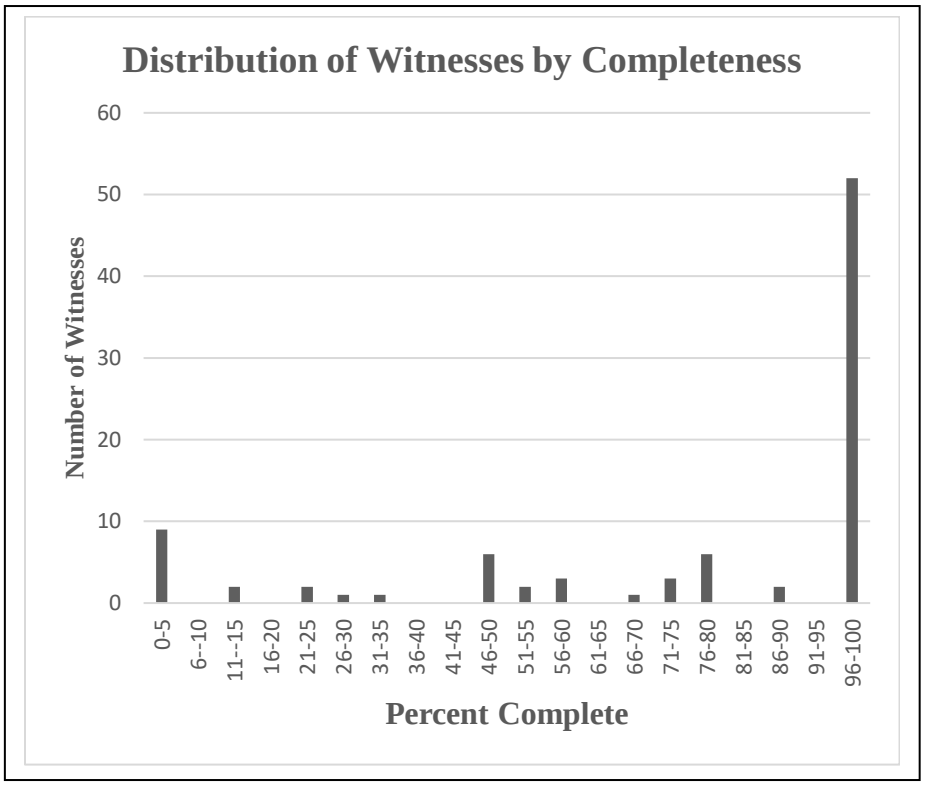


Completeness is important for the reconstruction of the textual history, because the computer depends on minimal difference between witnesses to determine quantitative affinity. Consequently, the computer reconstructed the genealogical history on the basis of witnesses having at least 80% of their text complete; the more fragmentary witnesses are added to the genealogical

tree where they best fit after the tree is constructed. The fragmentary witnesses are still important and should not be excluded from the study because they contribute to establishing fixed dates in the textual history.

Table 2.2
Distribution of Witnesses by Completeness:

% Complete	Number of Witnesses
0-5	9
6-10	0
11-15	2
16-20	0
21-25	2
26-30	1
31-35	1
36-40	0
41-45	0
46-50	6
51-55	2
56-60	3
61-65	0
66-70	1
71-75	3
76-80	6
81-85	0
86-90	2
91-95	0
96-100	52



Because many of the witnesses are fragmentary, it is of interest to know the distribution of those witnesses having 80% or greater completeness. They are the ones that contribute to the re-construction of the genealogical history. Table 2.3 and its associated graph display the distribution of these witnesses. It is evident that numerous contributing witnesses are from as early as the fourth century, so a reasonably good reconstruction can be expected.

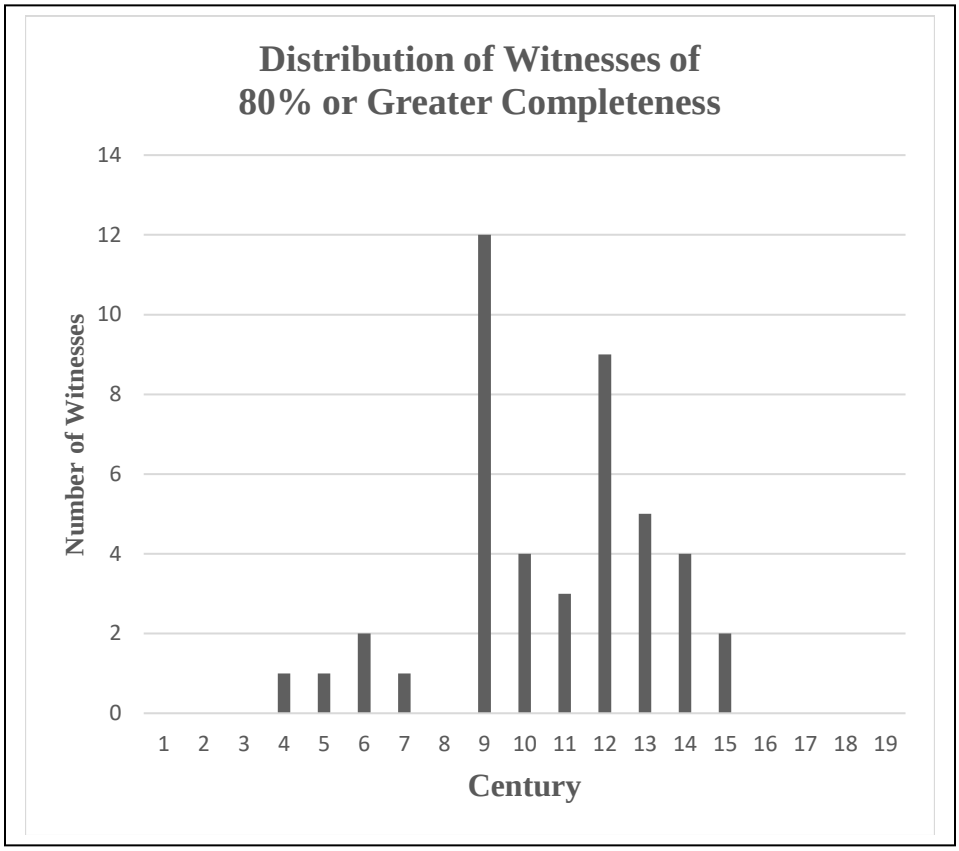
Limited Diversity

The more diverse the text the more difficult the reconstruction of its textual history is. In the overall picture, all witnesses to 2 Timothy agree in over 90% of the text. The places of variation and the number of variants at those sites provide the data for reconstruction. However, even so,

the number of places of variation and the number of variants constitute a limit to what can be reconstructed because of the magnitude and complexity of the problem.

Table 2.3
Distribution of Witnesses of 80% or Greater Completeness by Century

Century	Num. of Witnesses
1	0
2	0
3	0
4	1
5	1
6	2
7	1
8	0
9	12
10	4
11	3
12	9
13	5
14	4
15	2
16	0
17	0
18	0
19	0



But modern technology has expanded that limit to where reconstruction is now possible for texts the size and diversity of 2 Timothy. The NA-27 apparatus records 71 places of variation[7] for the Book of 2 Timothy with a total of 159 variant readings distributed among them.[8] This averaged out to 2.24 variants per place of variation. In earlier decades, this amount of information would have been impossible to manually process, but not so today; my desktop computer provides

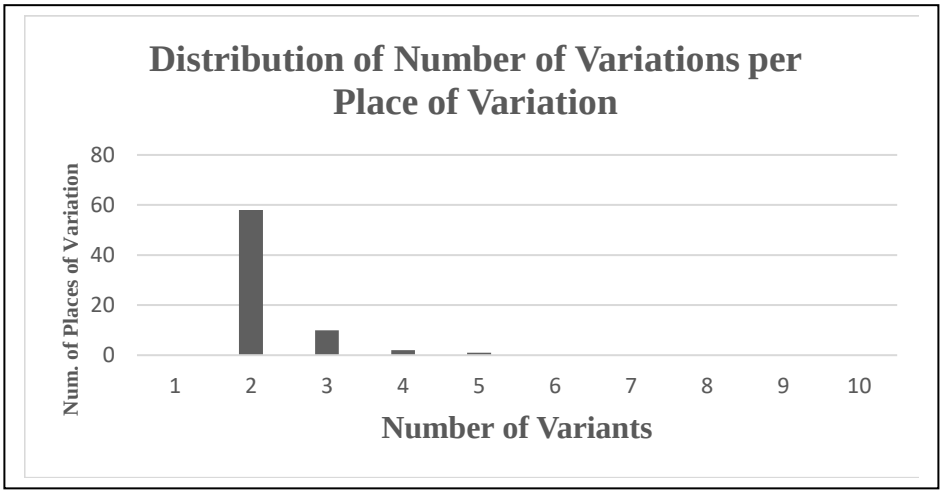
[7] Of course, there are more places of variation than this, but the editors of the NA-27 text have weeded out those that are insignificant for reconstruction and meaning.

[8] Appendix B provides a map showing where the places of variation occur in the text by chapter and verse.

complete solutions to problems this size in just a matter of minutes. Table 2.4 and its associated graph display the distribution of the number of variations per place of variation. For example, 58 places of variation have only two variations whereas only one place of variation has five variations.

Table 2.4
Distribution of Number of Variations per Place of Variation

Number of variants	Number of Places of Variation
1	0
2	58
3	10
4	2
5	1
6	0
7	0
8	1
9	0
10	0
Total =	159



However, a few maverick witnesses occur whose diversity obscures their genealogical affinity. These witnesses skew the reconstruction of the stemma and for this reason are excluded from the process but are added to the completed stemma where they best fit. For 2 Timothy they are D06*, D06^1, D06^2, 81*, 1175* and it-d; these each have an affinity with their parent exemplar of only 65-75%.

The NA-27 apparatus records seven different types of variations to the text. Table 2.5 displays the distribution of these types of variation for the Book of 2 Timothy. While the type of variation has no significance for the reconstruction process, the information is provided for those who are interested.

Table 2.5
Distribution of Variation Type

Omit a word	8
Omit a phrase	1
Alternate word	38
Alternate words	9
Transposed words	2
Added word or phrase	13
Other	0
Total =	71

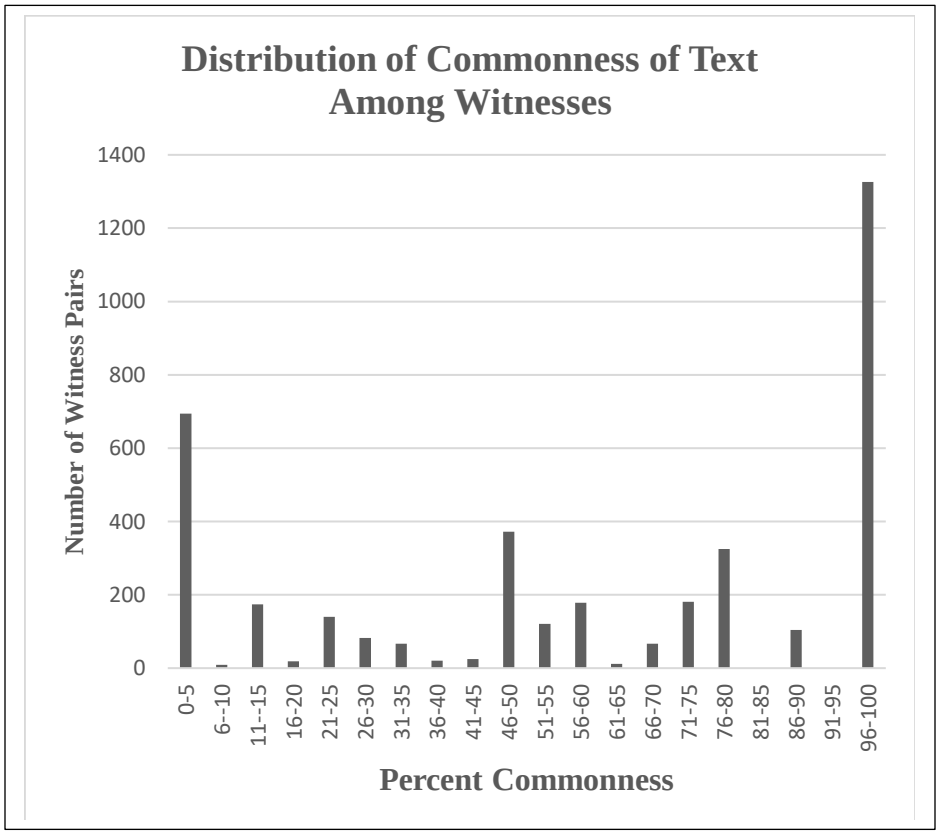
Commonness of Text

Commonness is a measure of the percentage of text two witnesses have in common. When two witnesses both have complete texts, that is, they are not fragmentary, having readings at every place of variation, they have 100% commonness, regardless of the agreement or disagreement of their readings.

Fragmentary witnesses, however, are less than complete and may actually have no commonness of text. For example, witness A may be 40% complete, lacking the text for the last 60% of the places of variation, and witness B may be 40% complete, lacking the text for the first 60% of the places of variation; as a result, the two witnesses have no commonness of text. The greater the commonness of text two witnesses have the greater potential they have for genealogical affinity. Table 2.6 and its associated graph display the distribution of commonness each witness shares with every other witness for the Book of 2 Timothy.

Table 2.6
Distribution of Commonness of Text among Witnesses

% Commonness	Number of witness pairs
0-5	694
6-10	9
11-15	174
16-20	19
21-25	140
26-30	82
31-35	67
36-40	20
41-45	25
46-50	372
51-55	121
56-60	178
61-65	12
66-70	67
71-75	181
76-80	325
81-85	0
86-90	104
91-95	0
96-100	1,326



Quantitative Affinity

Quantitative affinity[9] is a measure of how strongly two witnesses are genealogically related. Witnesses are genealogically related when they have many of the same readings at their shared places of variation. Quantitative affinity is determined by the number of places of variation where the witnesses have the same reading divided by the number of places of variation the witnesses have in common. For example, if witness A and witness B have 1,000 places of variation in common, and in 952 places they have the same reading, the quantitative affinity of A to B is 952 ÷ 1,000 = 0.952 or 95.2%. Table 2.7 and its associated graph display the distribution of quantitative affinity among all the pairs of witnesses for the Book of 2 Timothy.

It is evident that many of the extant witnesses to 2 Timothy have relatively strong quantitative affinity with one another. These data are skewed because of the many fragmentary witnesses. A better picture of the significant affinity is that which is among witnesses having 80% content or greater. These witnesses are the ones used to reconstruct the genealogical history. Table 2.8 and its associated graph display the distribution of quantitative affinity among witnesses having 80% content or greater. This suggests that reconstruction of the genealogical history is reasonably feasible.

Genealogical Affinity

Genealogical affinity among witnesses occurs when they share a common sibling gene. The sibling gene of a witness consists of the variants initiated in its parent exemplar. This information is derived from the database as the variants two witnesses share that occur a minimum number of times in the database.

Conclusion

There are sufficient witnesses to the text of the Book of 2 Timothy with dates distributed over the historical period of interest, being sufficiently complete, having relatively limited diversity, and having ample mutual commonness and strong genealogical affinity. There is good reason to expect that the genealogical history derived from these witnesses will be a good approximation of the actual textual history of the book.

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[9] Quantitative affinity is supplemented by the sibling gene to affirm sibling relationship.

Table 2.7
Distribution of Quantitative Affinity
Among all Witnesses

% Affinity	Number of Witnesses
0-5	423
6-10	2
11-15	5
16-20	27
21-25	11
26-30	3
31-35	76
36-40	40
41-45	252
46-50	248
51-55	154
56-60	192
61-65	338
66-70	567
71-75	297
76-80	315
81-85	241
86-90	266
91-95	164
96-100	384

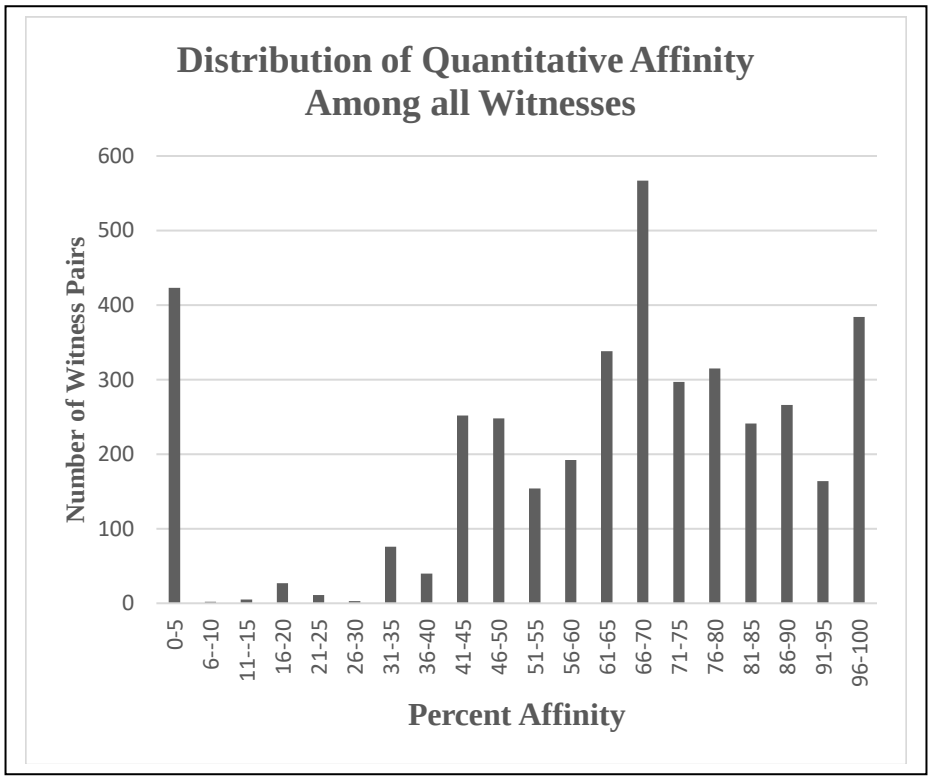
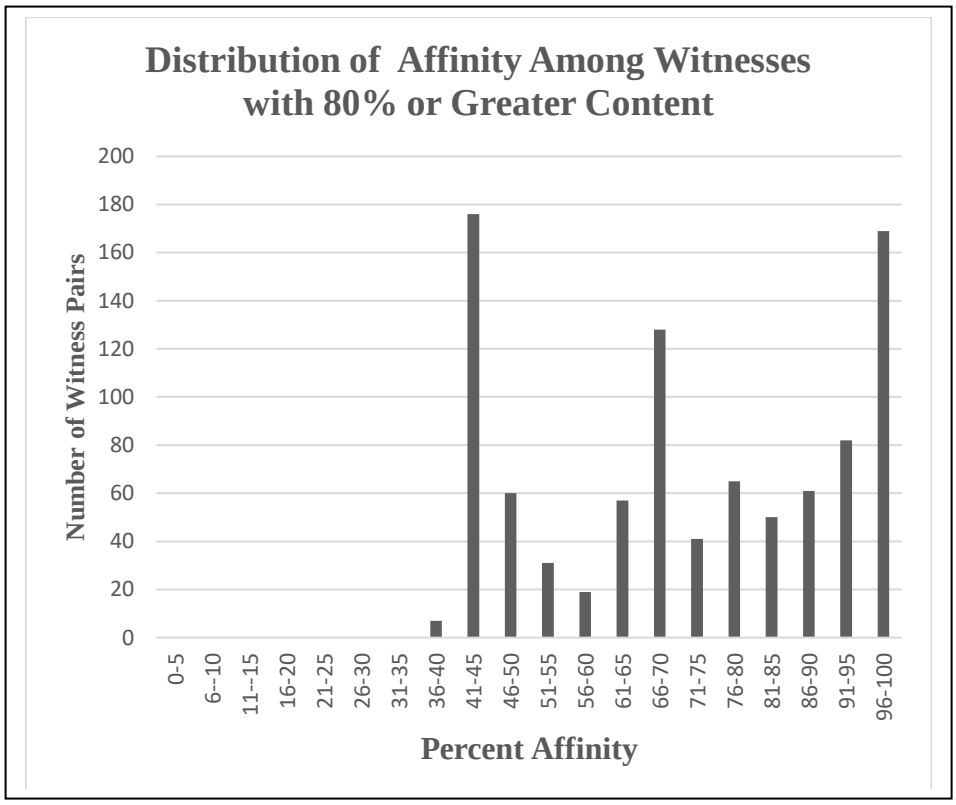


Table 2.8
Distribution of Quantitative Affinity Among Witnesses with 80% or Greater Content

% Affinity	Number of Witnesses
0-5	0
6-10	0
11-15	0
16-20	0
21-25	0
26-30	0
31-35	0
36-40	7
41-45	176
46-50	60
51-55	31
56-60	19
61-65	57
66-70	128
71-75	41
76-80	65
81-85	50
86-90	61
91-95	82
96-100	169



CHAPTER 3
GENEALOGICAL HISTORY OF THE MANUSCRIPTS

This chapter presents the genealogical history of the manuscripts[1] of the Greek text of the Second Epistle to Timothy as reconstructed by computer program Lachmann-10.[2] Beginning with a data base of 90 existing witnesses, 71 places of variation, and 159 variants, the program reconstructed 17 intermediate exemplars, arranging them in the genealogical stemma (tree diagram) presented in its full form in Appendix C, but in a condensed form in Figure 3.1. This condensed form portrays the genealogical interrelationship of all the reconstructed exemplars of the text of 2 Timothy including most of the terminal witnesses. The rectangular boxes contain the information for the exemplars created by the software and the boxes with rounded corners contain the information for the extant witnesses. Witnesses in the same box are siblings. Figure 3.2[3] displays a second tree diagram in which the principal line of descent from the autograph through the Antiochian text tradition appears in a straight line from which the other text traditions branch off. All the technical data and diagrams contained in this chapter were derived from the monitor screen of Lachmann-10 or the report it created.

The head exemplars of the three main branches of the stemma are exemplars Ex-103#, Ex-105#, and Ex-106#. These branches are quite independent of one another, having mutual affinities ranging from 51% to 77%. But they have affinities with the autograph ranging from 70% to 97%. In addition, the sibling gene of each uniquely distinguishes them from one another. The following table lists their mutual differences and affinities.

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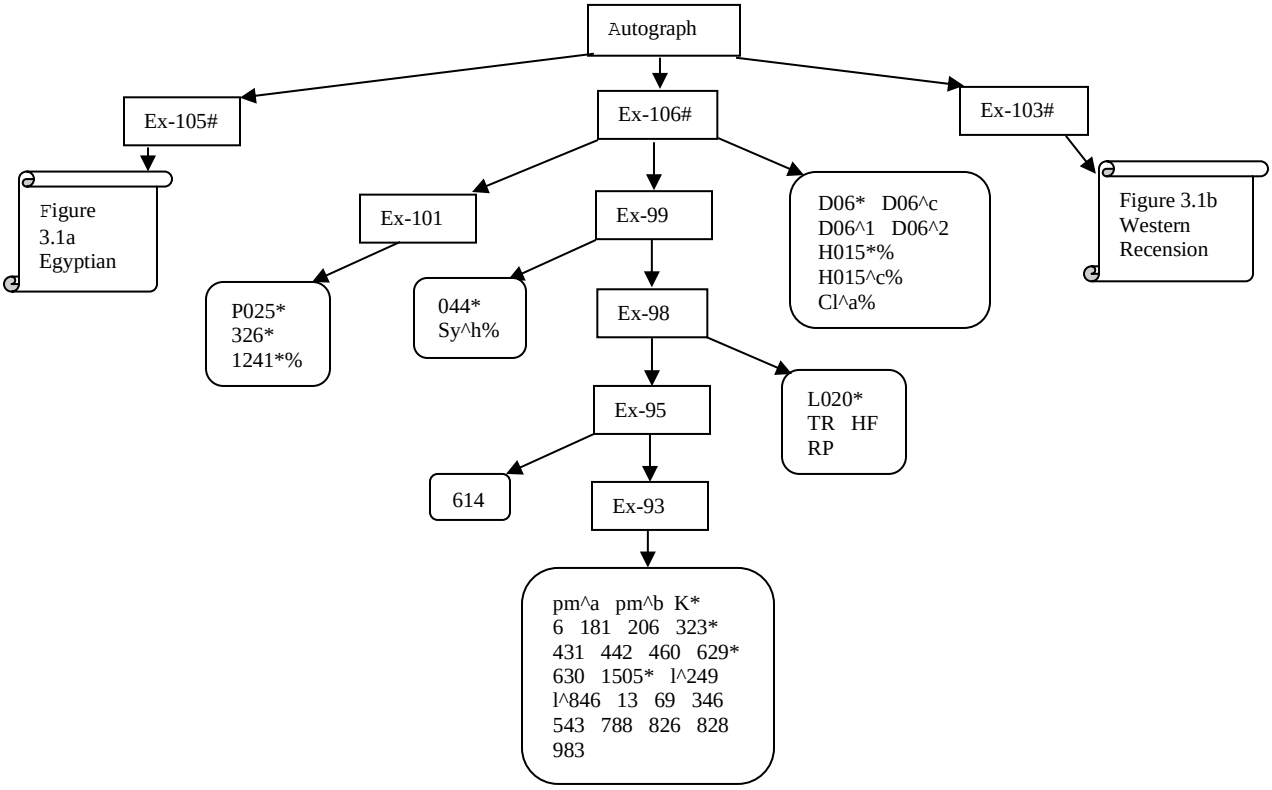
[1] The term *manuscript* is used here in its inclusive sense of manuscripts, translations, church fathers, and reconstructed exemplars—the sense I usually assign to the term *witness*.

[2] The total computing time was one minute and forty-three seconds including the time required for the software to assemble and format all the information contained in the tables, diagrams, and appendices of this book.

[3] The full diagram, displayed in Appendix C, requires six pages. The condensed form deletes all the terminal branches (extant witnesses) except one at each exemplar—the most interesting one. Likewise, it omits exemplars that only account for same-generation mixture (those with a $ sign attached to their name).

	Ex-103#	Ex-105#	Ex-106#	Autograph
Ex-103#		68%	51%	70%
Ex-105#	23		77%	97%
Ex-106#	35	16		80%
Autograph	21	2	14	

Figure 3.1
Condensed Genealogical Stemma of 2 Timothy



The above diagram displays the overall structure of the genealogical stemma of 2 Timothy, but it presents only the branch of the Antiochian text tradition in full detail, listing all the sibling descendants of each exemplar. The corresponding branch of the Egyptian text tradition is presented in Figure 3.1a and that of the Western text tradition in Figure 3.1b. Exemplar Ex-106# is the Antiochian recension, the ancestral source of the witnesses in the Antiochian tradition. Its date (c. AD 165) is derived from that of second-generation church father Clement (Cl^a% c. AD 215). It has an unusually low affinity with the autographic text of only 80%, differing from it in 14 places.[4] The TR, HF, and RP found their best fit as daughters of third-generation Exemplar Ex-98.

[4] The date, affinity and difference are found in Appendix C; so also for the other branches.

Figure 3.1a

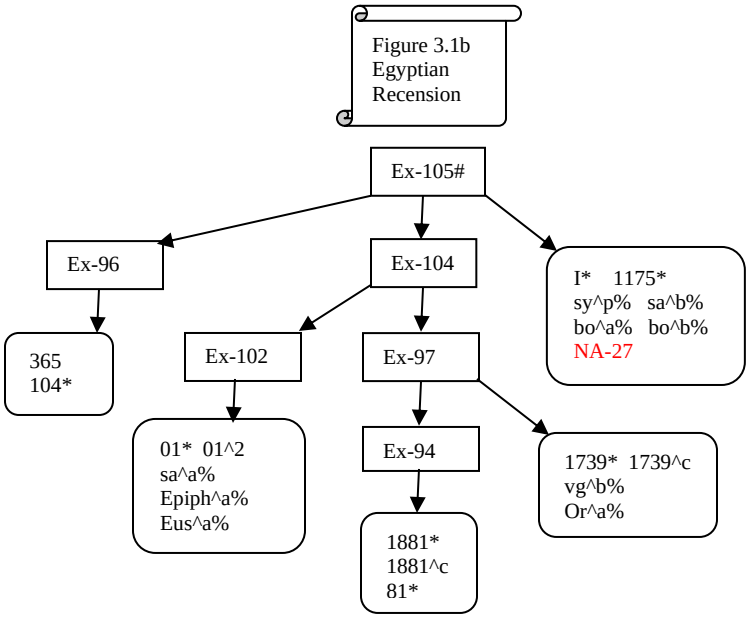


Figure 3.1a displays the Egyptian branch of the genealogical stemma of 2 Timothy. Exemplar Ex-105# is the Egyptian recension, the ancestral source of the witnesses in the Egyptian text tradition. Its date (c. AD 100) is derived from that of fourth-generation Sahidic translation (sa^a% c. AD 250). It has an affinity with the autographic text of 97%, differing from it in 2 places. NA-27 found its best fit as a daughter of first-generation Exemplar Ex-105#.

Figure 3.1b

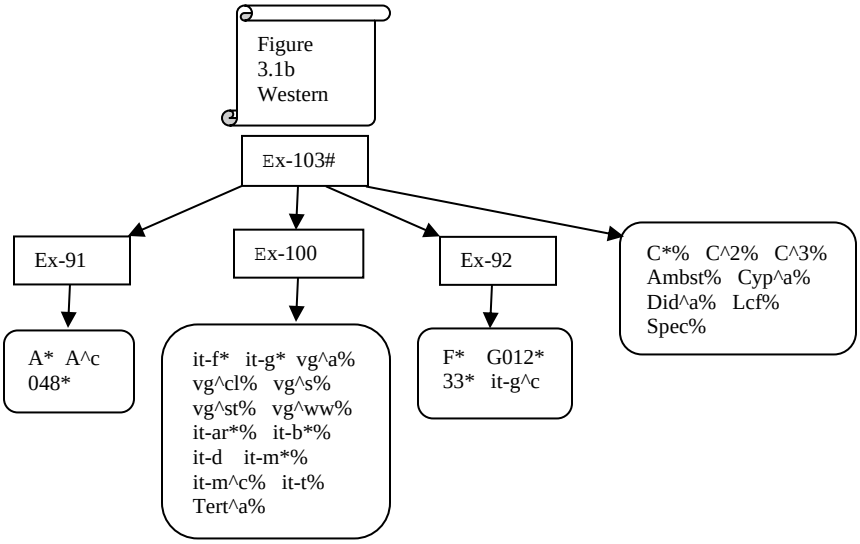
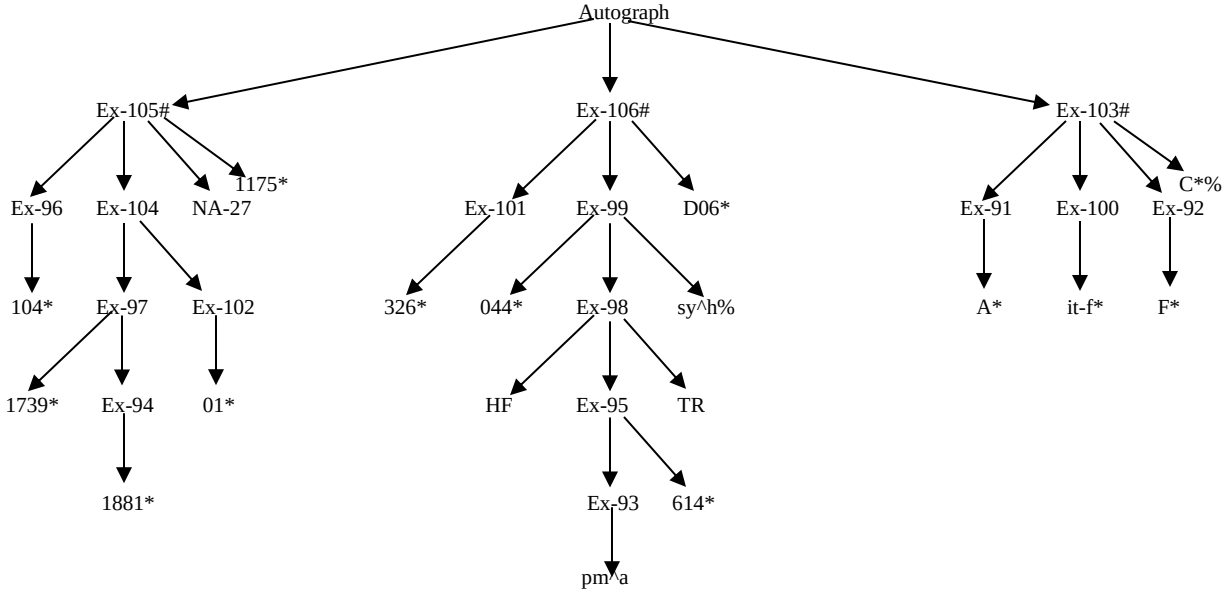


Figure 3.1b displays the Western branch of the genealogical stemma of 2 Timothy. Exemplar Ex-103# is the Western recension, the ancestral source of the witnesses in the Western

tradition. Its date (c. AD 120) is derived from that of the third-generation church father Tertullian (c. AD 220). It has an affinity with the autographic text of 70%, differing from it in 21 places.

Figure 3.2
Condensed Tree Diagram of 2 Timothy



Readings of the Autographic Text

The theory expressed in the first volume of this series[5] indicates that the readings of the autographic text should be determined on the basis of the "consensus among ancient independent witnesses." The solution for 2 Timothy ended up with three independent recensions which were candidates for being witnesses to the text of the autograph. The guideline given in the theory recommended selecting the three most ancient recensions for use in determining the consensus; for 2 Timothy they are: Exemplars Ex-103#, Ex-105#, and Ex-106#. The text of the autograph is presented in Appendix D.

The Generations of Genealogical History

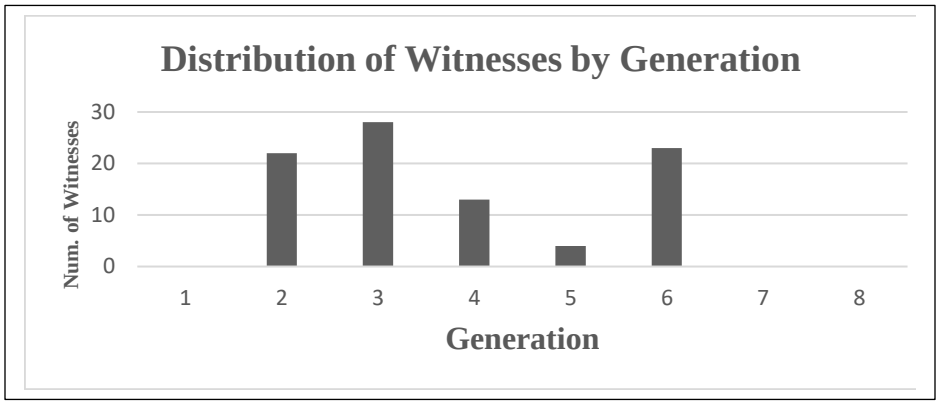
Program Lachmann-10 reconstructed the genealogical history of the text of 2 Timothy in six generations of descent from the autograph. Of course, the exact number of generations cannot be known because the genealogical history before the alleged first-generation major recensions was too fuzzy for the software to accurately reconstruct. The 90 extant witnesses are distributed

[5] Chapter Two of *The Genealogical History of the Greek Text of the Gospel of Matthew*.

throughout every generation of the genealogical history. Table 3.1 and its associated graph display the distribution of the extant witnesses of 2 Timothy by generation. Every generation has at least 4 extant witnesses.

Table 3.1
Distribution of Extant Witnesses by Generation

Generation	Num. of Witnesses
1	0
2	22
3	28
4	13
5	4
6	23
7	0
8	0



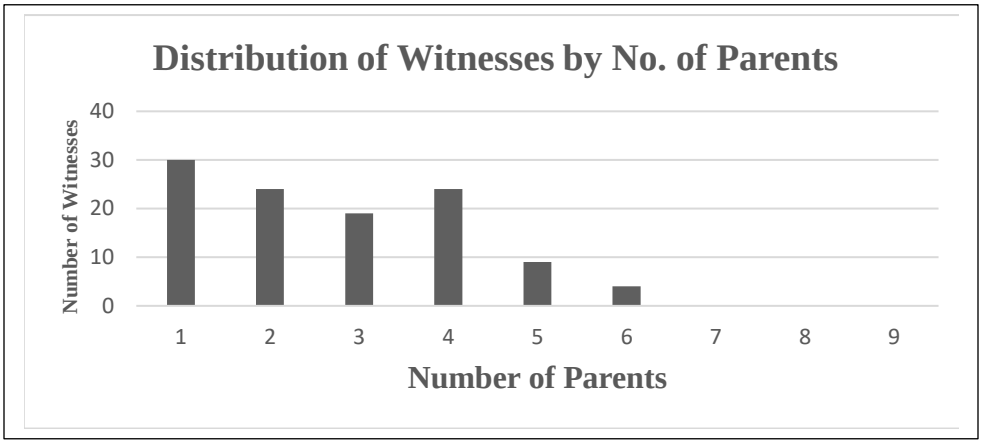
Mixture

The number of parents a witness had is a measure of the mixture of its text; the more parents, the more mixture. At any place of variation, the reading of a witness may differ from that of its primary parent exemplar[6] for one of two reasons: (1) the reading is a newly initiated variant having no prior existence; or (2) the scribe selected the reading from one of the secondary exemplars he was consulting. Witnesses having only one parent experienced no mixture; every variant differing from that of the primary parent exemplar was newly initiated by the scribe either accidentally or intentionally. Table 3.2 displays the distribution of witnesses by number of parents. Those witnesses with the greatest mixture are those with the most diverse text; for example: 30 of the witnesses had only one parent, having no mixture at all; MSS D06*, 81*, and 629* have 6 parents, indicating the extreme mixture of those witnesses. The sources of mixture are not displayed in the tree diagrams.

[6] A primary parent exemplar is the exemplar from which a witness derives its genealogical descent; secondary parent exemplars are the sources from which a witness acquires mixture. A witness has only one primary parent, but it may have any number of secondary parent exemplars.

Table 3.2
Distribution of Witnesses by Number of Parents

Num. of Parents	Num. of Witnesses
1	30
2	24
3	19
4	24
5	9
6	4
7	0
8	0
9	0



Primary Daughters

When an exemplar is the primary parent of one of its daughter manuscripts, then that daughter in turn is a primary descendant of the exemplar. Except for exemplars created to account for same-generation mixture (those marked with $), an exemplar always has at least two primary daughters, but it may have as many as needed for grouping multiple sibling daughters. The number of primary daughters of an exemplar is a measure of how well the software was able to find groups of sibling sisters. Table 3.3 displays the distribution of primary daughters by number of exemplars. Exemplar Ex-92 has four primary daughters; and Ex-93 has 23.

Table 3.3
Distribution of Exemplars by Number of Primary Daughters

Num. of Primary Daughters	Num. of Exemplars
2	12
3	3
4	1
23	1

Table 3.4
Distribution of Exemplars by Number of Secondary Daughters

Num. of Secondary Daughters	Num. of Exemplars	Num. of Secondary Daughters	Num. of Exemplars
0	8	7	1
2	1	19	1
3	1	23	2
4	1	25	1
5	2	58	1
6	2	Total	186

Critics of the genealogical theory protest that the genealogical trees it develops are almost exclusively binary, that is, nodes in the tree have only two branches—in other words, reconstructed exemplars have only two primary daughter descendants. Table 3.3 demonstrates the error of this

claim. Exemplars with no primary descendants are those created to account for same-generation mixture; they rightly have no primary descendants.

Secondary Daughters

When an exemplar is the source of mixture (a secondary parent) for one of its daughter descendants, then that daughter is a secondary descendant of the exemplar. An exemplar does not need to have any secondary descendants, but it may have as many as needed for resolving mixture within its associated branch. The number of secondary descendants of an exemplar is a measure of its value as a source of mixture, suggesting that scribes regarded the exemplar as having some measure of authority. Table 3.4 displays the distribution of secondary daughters by number of exemplars. For example, Exemplars Ex-103# and Ex-106#, the first-generation exemplars of the Western text tradition and of the Antiochian text tradition, each have 23 secondary daughters; those with more than 23 secondary daughters were merely sources of same-generation mixture.

Resolution of Mixture

The optimizing procedures of the software resolve all mixture in a genealogical tree, leaving every instance of a variant accounted for either by genealogical descent, by mixture, or by initiation. That is, the software locates the exemplar where every variant originated in the genealogical history of the witnesses.[7] This feature is treated further in Chapter Four where the genealogical history of the variants is discussed.

Distribution of Affinity

Another measure of the success of the software in reconstructing the genealogical history of the text of 2 Timothy is the distribution of the affinity of the witnesses to their primary parent exemplars. If this affinity is consistently high, the success may be regarded as high. Table 3.5 and its associated graph display the distribution of the affinity of the extant witnesses[8] to their corresponding primary parent exemplar. Table 3.6 and its associated graph display the distribution of

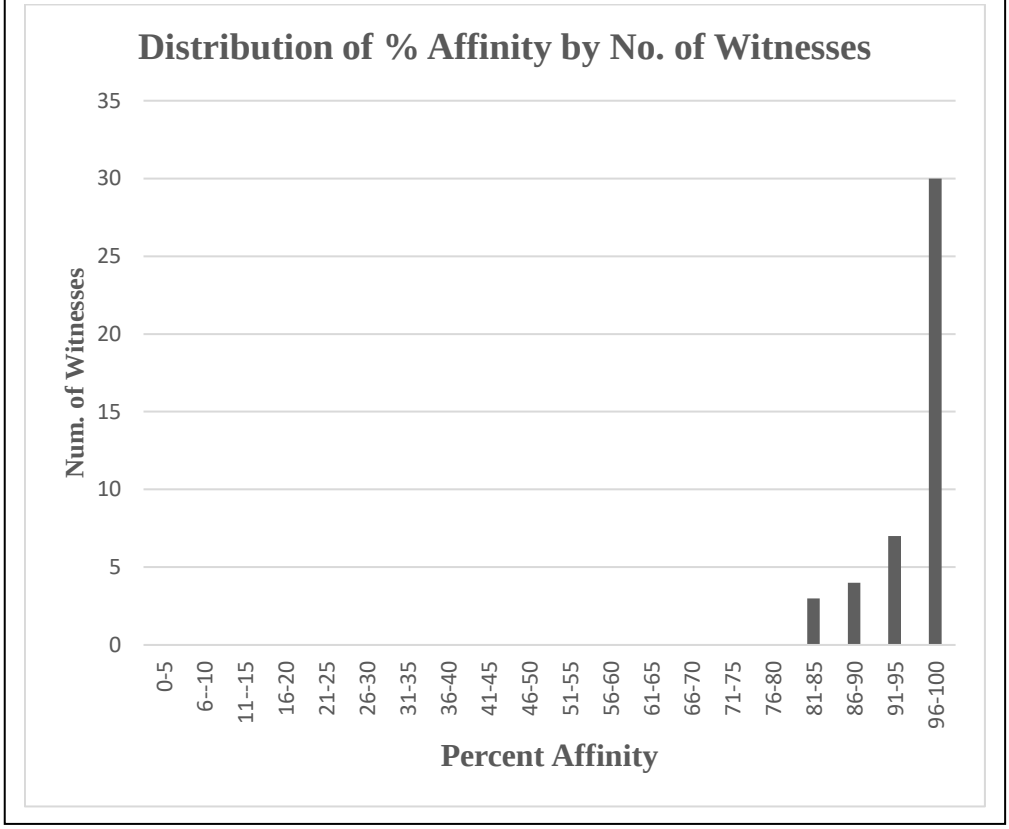
[7] While this is true for the book of 2 Timothy, for some of the other books the software may fail to uniquely identify the place of origin for a small percentage of variants.

[8] Witnesses with less than 80% content are excluded because they do not contribute to the reconstruction of the genealogical history but are attached at the most appropriate place after the tree is complete.

the affinity of the reconstructed exemplars to their corresponding primary parent exemplar, not including those functioning only to resolve same-generation mixture.[9]

Table 3.5
Distribution of Affinity of Extant Witnesses with Primary Parent

% Affinity	No. of Witnesses
0-5	0
6-10	0
11-15	0
16-20	0
21-25	0
26-30	0
31-35	0
36-40	0
41-45	0
46-50	0
51-55	0
56-60	0
61-65	0
66-70	0
71-75	0
76-80	0
81-85	3
86-90	4
91-95	7
96-100	30
Total	44



The evidence from Table 3.5 indicates that all but 7 extant witnesses had a strong affinity (> 90%) with their primary parent exemplar, and all had an affinity greater than 80%. This demonstrates that considerable close grouping exists among the extant witnesses.

The evidence from Table 3.6 indicates that 10 (62.5%) of the 16 reconstructed exemplars[10] have a strong affinity (> 90%) with their primary parent exemplar, and another 3 (18.75%) had a moderate affinity (81-90%) with their parent; Exemplar Ex-103#, the source of the Western text

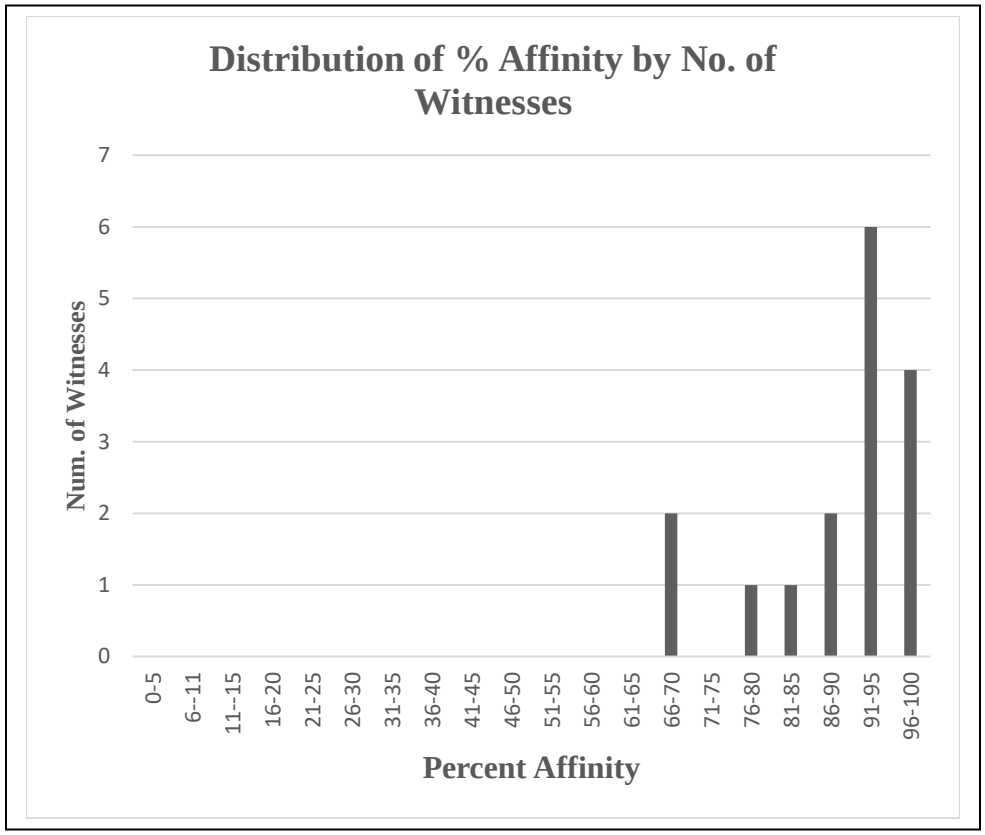
[9] Such exemplars do not contribute to the reconstruction of the tree diagram of the genealogical history of the witnesses, their affinity with their parent exemplar having no significance to the reconstruction process.

[10] The exemplars constructed just to account for same-generation mixture were not included in the study because they do not contribute to the construction of the genealogical tree.

tradition, has a weak affinity of 70%; Exemplar Ex-91 has 67%; and Exemplar Ex-106#, the source of the Antiochian text tradition, has 80%.

Table 3.6
Distribution of Affinity of Exemplars with Primary Parent

% Affinity	No. of Exemplars
0-5	0
6-11	0
11-15	0
16-20	0
21-25	0
26-30	0
31-35	0
36-40	0
41-45	0
46-50	0
51-55	0
56-60	0
61-65	0
66-70	2
71-75	0
76-80	1
81-85	1
86-90	2
91-95	6
96-100	4
Total	16



The presence of weak affinities is troubling because it questions the reality of any actual genealogical relationships. But the corresponding presence of sizeable sibling genes confirms that the given witness has a common ancestry with its alleged sisters, even though the relationship may be one of distant cousins; whatever the actual relationship may have been, within the collection of witnesses the relationship is closest possible.

Date of the Autograph

The date of the autograph was determined by the rule that a parent exemplar is fifty years older than its oldest sibling daughter. When the dates diminish to below AD 100, the generation gap is reduced to twenty years, giving more room for activity in the first century. The date of the

autograph (c. AD 80) is traced down through the Egyptian recension to fourth-generation Sahidic translation (sa^a% c. AD 250) through the following exemplars:

Autograph[0.00]<0>{AD 80}/0/0/0
|-Ex-105#[0.97]<1>{AD 100}/2/2/2
|-Ex-104[0.96]<2>{AD 150}/3/2/4
|-Ex-102[0.92]<3>{AD 200}/6/3/3
|-sa^a%[0.86]<4>{AD 250}/6/6/5

The Sahidic translation is fragmentary, having only 43 readings, being only 60.56% complete, but having 86%% affinity with its parent exemplar, differing by only 6 readings. So, the date of the autograph is quite firm.

Conclusions

The software does indeed reconstruct a genealogical history of the manuscripts of the Second Epistle to Timothy, and of the other books of the New Testament as well. However, the results are not what was anticipated, based on earlier experiments with smaller books, smaller databases, and less sophisticated programs. I anticipated that the commonly accepted text traditions would emerge as independent witnesses to the autograph. Those text traditions did emerge, but they turned out to be not exactly Western, Alexandrian, Caesarean, and Antiochian, but rather Western, Egyptian, and Antiochian, with the Byzantine tradition being the latest form of the Antiochian text tradition, and with no clear evidence of a Caesarean tradition.

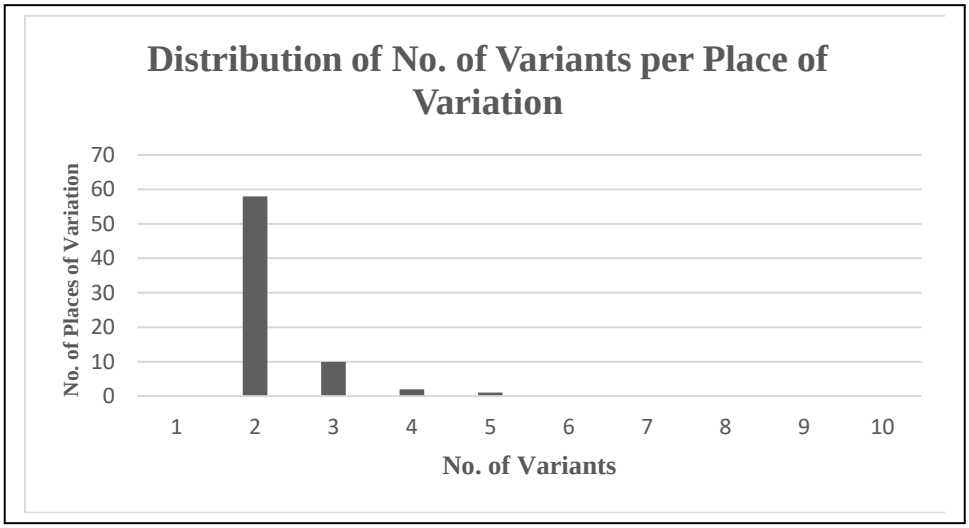
This concludes the discussion of the genealogical history of the witnesses to 2 Timothy. While the reconstruction of the genealogical history of witnesses depends on the genetic affinity (consensus), sibling genes, and the date of the witnesses, the genealogical history of variant readings depends on the consensus and inheritance of variants. The history of the variant readings of the text of 2 Timothy is discussed in Chapter Four.

CHAPTER 4
THE HISTORY OF THE TEXTUAL VARIANTS IN 2 TIMOTHY

Chapter Three presents the genealogical history of the manuscripts[29] of the Greek text of the Second Epistle to Timothy. That history is necessary before the genealogical history of an individual variant may be safely discussed, because the history of a textual variant is totally dependent upon the history of the manuscripts in which it occurs. The NA-27 Greek New Testament records 71 places of textual variation in the Book of 2 Timothy and 159 variant readings. This averages out to a variableness index of 2.24 variants per place of variation—a relatively low value. Table 4.1 and its associated graph display the distribution of the number of variants per place of variation.

Table 4.1
Distribution of Number of Variants per Place of Variation

Number of variants	Number of Places of Variation
1	0
2	58
3	10
4	2
5	1
6	0
7	0
8	0
9	0
10	0
Total=	159



[29] Again, the term *manuscript* is used in its broader sense to include manuscripts, translations, quotations from church fathers, and reconstructed exemplars.

Initially the number 159 seems large when considering textual variations in a book of the Bible, but this number must be considered with respect to the total number of places where variation could occur. If the number of words in the Greek text of 2 Timothy (c. 1,245) is regarded as the number of places where variation could occur, and each variation is regarded as the equivalent of one word, then the text of 2 Timothy is 94.3% pure[30] before variations are even considered. Thus, variation occurs in only5.7% of the text. In that small portion of the text 159 variants are recorded, but 71 of them are original readings, so only 80 are real variants. While this still seems like a large number, the genealogical software clearly identified all of them as non-original.

Types of Variants

Four basic types of textual variations occur in the text of 2 Timothy: (1) omissions, (2) alterations, (3) transpositions, and (4) additions. Table 4.2 lists the distribution of these types of variants in the 71 places of variation in the text of the Second Epistle to Timothy, and Table 4.3 lists their distribution with respect to all variations.

Table 4.2
Distribution of Variants by Type

Variation type	Number of Variants
Omit a word	8
Omit a phrase	1
Alternate word	38
Alternate words	9
Transposed words	2
Added word or phrase	13
Total	71

Table 4.3
Distribution of All Variants by Type

Variation Type	Number of Variants
Omit a word	16
Omit a phrase	2
Alternate word	80
Alternate words	27
Transposed words	4
Added word or phrase	30
Total	159

[30] ((1,245 – 71) ÷ 1,245) x 100 = 94.3.

Determining Exemplar Readings

Whenever the genealogical software creates a new exemplar as the parent of a group of sibling sister witnesses, at each place of variation, the reading of the exemplar is decided on the basis of four ordered rules:

(1) Majority consensus among all the immediate sibling children;

(2) if no majority, then postpone the decision until a sibling emerges for the exemplar currently being reconstructed, that sibling will have the inherited reading;[31]

(3) if, in the case of deciding the readings of the autograph, majority consensus fails, then accept the first variant (the NA-27 reading) if it is an option;

(4) if the first variant is not an option, then by default arbitrarily select the smallest variant number that is an option;[32]

(5) if witnesses are of different languages, then select the Greek reading, if available.

Table 4.4 lists the number of times each of the above rules was used in the process of constructing the genealogical history of the text of 2 Timothy.

Table 4.4
Frequency of Exemplar Reading Rules

(1) by greatest probability	1,097
(2) by deferred ambiguity	79
(4) by default to NA-27	17
(5) by arbitrary choice	1
(6) by language deference	12
Total	1,206

The evidence indicates that the vast majority of exemplar readings (90.96%) were determined by "consensus among independent witnesses," and 6.55% were determined by deferred ambiguity, while 1.41% were deferred to the NA-27 reading, and 1.08% were determined by arbitrary choice or language deference.

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[31] I call this practice *deferred ambiguity*. Since sibling witnesses rarely have scribal errors at the same place of variation, where the reading of one sibling is ambiguous—that is, it is uncertain which of two readings is the inherited reading and which is a newly initiated error—the other siblings will have the inherited reading. Of the 1,206 decisions the software made, only 17 were made on the basis of deferred ambiguity.

[32] Next to the first variant—the NA-27 choice—the reading with the smaller variant number is usually supported by more witnesses than those with larger variant numbers. While this option is purely arbitrary, it turns out to be rarely significant for determining the readings of the autograph. For determining the readings of the autograph, the algorithm treats the exemplars of the last five branches to be constructed as siblings constituting the ancient independent witnesses.

Autographic Readings

The readings of the autographic text of 2 Timothy were determined on the basis of consensus among the three most ancient independent witnesses. For the Book of 2 Timothy, the exemplars of the three most ancient independent recensions were used: (1) Exemplar Ex-103#, the Western text tradition; (2) Exemplar Ex-105#, the Egyptian text tradition; and (3) Exemplar Ex-106#, the Antiochian text tradition. Appendix D lists each of the 71 readings of the autograph together with its place of variation, the chapter and verse where it occurs, the reading of the text at that place, and the probability that the reading is original. Those readings lacking consensus were determined by default to the decision of the NA-27 editors' evaluation of internal evidence if that reading was among the available alternatives; otherwise, the next lowest variant number was selected by arbitrary choice. Table 4.5 lists the number of times each of the above rules was used in the process of determining the autographic readings of the text of 2 Timothy. The evidence indicates that 100% of the readings were determined by "consensus among ancient independent witnesses."

Table 4.5
Frequency of Exemplar Reading Rules

Number of Autographic variants decided by greatest probability	71	100%
Number of Autographic variants decided by choice of NA27	0	0.00%
Number of Autographic variants decided by arbitrary choice	0	0.00%
Number of Autographic variants decided by language deference	0	0.00%
Total	71	

Table 4.6
Distribution of Autographic Readings by Probability

Probability	Number of Readings
0.1	0
0.2	0
0.33	0
0.4	0
0.5	0
0.66	37
0.7	0
0.8	0
0.9	0
1	34

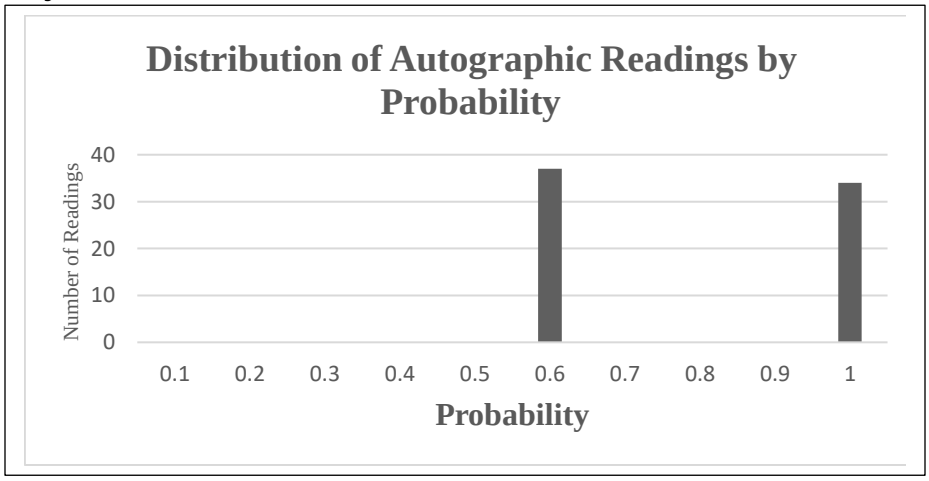

Table 4.6 and its associated graph displays the distribution of the probability of the reconstructed autographic readings. Of the 71 readings, 34 had a probability of 1.0 (100%), 37 had a probability of 0.66 (67%); none were ambiguous, being less than 50%.

Agreement with NA-27

In the database used in this work, the first variant at any place of variation is the reading of the NA-27 text. The second and subsequent variants are the alternate readings listed in the NA-27 database. Table 4.7 lists how often the various alternate readings were found to be original. The evidence indicates that the autographic text reconstructed by the genealogical software agrees with the text of NA-27 61 times or 85.91% of the time, and differs from the NA-27 text 10 times or 14.09% of the time. Appendix E lists the 10 places where the Lachmann-10 text differs from that of NA-27.

Table 4.7
Frequency of Variants

Variant 1	61
Variant 2	10
Variant 3	0
Variant 4	0
Variant 5	0
Variant 6	0
Variant 7	0
Total	71

The Origin of the Variants

The software identifies the place of origin of every variant in the genealogical tree, accounting for every instance of a variant as being the result of genealogical descent, mixture, or initiation—that is, the software finds the one and only exemplar or extant witness in the genealogical history where each variant originated.[33] Often, after the first initiation of a reading, it may have been introduced again in a later exemplar by means of mixture.

Exemplars Ex-108$ through Ex-111$, are children of the Autograph created by the software as sources for resolving same-generation mixture between the branches headed by the first-generation recensions, that is, for non-autographic readings that occur in more than one primary branch of the genealogical tree. These exemplars serve as virtual exemplars lost in the

[33] The place a variant reading was initially introduced in genealogical history is determined by locating the witness containing the variant reading where the reading differs from that of its parent exemplar and the reading is not accounted for by mixture. Mixture fails when the reading does not occur in any witness in preceding generations.

unrecoverable genealogical history between the Autograph and the assumed first-generation recensions. Of the 88 non-autographic variants, 83 are listed as originating in one of these virtual exemplars. Two possibilities exist for each of these variants: either it really originated only once in the earliest decades of unrecoverable history, or it originated independently in two or more major branches of the tree diagram of genealogical history; the latter case can be true for commonly occurring scribal errors, but not for the uncommon ones. Variants of the first kind are weakly distributed among the branches of the first-generation recensions and are of little genealogical significance individually; their distribution among the three most ancient recensions is weaker than that of their corresponding autographic reading.

Egyptian Recension

First-generation exemplar Ex-105# was the ancestral forefather of the Egyptian text tradition. This recension differs from the autograph by 2 secondary variants[34] none which are uniquely peculiar to this entire text tradition.

Western Recension

First-generation Exemplar Ex-103# was the Western recension, being the text from which most of the Old Latin translations were made. It differs from the autographic text by 21 secondary variants,[35] among which it uniquely originated the following 8 variants peculiar to this entire text tradition:

Place of Variation	Reference	Variant
11.2	2:4,1.2	*τω θεω*
18.2	2:14,2.2	*—μάχει*
20.2	2:16,1.2	*καινοφ—*
25.2	2:24,1.2	*νηπιον*
27.2	3:1,1.2	*γινωσκετε*
33.2	3:8,1.2	*Μαμβρης*
47.2	4:2,1.2	*2 1*
58.2	4:13,1.2	*—λειπον*

[34] In this and other lists of variants herein, an exemplar enclosed in square brackets [] is the source of mixture for the associated variant. Variants are listed only by their reference: 3:12,1.2[Ex-111$]; 4:18,1.1[Ex-111$]; Count = 2.

[35] 2:4,1.2; 2:14,1.1[Ex-111$]; 2:14,2.2; 2:14,3.1[Ex-111$]; 2:16,1.2; 2:18,1.2[Ex-111$]; 2:21,1.1[Ex-111$]; 2:22,1.2[Ex-111$]; 2:24,1.2; 2:25,1.1[Ex-111$]; 3:1,1.2; 3:8,1.2; 3:10,1.1[Ex-111$]; 3:15,1.2[Ex-111$]; 4:1,2.2[Ex-111$]; 4:2,1.2; 4:10,1.2[Ex-111$]; 4:13,1.2; 4:15,1.1[Ex-111$]; 4:16,1.1[Ex-111$]; 4:16,2.2[Ex-111$]; Count = 21.

Antiochian Recension

Exemplar Ex-106# was the Antiochian recension, being the text from which the Syrian and Antiochian witnesses were derived. It differs from the autographic text by 14 secondary variants,[36] among which it uniquely originated the following 7 variants peculiar to this entire text tradition:

Place of Variation	Reference	Variant
8.2	1:17,1.2	σπουδαιοτερον
10.3	2:3,1.3	συ ουν κακοπ—
14.2	2:7,2.2	δωη
15.2	2:12,1.2	αρνουμεθα
39.2	3:14,1.2	τινος
42.2	3:16,2.2	ελεγχον
52.2	4:7,1.2	αγ. τον καλον

Tracing Variant History

For various reasons, it may be of interest to trace the history of the genealogical heritage of the alternate readings at particular places of variation. For each variant at the desired place, one may want to see where it originated in genealogical history and how it was subsequently distributed by genetic inheritance. Upon request, software program Lachmann-10 displays the genealogical history of the variants at any selected place of variation. It constructs the historical tree diagram (like the one in Appendix C) and displays on the monitor screen the generation and index number of the variant contained in each and every witness. The following section presents typical examples of possible studies of interest.

Variants of Textual Interest

The genealogical history of some variants is more interesting than that of others because of their significance for translation. For example, words or phrases are missing in some witnesses (2:13; 4:8); also, some places of variation have multiple options widely distributed among the witnesses (4:22); the genealogical history may help to decide which option is more likely original.

Missing "For" in 2:13,1

2 Timothy 2:13 reads: "If we are faithless, He remains faithful; He cannot deny Himself." Some witnesses have the word "for" before the last clause, and some do not. The variants are:

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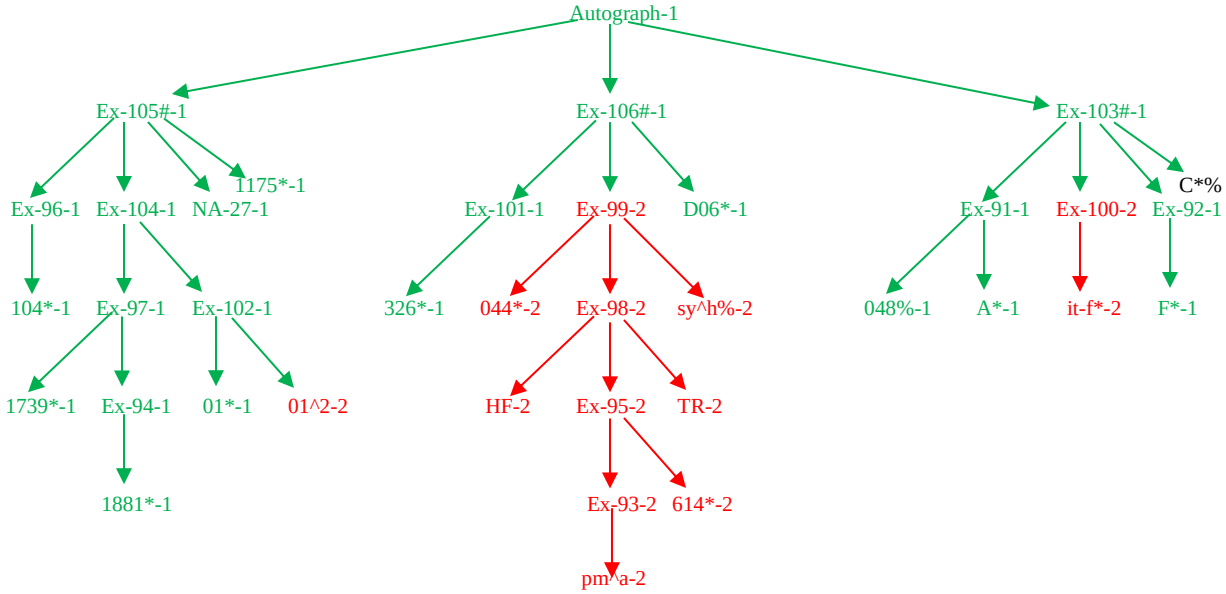
[36] 1:5,1.2[Ex-111$]; 1:17,1.2; 2:3,1.3; 2:7,1.2[Ex-111$]; 2:7,2.2; 2:12,1.2; 3:14,1.2; 3:16,2.2; 4:1,3.2[Ex-111$]; 4:6,1.2[Ex-111$]; 4:7,1.2; 4:14,1.2[Ex-111$]; 4:22,1.3[Ex-111$]; 4:22,3.2[Ex-111$]; Count = 14.

(1) γαρ—for

(2) *ομιτ*—omit

Figure 4.1 displays the distribution of the variants throughout genealogical history.

Figure 4.1
Distribution of 2:13,1



Variant 1 (omit "for") has the consensus of all three of the first-generation recensions: Exemplar Ex-103#, the recension from which the Western text tradition was derived; Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived; and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived; it was selected as the autographic reading on this basis with a probability of 100%. It has the support of all the witnesses in the Egyptian text tradition headed by first-generation Exemplar Ex-105#, except for MSS 01^2, bo^b%, sa^a%, and vg^b% (some no shown). It also has the support of all the witnesses in the Antiochian text tradition headed by first-generation Exemplar Ex-106#, except for those in the branch headed by second-generation Exemplar Ex-99. It also has the support of all the witnesses in the Western text tradition headed by first-generation Exemplar Ex-103#, except for those in the branch headed by second-generation Exemplar Ex-100. It also occurs independently as a

singularity[37] in MSS 6 and L020* (not shown). It has the greatest antiquity, [38] the broadest distribution, [39] and good persistence.

Variant 2 ("for") was first initiated in the Western text tradition headed by second-generation Exemplar Ex-100, after which it persisted throughout the history of that branch. It was then initiated by mixture into the Antiochian text tradition in the branch headed by second-generation Exemplar Ex-99, after which it persisted throughout the history of that branch, except for MSS 6 and L020*. It also occurs independently as a singularity in MSS 01^2, vg^b%, sa^a%, and bo^b% (some not shown). This reading lacks antiquity and adequate distribution, but it has good persistence once introduced.

Missing "All" in 4:8,1

2 Timothy 4:8 reads: "Finally, there is laid up for me the crown of righteousness, which the Lord, the righteous Judge, will give to me on that Day, and not to me only but also to all who have loved His appearing." Some witnesses have the word "all" and some do not. The variants are:

(1) πασι—all

(2) *ομιτ*—omit

Figure 4.2 displays the distribution of the variants throughout genealogical history. Variant 1 ("all") has the consensus of all three of the first-generation recensions: Exemplar Ex-103#, the recension from which the Western text tradition was derived; Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived; and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived; it was selected as the autographic reading on this basis with a probability of 100%. It has the support of all the witnesses in the Egyptian text tradition headed by first-generation Exemplar Ex-105#, except for those in the branch headed by third-generation Exemplar Ex-97, and except for MS sy^p% (no shown). It also has the support of all the witnesses in the Antiochian text tradition headed by first-generation Exemplar Ex-106#, except for MSS 6 and D06*. It also has the support of all the witnesses in the Western text tradition headed by first-generation Exemplar Ex-103#, except for those in the branch headed by second-generation Exemplar Ex-100, and except for MS Ambrst% (not shown). It also occurs independently as a

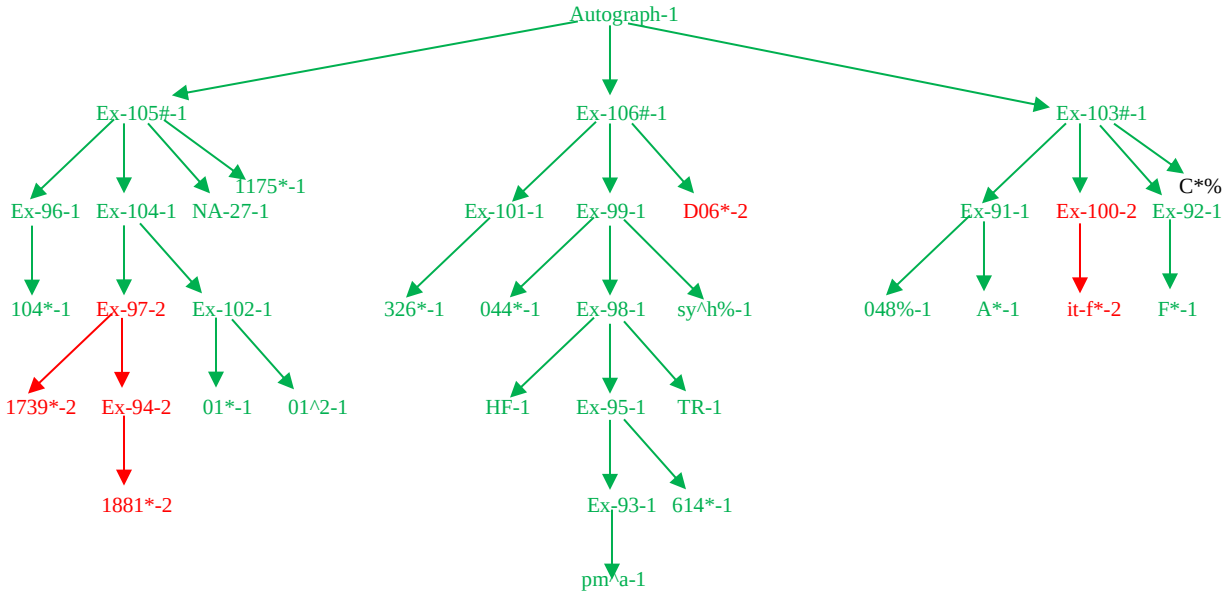
[37] A singularity lacks history and inheritance; at best, it is the result of mixture.

[38] Antiquity is the characteristic of a reading being older than the witness in which it occurs. See the glossary of terms.

[39] Distribution is the characteristic of a reading occurring in more than one text tradition. An original reading occurs in more than one first-generation exemplar. See the glossary of terms.

singularity in MSS 81* and 1739^c (not shown). It has the greatest antiquity, the broadest distribution, and good persistence.

Figure 4.2
Distribution of 4:8,1



Variant 2 (omit "all") was first initiated in the branch of the Western text tradition headed by second-generation Exemplar Ex-100, after which it persisted throughout the history of that branch. It was then initiated by mixture in the branch of the Egyptian text tradition headed by third-generation Exemplar Ex-97, after which it persisted throughout the history of that branch, except for MSS 81* and 1739^c. It also occurs independently as a singularity in MSS D06*, 6, sy^p%, and Ambst% (not shown). This reading lacks antiquity and adequate distribution, but it has good persistence once introduced.

Missing "All" in 4:21,1

2 Timothy 4:21 reads: "Do your utmost to come before winter. Eubulus greets you, as well as Pudens, Linus, Claudia, and all the brethren." Some witnesses have the word "all" and some do not. The variants are:

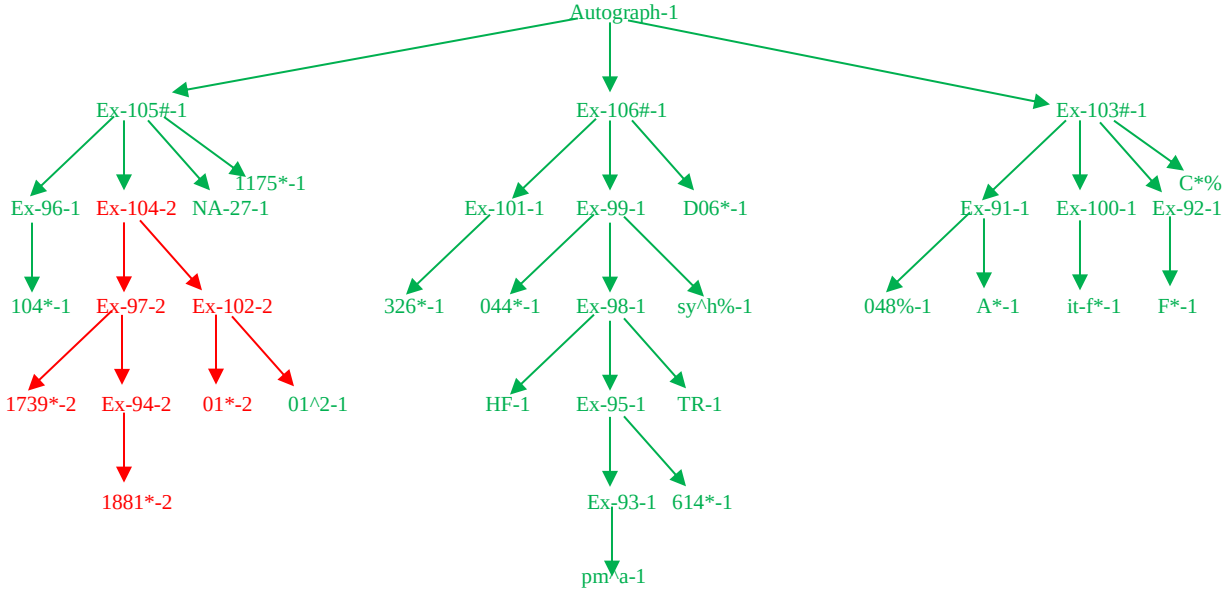
(3) παντες—all

(4) *ομιτ*—omit

Figure 4.3 displays the distribution of the variants throughout genealogical history. Variant 1 ("all") has the consensus of all three of the first-generation recensions: Exemplar Ex-103#, the

recension from which the Western text tradition was derived; Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived; and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived; it was selected as the autographic reading on this basis with a probability of 100%. It has the support of all the witnesses in the Egyptian text tradition headed by first-generation Exemplar Ex-105#, except for those in the branch headed by second-generation Exemplar Ex-104. It also has the support of all the witnesses in the Antiochian text tradition headed by first-generation Exemplar Ex-106#. It also has the support of all the witnesses in the Western text tradition headed by first-generation Exemplar Ex-103#, except for MS 33* (not shown). It also occurs independently as a singularity in MSS 81* and 1739^c (not shown). It has the greatest antiquity, the broadest distribution, and good persistence.

Figure 4.3
Distribution of 4:21,1



Variant 2 (omit "all") was first initiated in the branch of the Egyptian text tradition headed by second-generation Exemplar Ex-104, after which it persisted throughout the history of that branch, except for MSS 01^2, 81* sa^a, and vg^b (some not shown). It also occurs independently as a singularity in MS 33* (not shown). This reading lacks antiquity and adequate distribution, but it has good persistence once introduced.

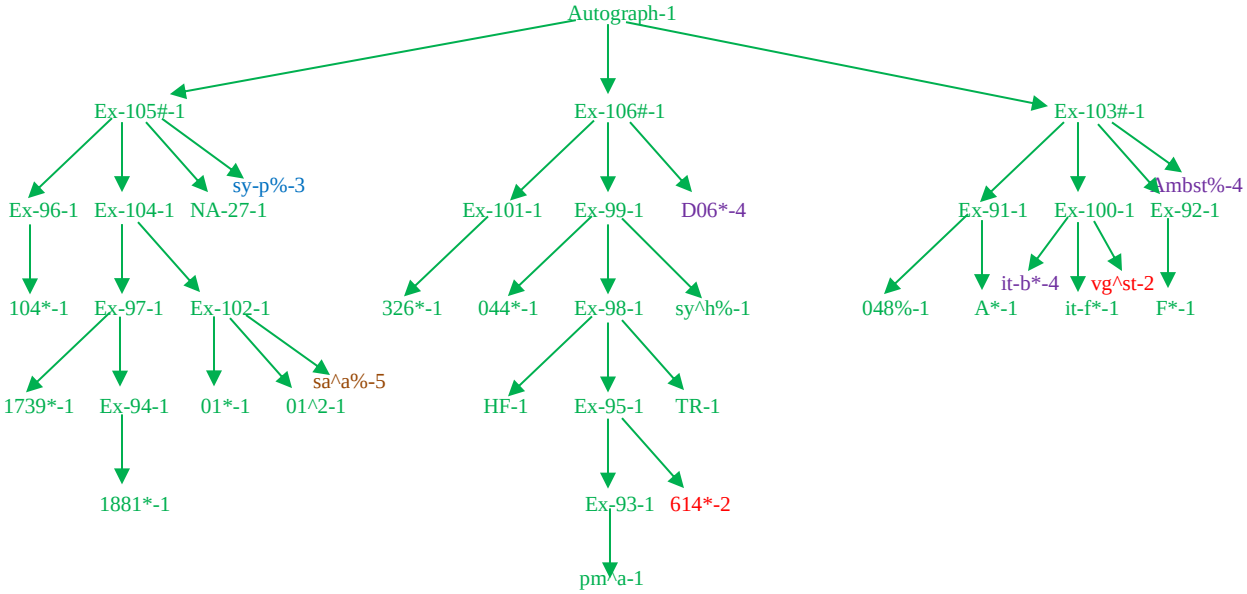
Multiple Variants in 4:22,2

2 Timothy 4:22 reads: "The Lord Jesus Christ be with your spirit. Grace be with you. Amen." The clause "Grace be with you" has five different renderings among the various witnesses. They are:

(1) η χαρις μεθ' υμων—Grace *be* with you [pl.]
(2) η χαρις μεθ' ημων—Grace *be* with us
(3) η χαρις μεθ' σου—Grace *be* with you [sing.]
(4) ερρως εν ειρηνη—I say peace
(5) ομιτ—omit

Figure 4.4 displays the genealogical distribution of these variants.

Figure 4.4
Distribution of 4:22,2



Variant 1 ("Grace *be* with you [pl.]") has the consensus of all three of the first-generation recensions: Exemplar Ex-103#, the recension from which the Western text tradition was derived; Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived; and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived; it was selected as the autographic reading on this basis with a probability of 100%. It has the support of all the witnesses in the Egyptian text tradition headed by first-generation Exemplar Ex-105#, except for MSS sy^p%, sa^a%, sa^b%, bo^a%, and bo^b%. It also has the support of all the witnesses in the Antiochian text tradition headed by first-generation Exemplar Ex-106#, except for MSS D06*, D06^1, 614*, and 460. It also has the support by mixture of all the witnesses in the Western text

tradition headed by first-generation Exemplar Ex-103#, except for MSS Ambst%*, vg^st, it-ar*%, and it-b*% (some not shown). It has the greatest antiquity, the broadest distribution, and good persistence.

Variant 2 ("Grace be with us") only occurs independently as a singularity in the following MSS: 460, 614*, vg^st%, and bo^a% (some not shown). It has no genealogical possibility of being original.

Variant 3 ("Grace *be* with you [sing.]") only occurs independently as a singularity in the following MSS: sy^p%, sa^b%, and bo^b% (some not shown). It has no genealogical possibility of being original.

Variant 4 ("I say peace") only occurs independently as a singularity in the following MSS: D06*, D06^1, it-ar*%, it-b*%, and Ambst (some not shown). It has no genealogical possibility of being original.

Variant 5 (omit clause) only occurs independently as a singularity in MS sa^a%. It has no genealogical possibility of being original.

Non-NA-27 in 1:11,1

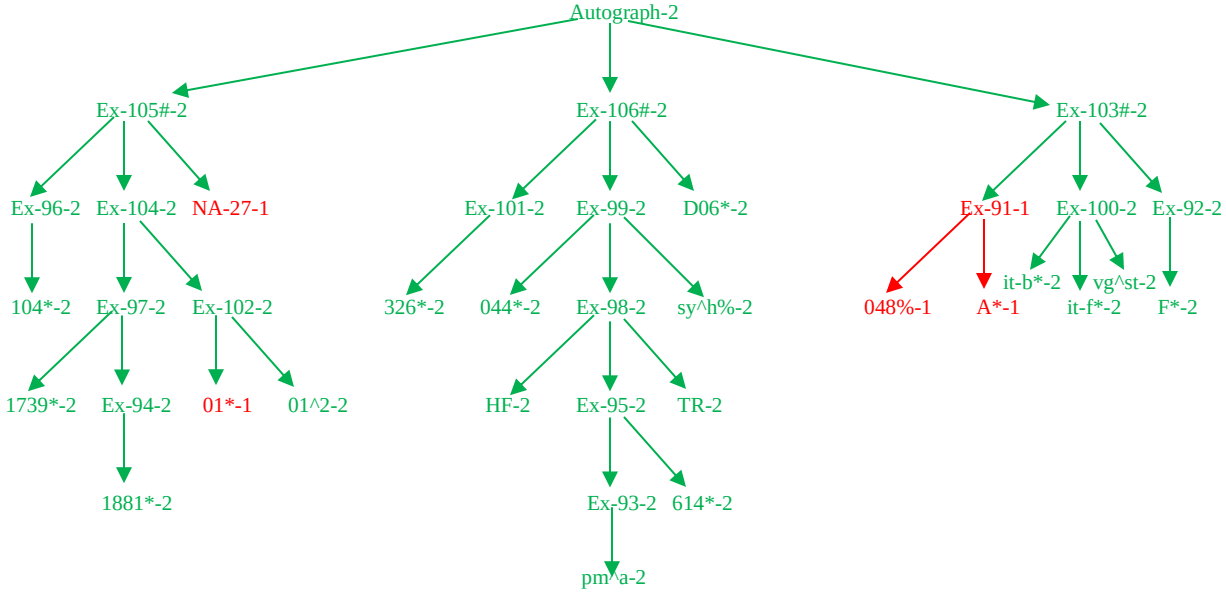
Lachmann-10 found 10 places where the autographic reading differed from that of NA-27 (see Appendix E); one instance occurs in 1:11. 2 Timothy 1:11 reads: "to which I was appointed a preacher, an apostle, and a teacher of the Gentiles." There are three variations of the phrase "teacher of the Gentiles." The variants are:

(1) *και διδασκαλος*—and teacher
(2) *και διδασκαλος εθνων*—and teacher of the Gentiles
(3) *και διακονος*—and deacon

Figure 4.5 displays the genealogical distribution of these variants. Variant 2 ("and teacher of the Gentiles) has the consensus of all three first-generation recensions: Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived, and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived, and Exemplar Ex-103#, the recension from which the Western text tradition was derived; it was selected as the autographic reading on this basis with a probability of 100%. It has the support of all the witnesses in the Egyptian text traditions except for MSS 1%, 1175*, and 01*. It has the support of all the witnesses in the Antiochian text traditions. It has the support of all the witnesses in the Western text traditions except

for those in the sub-branch headed by second-generation Exemplar Ex-91, and except for MS 33*. It has the greatest antiquity, the broadest distribution, and excellent persistence.

Figure 4.5
Distribution of 1:11,1



Variant 1 ("and teacher") was first initiated in the Western text tradition in the sub-branch headed by second-generation Exemplar Ex-91, after which it persisted throughout the history of that branch. It also occurs independently in the following singularities: MSS 01*, I%, and 1175* (some not shown). It lacks antiquity and significant distribution, but has good persistence once initiated.

Variant 3 ("and deacon") only occurs independently as a singularity in MS 33*, a daughter of Western second-generation Exemplar Ex-92 (not shown). It has no genealogical possibility of being original.

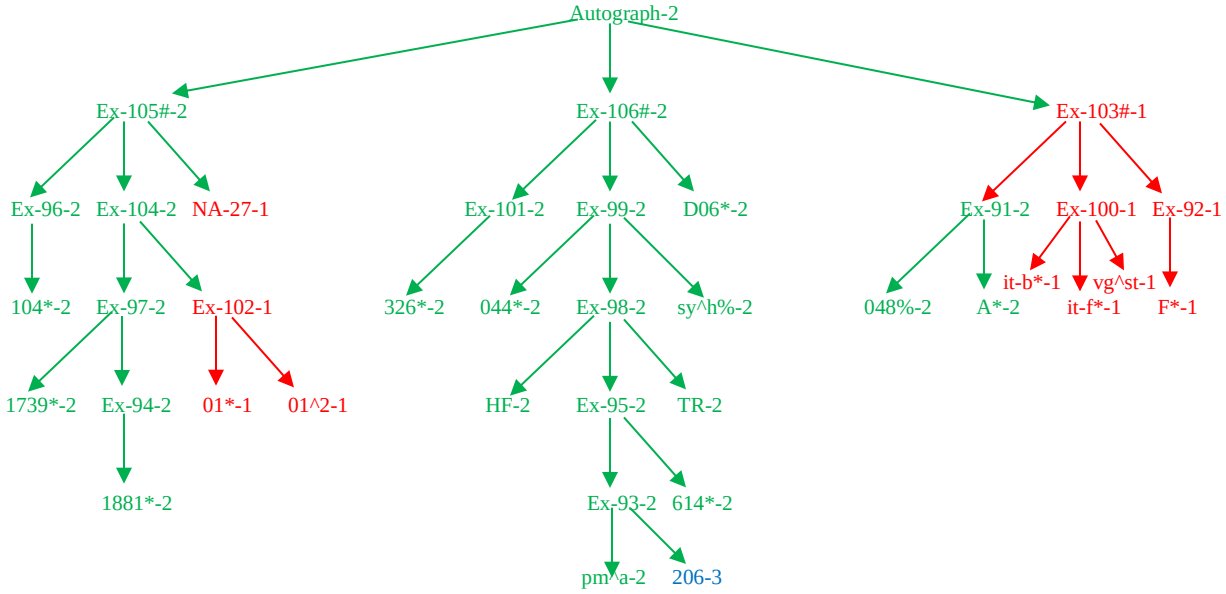
Non-NA-27 in 2:14,1

Another example of where Lachmann-10 found that the autographic reading differed from that of NA-27 occurs in 2:14. 2 Timothy 2:14 "Remind them of these things, charging them before the Lord not to strive about words to no profit, to the ruin of the hearers." Some witnesses have the word "Lord," some have "God" and some have "Christ." The variants are:

(1) *θεου*—God
(2) *κυριου*—Lord
(3) *Χριστου*—Christ

Figure 4.6 displays the genealogical distribution of these variants. Variant 2 ("Lord") has the consensus of two of the first-generation recensions: Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived, and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived; it was selected as the autographic reading on this basis with a probability of 67%. It has the support of all the witnesses in the Antiochian text traditions except for MSS 614*, 629*, and 630*. It has the support of all the witnesses in the Egyptian text traditions, except for those in the sub-branch headed by third-generation Exemplar Ex-102, and except for MSS I%, 1175*, bo^a%, and vg^b%. It also occurs independently as a singularity in MSS vg^a%, it-b*5, and it-d. It has the greatest antiquity, the broadest distribution, and excellent persistence.

Figure 4.6
Distribution of 2:14,1



Variant 1 ("God") was first initiated in the Western text tradition headed by first-generation Exemplar Ex-103#, after which it persisted throughout the history of that branch, except for those in the sub-branch headed by second-generation Exemplar Ex-91, and except for MSS vg^a%* and it-b*%. It was then initiated in the Egyptian text tradition headed by third-generation Exemplar Ex-102, after which it persisted throughout the history of that branch, It also occurs independently in the following singularities: MSS I%, 614*, 629*, 630, 1175*, vg^b%, and bo^a% (mostly not shown). It lacks antiquity and adequate distribution.

Variant 3 ("Christ") occurs independently as a singularity only in MS 206, a daughter of fifth-generation Exemplar Ex-93 of the Antiochian tradition. It has no genealogical possibility of being original.

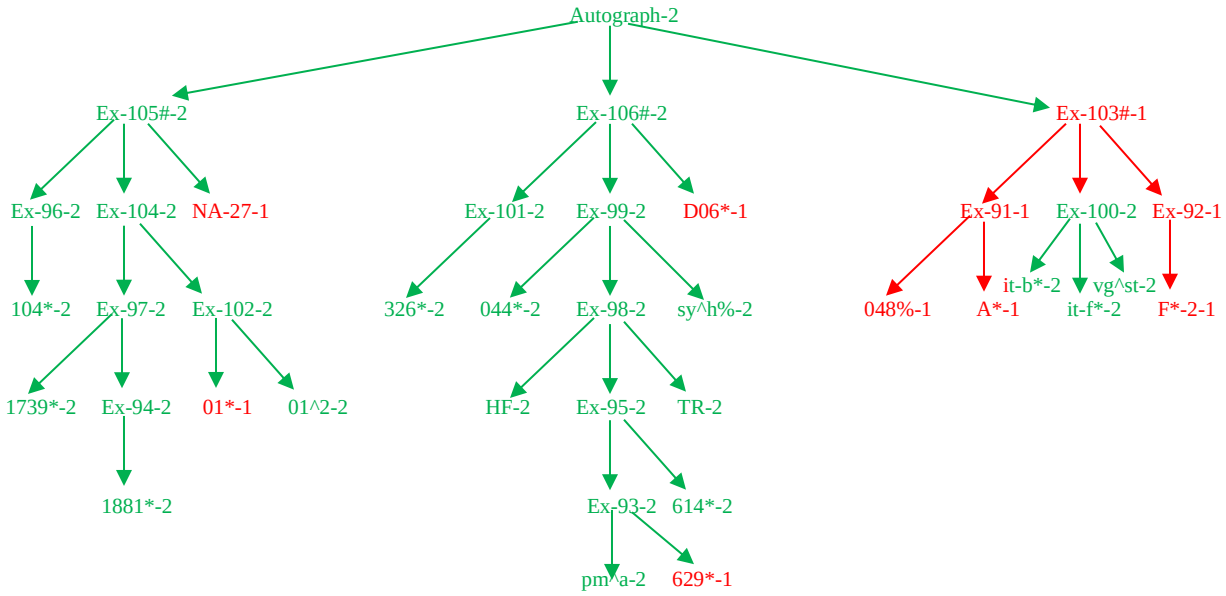
Non-NA-27 in 2:21,1

Another example of where Lachmann-10 found that the autographic reading differed from that of NA-27 occurs in 2:21. 2 Timothy 2:21 "Therefore if anyone cleanses himself from the latter, he will be a vessel for honor, sanctified and useful for the Master, prepared for every good work." Some witnesses have the word "and," and some do not. The variants are:

(1) omit—omit
(2) και—and

Figure 4.7 displays the genealogical distribution of these variants.

Figure 4.7
Distribution of 2:21,1



Variant 2 ("and") has the consensus of two of the first-generation recensions: Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived, and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived; it was selected as the autographic reading on this basis with a probability of 67%. It has the support of all the witnesses in the Antiochian text traditions except for MSS D06* and 629*. It has the support of all the witnesses in the Egyptian text traditions, except for MS 01*. It also has the support, by mixture, in

the witnesses in the sub-branch of Western text headed by second-generation Exemplar Ex-100. It has the greatest antiquity, the broadest distribution, and excellent persistence.

Variant 1 (omit "and") was first initiated in the Western text tradition in first-generation Exemplar Ex-103#, after which it persisted throughout the history of that branch, except for the witnesses in the sub-branch headed by second-generation Exemplar Ex-100. It also occurs independently in the following singularities: MSS 01*, D06*, and 629. It lacks antiquity and adequate distribution.

Variants of Theological Interest

Although most textual variations have little or no practical theological significance, a number are found in theological discussions. For example, Bart D. Ehrman argued that the earliest form of the Greek New Testament was less "orthodox" than the canonical form that emerged at the end of the "proto-orthodox" debates that culminated in the dominance of the "orthodox" parties in the fourth century. He wrote:

> It was within this milieu of controversy that scribes sometimes changed their scriptural texts to make them *say* what they were already known to *mean*. In the technical parlance of textual criticism—which I retain for its significant ironies—these scribes "corrupted" their texts for theological reasons.[40]

He is right about the ante-Nicene debates over the various heretical issues of the time and the emerging dominance of the orthodox parties, but his thesis that the doctrine of the apostles and first-century church, and the earliest form of the New Testament text were less "orthodox" is purely hypothetical. Of course, he provided what he regards as evidence. However, my own evaluation of the evidence he presented to establish his thesis indicates that the readings supported by the "consensus of ancient independent witnesses" are genuinely orthodox as normally interpreted, and that his "orthodox corruptions"—those intended to make orthodox doctrine more explicit—are found only in peripheral sources having little chance of being textually authoritative. The same may be said of any alleged "unorthodox" variants. So, I must conclude that what Ehrman really means is that the traditional canons of textual criticism are of no value for understanding the early text, that the "canonical text" of the New Testament is an "orthodox corruption," and that the original text, if there ever was one original, is forever lost. The one thing he was sure of according to his "socio-historical" research is that the earliest text was not "orthodox" and the current form

[40] Bart D. Ehrman, *The Orthodox Corruption of Scripture* (New York: Oxford University Press, 1993), xii; italics his.

of the text (i.e., the NA-28 text) is a corruption of the original text, being altered by orthodox scribes for theological reasons.

Ehrman has a problem, however, because, by his own admission, he does not know what the original text was. So how can he know it was corrupted? Also, evidently, he does not know, or at least he rejects, the fact that each existing witness has within its variants the history of its genealogical descent from the original text, and the fact that genealogical principles reconstruct the original text back to the first century, the time of the apostles. So, the reconstructed text is a first century event, not a fourth century one, and it is theologically orthodox, not a corruption. The following is the evidence he presented regarding doctrine in 2 Timothy:

"Christ" or "God" in 1:10,1

Ehrman claimed that the orthodox scribes tended to alter the text to convey a notion that the Christ who effects salvation is none other than God (p. 87). Regarding 2 Timothy 1:10 he stated:

> Comparable changes also occur sporadically throughout the manuscript tradition of the Pastoral Epistles. Thus, in the proem of 1 Timothy several Greek and versional witnesses change the "command of God our savior and Christ Jesus our hope" (1:1) to the "command of God our savior, (i.e.) Jesus Christ our hope"; in 2 Timothy 1:10 the reference to salvation that has now become manifest through the "epiphany of our Savior Christ Jesus" has been changed to speak of the salvation now made known through "the epiphany of our Savior, God" (MS I); and in Titus 3:6 a number of lectionaries change the reference to "Jesus Christ our Savior" to read "Jesus Christ our God." In the Old Latin tradition of Hebrews 13:20, "our Lord Jesus" has been changed to "our God Jesus" (MS d).[41]

Timothy 1:10 reads: "but has now been revealed by the appearing of our Savior Jesus Christ, who has abolished death and brought life and immortality to light through the gospel." Some witnesses have the phrase "Christ Jesus," some have "Jesus Christ," and some have "God." The variants are:

(1) Χριστου ̓Ιησου—Christ Jesus

(2) ̓Ιησου Χριστου—Jesus Christ

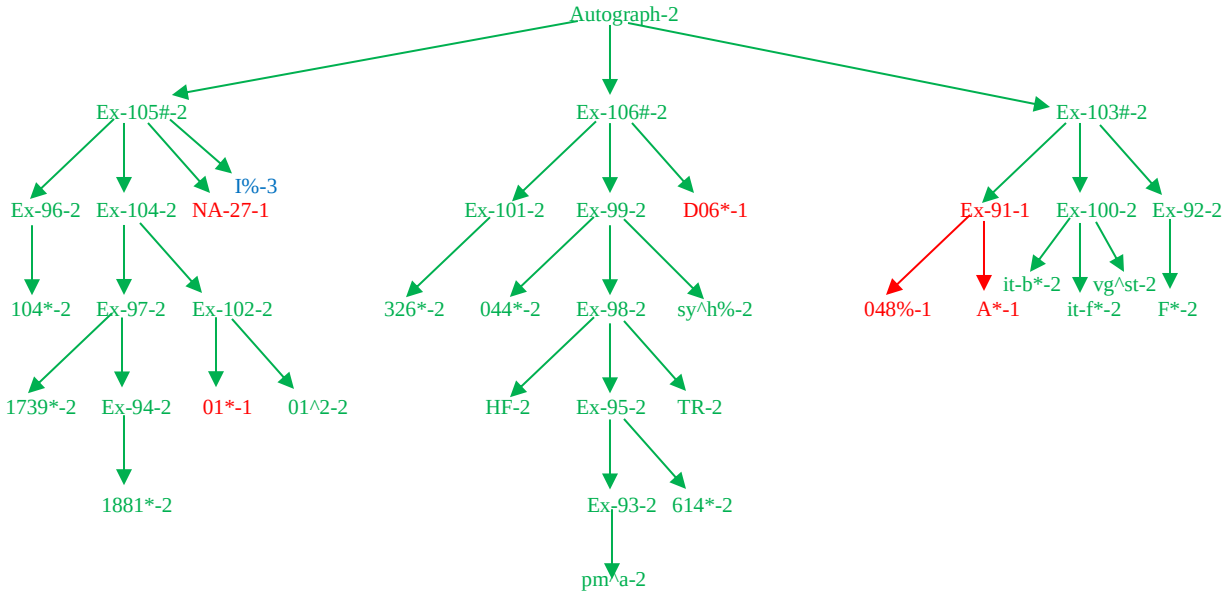
(3) θεου—God

Figure 4.8 displays the distribution of the variants throughout genealogical history. Variant 2 ("Jesus Christ") has the consensus of all three first-generation recensions: Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived, and Exemplar Ex-106#, the

[41] Ehrman, p. 87.

recension from which the Antiochian text tradition was derived, and Exemplar Ex-103#, the recension from which the Western text tradition was derived; it was selected as the autographic reading on this basis with a probability of 100%. It has the support of all the witnesses in all three text traditions, except for those in the sub-branch of the Western tradition headed by second-generation Exemplar Ex-91, and except for MSS 01*, 81*, vg^b%, and Ambrst%. It has the greatest antiquity, the broadest distribution, and excellent persistence.

Figure 4.8
Distribution of 1:10,1



Variant 1 ("Christ Jesus") was first initiated in the Western text tradition in the sub-branch headed by second-generation Exemplar Ex-91, after which it persisted throughout the history of that branch. It also occurs independently in the following singularities: MSS 01*, D06*, 81*, vg^b%, and Ambst%. It lacks antiquity and adequate distribution. This is another instance where the genealogical evidence greatly outweighs the internal evidence of the NA-27 reading, although the difference has no effect on the orthodoxy of canonical text.

Variant 3 ("God") occurs independently as a singularity only in MS I%, a daughter of first-generation Exemplar Ex-105# of the Egyptian tradition. It has no genealogical possibility of being original. Ehrman was right, a peripheral orthodox change was made, but that had no effect on the orthodoxy of the canonical text. The same may be said of his above references to 1 Tim. 1:1, Tit. 3:6, and Heb. 13:20.

Other Variants of Theological Interest

The following is a discussion of some other passages in 2 Timothy where doctrinal issues may seem significant to some readers.

"God" or "Christ" in 1:6,2

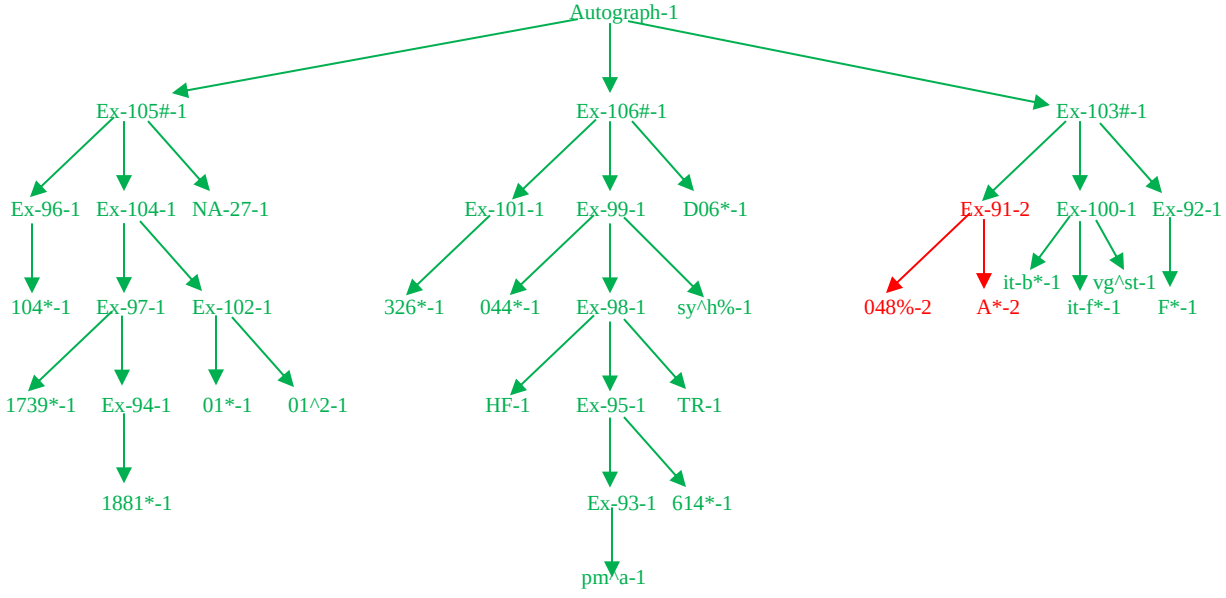
2 Timothy 1:6 reads: "Therefore I remind you to stir up the gift of God which is in you through the laying on of my hands." Some witnesses have the word "God" and some have "Christ." The variants are:

(1) θεου—God

(2) Χριστου—Christ

Figure 4.9 displays the distribution of the variants throughout genealogical history. Variant 1 ("God") has the consensus of all three first-generation recensions: Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived, and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived, and Exemplar Ex-103#, the recension from which the Western text tradition was derived; it was selected as the autographic reading on this basis with a probability of 100%. It has the support of all the witnesses in all three text traditions, except for those in the sub-branch of the Western tradition headed by second-generation Exemplar Ex-91. It also occurs as an independent singularity in MS 048%. It has the greatest antiquity, the broadest distribution, and excellent persistence.

Figure 4.9
Distribution of 1:6,2



Variant 2 ("Christ") was first initiated in the Western text tradition headed by second-generation Exemplar Ex-91, after which it persisted throughout the history of that branch, except for MS 048% (not shown). It also occurs as an independent singularity in MSS I% and 629* (not shown). This reading lacks antiquity and adequate distribution, but it has good persistence once introduced.

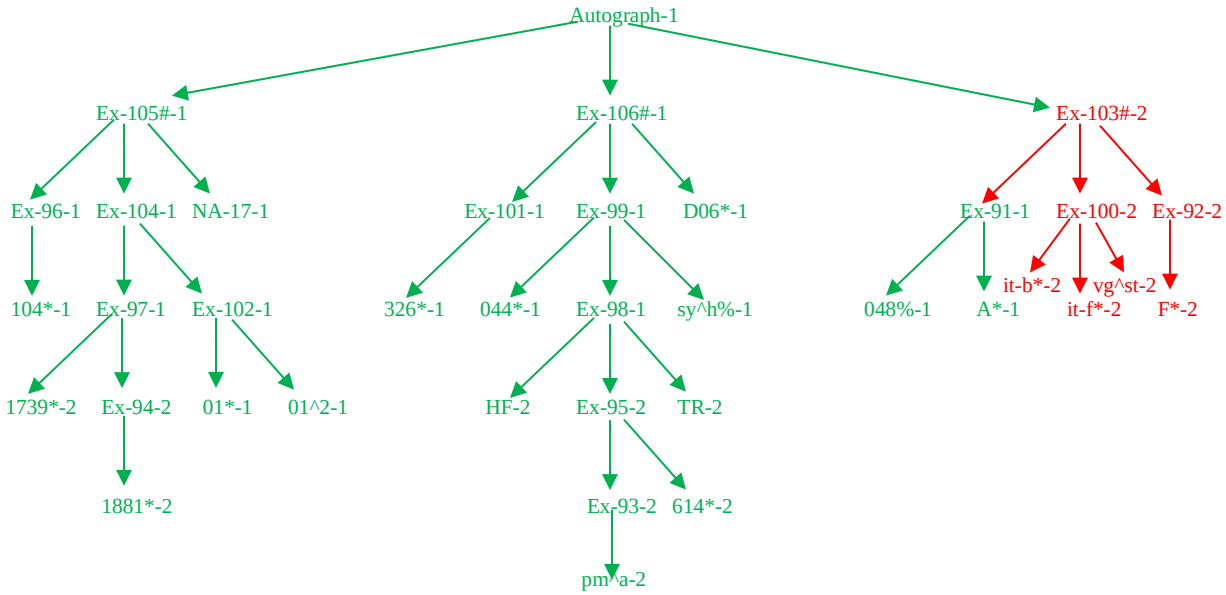
Omit "God" in 2:4,1

2 Timothy 2:4 reads: "No one engaged in warfare entangles himself with the affairs of this life, that he may please him who enlisted him as a soldier." Some witnesses have the words "for God" after the word "warfare" and some do not. The variants are:

(1) ομιτ—omit
(2) τω θεω—for God

Figure 4.10 displays the distribution of the variants throughout genealogical history.

Figure 4.10
Distribution of 2:4,1



Variant 1 (omit "for God") has the consensus of two of the first-generation recensions: Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived, and Exemplar Ex-106#, the recension from which the Antiochian text tradition was derived; it was selected as the autographic reading on this basis with a probability of 67%. It has the support of all the witnesses in the Antiochian text traditions. It has the support of all the witnesses in the Egyptian text traditions. It also has the support, by mixture, of the witnesses in the sub-branch of Western

text headed by second-generation Exemplar Ex-91. It also occurs as an independent singularity in MSS 33*, vg^a%, vg^s, and vg^st% (not shown). It has the greatest antiquity, the broadest distribution, and excellent persistence.

Variant 2 ("for God") was first initiated in the Western text tradition headed by first-generation Exemplar Ex-103#, after which it persisted throughout the history of that branch, except for the witnesses in the sub-branch headed by second-generation Exemplar Ex-91, and except for MSS 33*, vg^%, vg^s%, vg^st. This reading lacks antiquity and adequate distribution, but it has good persistence once introduced.

Tracing Any Variant

The above studies trace the history of variants of particular interest using the computer program Lachmann-10. But one may trace the history of any other desired variant using the information in Appendices D, F, and H. Take for example the variants at variation unit 10 at reference 2:3,1:

2 Timothy 2:3 reads: "bearing with one another, and forgiving one another, if anyone has a complaint against another; even as Christ forgave you, so you also must do." There are four variations of the word "Christ" in this verse. To trace the genealogical distribution of these variants, walk through the following steps:

Step 1: Using Appendices D and F, find the variant readings.

Appendix D reads:

10.1	2:3,1.1	Συγκακοπαθησον	0.67

That is, the autographic reading is the first variant (10.1), ⌜Συγκακοπαθησον "suffer hardship with" and that its probability is 0.67 (67%).

Appendix F reads:

10.2	2:3,1.2	Ex-109$;	κακοπ—
10.3	2:3,1.3	Ex-106#;	συ ουν κακοπ—

Variant 2 is κακοπαθησον "suffer hardship" initiated in virtual Exemplar Ex-109$.
Variant 3 is συ ουν κακοπαθησον "you therefore suffer hardship" initiated in Exemplar Ex-106#.

Step 2: Using Appendix H, find where these variants were initiated in the history of the text.

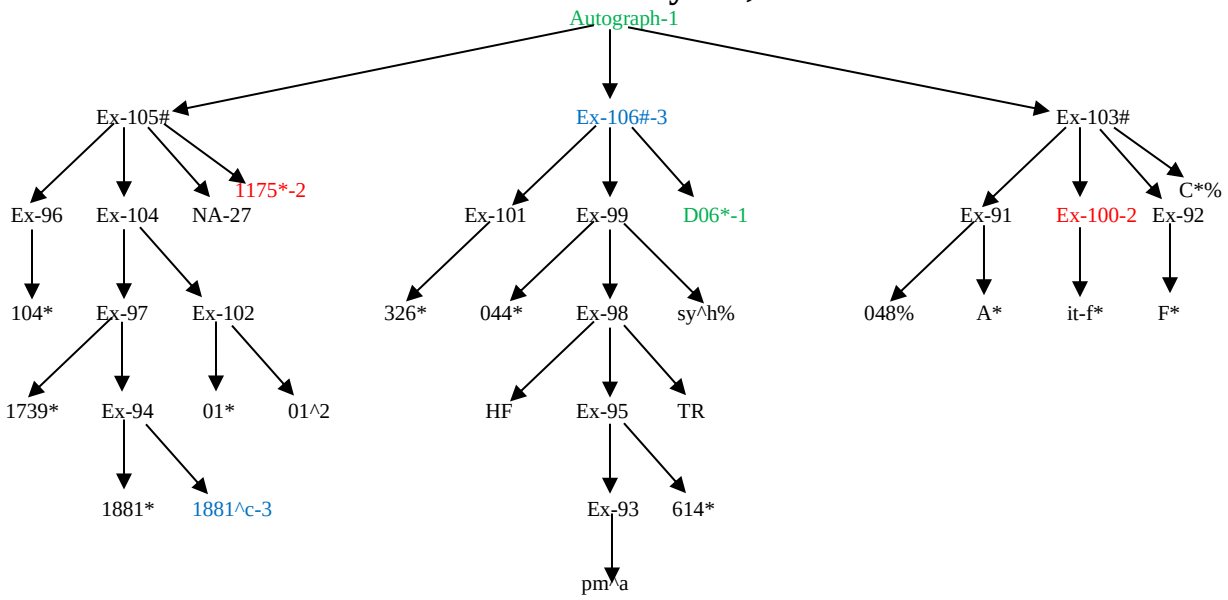
Appendix H reads:

10.1	2:3,1.1	[D06*]<2>; [H015*%]<2>; [P025*]<3>; [it-m*%]<3>; [it-m^c%]<3>; Autograph;
10.2	2:3,1.2	[1175*]<2>; [vg^b%]<4>; [Ex-100]<2>; Ex-109$<1>;
10.3	2:3,1.3	[1881^c]<5>; Ex-106#<1>;

That is, the first variant was initiated in the Autograph, and then by mixture it was subsequently introduced in MSS [D06*]<2>; [H015*%]<2>; [P025*]<3>; [it-m*%]<3>; [it-m^c%]. The second variant was initiated in virtual Exemplar Ex-109$, and then by mixture it was subsequently introduced in MSS [1175*]<2>; [vg^b%]<4>; [Ex-100]. The third variant was initiated in Exemplar Ex-106#, and then by mixture it was subsequently introduced in MS 1881^c.

Step 3: copy figure 3.2 from chapter 3 on a separate sheet of paper, as below, and write the variant numbers at the places on diagram where each variant was initiated; use green for the autographic reading (1), red for the first variant (2), blue for the second variant (3), as illustrated in figure 4.11.

Figure 4.11
Illustrating Marking Places of Initiation
At 2 Timothy 2:3,1

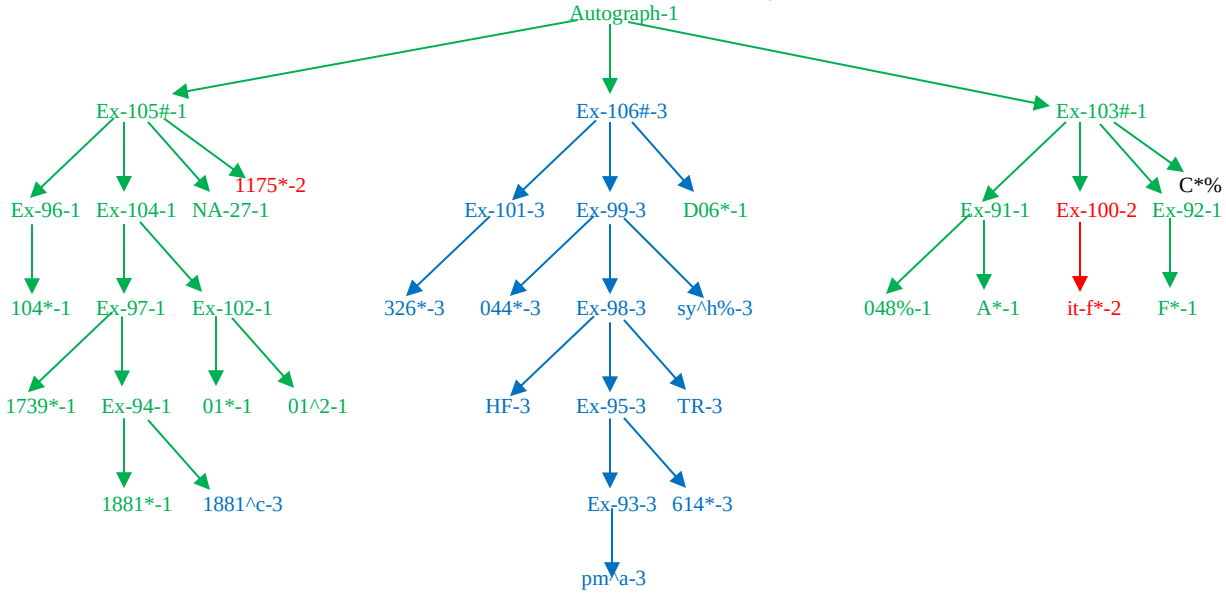


Step 4: Using its designated color, let each initiated variant extend by inheritance to all its descendants down to its extant terminal witnesses, or until changed by a new initiation, as shown in figure 4.12. Witnesses marked with % are fragmentary; their readings are often lacking; they may be ignored in this step.

Figure 4.12 displays the distribution of the variants throughout genealogical history. Variant 1 ("suffer hardship with") has the consensus of two of the first-generation recensions:

Exemplar Ex-105#, the recension from which the Egyptian text tradition was derived, and Exemplar Ex-103#, the recension from which the Western text tradition was derived; it was selected as the autographic reading on this basis with a probability of 67%. It has the support of all the witnesses in the Egyptian text tradition headed by first-generation Exemplar Ex-105#, except for MSS 1175*, 1881^c, and vg^b% (not shown). It also has the support of all the witnesses in the Western text tradition headed by first-generation Exemplar Ex-103#, except for the witnesses in the subbranch headed by second-generation Exemplar Ex-100. It also occurs as an independent singularity in MSS D06*, H015*%, P025*, it-m*%, and it-m^c% (some not shown). It has the greatest antiquity, the broadest distribution, and excellent persistence.

Figure 4.12
Distribution of 2 Timothy 2:3,1



Variant 2 ("suffer hardship") was first initiated in the branch of the Western text tradition headed by second-generation Exemplar Ex-100, after which it persisted throughout the history of that branch, except for MSS it-m% and it-m^c%. It also occurs independently as a singularity in the following MSS: 1175* and vg^b%, (not shown). This reading lacks antiquity and adequate distribution, but it has good persistence once introduced.

Variant 3 ("you therefore suffer hardship") was first initiated in the Antiochian text tradition headed by first-generation Exemplar Ex-106#, after which it persisted throughout the history of that branch, except for MSS D06*, H015*%, and P025%. It also occurs independently as a singularity in MS: 1881^c. This reading lacks antiquity and adequate distribution, but it has good persistence once introduced.

Conclusion

This chapter identifies the autographic readings of the Greek text of the Book of 2 Timothy and how they were determined. It provides the genealogical history of each variant reading, locating where each reading originated, and describing how each reading was distributed by inheritance throughout that history. It discusses the principal recensions, locating their origin in history, and identifying their characteristic readings.

CHAPTER 5
SUMMARY AND CONCLUSIONS

The genealogical software, and the theory it emulates, were successful in reconstructing a genealogical history of the Greek text of the Second Epistle to Timothy. The software made use of a modified version of the textual apparatus in the 27th edition of the Nestle-Aland Greek New Testament. Using index numbers to represent the variant readings in the witnesses to the text, the computer constructed a kind of genetic code for each witness based on its unique combination of variant readings. Then employing the basic principles of heredity, a relatively simple tree diagram was constructed representing the genealogical history of the text.

Heredity is the underlying principle of genealogical relationships. Because manuscripts of a text were copied from exemplars of earlier generations of the text, of necessity they have genealogical relationships. For manuscripts, quantitative affinity (consensus of variant readings) and a sibling gene, coupled with historical directionality constitute the variables for computing genealogical heredity. For variant readings, on the other hand, the domain of heredity is limited to their place of variation. There, heredity is determined by consensus among sibling sister witnesses and by what I call evidence of variant inheritance.[1] The software uses the heredity of manuscripts and the heredity of variant readings to guide the reconstruction of a historical genealogical tree diagram.

Mixture occurred when a scribe copied from more than one exemplar—a primary parent exemplar and one or more secondary exemplars. The readings of a manuscript were inherited from its primary parent exemplar or borrowed by mixture from its secondary parent exemplars; otherwise, a variant was newly introduced by scribal error (either accidentally or intentionally) thus initiating a new line of heredity. A good number of witnesses had no mixture, but considerable mixture occurred in others. As it turned out, the presence of mixture does not affect the reconstruction of the genealogical tree, but it is very useful in identifying the places in genealogical history

[1] At any place in the genealogical history of a text, the evidence of a variant's inheritance is its presence in other witnesses of the same or earlier generations.

where variants were initiated, in tracing the genealogical history of variants, and in identifying recensions.

The Effect of Recensions

The genealogical theory and associated software were designed to reconstruct the genealogical history of texts where the copying process was simple, without any radical discontinuities. It was anticipated that the initiation and transmission of textual variants would be gradual and that the tree would develop three or four main branches corresponding to the commonly accepted text types. However, the theory and software also made provision for radical dislocations if they perchance had occurred. As it turned out radical dislocations did occur in the form of some major and minor recensions.[2] Furthermore, the most radical recensions took place in the earliest generation that genealogical relationships could be reasonably determined. This information indicates that in the earliest days of New Testament history its text was in flux and its genealogical history for that time period cannot be confidently reconstructed. These details could have resulted in disappointment except that the earliest recensions, though diverse from one another, nevertheless had sufficient consensus to identify the autographic readings.

Binary Branches

The genealogical tree diagram reconstructed by the software is often binary, that is, there are only two branches where the tree divides. Table 3.3 in Chapter 3 indicates that 12 out of 17 branches were binary. Critics of the genealogical theory claim that the methodology fails whenever there are only two branches, because no consensus can exist where there are only two alternatives. That would be true except for the principle of deferred ambiguity. In such cases, where ambiguity exists in one witness, its sister has the inherited reading.

A reading has evidence of variant inheritance when it is also found in witnesses of earlier generations. A reading will not be found in any witness dating in a generation prior to the one in which the reading first originated. Autographic readings have continual evidence of variant inheritance; all others acquire that evidence in the generation of their origin subsequent to the autograph. The evidence of variant inheritance usually decides between two equally probable readings; but where even that fails, a final appeal can be made indirectly to internal evidence. So, a binary construction does not turn out to be a crucial weakness. Still, some may be concerned that the earliest history of the text is determined by such diverse witnesses. However, Table 4.4 of Chapter 4

[2] A recension is recognized by the introduction of a larger number of variants than normal in a witness, usually also accompanied by a larger number of secondary parent exemplars—mixture.

indicates that 97.51% of the textual decisions made in the reconstruction of the historical tree diagram were made on the basis of consensus or deferred ambiguity; so, diversity was not a significant deterrent. Furthermore, Table 4.5 of Chapter 4 indicates that 100 percent of the autographic readings were decided on the basis of consensus.

So What!

Someone may ask: "After all those painstaking computations, what is now known that was not already known by means of traditional textual critical methodology?" The answer should be self-evident, but for the sake of review, here is a list of the more prominent bits of knowledge the computations provide:

(1) A rigorous construction of the genealogical history of the witnesses to the text, something that did not previously exist.

(2) A precise account of the genealogical history of each variant reading, including its place of origin and subsequent distribution, something that did not previously exist.

(3) The identity of the autographic readings based on an unbiased implementation of the laws of heredity, together with the mathematical probability of each one, instead of educated estimates.

(4) An accurate description of the content and structure of the traditional text types, and their internal and external genealogical relationships, instead of educated estimates.

(5) Hopefully a better understanding of the laws of heredity as they apply to manuscripts.

The laws of heredity have been applied to the factual evidence derived from the existing witnesses to the text of 2 Timothy. They have been applied with mathematical precision apart for human intervention and bias. Hopefully the results provide a better understanding of the history of the text. In either case, no claim is made that the derived history and the text identified as autographic are free from uncertainty. The results are dependent on the validity of the underlying theory and its software implementation. Undoubtedly the future will bring forth improved theory and implementation.

James D. Price
June, 2021

APPENDIX A

List of Extant Witnesses to the Greek Text of the Second Epistle to Timothy

This appendix contains a list of the extant witnesses to the Greek text of the Second Epistle to Timothy. For each witness it lists its name, date, language, content (references where readings exist), number of readings, and percentage of completeness. In the content column, a verse is counted as long as it has at least one extant reading.

Witness	Date	Lan-guage	Content	No. of Readings	Percent Complete
01*	350	0	1:1-4:22	71	100.00%
01^2	650	0	1:1-4:22	71	100.00%
A*	450	0	1:1-4:22	70	98.59%
A^c	550	0	1:1-4:22	70	98.59%
C*%	450	0	3:10-4:22	37	52.11%
C^2%	550	0	3:10-12, 15-4:22	36	50.70%
C^3%	850	0	3:10-14, 16-4:22	36	50.70%
D06*	550	0	1:1-4:22	71	100.00%
D06^c	900	0	1:1-6, 11-12, 18; 2:4-19, 22; 3:1-14, 16-4:14; 4:16-17, 19-22	57	80.28%
D06^1	600	0	1:1-6, 11-2:22; 3:1-4:13; 4:16-22	63	88.73%
D06^2	850	0	1:1-12, 18; 2:4-19, 22-3:14; 3:16-4:17; 4:19-22	64	90.14%
F*	850	0	1:1-4:22	71	100.00%
G012*	850	0	1:1-4:22	71	100.00%
H015*%	550	0	1:12, 18-2:7; 3:8-11	11	15.49%
H015^c%	600	0	1:12, 18-2:7; 3:8-11	11	15.49%
I%	450	0	1:1-2, 10-12; 2:3-4, 14-16, 22; 3:6-8, 16-4:1; 4:8-10, 19-20	25	35.21%
K*	850	0	1:1-4:22	71	100.00%
L020*	850	0	1:1-4:22	71	100.00%
P025*	850	0	1:1-4:22	71	100.00%
044*	1000	0	1:1-4:22	71	100.00%
48%	450	0	1:6; 2:4-24	16	22.54%
6	1250	0	1:1-4:22	71	100.00%
33*	850	0	1:1-4:22	70	98.59%
81*	1044	0	1:1-4:22	71	100.00%
104*	1087	0	1:1-4:22	71	100.00%
181	950	0	1:1-4:22	71	100.00%
206	1300	0	1:1-4:22	71	100.00%
323*	1150	0	1:1-4:22	71	100.00%
326*	950	0	1:1-4:22	71	100.00%
365	1150	0	1:1-4:22	71	100.00%
431	1150	0	1:1-4:22	71	100.00%
442	1200	0	1:1-4:22	71	100.00%
460	1250	0	1:1-4:22	71	100.00%
614*	1250	0	1:1-4:22	71	100.00%
629*	1350	0	1:1-4:22	71	100.00%
630	1300	0	1:1-4:22	71	100.00%
1175*	950	0	1:1-4:22	71	100.00%

1241*%	1150	0	1:6, 12, 18; 2:4-6, 14-16, 19; 3:1-11, 16-4:2; 4:5, 8-13, 19-22	33	46.48%
1505*	1150	0	1:1-4:22	71	100.00%
1739*	900	0	1:1-4:22	71	100.00%
1739^c	950	0	1:1-4:22	71	100.00%
1881*	1350	0	1:1-4:22	71	100.00%
1881^c	1400	0	1:1-4:22	71	100.00%
pm^a	850	0	1:1-4:22	71	100.00%
pm^b	850	0	1:1-4:22	71	100.00%
TR	1892	0	1:1-4:22	71	100.00%
HF	1982	0	1:1-4:22	71	100.00%
RP	1995	0	1:1-4:22	71	100.00%
vg^a%	400	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5, 8-13, 15-16, 18-22	52	73.24%
vg^b%	400	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5, 8-13, 15-16, 18-22	52	73.24%
vg^cl%	1592	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5-6, 8-16, 18-22	55	77.46%
vg^s%	1590	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5, 8-13, 15-16, 18-22	51	71.83%
vg^st%	1994	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5-6, 8-16, 18-22	55	77.46%
vg^ww%	1889	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5-6, 8-16, 18-22	55	77.46%
it-ar*%	950	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5-6, 8-16, 18-22	56	78.87%
it-b*%	450	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:2; 4:5-6, 8-16, 18-22	56	78.87%
it-d	450	1	1:1-4:13; 4:15-22	70	98.59%
it-f*	550	1	1:1-4:22	71	100.00%
it-g*	800	1	1:1-4:22	71	100.00%
it-g^c	800	1	1:1-4:22	71	100.00%
it-m*%	950	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:1	36	50.70%
it-m^c%	1000	1	1:1-2, 6-2:16; 2:19-22; 3:1-14, 16-4:1	36	50.70%
it-t%	1000	1	2:3-7; 4:1-2, 5-6, 8-13, 15-16, 18	20	28.17%
sy^p%	425	1	1:1-2, 6, 12-18; 2:4-6, 13, 16, 19, 22; 3:1-11, 16-4:2; 4:5, 8-13, 19-22	36	50.70%
sy^h%	616	1	1:1-2:7; 2:13-16, 19-24; 3:1-11, 16-4:2; 4:5, 8-13, 18-22	49	69.01%
sa^a%	250	1	1:1-2, 6, 11-18; 2:4-6, 13-16, 19, 22-24; 3:1-11, 15-4:2; 4:5, 8-13, 19-22	43	60.56%
sa^b%	250	1	1:6, 11-18; 2:4-6, 14-16, 19, 24; 3:1-11, 15-4:2; 4:5, 8-13, 19-22	37	52.11%
bo^a%	250	1	1:6, 11-2:6; 2:13-16, 19, 22-24; 3:1-11, 15-4:2; 4:5, 8-13, 19-22	43	60.56%
bo^b%	250	1	1:1-2, 6, 11-18; 2:4-6, 13-16, 19, 22-24; 3:1-11, 15-4:2; 4:5, 8-13, 19-22	41	57.75%

l^249	850	0	1:1-4:22	71	100.00%
l^846	850	0	1:1-4:22	71	100.00%
13	1250	0	1:1-4:22	71	100.00%
69	1450	0	1:1-4:22	71	100.00%
346	1150	0	1:1-4:22	71	100.00%
543	1150	0	1:1-4:22	71	100.00%
788	1050	0	1:1-4:22	71	100.00%
826	1150	0	1:1-4:22	71	100.00%
828	1150	0	1:1-4:22	71	100.00%
983	1150	0	1:1-4:22	71	100.00%
NA-27	1979	0	1:1-4:22	71	100.00%
Ambst%	366	1	1:10; 2:4, 12, 21; 3:1, 3, 14, 16; 4:6, 8, 13-15, 22	16	22.54%
Cl^a%	215	0	2:14; 3:15-16	3	4.23%
Cyp^a%	258	1	2:4, 12; 3:8	3	4.23%
Did^a%	398	0	4:7, 16	2	2.82%
Epiph^a%	403	0	2:7; 4:10	3	4.23%
Eus^a%	339	0	4:7, 10	2	2.82%
Lcf%	371	1	2:16	1	1.41%
Or^a%	254	0	1:10, 17; 2:21; 4:7	4	5.63%
Spec%	450	0	2:16; 3:1	2	2.82%
Tert^a%	220	1	2:12-13	2	2.82%

APPENDIX B

List of the References Associated

with Each Place of Variation

This appendix contains a list of the references associated with each place of variation. The number to the left of the hyphen is the index number of the place of variation, and the numbers to the right constitute the reference. The reference indicates the chapter, verse, and ordered rank of the place of variation in that verse. For example, 5-1:6,2 indicates that the 5th place of variation occurs in chapter 1, verse 6, and is the 2th place of variation in that verse.

Reference at Each Place of Variation

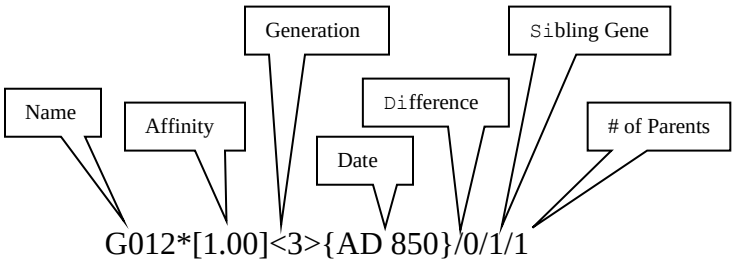
1- 1:2,1	2- 1:5,1	3- 1:6,1	4- 1:6,2	5- 1:10,1	6- 1:11,1	7- 1:12,1
8- 1:17,1	9- 1:18,1	10- 2:3,1	11- 2:4,1	12- 2:6,1	13- 2:7,1	14- 2:7,2
15- 2:12,1	16- 2:13,1	17- 2:14,1	18- 2:14,2	19- 2:14,3	20- 2:16,1	21- 2:18,1
22- 2:19,1	23- 2:21,1	24- 2:22,1	25- 2:24,1	26- 2:25,1	27- 3:1,1	28- 3:2,1
29- 3:3,1	30- 3:6,1	31- 3:6,2	32- 3:6,3	33- 3:8,1	34- 3:9,1	35- 3:10,1
36- 3:10,2	37- 3:11,1	38- 3:12,1	39- 3:14,1	40- 3:15,1	41- 3:16,1	42- 3:16,2
43- 3:17,1	44- 4:1,1	45- 4:1,2	46- 4:1,3	47- 4:2,1	48- 4:3,1	49- 4:5,1
50- 4:5,2	51- 4:6,1	52- 4:7,1	53- 4:8,1	54- 4:9,1	55- 4:10,1	56- 4:10,2
57- 4:11,1	58- 4:13,1	59- 4:13,2	60- 4:14,1	61- 4:15,1	62- 4:16,1	63- 4:16,2
64- 4:17,1	65- 4:18,1	66- 4:19,1	67- 4:20,1	68- 4:21,1	69- 4:22,1	70- 4:22,2
71- 4:22,3						

Appendix C

The Genealogical Tree Diagram of The Textual History of the Second Epistle to Timothy

This appendix contains the tree diagram of the genealogical history of the Greek text of the Second Epistle to Timothy. The tree is displayed vertically rather than horizontally. That is, the autograph in the upper left corner with succeeding generations indented from the left progressively downward. Sibling daughter descendants are linked by vertical lines. For example, the first-generation descendants of the autograph are Ex-144#,[44] Ex-146#, and Ex-147#. Only the primary exemplars are displayed, so no mixture connections are shown. The diagram spills over onto succeeding pages, but the lowercase letters at the page breaks show where the lines from one page connect to those of the next.

The format of the information on each line is as follows: (1) the name of the witness; (2) the genealogical affinity of the witness with its primary parent exemplar, enclosed in square brackets []; (3) generation from the autograph, enclosed in angular brackets <>; (4) date, enclosed in curly brackets {}; (5) the number of variants the witness differs from its primary parent, enclosed in slant marks //; (6) The number of variants in the sibling gene; and (7) the number of parents the witness has.



[44] The names of exemplars created by the software have the prefix "Ex-" followed by a number; extant witnesses have the names provided in NA-27 as modified for compatibility with the software (discussed in Chapter Two).

Genealogical Tree of 2 Timothy

```
Autograph[0.00]<0>{AD 80}/0/0/0
  |-Ex-103#[0.70]<1>{AD 120}/21/21/2
  |   |-C*%[0.81]<2>{AD 450}/7/21/3
  |   |-C^2%[0.83]<2>{AD 550}/6/21/4
  |   |-C^3%[0.81]<2>{AD 850}/7/21/4
  |   |-Ambst%[0.38]<2>{AD 366}/10/21/5
  |   |-Cyp^a%[0.67]<2>{AD 258}/1/21/2
  |   |-Did^a%[1.00]<2>{AD 398}/0/21/1
  |   |-Lcf%[1.00]<2>{AD 371}/0/21/1
  |   |-Spec%[0.50]<2>{AD 450}/1/21/2
  |   |-Ex-91[0.67]<2>{AD 400}/23/21/5
  |   |   |-A*[1.00]<3>{AD 450}/0/23/1
  |   |   |-A^c[1.00]<3>{AD 550}/0/23/1
  |   |   |-048%[0.81]<3>{AD 450}/3/23/3
  |   |-Ex-92[0.99]<2>{AD 750}/1/21/2
  |   |   |-F*[1.00]<3>{AD 850}/0/1/1
  |   |   |-G012*[1.00]<3>{AD 850}/0/1/1
  |   |   |-33*[0.81]<3>{AD 850}/13/1/5
  |   |   |-it-g^c[0.97]<3>{AD 800}/2/1/3
  |   |-Ex-100[0.86]<2>{AD 170}/10/21/4
  |       |-it-f*[0.97]<3>{AD 550}/2/10/2
  |       |-it-g*[0.97]<3>{AD 800}/2/10/3
  |       |-vg^a%[0.81]<3>{AD 400}/10/10/4
  |       |-vg^cl%[0.87]<3>{AD 1592}/7/10/5
  |       |-vg^s%[0.82]<3>{AD 1590}/9/10/4
  |       |-vg^st%[0.75]<3>{AD 1994}/14/10/4
  |       |-vg^ww%[0.80]<3>{AD 1889}/11/10/4
  |       |-it-ar*%[0.82]<3>{AD 950}/10/10/5
  |       |-it-b*%[0.82]<3>{AD 450}/10/10/5
  |       |-it-d[0.69]<3>{AD 450}/22/10/4
  |       |-it-m*%[0.83]<3>{AD 950}/6/10/4
  |       |-it-m^c%[0.83]<3>{AD 1000}/6/10/4
  |       |-it-t%[0.85]<3>{AD 1000}/3/10/3
  |       |-Tert^a%[1.00]<3>{AD 220}/0/10/1
  |-Ex-105#[0.97]<1>{AD 100}/2/2/2
  |   |-I%[0.76]<2>{AD 450}/6/2/4
  |   |-1175*[0.72]<2>{AD 950}/20/2/5
  |   |-sy^p%[0.83]<2>{AD 425}/6/2/3
  |   |-sa^b%[0.92]<2>{AD 250}/3/2/3
  |   |-bo^a%[0.84]<2>{AD 250}/7/2/4
  |   |-bo^b%[0.88]<2>{AD 250}/5/2/4
  |   |-NA-27[0.86]<2>{AD 1979}/10/2/3
 a  b
```

```
a  b
|  |-Ex-96[0.89]<2>{AD 1037}/8/2/4
|  |  |-365[0.90]<3>{AD 1150}/7/8/3
|  |  |-104*[0.92]<3>{AD 1087}/6/8/4
|  |-Ex-104[0.96]<2>{AD 150}/3/2/4
|     |-Ex-102[0.92]<3>{AD 200}/6/3/3
|     |  |-01^2[0.89]<4>{AD 650}/8/6/4
|     |  |-01*[0.82]<4>{AD 350}/13/6/3
|     |  |-sa^a%[0.86]<4>{AD 250}/6/6/5
|     |  |-Epiph^a%[1.00]<4>{AD 403}/0/6/1
|     |  |-Eus^a%[1.00]<4>{AD 339}/0/6/1
|     |-Ex-97[0.96]<3>{AD 204}/3/3/4
|        |-1739*[0.99]<4>{AD 900}/1/3/2
|        |-1739^c[0.97]<4>{AD 950}/2/3/3
|        |-vg^b%[0.71]<4>{AD 400}/15/3/5
|        |-Or^a%[1.00]<4>{AD 254}/0/3/1
|        |-Ex-94[0.90]<4>{AD 994}/7/3/6
|           |-1881^c[0.97]<5>{AD 1400}/2/7/2
|           |-1881*[0.99]<5>{AD 1350}/1/7/2
|           |-81*[0.83]<5>{AD 1044}/12/7/6
|-Ex-106#[0.80]<1>{AD 165}/14/14/2
   |-D06*[0.75]<2>{AD 550}/18/14/6
   |-D06^c[0.93]<2>{AD 900}/4/14/3
   |-D06^1[0.90]<2>{AD 600}/6/14/3
   |-D06^2[0.92]<2>{AD 850}/5/14/3
   |-H015*%[0.91]<2>{AD 550}/1/14/2
   |-H015^c%[1.00]<2>{AD 600}/0/14/1
   |-Cl^a%[0.67]<2>{AD 215}/1/14/2
   |-Ex-101[0.96]<2>{AD 800}/3/14/3
   |  |-P025*[0.89]<3>{AD 850}/8/3/3
   |  |-326*[0.92]<3>{AD 950}/6/3/4
   |  |-1241*%[0.97]<3>{AD 1150}/1/3/2
   |-Ex-99[0.96]<2>{AD 566}/3/14/2
      |-044*[0.93]<3>{AD 1000}/5/3/3
      |-sy^h%[0.94]<3>{AD 616}/3/3/4
      |-Ex-98[0.96]<3>{AD 700}/3/3/2
         |-L020*[0.93]<4>{AD 850}/5/3/4
         |-TR[0.97]<4>{AD 1892}/2/3/2
         |-HF[1.00]<4>{AD 1982}/0/3/1
         |-RP[0.99]<4>{AD 1995}/1/3/2
         |-Ex-95[1.00]<4>{AD 750}/0/3/1
            |-614*[0.94]<5>{AD 1250}/4/0/4
            |-Ex-93[1.00]<5>{AD 800}/0/0/1
               a
```

a
|-pm^a[1.00]<6>{AD 850}/0/0/1
|-K*[0.97]<6>{AD 850}/2/0/2
|-6[0.86]<6>{AD 1250}/10/0/4
|-181[0.99]<6>{AD 950}/1/0/1
|-206[0.99]<6>{AD 1300}/1/0/1
|-323*[0.99]<6>{AD 1150}/1/0/2
|-431[0.99]<6>{AD 1150}/1/0/2
|-442[0.99]<6>{AD 1200}/1/0/1
|-460[0.99]<6>{AD 1250}/1/0/2
|-629*[0.92]<6>{AD 1350}/6/0/6
|-630[0.96]<6>{AD 1300}/3/0/3
|-1505*[0.90]<6>{AD 1150}/7/0/4
|-pm^b[1.00]<6>{AD 850}/0/0/1
|-l^249[1.00]<6>{AD 850}/0/0/1
|-l^846[1.00]<6>{AD 850}/0/0/1
|-13[1.00]<6>{AD 1250}/0/0/1
|-69[1.00]<6>{AD 1450}/0/0/1
|-346[1.00]<6>{AD 1150}/0/0/1
|-543[1.00]<6>{AD 1150}/0/0/1
|-788[1.00]<6>{AD 1050}/0/0/1
|-826[1.00]<6>{AD 1150}/0/0/1
|-828[1.00]<6>{AD 1150}/0/0/1
|-983[1.00]<6>{AD 1150}/0/0/1

Appendix D

List of Autographic Readings

For 2 Timothy

This appendix contains the list of autographic readings for the Greek text of the Second Epistle to Timothy as determined by the genealogical method described in this book. The list contains the index of each place of variation (variation unit), the associated reference, the Greek reading at that place, and the probability that the reading is autographic.

Place of Variation	Reference	Autographic Reading	Probability
1.1	1:2,1.1	⸀Χριστου ̓Ιησου	1
2.1	1:5,1.1	⸂λαβων	0.67
3.1	1:6,1.1	⸂ἀναμιμνησκω	1
4.1	1:6,2.1	⸂θεου	1
5.2	1:10,1.2	2 1	1
6.2	1:11,1.2	και διδ. εθνων	1
7.1	1:12,1.1	⸰και	1
8.1	1:17,1.1	⸂σπουδαιως	0.67
9.1	1:18,1.1	⸆ ομιτ	1
10.1	2:3,1.1	⸂Τυγκακοπαθησον	0.67
11.1	2:4,1.1	⸆ ομιτ	0.67
12.1	2:6,1.1	⸂πρωτον	1
13.1	2:7,1.1	⸂ο	0.67
14.1	2:7,2.1	⸂δωσει	0.67
15.1	2:12,1.1	⸂ἀρνησομεθα	0.67
16.1	2:13,1.1	⸰γαρ	1
17.2	2:14,1.2	κυριου	0.67
18.1	2:14,2.1	⸂λογομαχειν	0.67
19.2	2:14,3.2	εις	0.67
20.1	2:16,1.1	⸂κενοφωνιας	0.67
21.1	2:18,1.1	⸰την	0.67
22.1	2:19,1.1	⸆ ομιτ	1
23.2	2:21,1.2	και	0.67
24.1	2:22,1.1	⸀των ἐπικαλουμενων	0.67
25.1	2:24,1.1	⸂ηπιον	0.67
26.2	2:25,1.2	δῷ	0.67
27.1	3:1,1.1	⸂γινωσκε	0.67
28.1	3:2,1.1	⸂ἀχαριστοι	1
29.1	3:3,1.1	⸀αστοργοι ασπονδοι	1
30.1	3:6,1.1	⸂αἰχμαλωτιζοντες	1
31.1	3:6,2.1	⸆ ομιτ	1
32.1	3:6,3.1	⸅ ομιτ	1
33.1	3:8,1.1	⸂̓Ιαμβρης	0.67
34.1	3:9,1.1	⸂ανοια	1
35.2	3:10,1.2	—θηκας	0.67
36.1	3:10,2.1	□τη ἀγαπη	1
37.1	3:11,1.1	⸂ἐγενετο	1
38.1	3:12,1.1	⸀εὐσεβως ζην⸅	0.67
39.1	3:14,1.1	⸂τινων	0.67

40.1	3:15,1.1	◦τα	0.67
41.1	3:16,1.1	◦και	1
42.1	3:16,2.1	⌜ἐλεγμον	0.67
43.1	3:17,1.1	⌜αρτιος	1
44.1	4:1,1.1	⊤ ομιτ	1
45.1	4:1,2.1	⌜κρινειν	0.67
46.1	4:1,3.1	⌜ και	0.67
47.1	4:2,1.1	⌞ἐπιτιμησον παρακαλεσον⊤	0.67
48.1	4:3,1.1	⌜ἰδιας ἐπιθυμιας	1
49.1	4:5,1.1	◦κακοπαθησον	1
50.1	4:5,2.1	⊤ ομιτ	1
51.1	4:6,1.1	⌜ἀναλυσεως μου	0.67
52.1	4:7,1.1	⌜καλον ἀγωνα	0.67
53.1	4:8,1.1	◦πασι	1
54.1	4:9,1.1	⌜ταχεως	1
55.1	4:10,1.1	⌜ἐγκατελιπεν	0.67
56.1	4:10,2.1	⌜Γαλατιαν	1
57.1	4:11,1.1	⌜αγε	1
58.1	4:13,1.1	⌜ἀπελιπον	0.67
59.1	4:13,2.1	⊤ ομιτ	1
60.1	4:14,1.1	⌜ἀποδωσει	0.67
61.2	4:15,1.2	ανθεστηκεν	0.67
62.2	4:16,1.2	συμπαρεγ—	0.67
63.1	4:16,2.1	⌜ἐγκατελιπον	0.67
64.1	4:17,1.1	⌜ἀκουσωσιν	1
65.2	4:18,1.2	και	0.67
66.1	4:19,1.1	⊤ ομιτ	1
67.1	4:20,1.1	⌜ἀπελιπον	1
68.1	4:21,1.1	◦παντες	1
69.1	4:22,1.1	⊤ ομιτ	0.67
70.1	4:22,2.1	⌜η χαρις μεθ᾽ υμων	1
71.1	4:22,3.1	⊤ ομιτ	0.67

Appendix E

List of the Places the Lachmann-10 Text Differs from the NA-27 Text for the Second Epistle to Timothy

Ref.		NA-27 Reading		Lochmann Reading	Prob.
1:10,1.2	Replace NA-27 =>	ʻΧριστου ʼΙησου	with =>	*2 1*	[1.00]
1:11,1.2	Replace NA-27 =>	ʻκαι διδασκαλος	with =>	*και διδ. εθνων*	[1.00]
2:14,1.2	Replace NA-27 =>	⌜θεου	with =>	*κυριου*	[0.67]
2:14,3.2	Replace NA-27 =>	⌜ἐπ’	with =>	*εις*	[0.67]
2:21,1.2	At NA-27 =>	⊤ *ομιτ*	insert =>	*και*	[0.67]
2:25,1.2	Replace NA-27 =>	⌜δωη	with =>	*δῷ*	[0.67]
3:10,1.2	Replace NA-27 =>	⌜παρηκολουθησας	with =>	*—θηκας*	[0.67]
4:15,1.2	Replace NA-27 =>	⌜ἀντεστη	with =>	*ανθεστηκεν*	[0.67]
4:16,1.2	Replace NA-27 =>	⌜παρεγενετο	with =>	*συμπαρεγ—*	[0.67]
4:18,1.2	At NA-27 =>	⊤ *ομιτ*	insert =>	*και*	[0.67]

Appendix F

Places Where the Non-Autographic Variants Were Initiated

Only Once in the Textual History of 2 Timothy

Arranged in Order by Reference

This appendix lists the place in the genealogical history of the text of the Book of 2 Timothy where each non-original textual variant was first initiated, arranged in order by reference. For each variant, the table lists (1) the place of variation in the text where the variation occurred, (2) the associated reference, (3) the exemplar or extant witness in which the variant was initiated, and (4) the text of the variant. For example, the following line means:

11.2	2:4,1.2	Ex-103#	τω θϵω

(1) 11.2 refers to the second variant at variation unit 11.
(2) 2:4,1.2 is the reference where this place of variation occurs: chapter 2, verse 4, the first place of variation in this verse, the second variant there.
(3) This variant was initiated in Exemplar Ex-103#.
(4) The variant reads: τω θϵω (to God)
(5) Since the variant was first initiated in an exemplar, one can presume that the variant was inherited by all of the descendants of that exemplar (Ex-103#) unless otherwise altered in one of its subsequent branches.

The following line means:

17.3	2:14,1.3	206	Χριστου

(1) 17.3 refers to the tthird variant at variation unit 17.
(2) 2:14,1.3 is the reference where this place of variation occurs: chapter 2, verse 14, the first place of variation in this verse, the third variant there.
(3) This variant was initiated in fragmentary terminal witness MS 206
(4) The variant reads: Χριστου (Christ)

Since the variant was initiated in a terminal witness, it is a singularity with no inheritance.
The following line means:

5.1	1:10,1.1	Ex-108$	῾Χριστου ᾽Ιησου

(1) 5.1 refers to the first variant at variation unit 5.
(2) 1:10.1.1 is the reference where this place of variation occurs: chapter 1, verse 10, the first place of variation in this verse, the first variant there.
(3) This variant was initiated in exemplar Ex-108$, a virtual exemplar, a source of mixture.
(4) The variant reads: Χριστου ᾽Ιησου (Christ Jesus).

VarUnit	Reference	Source	Reading
1.2	1:2,1.2	Ex-108$	2 1
1.3	1:2,1.3	Ex-109$	κυριου Ι. Χρ.
2.2	1:5,1.2	Ex-111$	λαμβανων
3.2	1:6,1.2	Ex-108$	υπομιμνησκω
4.2	1:6,2.2	Ex-91	Χριστου
5.1	1:10,1.1	Ex-108$	‘Χριστου Ἰησου
5.3	1:10,1.3	I%	θεου
6.1	1:11,1.1	Ex-108$	‘και διδασκαλος
6.3	1:11,1.3	33*	κ. διακονος
7.2	1:12,1.2	Ex-111$	° ομιτ
8.2	1:17,1.2	Ex-106#	σπουδαιοτερον
9.2	1:18,1.2	Ex-109$	μοι
10.2	2:3,1.2	Ex-109$	κακοπ—
10.3	2:3,1.3	Ex-106#	συ ουν κακοπ—
11.2	2:4,1.2	Ex-103#	τω θεω
12.2	2:6,1.2	01*	προτερον
13.2	2:7,1.2	Ex-111$	α
14.2	2:7,2.2	Ex-106#	δωη
15.2	2:12,1.2	Ex-106#	αρνουμεθα
16.2	2:13,1.2	Ex-109$	° ομιτ
17.1	2:14,1.1	Ex-111$	‘θεου
17.3	2:14,1.3	206	Χριστου
18.2	2:14,2.2	Ex-103#	—μάχει
19.1	2:14,3.1	Ex-111$	‘ἐπ’
20.2	2:16,1.2	Ex-103#	καινοφ—
21.2	2:18,1.2	Ex-111$	° ομιτ
22.2	2:19,1.2	01*	παντας
23.1	2:21,1.1	Ex-111$	⊤ ομιτ
24.2	2:22,1.2	Ex-111$	παντων των επικ.
24.3	2:22,1.3	Ex-91	παντων των αγαπωντων
25.2	2:24,1.2	Ex-103#	νηπιον
26.1	2:25,1.1	Ex-111$	‘δωη
27.2	3:1,1.2	Ex-103#	γινωσκετε
27.3	3:1,1.3	Ex-111$	γινωσκετω
28.2	3:2,1.2	K*	αχρηστοι
29.2	3:3,1.2	Ex-108$	2 1
29.3	3:3,1.3	Ex-102	2
29.4	3:3,1.4	Ex-109$	—
30.2	3:6,1.2	Ex-111$	—λωτευοντες
31.2	3:6,2.2	TR	τα
32.2	3:6,3.2	Ex-108$	και ηδοναις
33.2	3:8,1.2	Ex-103#	Μαμβρης

34.2	3:9,1.2	Ex-91	διανοια
35.1	3:10,1.1	⌜παρηκολουθησας	
36.2	3:10,2.2	Ex-91	□ ομιτ
37.2	3:11,1.2	Ex-108$	εγενοντο
38.2	3:12,1.2	Ex-111$	2 1
39.2	3:14,1.2	Ex-106#	τινος
40.2	3:15,1.2	Ex-111$	○ ομιτ
41.2	3:16,1.2	Ex-109$	○ ομιτ
42.2	3:16,2.2	Ex-106#	ελεγχον
43.2	3:17,1.2	Ex-108$	τελειος
44.2	4:1,1.2	Ex-109$	ουν
44.3	4:1,1.3	326*	εγω
44.4	4:1,1.4	Ex-108$	ουν εγω
45.2	4:1,2.2	Ex-111$	κριναι
46.2	4:1,3.2	Ex-111$	κατα
47.2	4:2,1.2	Ex-103#	2 1
48.2	4:3,1.2	Ex-108$	επιθ. τας ιδιας
49.2	4:5,1.2	Ex-108$	○ ομιτ
50.2	4:5,2.2	Ex-91	ως καλος στρατιωτης Χριστου Ιησου
51.2	4:6,1.2	Ex-111$	εμης αναλ.
52.2	4:7,1.2	Ex-106#	αγ. τον καλον
53.2	4:8,1.2	Ex-109$	○ ομιτ
54.2	4:9,1.2	Ex-108$	ταχιον
54.3	4:9,1.3	442	εν ταχει
55.2	4:10,1.2	Ex-111$	—λειπεν
56.2	4:10,2.2	Ex-108$	Γαλλιαν
57.2	4:11,1.2	Ex-108$	αγαγε
58.2	4:13,1.2	Ex-103#	—λειπον
59.2	4:13,2.2	Ex-111$	δε
59.3	4:13,2.3	1175*	και
60.2	4:14,1.2	Ex-111$	—δωη
61.1	4:15,1.1	Ex-111$	⌜ἀντεστη
62.1	4:16,1.1	Ex-111$	⌜παρεγενετο
63.2	4:16,2.2	Ex-111$	—λειπον
64.2	4:17,1.2	Ex-99	—ση
65.1	4:18,1.1	Ex-111$	⊤ ομιτ
66.2	4:19,1.2	181	Λεκτραν την γυναικα αυτου και Σιμαιαν και Ζηνωνα τους υιους αυτου
67.2	4:20,1.2	Ex-108$	—λειπον
68.2	4:21,1.2	Ex-109$	○ ομιτ
69.2	4:22,1.2	Ex-108$	Ιησους
69.3	4:22,1.3	Ex-111$	Ιησ. Χριστος
70.2	4:22,2.2	Ex-108$	η χ. μ. ημων
70.3	4:22,2.3	Ex-109$	η χ. μ. σου

70.4	4:22,2.4	Ex-111$	ερρωσ εν ειρηνη
70.5	4:22,2.5	sa^a%	—
71.2	4:22,3.2	Ex-111$	αμην

Appendix G

Places Where the Non-Autographic Variants Were Initiated in the Textual History of 2 Timothy Arranged in Order by Witness

List of Places Where Non-Autographic Variants Were Initiated in the Genealogical History, Arranged in Order by Witness

Total = 88

Witness	Place of Variation	Reference	Variant Reading
01*	12.2	2:6,1.2	προτερον
01*	22.2	2:19,1.2	παντας
Total for 01* = 2			
I%	5.3	1:10,1.3	θεου
Total for I% = 1			
K*	28.2	3:2,1.2	αχρηστοι
Total for K* = 1			
33*	6.3	1:11,1.3	κ. διακονος
Total for 33* = 1			
181	66.2	4:19,1.2	Λεκτραν την γυναικα αυτου και Σιμαιαν και Ζηνωνα τους υιους αυτου
Total for 181 = 1			
206	17.3	2:14,1.3	Χριστου
Total for 206 = 1			
326*	44.3	4:1,1.3	εγω
Total for 326* = 1			
442	54.3	4:9,1.3	εν ταχει
Total for 442 = 1			
1175*	59.3	4:13,2.3	και
Total for 1175* = 1			
TR	31.2	3:6,2.2	τα
Total for TR = 1			
sa^a%	70.5	4:22,2.5	—
Total for sa^a% = 1			
Ex-91	4.2	1:6,2.2	Χριστου

Ex-91	24.3	2:22,1.3	παντων των αγαπωντων
Ex-91	34.2	3:9,1.2	διανοια
Ex-91	36.2	3:10,2.2	□ ομιτ
Ex-91	50.2	4:5,2.2	ως καλος στρατιωτης Χριστου Ιησου
Total for Ex-91 = 5			
Ex-99	64.2	4:17,1.2	—ση
Total for Ex-99 = 1			
Ex-102	29.3	3:3,1.3	2
Total for Ex-102 = 1			
Ex-103#	11.2	2:4,1.2	τω θεω
Ex-103#	18.2	2:14,2.2	—μάχει
Ex-103#	20.2	2:16,1.2	καινοφ—
Ex-103#	25.2	2:24,1.2	νηπιον
Ex-103#	27.2	3:1,1.2	γινωσκετε
Ex-103#	33.2	3:8,1.2	Μαμβρης
Ex-103#	47.2	4:2,1.2	2 1
Ex-103#	58.2	4:13,1.2	—λειπον
Total for Ex-103# = 8			
Ex-106#	8.2	1:17,1.2	σπουδαιοτερον
Ex-106#	10.3	2:3,1.3	συ ουν κακοπ—
Ex-106#	14.2	2:7,2.2	δωη
Ex-106#	15.2	2:12,1.2	αρνουμεθα
Ex-106#	39.2	3:14,1.2	τινος
Ex-106#	42.2	3:16,2.2	ελεγχον
Ex-106#	52.2	4:7,1.2	αγ. τον καλον
Total for Ex-106# = 7			
Ex-108$	1.2	1:2,1.2	2 1
Ex-108$	3.2	1:6,1.2	υπομιμνησκω
Ex-108$	5.1	1:10,1.1	῾Χριστου Ἰησου
Ex-108$	6.1	1:11,1.1	῾και διδασκαλος
Ex-108$	29.2	3:3,1.2	2 1
Ex-108$	32.2	3:6,3.2	και ηδοναις
Ex-108$	37.2	3:11,1.2	εγενοντο
Ex-108$	43.2	3:17,1.2	τελειος

Ex-108$	44.4	4:1,1.4	ουν εγω
Ex-108$	48.2	4:3,1.2	επιθ. τας ιδιας
Ex-108$	49.2	4:5,1.2	° ομιτ
Ex-108$	54.2	4:9,1.2	ταχιον
Ex-108$	56.2	4:10,2.2	Γαλλιαν
Ex-108$	57.2	4:11,1.2	αγαγε
Ex-108$	67.2	4:20,1.2	—λειπον
Ex-108$	69.2	4:22,1.2	Ιησους
Ex-108$	70.2	4:22,2.2	η χ. μ. ημων
Total for Ex-108$ = 17			
Ex-109$	1.3	1:2,1.3	κυριου Ι. Χρ.
Ex-109$	9.2	1:18,1.2	μοι
Ex-109$	10.2	2:3,1.2	κακοπ—
Ex-109$	16.2	2:13,1.2	° ομιτ
Ex-109$	29.4	3:3,1.4	—
Ex-109$	41.2	3:16,1.2	° ομιτ
Ex-109$	44.2	4:1,1.2	ουν
Ex-109$	53.2	4:8,1.2	° ομιτ
Ex-109$	68.2	4:21,1.2	° ομιτ
Ex-109$	70.3	4:22,2.3	η χ. μ. σου
Total for Ex-109$ = 10			
Ex-111$	2.2	1:5,1.2	λαμβανων
Ex-111$	7.2	1:12,1.2	° ομιτ
Ex-111$	13.2	2:7,1.2	α
Ex-111$	17.1	2:14,1.1	⌜θεου
Ex-111$	19.1	2:14,3.1	⌜ἐπ’
Ex-111$	21.2	2:18,1.2	° ομιτ
Ex-111$	23.1	2:21,1.1	⊤ ομιτ
Ex-111$	24.2	2:22,1.2	παντων των επικ.
Ex-111$	26.1	2:25,1.1	⌜δωη
Ex-111$	27.3	3:1,1.3	γινωσκετω
Ex-111$	30.2	3:6,1.2	—λωτευοντες
Ex-111$	35.1	3:10,1.1	⌜παρηκολουθησας
Ex-111$	38.2	3:12,1.2	2 1
Ex-111$	40.2	3:15,1.2	° ομιτ
Ex-111$	45.2	4:1,2.2	κριναι
Ex-111$	46.2	4:1,3.2	κατα

Ex-111$	51.2	4:6,1.2	εμης αναλ.
Ex-111$	55.2	4:10,1.2	—λειπεν
Ex-111$	59.2	4:13,2.2	δε
Ex-111$	60.2	4:14,1.2	—δωη
Ex-111$	61.1	4:15,1.1	⌜ἀντεστη
Ex-111$	62.1	4:16,1.1	⌜παρεγενετο
Ex-111$	63.2	4:16,2.2	—λειπον
Ex-111$	65.1	4:18,1.1	⊤ ομιτ
Ex-111$	69.3	4:22,1.3	Ιησ. Χριστος
Ex-111$	70.4	4:22,2.4	ερρωσ εν ειρηνη
Ex-111$	71.2	4:22,3.2	αμην
Total for Ex-111$ = 27			

Appendix H

Every Place Where a Variant is Initiated

in the Textual History of 2 Timothy

Arranged in Order by Reference

This appendix lists every place a variant is introduced into the textual history of 2 Timothy either initially or later by mixture. The information is arranged in order by reference as follows: (1) place of variation, (2) reference, (3) witness(es) where variant was initiated. Those witnesses enclosed in square brackets [] are places where the variant was introduced by mixture; those not enclosed are where the variant first originated. The number enclosed in <> is the generation of the preceding witness. For example, the following line means:

1.1	1:2,1.1	[81*]<5>; Autograph;

(1) 1.1 refers to the first variant in variation unit 1.
(2) 1:2,1.1 is the reference where this place of variation occurs: chapter 1, verse 2, the first place of variation in this verse, the first variant there.
(3) *Autograph* means that the variant was initiated in the autograph and then by mixture in [81*]<5>.
(4) Since the variant was first initiated in an exemplar, in this case the autograph, one can presume that the variant was inherited by all of the descendants of the autograph unless otherwise altered in one of its subsequent branches.

The following line means:

1.3	1:2,1.3	[01*]<4>; [33*]<3>; [sy^p%]<2>; Ex-109$<1>;

(1) 1.3 refers to the third variant in variation unit 1.
(2) 1:2,1.3 is the reference where this place of variation occurs: chapter 1, verse 2, the first place of variation in this verse, the third variant there.
(3) The variant was first initiated in first-generation virtual exemplar Ex-109$, and subsequently initiated by mixture from Ex-133$ into [01*]<4>; [33*]<3>; [sy^p%]<2>.

Since the variant was first initiated in a virtual exemplar, one may safely assume that the variant randomly happened by scribal accident and not by actual mixture in a context of actual genealogical descent.

The following line means:

6.3	1:11,1.3	33*<3>;

(1) 6.3 refers to the third variant in variation unit 6.
(2) 1:11,1.3 is the reference where this place of variation occurs: chapter 1, verse 11, the first place of variation in this verse, the third variant there.

(3) The variant was first initiated only in third-generation extant MS 33*. This is a singularity; it has no heredity.

Place of Variation	Reference	Places Variant is Introduced
1.1	1:2,1.1	[81*]<5>; Autograph;
1.2	1:2,1.2	[629*]<6>; [TR]<4>; [RP]<4>; [Ex-97]<3>; Ex-108$<1>;
1.3	1:2,1.3	[01*]<4>; [33*]<3>; [sy^p%]<2>; Ex-109$<1>;
2.1	1:5,1.1	[044*]<3>; Autograph;
2.2	1:5,1.2	[01^2]<4>; [81*]<5>; [365]<3>; [it-d]<3>; [Ex-106#]<1>; [Ex-108$]<1>; Ex-111$<1>;
3.1	1:6,1.1	Autograph;
3.2	1:6,1.2	[D06*]<2>; [D06^c]<2>; [D06^1]<2>; [D06^2]<2>; [044*]<3>; [365]<3>; [1505*]<6>; [it-d]<3>; Ex-108$<1>;
4.1	1:6,2.1	[048%]<3>; Autograph;
4.2	1:6,2.2	Ex-91<2>;
5.1	1:10,1.1	[01*]<4>; [D06*]<2>; [81*]<5>; [vg^b%]<4>; [NA-27]<2>; [Ambst%]<2>; [Ex-91]<2>; Ex-108$<1>;
5.2	1:10,1.2	Autograph;
5.3	1:10,1.3	I%<2>;
6.1	1:11,1.1	[01*]<4>; [I%]<2>; [1175*]<2>; [NA-27]<2>; [Ex-91]<2>; Ex-108$<1>;
6.2	1:11,1.2	Autograph;
6.3	1:11,1.3	33*<3>;
7.1	1:12,1.1	Autograph;
7.2	1:12,1.2	[01*]<4>; [044*]<3>; [1175*]<2>; [vg^b%]<4>; [sy^p%]<2>; [Ex-108$]<1>; Ex-111$<1>;
8.1	1:17,1.1	[D06*]<2>; [P025*]<3>; [6]<6>; Autograph;
8.2	1:17,1.2	[365]<3>; [Ex-91]<2>; Ex-106#<1>;
9.1	1:18,1.1	[vg^a%]<3>; [vg^s%]<3>; [vg^st%]<3>; [vg^ww%]<3>; Autograph;
9.2	1:18,1.2	[629*]<6>; [sy^h%]<3>; [Ex-96]<2>; [Ex-100]<2>; Ex-109$<1>;
10.1	2:3,1.1	[D06*]<2>; [H015*%]<2>; [P025*]<3>; [it-m*%]<3>; [it-m^c%]<3>; Autograph;
10.2	2:3,1.2	[1175*]<2>; [vg^b%]<4>; [Ex-100]<2>; Ex-109$<1>;
10.3	2:3,1.3	[1881^c]<5>; Ex-106#<1>;
11.1	2:4,1.1	[33*]<3>; [vg^a%]<3>; [vg^s%]<3>; [vg^st%]<3>; [Ex-91]<2>; Autograph;
11.2	2:4,1.2	Ex-103#<1>;
12.1	2:6,1.1	Autograph;
12.2	2:6,1.2	01*<4>;
13.1	2:7,1.1	[P025*]<3>; Autograph;
13.2	2:7,1.2	[01^2]<4>; [1175*]<2>; [vg^b%]<4>; [Ex-94]<4>; [Ex-96]<2>; [Ex-100]<2>; [Ex-106#]<1>; [Ex-108$]<1>; Ex-111$<1>;
14.1	2:7,2.1	[D06*]<2>; [D06^c]<2>; [D06^1]<2>; [D06^2]<2>; Autograph;
14.2	2:7,2.2	[Ex-94]<4>; [Ex-96]<2>; Ex-106#<1>;

15.1	2:12,1.1	[01*]<4>; [044*]<3>; [81*]<5>; [vg^b%]<4>; Autograph;
15.2	2:12,1.2	[it-d]<3>; [Ambst%]<2>; [Cyp^a%]<2>; [Ex-104]<2>; Ex-106#<1>;
16.1	2:13,1.1	[L020*]<4>; [6]<6>; Autograph;
16.2	2:13,1.2	[01^2]<4>; [vg^b%]<4>; [sa^a%]<4>; [bo^b%]<2>; [Ex-99]<2>; [Ex-100]<2>; Ex-109$<1>;
17.1	2:14,1.1	[I%]<2>; [614*]<5>; [629*]<6>; [630]<6>; [1175*]<2>; [vg^b%]<4>; [bo^a%]<2>; [NA-27]<2>; [Ex-102]<3>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
17.2	2:14,1.2	[vg^a%]<3>; [it-b*%]<3>; [it-d]<3>; [Ex-91]<2>; Autograph;
17.3	2:14,1.3	206<6>;
18.1	2:14,2.1	[Ex-92]<2>; Autograph;
18.2	2:14,2.2	[1175*]<2>; [vg^b%]<4>; Ex-103#<1>;
19.1	2:14,3.1	[01*]<4>; [I%]<2>; [P025*]<3>; [1175*]<2>; [1241*%]<3>; [NA-27]<2>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
19.2	2:14,3.2	[it-d]<3>; Autograph;
20.1	2:16,1.1	[33*]<3>; [vg^a%]<3>; [vg^cl%]<3>; [vg^s%]<3>; [vg^st%]<3>; [vg^ww%]<3>; [it-ar*%]<3>; [it-m*%]<3>; [it-m^c%]<3>; [Ex-91]<2>; Autograph;
20.2	2:16,1.2	Ex-103#<1>;
21.1	2:18,1.1	[it-d]<3>; [Ex-91]<2>; Autograph;
21.2	2:18,1.2	[048%]<3>; [Ex-102]<3>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
22.1	2:19,1.1	Autograph;
22.2	2:19,1.2	01*<4>;
23.1	2:21,1.1	[01*]<4>; [D06*]<2>; [629*]<6>; [NA-27]<2>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
23.2	2:21,1.2	[Ex-100]<2>; Autograph;
24.1	2:22,1.1	[vg^a%]<3>; [vg^cl%]<3>; [vg^s%]<3>; [vg^st%]<3>; [vg^ww%]<3>; [it-ar*%]<3>; [it-b*%]<3>; [it-d]<3>; [it-m*%]<3>; [it-m^c%]<3>; Autograph;
24.2	2:22,1.2	[I%]<2>; [048%]<3>; [81*]<5>; [104*]<3>; [326*]<3>; [sy^h%]<3>; [sa^a%]<4>; [bo^a%]<2>; [Ex-103#]<1>; [Ex-109$]<1>; Ex-111$<1>;
24.3	2:22,1.3	Ex-91<2>;
25.1	2:24,1.1	[33*]<3>; [Ex-91]<2>; Autograph;
25.2	2:24,1.2	[D06*]<2>; Ex-103#<1>;
26.1	2:25,1.1	[01*]<4>; [D06*]<2>; [044*]<3>; [81*]<5>; [104*]<3>; [NA-27]<2>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
26.2	2:25,1.2	[33*]<3>; Autograph;
27.1	3:1,1.1	[vg^a%]<3>; [vg^cl%]<3>; [vg^s%]<3>; [vg^st%]<3>; [vg^ww%]<3>; [it-ar*%]<3>; [it-b*%]<3>; [it-d]<3>; [it-m*%]<3>; [it-m^c%]<3>; Autograph;
27.2	3:1,1.2	Ex-103#<1>;
27.3	3:1,1.3	[1175*]<2>; [Ambst%]<2>; [Spec%]<2>; [Ex-108$]<1>; [Ex-109$]<1>; Ex-111$<1>;
28.1	3:2,1.1	Autograph;
28.2	3:2,1.2	K*<6>;
29.1	3:3,1.1	[sa^a%]<4>; Autograph;
29.2	3:3,1.2	[D06*]<2>; [D06^c]<2>; [D06^1]<2>; [D06^2]<2>; [365]<3>; [1175*]<2>; [vg^b%]<4>; [it-ar*%]<3>; [it-d]<3>; [it-g*]<3>; [it-g^c]<3>; [it-m*%]<3>; [it-m^c%]<3>; [Ambst%]<2>; Ex-108$<1>;
29.3	3:3,1.3	Ex-102<3>;

29.4	3:3,1.4	[431]<6>; [sy^p%]<2>; Ex-109$<1>;
30.1	3:6,1.1	[6]<6>; [1505*]<6>; Autograph;
30.2	3:6,1.2	[D06^2]<2>; [326*]<3>; [Ex-98]<3>; [Ex-108$]<1>; [Ex-109$]<1>; Ex-111$<1>;
31.1	3:6,2.1	Autograph;
31.2	3:6,2.2	TR<4>;
32.1	3:6,3.1	Autograph;
32.2	3:6,3.2	[1505*]<6>; [sy^h%]<3>; [Ex-91]<2>; Ex-108$<1>;
33.1	3:8,1.1	[33*]<3>; [vg^a%]<3>; [vg^s%]<3>; [vg^st%]<3>; [Ex-91]<2>; Autograph;
33.2	3:8,1.2	Ex-103#<1>;
34.1	3:9,1.1	Autograph;
34.2	3:9,1.2	Ex-91<2>;
35.1	3:10,1.1	[NA-27]<2>; [Ex-102]<3>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
35.2	3:10,1.2	[it-d]<3>; Autograph;
36.1	3:10,2.1	Autograph;
36.2	3:10,2.2	Ex-91<2>;
37.1	3:11,1.1	Autograph;
37.2	3:11,1.2	[K*]<6>; [614*]<5>; [629*]<6>; [Ex-91]<2>; [Ex-94]<4>; Ex-108$<1>;
38.1	3:12,1.1	[1175*]<2>; [vg^b%]<4>; [NA-27]<2>; [Ex-94]<4>; Autograph;
38.2	3:12,1.2	[P025*]<3>; [33*]<3>; [1505*]<6>; [Ex-91]<2>; [Ex-105#]<1>; [Ex-108$]<1>; Ex-111$<1>;
39.1	3:14,1.1	[P025*]<3>; [1505*]<6>; [it-b*%]<3>; [it-d]<3>; Autograph;
39.2	3:14,1.2	[C^3%]<2>; [vg^b%]<4>; [Ex-96]<2>; [Ex-100]<2>; Ex-106#<1>;
40.1	3:15,1.1	[C*%]<2>; [Ex-91]<2>; Autograph;
40.2	3:15,1.2	[D06*]<2>; [1175*]<2>; [sa^b%]<2>; [bo^a%]<2>; [bo^b%]<2>; [Cl^a%]<2>; [Ex-102]<3>; [Ex-103#]<1>; [Ex-109$]<1>; Ex-111$<1>;
41.1	3:16,1.1	[vg^a%]<3>; [vg^s%]<3>; [vg^st%]<3>; [vg^ww%]<3>; Autograph;
41.2	3:16,1.2	[sy^p%]<2>; [Ambst%]<2>; [Ex-100]<2>; Ex-109$<1>;
42.1	3:16,2.1	Autograph;
42.2	3:16,2.2	[it-d]<3>; Ex-106#<1>;
43.1	3:17,1.1	Autograph;
43.2	3:17,1.2	[D06*]<2>; [it-d]<3>; Ex-108$<1>;
44.1	4:1,1.1	[6]<6>; Autograph;
44.2	4:1,1.2	[1505*]<6>; [Ex-99]<2>; Ex-109$<1>;
44.3	4:1,1.3	326*<3>;
44.4	4:1,1.4	[D06^1]<2>; [Ex-98]<3>; Ex-108$<1>;
45.1	4:1,2.1	[C*%]<2>; [C^2%]<2>; [C^3%]<2>; [vg^a%]<3>; [vg^cl%]<3>; [vg^s%]<3>; [vg^st%]<3>; [vg^ww%]<3>; [it-ar*%]<3>; [it-b*%]<3>; [it-d]<3>; [it-m*%]<3>; [it-m^c%]<3>; [it-t%]<3>; [Ex-91]<2>; Autograph;
45.2	4:1,2.2	[6]<6>; [Ex-94]<4>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
46.1	4:1,3.1	[D06*]<2>; [6]<6>; Autograph;
46.2	4:1,3.2	[01^2]<4>; [vg^cl%]<3>; [sa^a%]<4>; [Ex-94]<4>; [Ex-96]<2>; [Ex-106#]<1>; [Ex-108$]<1>; Ex-111$<1>;

47.1	4:2,1.1	[01^2]<4>; [C*%]<2>; [C^2%]<2>; [C^3%]<2>; [33*]<3>; [81*]<5>; [Ex-91]<2>; Autograph;
47.2	4:2,1.2	[sa^b%]<2>; [bo^a%]<2>; [bo^b%]<2>; Ex-103#<1>; [Ex-104]<2>;
48.1	4:3,1.1	[1505*]<6>; Autograph;
48.2	4:3,1.2	[326*]<3>; [Ex-98]<3>; Ex-108$<1>;
49.1	4:5,1.1	Autograph;
49.2	4:5,1.2	[01*]<4>; [vg^b%]<4>; Ex-108$<1>;
50.1	4:5,2.1	Autograph;
50.2	4:5,2.2	Ex-91<2>;
51.1	4:6,1.1	[P025*]<3>; [630]<6>; Autograph;
51.2	4:6,1.2	[vg^st%]<3>; [vg^ww%]<3>; [it-ar*%]<3>; [it-d]<3>; [it-f*]<3>; [it-t%]<3>; [Ex-106#]<1>; [Ex-108$]<1>; Ex-111$<1>;
52.1	4:7,1.1	[81*]<5>; [629*]<6>; Autograph;
52.2	4:7,1.2	[365]<3>; [it-d]<3>; [Ex-97]<3>; Ex-106#<1>;
53.1	4:8,1.1	[81*]<5>; [1739^c]<4>; Autograph;
53.2	4:8,1.2	[D06*]<2>; [6]<6>; [sy^p%]<2>; [Ambst%]<2>; [Ex-97]<3>; [Ex-100]<2>; Ex-109$<1>;
54.1	4:9,1.1	Autograph;
54.2	4:9,1.2	[I%]<2>; [33*]<3>; Ex-108$<1>;
54.3	4:9,1.3	442<6>;
55.1	4:10,1.1	[it-d]<3>; Autograph;
55.2	4:10,1.2	[D06^2]<2>; [L020*]<4>; [P025*]<3>; [1175*]<2>; [Ex-94]<4>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
56.1	4:10,2.1	Autograph;
56.2	4:10,2.2	[C*%]<2>; [C^2%]<2>; [C^3%]<2>; [81*]<5>; [104*]<3>; [326*]<3>; [vg^st%]<3>; [vg^ww%]<3>; [bo^b%]<2>; [Ex-102]<3>; Ex-108$<1>;
57.1	4:11,1.1	Autograph;
57.2	4:11,1.2	[1881*]<5>; [Ex-91]<2>; [Ex-96]<2>; Ex-108$<1>;
58.1	4:13,1.1	[it-d]<3>; Autograph;
58.2	4:13,1.2	[L020*]<4>; [104*]<3>; [1175*]<2>; [1881^c]<5>; [Ex-101]<2>; Ex-103#<1>;
59.1	4:13,2.1	Autograph;
59.2	4:13,2.2	[D06*]<2>; [vg^b%]<4>; [Ambst%]<2>; [Ex-100]<2>; [Ex-108$]<1>; Ex-111$<1>;
59.3	4:13,2.3	1175*<2>;
60.1	4:14,1.1	[D06*]<2>; [D06^c]<2>; [6]<6>; [630]<6>; Autograph;
60.2	4:14,1.2	[vg^st%]<3>; [vg^ww%]<3>; [it-b*%]<3>; [Ambst%]<2>; [Ex-106#]<1>; [Ex-108$]<1>; Ex-111$<1>;
61.1	4:15,1.1	[01*]<4>; [D06*]<2>; [1175*]<2>; [NA-27]<2>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
61.2	4:15,1.2	[it-ar*%]<3>; [it-g*]<3>; [it-g^c]<3>; Autograph;
62.1	4:16,1.1	[01*]<4>; [326*]<3>; [1175*]<2>; [1739*]<4>; [vg^b%]<4>; [NA-27]<2>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
62.2	4:16,1.2	[it-d]<3>; Autograph;
63.1	4:16,2.1	[it-d]<3>; Autograph;

63.2	4:16,2.2	[D06^1]<2>; [L020*]<4>; [104*]<3>; [1175*]<2>; [Ex-101]<2>; [Ex-103#]<1>; [Ex-108$]<1>; Ex-111$<1>;
64.1	4:17,1.1	Autograph;
64.2	4:17,1.2	Ex-99<2>;
65.1	4:18,1.1	[C*%]<2>; [C^2%]<2>; [C^3%]<2>; [D06*]<2>; [6]<6>; [33*]<3>; [vg^a%]<3>; [vg^cl%]<3>; [vg^s%]<3>; [vg^st%]<3>; [vg^ww%]<3>; [it-ar*%]<3>; [it-b*%]<3>; [it-d]<3>; [it-t%]<3>; [Ex-91]<2>; [Ex-105#]<1>; [Ex-108$]<1>; Ex-111$<1>;
65.2	4:18,1.2	[365]<3>; Autograph;
66.1	4:19,1.1	Autograph;
66.2	4:19,1.2	181<6>;
67.1	4:20,1.1	Autograph;
67.2	4:20,1.2	[C*%]<2>; [C^2%]<2>; [C^3%]<2>; [L020*]<4>; [33*]<3>; [323*]<6>; [1175*]<2>; [Ex-96]<2>; [Ex-101]<2>; Ex-108$<1>;
68.1	4:21,1.1	[01^2]<4>; [81*]<5>; [vg^b%]<4>; [sa^a%]<4>; Autograph;
68.2	4:21,1.2	[33*]<3>; [Ex-104]<2>; Ex-109$<1>;
69.1	4:22,1.1	Autograph;
69.2	4:22,1.2	[104*]<3>; [614*]<5>; [vg^st%]<3>; [Ex-91]<2>; Ex-108$<1>;
69.3	4:22,1.3	[01^2]<4>; [C*%]<2>; [C^2%]<2>; [C^3%]<2>; [81*]<5>; [365]<3>; [1175*]<2>; [vg^cl%]<3>; [vg^ww%]<3>; [it-ar*%]<3>; [it-b*%]<3>; [it-d]<3>; [it-f*]<3>; [bo^a%]<2>; [Ambst%]<2>; [Ex-106#]<1>; [Ex-109$]<1>; Ex-111$<1>;
70.1	4:22,2.1	Autograph;
70.2	4:22,2.2	[460]<6>; [614*]<5>; [vg^st%]<3>; [bo^a%]<2>; Ex-108$<1>;
70.3	4:22,2.3	[sy^p%]<2>; [sa^b%]<2>; [bo^b%]<2>; Ex-109$<1>;
70.4	4:22,2.4	[D06*]<2>; [D06^1]<2>; [it-ar*%]<3>; [it-b*%]<3>; [Ambst%]<2>; [Ex-110$]<1>; Ex-111$<1>;
70.5	4:22,2.5	sa^a%<4>;
71.1	4:22,3.1	[6]<6>; [it-b*%]<3>; Autograph;
71.2	4:22,3.2	[01^2]<4>; [1175*]<2>; [1739^c]<4>; [bo^a%]<2>; [Ex-96]<2>; [Ex-100]<2>; [Ex-106#]<1>; [Ex-108$]<1>; Ex-111$<1>;

GLOSSARY OF TERMS

Boldfaced words in the following definitions refer to other terms defined in this glossary.

Affinity: the degree to which two **witnesses** to a text have the same readings. Affinity consists of two components: **Quantitative Affinity** and **Genetic Affinity**.

Antiquity: the characteristic of a **reading** being older than the **witness** in which it occurs. An inherited reading has antiquity, that is, it is older than the witness in which it occurs. See **inheritance**. A newly initiated reading lacks antiquity, that is, it is only as old as the witness in which it originated. A reading introduced by mixture is only as old as its age in its source of mixture. In the reconstruction process, the software recognizes the antiquity of a reading by its presence in other witnesses in the active database.

Autograph: The original document written by the hand of its author or by his secretary to whom he dictated its text.

Autographic Text: The words originally written in an original document.

Commonness: A measure of the degree to which **witnesses** to a given text share the same value of a genetic characteristic of the text. See Commonness of Place of Variation and Commonness of Reading.

Commonness of Place of Variation: The degree to which two **witnesses** to a given text have the same **places of variation** regardless of the **readings** at those places—that is, they share a common portion of the text. The Commonness of Place of Variation of A with B = the number of **places of variation** where both A and B have a **reading**, where A and B are **witnesses** to the same text. This measure is important for dealing with fragmentary **witnesses**. Two **witnesses** that both have a complete text have 100% Commonness of Place of Variation.

Commonness of Readings: A measure of the degree to which two **witnesses** to a text have the same **readings**. It is calculated as follows: The Commonness of Readings of A with B = the number of **places of variation** where both A and B have the same **reading**, where A and B are **witnesses** to the same text.

Completeness: A measure of how much of a text a particular **witness** contains. It is calculated as follows: The Completeness of A = (the number of **places of variation** A has of the text) ÷ (the total number of **places of variation** in the text), where A is a **witness** to the text. This measure is important for dealing with fragmentary **witnesses**.

Content: A list of the **places of variation** a **witness** contains, expressed in terms of references (chapter and verse)—that is, that portion of the text the **witness** contains.

Deferred Ambiguity: The principle of deferred ambiguity states that when consensus fails to recover a reading of an exemplar being reconstructed, the sister of that exemplar will have the inherited reading in the next prior generation.

Distribution: the characteristic of a **reading** occurring in more than one text tradition. An original reading occurs in more than one first-generation exemplar. An original reading is expected to have both first-generation distribution and antiquity.

Exemplar: A **witness** from which other **witnesses** have been copied. The software creates exemplars in the process of reconstructing the genealogical history of a text.

Fragment: A **witness** that is missing part of its text due to damage or deterioration.

Genetic Affinity: see **Quantitative Affinity**.

Genetic Dominance: A **reading** has genetic dominance as long as it is inherited by the **descendants** of the exemplar in which it first occurs. It loses genetic dominance at any place in the genetic history of the exemplar in which it occurs where an alternate reading replaces it.

Heredity: That characteristic of a **reading** correctly copied into a daughter **witness** of the **exemplar** in which the reading is found.

Inheritable Variant: A variant initiated by one of the ancestor exemplars of a witness.

Inheritance: That characteristic of a **reading** correctly copied from the parent **exemplar** of the **witness** in which the reading is found. An inherited reading is passed down from prior ancestor exemplars.

Inheritance Persistence: The inheritance persistence of a witness is the ratio of the number inheritable variants to the number of actually inherited ones.

Lectionary: A **manuscript** edited and arranged in sections assigned for reading in the Church at specified times in the liturgical calendar—something like a hymnbook.

Majuscule: A **manuscript** written in all capital letters.

Manuscript: A handwritten copy of a text made from an earlier copy (**exemplar**). The term is sometimes used as a synonym of ***witness***.

Minimal Reading: The reading of a witness that occurs least often in the working database.

Minuscule: A **manuscript** written in lower case characters.

Papyri: Manuscripts copied on paper made from papyrus. They are usually rather early, but mostly fragmentary.

Parent Exemplar: The **manuscript** from which another **manuscript** was directly copied.

Place of Variation: A place in a text where the **witnesses** to the text have different **readings**. In the data base, each place of variation is assigned a sequential index number in order to distinguish them from one another; each one also has assigned to it the chapter and verse where it occurs in the text.

Primary Parent: The **parent exemplar** of a **witness** from which it derives most of its readings, and its place in the tree diagram that maps the genealogical history of the text. A witness has only one primary parent exemplar.

Quantitative Affinity: A measure of the degree to which **witnesses** to a given text are genetically related. The mutual quantitative affinity between two witnesses is the inverse ratio of the number of places the two witnesses have the same readings to the number of places their readings are different.

Reading: At each **place of variation** in a text, the **witnesses** have different words. The words contained in a given witness at a particular **place of variation** constitute the *reading* of that witness at that place. The reading may be a word, phrase, sentence, verse, etc., or nothing at all (an omission).

Recension: A recension is understood to be a **witness** derived from multiple sources and having a significant number of variations from its **primary parent exemplar**. A recension was a deliberate alteration of a text tradition for the purpose of correction or improvement. A recension occurred when a Christian community noted that their Bibles (**manuscripts**) had different **readings**, and there was an attempt to recover the readings of the **autograph**. This likely took place under the authority of the leadership of the community and was carried out by competent scribes. It is possible that in some recensions some of the corrections were made to strengthen the doctrines of the community.

Secondary Descendant: A descendant of a **secondary parent** functioning as a source of mixture for the given descendant.

Secondary Parent: A **parent exemplar** of a witness other than the **Primary Parent Exemplar**. Secondary parents are the sources of mixture for their **secondary descendants**.

Siblings: Sisters, first generation descendants (copies) of the same **exemplar**.

Sibling Gene: The collection of **minimal readings** a **witness** has that occur only in it and its **sibling** sisters. These are the readings where the text of the parent exemplar of the siblings differs from the text of its genealogical ancestors**.**

Singularity: A **reading** in an extant **witness** having no **heredity**; it differs from that of its **parent exemplar**.

Stemma: A tree diagram of the genealogical relationships of the witnesses to the text of an ancient literary composition.

Stemmatics: Stemmatics is the method used for recovering the original text of the ancient Greek and Latin classics, also known as the family-tree method.

Uncial: A **manuscript** written in all capital letters.

Variant Heredity: The characteristic of variant readings that provides a measure of the likelihood that a given reading in a particular witness A has been inherited from another witness B in an earlier generation. It is quantified as the **genetic distance** between witness A containing the given reading and another witness B in an earlier generation containing the same reading. The witness B having the least genetic distance from witness A is the closest near relative of A with respect to the given reading. A reading has no variant heredity until after it is first initiated somewhere in the genealogical history of the text.

Variant Reading: See *Reading*.

Variation Unit: See *Place of Variation*.

Version: A translation of a document into a language other than that of the original document itself.

Virtual Exemplar: An **exemplar** created by the software to account for same-generation mixture. These exemplars do not contribute to the primary structure of the tree diagram.

Witness: A **manuscript** of a document in its original language, or a translation of that document into another language, or a quotation of the text of a **manuscript** or translation.

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