

Examining *A Critical Examination of the CBGM*: A Review Article

W. Andrew Smith, *Shepherds Theological Seminary*

Peter J. Gurry, *A Critical Examination of the Coherence-Based Genealogical Method in New Testament Textual Criticism*, NTTSD 55; Leiden-Boston: Brill, 2017. Pp. xiv + 254. Cloth. ISBN 978-90-04-35454-8. \$127.

The Coherence-Based Genealogical Method (CBGM) was developed at the Institut für Neutestamentliche Textforschung (INTF) by Gerd Mink so that textual critics could produce a working hypothesis for the genealogical structure of the New Testament textual tradition and evaluate text-critical decisions in a highly contaminated tradition. Despite numerous presentations of the CBGM by INTF scholars at academic conferences and in journal articles, the application of the CBGM software to making text-critical decisions is neither well understood nor well tested by scholars outside the INTF. The rationale for Peter Gurry's book, which is a revision of his Cambridge University dissertation, is to "assess [the method's] effectiveness as a text critic's tool in practice," as "there has been no sustained attempt to critically test its principles and procedures" (2).

Part 1: Introduction of the CBGM

The first part of Gurry's book (chapters 1 and 2) helpfully introduces and explains the method. Chapter 1 details the history of the method's development through three stages: (1) the early formulation, explanation, and refinement of the method from the initial INTF report in 1982 until the printing of the first *Editio Critica Maior* (ECM) fascicles; (2) the development of coherence principles as the four early ECM fascicles were being produced (1997–2005); and (3) the period of explaining the method and production of the second edition of the ECM for the Catholic Epistles, which was produced in 2013. Through this progression, there is a development of ideas regarding the usefulness of text types, the concept of coherence and types of coherence (pre-genealogical, genealogical, and stemmatic), and the construction and use of the global stemma. The reception history of the method is then traced through some scholars that have interacted with the method, including David Parker, Tommy Wasserman, Timo Flink, Eldon Epp, Dirk Jongkind, Bengt Alexanderson, and others. This represents a useful review of the method's reception, where Gurry is critical of any misstep made by each reviewer. For example, he notes "problems" in Parker's description of the method, "such as his mislabeling of 'local stemmata' as 'substemmata' and his somewhat confused description of the various types of coherence" (22). Gurry's review of an overall trajectory for the history of the method and its major evaluators provides the reader with a valuable context in which to approach the discussion that follows.

Chapter 2, arguably the most helpful chapter of the book, is Gurry's introduction to the details of the method, "one that clearly but still accurately lays out its purpose, scope, basic principles, procedures, and its use on the Catholic Epistles" (34). Gurry does an admirable job placing Mink's assumptions, principles, and procedures in the broader context of (largely New Testament) text-critical research. Mink's solution to the problem of attempting to produce a *stemma codicum* in a highly contaminated tradition is to instead produce a stemma of texts that

are removed from their physical vehicles. Gurry systematically and clearly defines necessary terminology and then proceeds in a stepwise fashion to acquaint the reader with the method through simple examples. Where textual flow diagrams become difficult to read in a traditional printed book format—these diagrams are notoriously large because of the number of witnesses involved—online copies of the illustrations are available that can be scaled to a more readable size. With the basics of the method in place, Gurry then walks the reader through the application of the CBGM to the Catholic Epistles. A short introduction to the impact of the CBGM on the practice of reasoned eclecticism orients the reader to consider how genealogical coherence will be applied in each of four variant examples that follow (at Jas 2.4/2–6, 1 Pet 4.16/24–28, Jas 2.3/44–48, and 1 Pet 1.6/18). Each editorial decision is explained at an introductory level so that the reader can take the first steps in understanding how the genealogical data are applied. In one regard, it is not the CBGM itself that is complex: pre-genealogical coherence quantifies the level of agreement between manuscripts at points of variation; genealogical coherence determines the *direction* of variation between witnesses;¹ and stemmatic coherence amalgamates the previously processed data to create a global stemma. But understanding how to interpret the results of applying the CBGM is another matter. Gurry’s description of the method particularly shines in his explanation of the *results* of applying the CBGM. For example, in preparing to look at examples, Gurry reminds us that multiple emergence of a variant is detected from a textual flow diagram when the witnesses of emergence are not closely related (72).² Principles of this nature are key to understanding *application* of the CBGM.

As the second chapter demonstrates the use of the CBGM in the Catholic Epistles, it is surprising that Gurry does not provide an explanation of the output from the Genealogical Queries tools provided on the INTF website (<http://intf.uni-muenster.de/cbGM/GenQ.html>). In my experience, students find these outputs difficult to decipher at first, and a clear understanding of how to use these tools would be of interest in a guide such as this. For example, using the Comparison of Witnesses tool to compare the texts of 02 and 1611, one produces the table found in Figure 1. Being able to visualize the relationship of prior and posterior readings in a tabular format allows the reader to see just how strong the relationship is between these two texts.

Comparison of A and 1611											
W1	DIR	W2	WRIT	NR	PERC1	EQ	PASS	W1<W2	W1>W2	UNCL	NOREL
A	-->	1611	Jas	6	88.740	662	746	0	77	0	7
A	-->	1611	1Pt	6	88.164	581	659	0	72	4	2
A	-->	1611	2Pt	13	87.468	342	391	0	43	4	2
A	-->	1611	1Jn	2	92.799	683	736	0	52	0	1
A	-->	1611	2Jn	1	92.079	93	101	0	7	0	1
A	-->	1611	3Jn	18	86.957	80	92	0	12	0	0
A	-->	1611	Jd	9	89.796	176	196	0	17	2	1
A	-->	1611	CL	3	89.593	2617	2921	0	280	10	14

Figure 1. Sample output from the Genealogical Queries Comparison of Witnesses tool

¹ The term *witness*, following Mink, is used here to refer to a textual state and not a manuscript (Gerd Mink, “Problems of a Highly Contaminated Tradition: The New Testament; Stemata of Variants as a Source of Genealogy for Witnesses,” in *Studies in Stemmatology II*, ed. Pieter van Reenen, August den Hollander, and Margot van Mulken [Philadelphia: John Benjamins, 2004], 13).

² Cf. Gerd Mink, “Problems of a Highly Contaminated Tradition,” 54. Mink’s comments on “what values [of agreement] are to be regarded as high or low” and dependency on the “*character of the variant*” are also helpful.

That the first part of the book is 86 pages in length is indicative of the perceived learning curve required to become conversant enough with the principles and terminology of the CBGM to begin the critical examination of the final two parts of this book. Perhaps the unanswered question for beginners will instead be philosophical: how is application of the method an improvement over prior work in textual criticism? It may be that explicitly framing the discussion in terms of the precise problems to be solved could serve to alleviate the stress of this learning curve. If there is widespread confusion about the method, then there are only a select few who will have the motivation and tenacity to investigate further—and for these, clearly identifying the payoff will justify the journey. In practice, the primary use of the CBGM is to help identify coincidental agreements, something that is otherwise very difficult to do without computer assistance. The secondary practical use is to provide a representation of the relationship between readings in local stemmata and of genealogical coherence between witnesses in tabular charts and textual flow diagrams. As a global stemma has never yet been created by the INTF, the entire *practical* application of the CBGM can be summarized in these two use cases. It is quite secondary that the method provides a better way to group textual affinities than the historical text type model and a way to understand textual flow diagrams.

Part 2: Goals and Practice of the CBGM

In the second part of the book (chapters 3 and 4), the CBGM is evaluated in its ability to hypothesize an *Ausgangstext* (“initial text”) and the subsequent textual tradition. Chapter 3 begins with a 13-page discussion of what exactly is meant by the term *Ausgangstext*, concluding that to distinguish the meaning (“that text from which the extant tradition descends”) from its referent (whether that be an authorial text, an archetype, etc.) answers the question (100). Additionally, Gurry asserts that an editor will need to explicitly identify their intended referent, as this influences the evidence available for making text-critical decisions (101). This intersection of text-critical decision making and defining the referent of *Ausgangstext* leads Gurry to discuss the merits of the CBGM being labeled by Mink as a “meta-method” that can be integrated with any other method (e.g., reasoned eclecticism, radical/thoroughgoing eclecticism, or Byzantine priority). While the editors of the CBGM are successfully integrating the method with reasoned eclecticism, Gurry finds the CBGM to be definitionally incompatible with thoroughgoing eclecticism and irrelevant to those presupposing Byzantine priority. In the latter case, the INTF provided Gurry with a sandbox copy of the CBGM, in which he could experiment with local stemmata. In nearly all places of variation, Gurry was able to substitute the Robinson-Pierpont Byzantine text as the initial reading where it differed from the ECM’s initial text. The resulting textual flow diagrams were largely unchanged (which is to be expected, given the highly coherent nature of the New Testament textual tradition) and Gurry concluded that “More pertinent to our question about the use of the CBGM for the Byzantine priority view, it may be that the results shown here could be of value in deciding those places where the Byzantine tradition is split” (107). The chapter closes with an assessment of the CBGM’s ability to detect coincidental agreement, a problem tackled by E. C. Colwell, Gordon Fee, and others. Pre-genealogical coherence (simply the numerical agreements between witnesses) is the key data set in identifying coincidental agreements: agreement between dissimilar witnesses (i.e., those having low pre-genealogical coherence) is probably coincidental unless some aspect of the variant suggests it is not (110–113).

In chapter 4, the book of James is used to evaluate the claim that the CBGM can be utilized to identify coincidental agreements, and thus help text critics evaluate transcriptional probabilities. Identifying scribally created singular readings is a difficult problem to solve, and

the CBGM offers a means to identify these readings using textual flow diagrams (117–119). If a witness that contains a reading found in none of its closest relatives, that reading is unlikely to have been copied from its exemplar(s); when looking at potential relatives, changing the connectivity parameter of the CBGM allows the user to vary the strictness of selecting ancestors based on the type of reading (120). Gurry recorded the types of variants that occurred at the 664 locations in the text of James where the CBGM has textual flow diagrams, setting the connectivity to 1, 10, and *absolute* (= 499). In the resulting data set, the total number of textual changes scaled upward with the increasing connectivity values. Substitutions were the most frequent variant, followed by one-word omissions and additions (126). Gurry explains the results of this test:

As the connectivity tightens, we get a higher percentage of substitutions and a lower percentage of omissions of two or more words. Both are accounted for if we consider that many substitutions are easy to make whereas omissions of two or more words are less so. This suggests that coherence and connectivity work as designed. (127)

This is a practical and valuable experiment to demonstrate how varying connectivity impacts the CBGM output. Regarding the results, Gurry makes no comment on the potentially interesting data points for single-word additions, which decreases from 18.3% (connectivity = 1) to 16.8% (connectivity = 10) before rising to 17.4% (connectivity = 499). He does observe that, based on these examples, the CBGM still requires an intelligent user to make decisions such as choosing a connectivity level, even if the result of changing that level seems to have less impact than expected. He then compares the results of this experiment with the results of James Roysse's method used in *Scribal Habits in Early Greek New Testament Papyri* while acknowledging that a direct comparison is not entirely appropriate given the different biblical texts and Roysse's focus on papyri (127–128). This comparison is simply observational, without the benefit of statistical analysis. In the entire book, a reader is left wondering why the critical evaluation of a numerically based method of comparing texts is devoid of any statistical analyses. Such analyses could bolster (or reverse) Gurry's observations regarding his test results.

Returning to the experiment, Roysse examined singular readings in his selected papyri, so Gurry concedes that a better point of comparison would be to use the ECM data to compare the types of changes that occur for the singular readings in *James* with the averaged types of changes that are reported by the CBGM. Gurry notes that, for omissions and additions of a single word, "the CBGM results show around six percentage points more than singular readings" (129). Additionally, omissions and additions of two or more words have a lower percentage in the CBGM results than singular readings. And Gurry finds it most interesting that "in both datasets omissions outnumber additions just as they do in Roysse's study, but here the difference is far less significant than Roysse found in the papyri" (129). Again, there is missed opportunity to analyze these data beyond general comments on percentage values.

In the final section of this chapter, Gurry performs five additional tests to determine the impact of variables other than connectivity on the CBGM's results: (1) including/excluding fragmentary witnesses; (2) using a data source of the entire Catholic Epistles or just the book of James; (3) setting the initial text to the *a* or *b* readings; and (4) setting the text of the *a* witness to the ECM text or the Robinson-Pierpont Byzantine text. Summarizing his results, Gurry notes that "what is immediately obvious from the comparison is that the most significant variable by far is whether reading *a* or *b* is set as the initial text for each diagram (test four)" (134) and that "the other tests are all surprisingly even; none is an outlier" (135). Gurry is to be commended for running these additional tests, though they are incomplete without determining if the results are statistically significant. For example, to go further with the analysis for these five experiments, we can run Fisher's exact tests to compare each test in a pairwise fashion within

variation type using the data from Gurry's *Comparison of results from the tests in Jas 1* (134) and discover that comparing six of his data values result in statistically significant results at a significance level of 0.05 (i.e., $p \leq 0.05$; this is without adjusting for multiple comparisons since this is merely an exploratory analysis). The results are summarized in Figure 2; for addition variants, the results in test four are significant when compared to all other tests; for omission variants, the results of test four are significant when compared to test one (normal settings of excluded fragmentary witnesses, a data source of the Catholic Epistles, initial text of *a*, and text of *a* witness = ECM2) and test three (where fragmentary witnesses are included, and the data source is the book of James). This last step would have helped make Gurry's case—here and elsewhere—without resorting to subjective analysis.

Variation Type	Test Comparison	p value
Omission	1 vs. 4	<0.0042
Omission	3 vs. 4	<0.0192
Addition	1 vs. 4	<0.0001
Addition	2 vs. 4	<0.0002
Addition	3 vs. 4	<0.0000
Addition	4 vs. 5	<0.0000

Figure 2. Statistically significant results of Gurry's compared test scenarios

Part 3: Problems of Tradition History, Variant Selection, and Capability

The third and final part of the book (chapters 5 through 7) challenges the CBGM's ability to trace the historical development of the New Testament text tradition and offers opinions regarding the method's limitations and possible enhancements. Genealogical coherence, while not explicitly concerned with *history*, determines prior and posterior readings at each point of variation and thus does indicate a localized concept of time, but where the arrow of time represents developments away from the *Ausgangstext* (see conceptual representation in Figure 3). Mink does caution that these "stemmatic ancestors" that are used to construct optimal sub-temma "must not be confused with the historical exemplars of the descendant which normally are lost."³ Indeed, in each published work on the CBGM, Mink is consistent in presenting the stemmata as being unanchored to time and physical manuscripts.

In chapter 5, Gurry assesses whether the CBGM really is concerned with history. He begins by reviewing the critiques of several scholars who have commented on the CBGM's relationship to history. Gurry begins with Yii-Jan Lin's observation that the CBGM's reliance on numerical scientific methods and the principle of parsimony lead to a "clinical perspective" that has no place for historical narrative to impact the transmission of the biblical text.⁴ He then cites Stephen Carlson's response paper to the panelists of a 2014 Society of Biblical Literature

³ Gerd Mink, "The Coherence-Based Genealogical Method, CBGM: Introductory Presentation" (Münster: INTF, 2009), 133.

⁴ Yii-Jan Lin, *The Erotic Life of Manuscripts* (Oxford: Oxford University Press, 2016), 137. Gurry's critical response to Lin, that "to suggest that such a view is less historical because some find it boring is to confuse matters" (148), appears to mischaracterize Lin's argument. At the end of the book, Gurry essentially agrees with Lin's position by noting that one limitation of the method (regarding historical reconstruction) is that "history is made by human beings who do not always operate in ways we might deem parsimonious" (207).

Annual Meeting session on the CBGM, in which Carlson concludes that the method is only concerned with determining the *Ausgangstext* and that “those interested in the history of the text will have to look elsewhere.”⁵ Finally, Gurry asserts that “the most important questions about the CBGM’s relationship to history have been raised by Dirk Jongkind in a series of unpublished presentations” (149). According to Gurry, the two problems identified by Jongkind in his papers are: (1) the data regarding agreements at points of variation behind pre-genealogical coherence is not objective; and (2) the CBGM’s use of a “false proxy” results in the inversion of certain relationships where contamination is a factor (149–151). In the analysis that follows, Gurry summarizes Jongkind’s experiment and criticisms, but the reader is disadvantaged to have no opportunity to interact directly with Jongkind’s work.⁶ Gurry uses the experiment as a foundation from which to launch his discussion of a “real case” of a problem with the CBGM and its ability to explain the development of texts (154–155).

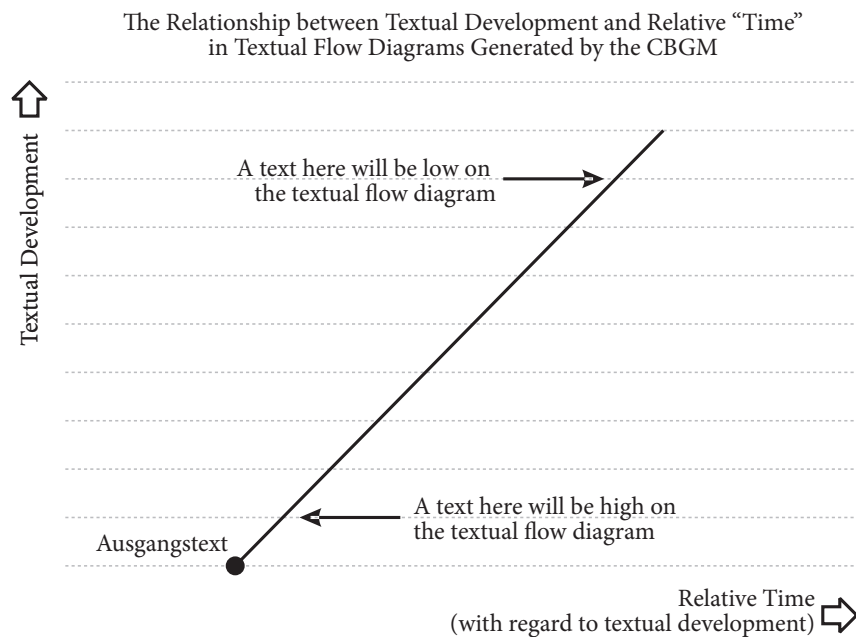


Figure 3. A visual representation of relative time in the context of the CBGM’s textual flow diagrams. Readings that are “prior” or “posterior” for a given instance of text are either closer or farther from the *Ausgangstext*, respectively

Jongkind’s experiment is somewhat similar to a problematic scenario proposed by Mink years earlier, in which serial contamination of a transmission stream by a witness can begin to look like a circular relationship (see Figure 4a).⁷ Mink notes that “usually a number of the variants

⁵ Stephen Carlson, “Comments on the Coherence-Based Genealogical Method,” *TC* 20 (2015), 2.

⁶ The editors of *TC: A Journal of Biblical Textual Criticism* provide a very brief summary of Jongkind’s paper in volume 20 (2015): <http://rosetta.reltech.org/TC/v20/TC-2015-CBGM-intro.pdf>. Gurry also refers to other unpublished portions of this dialogue; it is unfortunate that Mink’s paper entitled “Some Notes on Dirk Jongkind’s Paper ‘Textual Criticism of the New Testament and the Coherence Based Genealogical Method: Some Critical Remarks,’” presented at an INTF colloquium in January of 2014 remains unpublished as well.

⁷ Gerd Mink, “Problems of a Highly Contaminated Tradition: The New Testament; Stemmatology of Variants as a Source of Genealogy for Witnesses,” in *Studies in Stemmatology II*, ed. Pieter van Reenen, August den Hollander, and Margot van Mulken (Philadelphia: John Benjamins, 2004), 13–85, 49–59.

in an ancestor in a contaminated tradition are posterior to the corresponding variants of the descendant, and a number of the variants in the descendant are prior to those of the ancestor" (italics original).⁸ This raises a problem such that the relationship between the text of C and the text of E may appear contradictorily reversed when compared in isolation. Mink provides a possible solution to this problem by introducing an intermediary node (that "does not represent a hyparchetype"), but exploration of this solution is outside the scope of this discussion.⁹ Where Jongkind's scenario differs from Mink's is that: (1) the transmission of A into 1, 2, and 3 is assumed to be without variation apart from the influence of R (figure 4b); and (2) Jongkind's focus was on "explaining how the various witnesses relate to one another in their historical sequence"¹⁰ rather than solving the problem of indirect relationships between texts.¹¹

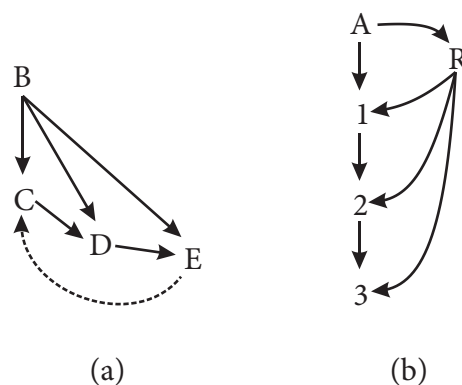


Figure 4. (a) Mink's scenario of simple contamination (solid lines) and two-stage contamination (add the dotted line); (b) Jongkind's scenario of serial (and growing) influence from witness R

This second difference (the desire to obtain a historical sequence from the CBGM output) becomes Gurry's point of departure for discussing the history of textual transmission. He reports Jongkind's conclusion that the major problem for the CBGM is that the method assumes that posterior readings are *later* readings and that "the term 'earlier text' does not necessarily mean that the text of this witness was in existence before the text with which it is compared"; he immediately follows that "If true, this could present a serious problem for Wachtel's claim that the

⁸ Mink, "Problems," 51.

⁹ Mink, "Problems," 60–61.

¹⁰ This is quoted in Bruce Morrill's response paper delivered at the 2014 Society of Biblical Literature Annual Meeting mentioned above. I am grateful to Bruce for sharing his paper with me.

¹¹ The first point of difference seems unlikely, especially light of the complex transmission history of the New Testament; is it realistic to assume a situation in which that transmission of A to 1 to 2 to 3 is perfect in all cases *except* where R has had increasing influence? Even minor points of variation between 1, 2, and 3 outside the influence of R should alter the results of the experiment. Gurry rightly comes to the same conclusion that "the example succeeds in showing how the CBGM may be misled, but at the risk of being unrealistic" (156). In his response paper, Morrill voices the same concern (having sorted through real New Testament textual data) and then reports Mink's observation that "it would only take 1 agreement between A and R, against any other manuscript, to show the influence of R in the global stemma." The high level of contamination for the New Testament textual tradition would indicate that this experiment may be too cleanly constructed. That said, Jongkind should be praised for proactively testing the CBGM with difficult textual scenarios at a level of engagement which the text-critical community desperately needs to better understand the use of the method. Like any test suite, this (and any other) testing should undergo refinement to improve test scenarios.

global stemma can provide ‘the relative chronology of the development of the text’” (153). But here he has misunderstood what Wachtel is referring to regarding *relative* chronology, perhaps because all these terms (ancestor, descendant, prior, posterior) are typically associated with linear time. In “The Coherence Method and History,” Wachtel repeatedly emphasizes that “the structure of the textual tradition must not be equated with the history of manuscript production.”¹² Wachtel’s full statement in the conclusion of the article is: “Textual history, according to the CBGM approach, deals with texts carried by manuscripts, not with the manuscript traditions as such. The relative chronology of the textual development is quite independent of the history of manuscripts.”¹³

Despite this, Gurry uses the known relationship between the Harklean Group of witnesses and the Byzantine text to assess the CBGM’s ability to cope with the historical issues raised by Jongkind in a more realistic experiment. Gurry notes Jongkind’s concern that the members of the Harklean group are incorrectly “placed below the late Byzantine form of text as found in witness 35 and 18 but which, according to Wachtel represent an early state of the development of the ‘Koine text’” (159). Evaluating the data from ECM James, Gurry observes that “there remains a question as to how a witness that preserves a presumably late [Byzantine] text form like 35 could be an ancestor to a witness like 1611 which largely preserves a seventh-century text” (166). By identifying this apparent problem, Gurry illustrates the possible confusion between textual development and linear time; the *readings* peculiar to the Harklean Group which diverge from the mainstream (Byzantine) text represent a further development of the text (i.e., they are more distant from the *Ausgangstext* than the mainstream text) regardless of the date of production. Gurry confirms this assessment by counting the distinctive Harklean (sixty-eight) and Byzantine (forty-three) readings in the book of 1 John (172). Nonetheless, Gurry proposes to solve the apparent problem by creating a partial global stemma (166–167). He notes that the INTF staff have never created a complete global stemma and only one partial top-level global stemma was created by Mink.¹⁴ Gurry’s attempt at a partial global stemma is unique: he proposes a “novel approach” to optimizing substemmata (briefly described) and asserts that he has demonstrated “how it would be possible to construct a global stemma with significantly less effort than what is currently required” (167–168). Unfortunately, the reader is simply provided with the resultant partial global stemma (168) without the supporting work or data. For a novel method of constructing a partial global stemma—itsself a novel task—it would have been appropriate to put the work up for evaluation, even if relegated to an appendix. As it stands, we are left with no means to validate Gurry’s results. His conclusion is that Jongkind’s “false proxy” “is not actually a problem” and that “it does not appear that the Harklean text is a direct ancestor of the Byzantine text as Wachtel has suggested” (175). From this study Gurry rightly concludes that “it is not always clear what the CBGM’s genealogies relate” and that “Some of the objections are based on misunderstanding or unjustified assumptions about what constitutes history” (179).

In chapter 6, Gurry discusses the selection of variants for the CBGM, noting that the editors of the ECM volumes distinguish between readings that are genealogically significant (i.e.,

¹² Klaus Wachtel, “The Coherence Method and History,” *TC* 20 (2015): 5. Thus, “This structure shows the relationship between states of text preserved in manuscripts, not between manuscripts as such” (ibid.). Additionally, regarding the predominant textual flow, Wachtel’s assertion that “In a contaminated tradition, however, there is nearly always a flow in the opposite direction as well” (5) would not be possible if prior/posterior terminology in this context was referring to linear time.

¹³ Wachtel, “Coherence Method,” 6.

¹⁴ Mink, “Introductory Presentation,” 576. Cf. Mink, “Problems,” 74–76.

variants) and those that are not. When an editor begins collating the transcription data of the Greek manuscripts, Greek spelling is regularized (or normalized) into two categories, where there are: (1) minor vowel/diphthong or consonantal changes; and (2) legitimate alternate spellings (orthographic variations) that are recognized in lexicons. Any “error” readings are mapped to intended readings if possible. Gurry questions whether this process of regularization is justified and ultimately concludes that four more categories of variants should be included in the CBGM: “meaningful” singular readings, spelling variations, nonsense readings, and corrections (205). Gurry begins by surveying several studies that have analyzed a variety of textual traditions. At the start of his survey, he claims Peter Robinson, in his work on phylogenetic analysis, “advocates an expansive model that includes as much data as possible” (181). This is perhaps noted to support Gurry’s conclusion that variant spellings should not be regularized. However, for traditions with unstable spelling (such as Hellenistic Greek), Robinson adopts a model of regularization that mimics that of the INTF: most alternative spellings are discarded as genetically unimportant, but Robinson retains a separate category for the less common spellings that are legitimate orthographic variants.¹⁵ It is only in the first half of the study that Robinson concluded that spelling regularization can be genealogically significant in traditions “where the spelling of individual words is relatively standard across copies.”¹⁶ Ulrich Schmid’s work on genealogy by chance is also brought to the fore by Gurry to note that identification of coincidental agreements is perhaps more difficult than previously determined and, as a result, the CBGM should use a more inclusive data set in determining textual relations (183–185).¹⁷

Within this context, Gurry provides the reader with a helpful distinction made by the CBGM users between a reading (“any difference between two witnesses at the same point of comparison”) and a variant (a genealogically significant reading), such that “the CBGM’s genealogies are based on all meaningful, non-spelling differences of the first hand from the collated, continuous text manuscripts” (185). Each of these variants is of equal weight in the CBGM, which Gurry then challenges by citing an unusual use of the CBGM by Alberto Cantera to study of Avestan manuscripts. Cantera found that Avestan manuscripts rarely have variants that are “grammatically correct and logically possible” and adopted a pre-genealogical model that classified and weighed variants according to three types.¹⁸ Cantera appears to treat his categories as self-evident, as there is no justification given for the relative weights of the categories. Gurry comments that “Cantera’s three categories would not map well onto the New

¹⁵ Peter Robinson, “Four Rules for the Application of Phylogenetics in the Analysis of Textual Traditions,” *Digital Scholarship in the Humanities* 31 (2016): 647. Robinson provides an example from the first line of the Nun’s Priest’s Tale, in which four forms of a verb are retained from among the many spelling variations.

¹⁶ Robinson, “Four Rules,” 641. Papyrologists have certainly demonstrated that spelling in Hellenistic Greek is fluid (see, for example, Francis Thomas Gignac, *A Grammar of the Greek Papyri of the Roman and Byzantine Periods* [Milan: Istituto editoriale cisalpino-La goliardica, 1976]).

¹⁷ Ulrich Schmid, “Genealogy by Chance! On the Significance of Accidental Variation,” in *Studies in Stemmatology II*, 127–43.

¹⁸ Cantera writes: “Since not every error is significant in the same way or to the same degree, I distinguish between three different kinds of variants (1, 2 or 3). Variant of the type 1 are frequent variations of single letters, such as the usual variation between \bar{i} and ii or the confusion between ar , $\bar{a}r$, r , etc. More significant are the variants of level 2 like haplogogies, dittographies, metatheses, accumulations of changes of level 1, etc. And finally level 3 is reserved for aberrant variants that are quite unlikely to arise independently” (Alberto Cantera, “Building Trees: Genealogical Relations Between the Manuscripts of the *Widēwdād*,” in *The Transmission of the Avesta*, ed. Alberto Cantera, *Iranica* 20 [Wiesbaden: Harrassowitz, 2012], 329).

Testament” but that “his process is promising” (188). But why is this method promising and what evidence supports that conclusion? Note that Robinson attempted a system of weighing variants in a series of experiments and concluded that weighing variants “had virtually no effect on the quantitative analysis.”¹⁹ Regardless, a more significant question is: how would any scheme of weighing variants be less subjective than assigning equal weights to all variants, and how would one verify that decision quantitatively? Let us assume we feel that a spelling variant should be assigned a multiplier of 1.3 and a transposition variant a multiplier of 2.1—how are those values justifiable? Perhaps there is a sophisticated analysis that may one day provide a way to weigh these items objectively, but until that time the suggestion to assign variant weights appears somewhere between arbitrary and unmeaningful.

Gurry successfully makes the case that there are instances, however rare, where something like spelling variation may be genealogically significant (such as with P75 and 03). I do not think Robinson, Schmid, or Cantera support his argument, however. When the CBGM is available for users to install locally (see below), users can experiment freely with the data that are used, but retention of unregularized spelling would require additional development to flag instances of spelling variation that are *not* significant. A better solution would perhaps involve designing ways in which the CBGM could indicate genealogical relationships between or among witnesses that are not strictly based on comparison of text strings.

In the final chapter of the book, Gurry briefly surveys what he deems to be three limitations of the method, followed by seven suggested improvements. Though this is a short chapter (13 pages), it provides a helpful window through which we can view Gurry’s perspective and understanding of the CBGM. Considering the previous chapters, the limitations identified are straightforward. The first limitation is that “contamination remains a problem” (206), as Gurry sought to prove in chapter 5; he explains that a problematic scenario “can happen when contamination replaces the posterior readings of one ancestor with the prior readings of another close ancestor” (206–207). The second limitation is that “history is made by human beings who do not always operate in ways we might deem parsimonious” (207). While users of the CBGM are encouraged to use historical data to influence decisions at points of variation, there may inevitably be historical circumstances that are unknown but whose impact is witnessed in the textual tradition. The third limitation, which Gurry identifies as a limitation for the *users* of the CBGM, is that “the CBGM cannot tell us the specific cause(s) of any particular variation,” so users of the method must still be actively engaged in explaining scribal activity. This may be self-evident, but the method never claims to replace the thinking textual critic; it is simply a method of testing text-critical decisions.

The suggested improvements section of this chapter is occasionally surprising, and it is worthwhile to consider these items in some detail to better understand the design and trajectory of the CBGM. The suggested improvements include: (1) allow coincidental agreements to be removed; (2) include more data and allow for greater discrimination; (3) provide a better presentation of textual flow data; (4) allow for reconstruction of lost hyparchetypes; (5) define texts clearly and consistently; (6) allow coherence to be studied across variation units; and (7) open the method to the public.

The first suggested improvement, to provide users with a switch to toggle identified coincidental agreements on or off, will (in Gurry’s opinion) remove the “contradiction” of allowing coincidental agreements to be “discarded” at the step of constructing a global stemma, while those same coincidental agreements remain a part of pre-genealogical coherence (210). In chapter 6, Gurry cautioned against incorrectly identifying coincidental agreements and here this advice is necessary; how would his suggestion handle the case where a variant is coinci-

¹⁹ Robinson, “Four Rules,” 648.

dental in one or more cases but not coincidental in the others? Perhaps split readings could be separately tagged as either coincidental or not (e.g., split coincidental reading b₁ is toggled off while a non-coincidental split reading b₂ remains)?

In his second suggested improvement, Gurry observes that the abundance of textual data available to the CBGM is not being fully realized and recommends that more types of variants should be allowed (e.g., “error” readings), all variants should be weighable, and all the evidence of lectionaries, versions, and patristic sources should be included in the CBGM. While it is difficult not to agree with Gurry that our present data abundance should be fully utilized—more data is always better, leaving it to the user of the data to filter out what they need—in some cases this is simply not practical. The CBGM was not built to handle fragmentary data; how would short patristic witnesses or highly fragmented versions like the Coptic be useful? As noted above, weighing variants either increases subjectivity or (if Robinson’s findings hold true here) has negligible impact. The suggestion to include lectionary data in the CBGM is a solid one, and current ECM projects are incorporating lectionary transcriptions.

The third suggested improvement is to improve the presentation of textual flow data by making the underlying data more accessible to the user. He recommends that: (1) the user be able to decide how many potential ancestors appear in a (presumably general) textual flow diagram; and (2) that the overall strength of a link between nodes in a diagram be revealed by varying the opacity of the arrows between them and displaying flow arrows in both directions. Making the textual data more accessible is quite a good suggestion and the INTF and the Cologne Center for eHumanities (CCeH) have made related improvements to the CBGM web materials since the publication of this book. For example, clicking on a witness in a text flow diagram in the coherence/attestation diagrams (<http://ntg.cceh.uni-koeln.de/acts/ph4/coherence>) immediately pulls up a list of relatives with customizable output parameters. Prior and posterior readings are listed in the relatives pop-up, which may be more realistic than having a user attempt to discern the strength of a connecting line based on opacity. As the INTF is not a software development company with full-time programming staff and a production team, I suspect requests of this nature are evaluated carefully and resourced when time and money permit. But Gurry is correct that putting more data in the hands of a user is always better, especially when the user can filter and customize that data based on their interests.

Gurry’s fourth suggested improvement, that the CBGM “allow the reconstruction of lost hyparchetypes” (214), is fundamentally at odds with the purpose and function of the method, which is to evaluate the relationships of *texts*, not manuscripts. Having chastised senior scholars for confusing texts (witnesses) and manuscripts in his very adept description of the CBGM at the start of the book, Gurry subsequently argues for the allowance of hyparchetypes, noting that “reconstructing lost ancestors provides more detail, taking us that much closer to historical manuscript relations” (215). Lachmannian stemmatics can function with hyparchetypes because they are situated in time and help explain the relationship between manuscripts; not allowing hyparchetypes in the CBGM is not merely a matter of forgoing “the choice” (214) but recognizes that this mixture of categories is nonsensical. Gurry takes it a step further by noting that “a global stemma with witnesses that have five or six ancestors is likely to be removed from the historical manuscript reality that it has to be” because of the unlikely possibility that “scribes used five or six exemplars for a single book or section of a manuscript” (215). The physical scenario described is rightly ridiculous, but not one suggested by a global stemma; readings accumulate in the flow of textual transmission from one copy to the next, and are not indicative of mixture within a single copying event. In the end, this suggestion is the result of a category error. It is like suggesting that one bring dice to a poker game; both are associated with games of chance, but dice have no place in poker.

The fifth suggestion is to more clearly define what is meant by “text” and then use the term more consistently. For his first example of this issue, Gurry states, “Typically, the text of a witness is defined as the text of the first hand of the manuscript in which it is found. But when it comes to ‘error’ or nonsense readings, the CBGM defines the text as what was intended by the scribe” (216). Nothing is cited by Gurry here, so it may simply be that he wishes for the ECM volumes to explicitly state what decisions are made when regularizing the Greek transcription data before it is passed to the CBGM.²⁰ For his second example, he finds the ECM references to the Byzantine text to be confused with possibly conflicting definitions:

In one case it is defined as all the agreed readings of Byzantine manuscripts. By this definition, it is “generally identical with the primary line text.” But, on the same page, the Byzantine text is also defined *against* this same primary line text. Thus the same term is used for almost completely opposite entities. (216)

While textual criticism as a discipline would benefit from careful definition and use of terms like “text” (qualified or not), I find it difficult to understand Gurry’s criticism of the ECM’s use of the term. The volume clearly states that “in James the undivided witness of the Byzantine text differs from the primary line text in only 61 of more than 700 instances of textual variation” and that “Elsewhere the Byzantine is generally identical with the primary line text.”²¹

Gurry’s sixth suggestion is to “allow coherence to be studied across variation units,” which is an attempt to deal with contamination through harmonization that can occur across books (216–217). This could reflect influence from the Septuagint (for example), though comparing Septuagint text with New Testament text would be challenging. However, “for cases where the contaminating influence may be within the New Testament itself, it would be possible to build a version of the CBGM that could bring coherence on such possibilities” (217). It should be sufficient to note that in the step of establishing genealogical coherence, an editor using the CBGM can account for this very issue using the traditional canons of criticism.

The final suggestion of opening the method to the public, Gurry notes that “if the CBGM is to become a widely-used tool, one that is trusted by text critics and actually used by exegetes and translators, it absolutely must be opened up for public use and scrutiny”; if only editors of the ECM can make full use of the CBGM, then it can never gain wide acceptance and “will continue to be met with frustration and even suspicion” (218). This is a good suggestion and one that exposes a tension that might otherwise remain invisible. As the INTF is a research institute that is being funded to produce critical editions—and not release software tools—the scholarly community will no doubt have difficulty accepting one output without the other. When I first attended a presentation of the CBGM years ago, my first question as a former software developer involved testing the software. The *assurance* of quality assurance is gained by having someone other than the coder test that the software operates as expected; for large data sets such as the New Testament Greek texts, it would be difficult for an outside user to know if the data is being handled accurately or not by the software. I would take Gurry’s suggestion a step further and advocate that the method become an open-source software package so that the broader community can design tests not only for testing coherence relationships but also

²⁰ Note that the ECM volumes do list all error readings that have been regularized. These are marked with an “f” in the critical apparatus and the unregularized text is listed in a supplemental volume. Future editions will also include “r” readings to indicate regularized spelling variations not considered errors, though the unregularized forms will likely only be provided online and not in the printed volumes.

²¹ Barbara Aland et al., eds. *Novum Testamentum Graecum: Editio Critica Maior IV; Catholic Letters; Part 2; Supplementary Material*, 2d revised ed. (Stuttgart: Deutsche Bibelgesellschaft, 2013), 10.

for testing the code itself.²² The first request should be met in the future as the CCEH is planning a Docker-based release of the CBGM that will be available to the public.²³ What support will look like for such a release is another matter.

Appendices in this volume include: a handy list of differences between the NA27, the ECM1 and the ECM2/NA28/UBS5; a list of the Harklean readings in 1 John; and a list of orthographica for James. Scriptural and author indices are included. The short subject index at the end of the volume is sufficient to the task, and Gurry has had added entries for “pudding” and “unicorn” for fun. Typographical errors are minimal (e.g., “should a any given” on p. 123; read “these” for “this” on p. 125, n33; read “unit” for “unites” on p. 132; omission of “of” on p. 136, n45).

In conclusion, the CBGM deserves the serious scrutiny of the scholarly community outside the INTF, and Gurry’s examination of the method is the first major published work to start the conversation. The strengths of this book include the introduction to the history and reception of the method, the descriptions of the method’s process, and the straightforward examples of using the method found in the first two-thirds of the book. Additionally, Gurry’s clarifications regarding the referent of *Ausgangstext* in the process of editing the ECM serve as a good reminder that the text-critical community needs to clearly state presuppositions when producing a critical text of the Greek New Testament. The testing of the method’s parameters in chapter four begins a welcome exploration that could have had a more meaningful impact if supported by statistical analysis; this is a general weakness in the humanities when analyzing data such as these. The final third of the book raises some good questions about the use and future of the method, though Gurry’s answers are not always satisfying. His analysis of the method draws attention to the differing opinions of scholars regarding the CBGM and history, especially what is meant by *history* in each context. Finally, looking to the future, Gurry provides some helpful recommendations for moving forward with the CBGM. Some of his suggestions are fundamentally at odds with the method itself but discussing these in detail will also move the discussion forward.

²² In a sense this is available now (see the following footnote), though it would take a sophisticated user to be able to install and make use of the software.

²³ The website for this project is found at <http://ntg.cceh.uni-koeln.de/> and some database materials are already available on GitHub (<https://github.com/cceh/ntg>).