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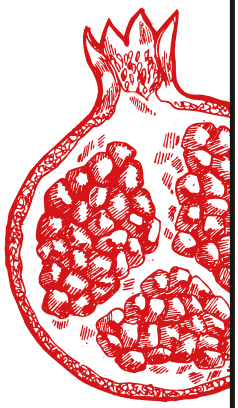

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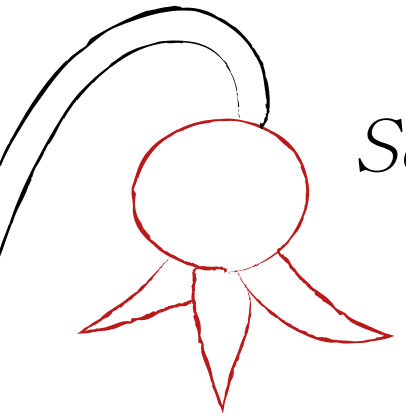

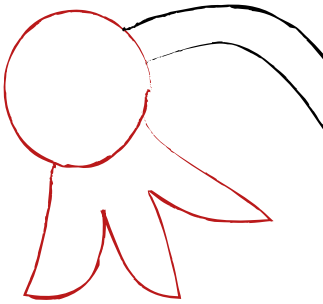

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ADVANCES IN ANCIENT BIBLICAL AND NEAR EASTERN RESEARCH

BACKGROUND AND AIMS OF A SCROLL APPROACH TO THE FORMATION OF THE HEBREW BIBLE

David M. Carr

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Abstract

This essay updates a proposal for a material-historical scroll approach to the formation of the Hebrew Bible, particularly the Pentateuch (cf. Carr 2020). It starts by surveying ancient Egyptian, Levantine, Greek, Demotic and Second Temple Jewish practices surrounding literary scrolls—how compositions were inscribed on them, scroll length ranges, and ways that existing scrolls were revised. This survey suggests that a substantial shift occurred around early Hellenistic period toward development of scrolls with high carrying capacity (both in writing density and length), facilitating a revolution in the amount of literary material that could be recorded on a single written object. Though possibly prompted by Greek writing practices, this development of high-carrying-capacity scrolls seems associated with priest-adjacent preservationist scribal contexts where such scrolls were used to conserve indigenous literary traditions amidst an environment dominated by another language. These findings have implications for exploring the relation between written artifacts and memorized/performed textual works in the Ancient Near East and the development of models for the inscription of Hebrew textual traditions. In addition, the article proposes several measures for use in analyzing scroll features across multiple culture areas.

Cette contribution reprend de façon actualisée une approche historico-matérielle de la formation de la Bible hébraïque et en particulier du Pentateuque, à travers l'étude des manuscrits de la Mer morte (cf. Carr 2020). Son point de départ est l'analyse de pratiques anciennes égyptiennes, levantines, grecques, démotiques et du judaïsme du Second Temple concernant les rouleaux littéraires – comment les compositions (ou des parties de celles-ci) étaient inscrites, les longueurs et les types de rouleaux, et les façons dont les rouleaux existants étaient révisés. Cette étude préliminaire suggère qu'un changement important survient au début de la période hellénistique qui conduit au développement de rouleaux avec une capacité d'inscription exceptionnelle (tant en termes de densité d'écriture que de longueur), ce qui favorise une révolution quant à la quantité de matériel littéraire qui pouvait être enregistré sur un seul objet écrit. Cette évolution, bien qu'en partie possiblement suscitée par les pratiques grecques d'écriture, semble associée à certains contextes scribaux préservationnistes liés au temple et proches des prêtres. Dans ce cadre, ces rouleaux sont utilisés pour préserver des traditions littéraires indigènes au sein d'un environnement plus large dominé par une autre langue. Ces découvertes ont des implications pour l'étude de la relation complexe entre artefacts écrits et œuvres textuelles mémorisées ou exécutées dans le Proche-Orient Ancien et pour le développement de modèles qui analysent l'inscription des traditions textuelles hébraïques En outre, cette contribution propose plusieurs unités de mesures pour l'analyse des caractéristiques des rouleaux dans de multiples aires culturelles.

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BACKGROUND AND AIMS OF A SCROLL APPROACH TO THE FORMATION OF THE HEBREW BIBLE[1]

David M. Carr

Introduction

The aim of this contribution is to summarize and update my proposal for a scroll approach to study of the formation of the Bible, a proposal that I presented orally in 2017 and published in preliminary form at the end of 2020 in an article entitled "Rethinking the Materiality of Biblical Texts" in the *Zeitschrift für die Alttestamentliche Wissenschaft* (*ZAW*) (Carr 2020). The 2017 talk occurred in a panel session on divisions between different models of Pentateuchal criticism, where I was assigned to speak (self-critically) on the topic of how the tradition-historical method can be improved. I took the opportunity there to build in

[1] I thank Danilo Verde for proposing the panel out of which this article arose and, along with Eibert Tigchelaar, for organizing it. I thank my fellow panelists and participants for their responses to my 2017 presentation on the panel. Those

particular on the work of Menahem Haran, an intellectual ancestor of the Neo-Documentarian approach, in suggesting that Pentateuchal scholars, including those like me who advocate tradition-historical models for the formation of the Pentateuch, should take more account of ancient practices surrounding the writing and revision of ancient scrolls. The 2020 *ZAW* article on the materiality of biblical texts

familiar with my *ZAW* article and/or Leuven panel contribution will notice major shifts and updates, reflecting my further work on the topic over the last two years. Over that time, I have benefited from discussions with Eibert Tigchelaar, Drew Longacre, Mladen Popović, James Nati, Molly Zahn, and others who are among those who have been doing a version of what I call a "scroll approach" for a long time. I owe an additional debt of gratitude to the Humboldt Foundation and to colleagues in Germany and France whom I consulted during a two-month research stay in Berlin as a guest of the Humboldt University funded by the Humboldt Foundation, combined with a visit to Paris, where I lectured on the topic at the Sorbonne hosted by Chloé Ragazzoli, whose work I have found to be strategically helpful in this project. My time in Berlin was particularly enabled by the excellent team gathered there under the auspices of the DEMBIB (Demotic Egyptian Papyri and the Formation of the Hebrew Bible) ERC grant project headed by Bernd Schipper. I was helped in making some key measurements of Dead Sea Scroll materials through the use of preliminary versions of the Scripta Qumranica Electronica Platform (hereafter abbreviated SQ), and I am grateful to the SQ team for providing me with access to this tool. Some colleagues deserving special mention whom I consulted (in person or by email) during this stay include my host in Berlin, Bernd Shipper, along with James Moore, Joachim Quack, Joseph Cross, Robert Kade, Chloé Ragazzoli, William Johnson, Emanuel Tov, Tawny Holm, Jacqueline Jay, Erhard Blum, Eibert Tigchelaar, Molly Zahn, and Verena Lepper. A few of these read earlier drafts of all or part of this essay, and I am grateful to them for their corrections and insights. None reviewed the present form of it. Also, I am particularly grateful to Drew Longacre, whose work on a Hellenistic shift in script size was important in prompting a key part of what follows, and who has shared his work along parallel lines with me. I am also very grateful to Asaf Gayer, my collaborator on a related project on script density that was prompted by Drew Longacre's work. I could not have done much of the analytical work without the tools and skills that Asaf Gayer generously shared with me over the last year, and much of the recent development in my thinking about Jewish literary scrolls has resulted from this collaboration and Asaf Gayer's important questions and reflections on earlier drafts of my work.

expanded on this idea, arguing for what I called a "scroll approach" to the formation of the Hebrew Bible that drew explicitly on scholarship regarding ancient scroll practices in Egypt, Greece, and Second Temple Judaism. This scroll approach represented a turn toward the materiality of texts and scribal practices oriented around the particular materiality of scrolls.

Of course, I am not the first to inquire about how scroll practices might inform biblical study. Menahem Haran, for example, wrote a series of articles, mostly published in the early 1980s, that exemplified what I'm terming a "scroll approach."[2] Yet, though pioneering in many ways, Haran's work appeared before the publication of a number of the Dead Sea Scrolls, and it relied primarily on a mix of data from the Bible itself, references to scroll production in rabbinic literature, and some older research in Classics and Egyptology. Within European biblical scholarship, Konrad Schmid's dissertation, published in 1996, had an extensive section on scroll technology, relying on a similar mix of data.[3] In addition, many Qumran specialists came into the field via biblical studies and have used insights from the Dead Sea Scrolls to illuminate their work on the Bible.[4] In the meantime, there's been an explosion of detailed work on scrolls and scroll practices in Egyptology (e.g., Eyre 2013; Ragazzoli 2019) and Classics (especially Johnson 2004), and there's been fuller publication and discussion of the Dead Sea Scrolls along with other finds like the Wadi Daliyeh papyri, Pap Amherst 63,

[2] See Haran 1982, 1983, 1984, 1985, 1986.

[3] Schmid 1996. He has since updated this with Schmid 2006, and his work on this topic continues. Cynthia Edenberg is another biblical scholar who has included reflections on scroll practices in the evaluation of hypotheses about the prehistory of biblical books (e.g., 2020, 391–93, 400).

[4] I list some examples of such scholars in notes 1 and 3 of Carr 2020. This list was shortened in that article for limits of space, but it could easily have included many others whom I have greatly learned from but did not directly consult on the article, such as Daniel Falk, Charlotte Hempel, Jutta Jokiranta, Ingo Kottsieper, Nathan Mastnjak, Sara Milstein, Matthew Monger, Eva Mroczek, Hindy Najman, Mika S. Pajunen, Mladen Popović, John Quant, Daniel Stökl Ben Ezra, and Sidnie White-Crawford.

and the Deir-ʿAlla plaster texts, which, though on hard media, appear to depict traditions transmitted on scroll media.

This latter work on primary texts is all, of course, scroll-focused. What I'm terming a "scroll approach" to the Bible takes insights from this varied work from multiple disciplines and uses them *to inform hypothetical models for the writing and revision of pre-biblical scrolls that we do not have*. This focus on the use of actual scroll research to form hypothetical models is what distinguishes a scroll approach to the formation of the Bible from both studies of actual scrolls per se (e.g., Qumran studies, papyrology, etc.) and biblical studies that merely talk generally about what might have happened with this or that scroll. As such, the scroll approach advocated here is inherently interdisciplinary (since it is cross-referencing diverse ancient domains), focusing on dynamics specific to scroll media in the ancient world and using insights from this interdisciplinary investigation to inform hypotheses about the writing, revision, and performance/use of pre-biblical scrolls. Of course, this kind of interdisciplinary work can be fruitful in the study of scroll artifacts and practices in comparatively well-documented ancient areas, as has already been done, for example, by Chloé Ragazzoli and Christopher Eyre, in the study of Egyptian scrolls, and Emanuel Tov, Drew Longacre, and James Nati in the study of Qumran scrolls. Specialists in those areas can better determine how that work on their own materials might best be done. The contention here is just that biblical studies—and the study of Northwest Semitic literature more generally—can particularly benefit from this kind of approach because the scroll side of Iron Age and Persian-period scribal practices is relatively poorly documented, especially when it comes to scrolls bearing literary texts.

I readily admit that this umbrella term of "scroll approach" is somewhat awkward, but I prefer it for now to more general appellations such as "material historical approach" because it foregrounds how the literary materials that preceded the Bible likely were written on scroll media that were used in specific ways in ancient contexts. These scroll practices are different from the practices surrounding later codex books and other forms of media that often inform the imaginations of biblical scholars, who build hypotheses about the written sources behind

the Bible. Ancient and contemporary versions of the source-critical approach are often implicitly based on models of print culture. The tradition-historical approach to the oral background of the Pentateuch was informed by models taken from the study of European saga cycles. More recent redaction-critical models often bear an uncanny resemblance to processes of computer word-processing, supplementing and slightly revising a fixed prior text.[5] Within this context, advancing a broader umbrella of an interdisciplinary scroll approach to the formation of the Pentateuch and other biblical texts is a way of gathering and recognizing present and future work in biblical studies that more seriously takes into account the fact that pre-biblical written sources were likely inscribed on scroll media and takes into account scholarship (including the most recent scholarship) on how such scroll media were used in the ancient Near East.

Though it is quite clear that there are important differences between the scroll practices used in each ancient context, the virtue of a scroll approach (to the formation of the Bible) is to add more sustained attention to diverse tendencies in (literary) textual formation that were

[5] A recent extension of computer-media metaphors is Dershowitz 2021. Its title, *The Dismembered Bible: Cutting and Pasting Scripture in Antiquity* (and the sub-headings to chapter three) suggests that the book will offer ancient analogies to the contemporary phenomenon of cutting and pasting. Nevertheless, the contents collect a highly diverse set of examples of the revision of texts by physical means, from some exemplars of the Book of the Dead (the Papyrus of Ani) through a handful of Qumran scrolls (4Q14, 4Q22, 4Q216) to "Modern Analogues" like the Jefferson Bible. The closest analogy to the secondary joining of multiple traditions is the *Tomoi Synkollēsimoi* documents, but these are specifically Roman-period documents of an administrative genre. Most other examples (e.g., 4Q41) are likely examples of material repair. There is one example, 4Q216 (4QJub[a]), of a scroll bearing a literary text that *may* have had a prologue secondarily added to it (so Hempel 2000; Monger 2017). For discussion of some problems with this approach, see Tigchelaar 2014. Overall, though Dershowitz and I are in agreement on the need to attend to material elements of the writing and revision process, I think more progress will be made through attending more than Dershowitz does to the genres of examples, to the specific kinds of revision characteristic of literary scrolls in particular, and to the distinctive (literary) scroll practices characteristic of ancient contexts nearby that of ancient Israel (certainly not modern analogues).

influenced by the materiality of ancient literary texts, texts all too often treated by biblical scholars as pure abstractions. These "biblical" texts were fully instantiated on a certain kind of material object, a scroll, which has certain characteristics, especially insofar as such scrolls were designed to be read by humans with certain bodily characteristics (Carr 2020, 596–98). Those ancient humans may have been somewhat smaller in stature, on average, than ourselves, and they typically wrote and read these scrolls when seated on the ground, with the scroll thus spread on the lap a certain distance from their eyes. These eyes had a certain field of vision and their hands certain abilities in rolling, unrolling, and otherwise manipulating the scroll. Material characteristics such as these, along with some ancient interactions among ancient scroll cultures, played an important role, I will suggest, in the types of literary book rolls that were produced, how they could be revised, and how they could be used to support a broader culture of study, memorization, and performance.

Let us now turn from this general thesis to brief illustrations from several ancient Near Eastern contexts. The aim in this essay is to explore, preliminarily, different ways that an interdisciplinary look at multiple ancient scribal contexts could raise important questions about scroll practices for scholars working in each context. In particular, my particular focus as a biblical scholar (with some expertise in the Dead Sea Scrolls) is on identifying avenues of exploration and cross-contextual categories for comparison (e.g., terms for the carrying capacity of scrolls) where insights from relatively well-documented periods and loci of ancient (literary) scroll production (e.g., ancient and Greco-Roman-period Egypt, Persian-period Elephantine, the areas around the Dead Sea) can connect with questions about pre-biblical processes and models of formation that are being asked by biblical scholars. At points, I draw here on work carried out by specialists in these well-documented periods and loci to execute probes showing possible lines of exploration. This work is intended to provide evocative illustrations, requiring expansion and correction by specialists in the respective areas, of potentially productive connections between the study of actual ancient (literary) scrolls and the biblical scroll approach proposed here.

Illustrations of Ancient Literary Scroll Practices

Egypt (Pre-Persian Egyptian Literary Scrolls)

I start with one of the most important areas of scroll research, scroll practices surrounding early, pre–Persian-period Egyptian scrolls bearing literary texts. I will focus this brief discussion on four things that older Egyptian scroll practices illustrate: (1) the way the materiality of ancient scrolls and ancient bodies led to limits in the size of literary scrolls when compared to certain types of non-literary scrolls; (2) the function of literary scrolls as part of a broader ancient Egyptian process of writing-supported study and performance; (3) how scrolls written on papyrus lent themselves to revision by extension; (4) and the way ancient Egyptian literary scrolls were produced in an integrated scribal environment—whether temple-based or not—that involved the intensive production and preservation of other types of scrolls in the same language (letters, records, etc.).

The first point should be obvious, but unfortunately is missed by many biblical scholars: there are important format and other differences between scrolls bearing literary texts and unusually large administrative and mortuary scrolls that were not meant for regular reading. Some biblical scholars have referred to Papyrus Harris I (BM EA 9999) as an example of the potential large size of scrolls that might once have contained larger literary complexes of the Bible. And indeed, it is extraordinarily large at around 41 meters in length and 42 centimeters in height. Nevertheless, this monster-sized scroll could be so large and unwieldy because it was likely never meant for regular reading by human eyes. Instead, this record of temple endowments and deeds of Ramses III was stored as a record *for divine eyes* of his contributions to the temple and his great deeds, and a divine readership is likely similarly assumed for other large scrolls bearing copies of the Book of the Dead.[6] There

[6] For publication of Harris's notebook page describing the find site, see Hamernik 2010. See also the discussion in Quack 2014, who persuasively argues that mortuary texts and amulets are materially distinguished from other forms of texts (that are actualized orally so that their holiness comes from that verbal actualization) by the fact that the material object itself is understood to be the effective agent.

are also a number of quite large scrolls bearing administrative records from ancient Egypt that are often distinguished from literary scrolls by a particular administrative script. Their large height and frequent long length were not problems, since such administrative scrolls were not created for any kind of regular reading or even consultation. Instead, as work by Christopher Eyre (2013) suggests, they served as material witnesses to certain legal or other transactions.

In contrast, the height and length of scrolls bearing literary texts appear to have been modest. Most often, they were created by cutting larger administrative scrolls in half length-wise and erasing their original records. Apparently created for more ongoing use than documentary or mortuary scrolls, these early Egyptian literary scrolls were limited in both height and length by the limits of the scribe's reading body. Of course, this did not impose a hard and fast limit. Nevertheless, the further one went from a scroll height of around 20 to 25 centimeters, the less easily readable and manipulable the scroll became. We see similar limits of page size imposed on contemporary book media of diverse types that are not scrolls, from printed books to dedicated digital book readers (like the Amazon Kindle) that technologically could easily be larger. These column size limits for texts meant for ongoing reading have to do with the materiality of the human body—the arms that hold a scroll and the eyes that read sections of it (Černý 1947, 24–25).

Body size and the limits of arm reach also seem to have imposed some fuzzy limits on the length of literary scrolls intended for some kind of ongoing reading. My rough working database of 125 Egyptian literary scrolls suggests that few of them exceeded 9 meters in length, and all but eight of the 120 scrolls are 4 meters or less in length.[7] Notably, the vast majority of longer scrolls contain parts or all of multiple compositions, whether they were the miscellanies so beautifully studied by Chloé Ragazzoli (2019) or additional individual scrolls like Papyrus Prisse with the Instructions of Kagemni and Ptahhotep, Leiden 344 with Hymns to Amun on the recto and the *Admonitions of Ipuwer* on

[7] The following are the eight longer papyri in my preliminary list: Anastasi (Papyri) 1, 4, and 5; Papyrus Prisse; Sallier 4; Chester Beatty 1; Berlin P. 3022; and Papyrus Lansing.

the verso, or Chester Beatty P. 1, which similarly combines love songs with another tradition, in this case that of Horus and Seth. Scrolls bearing single compositions do exist, but most longer exemplars tend to be in the 3.5 meter to 5 meter range. So far as I know, we have very few literary scrolls higher than around 25 cm (the Westcar Papyrus is ~28 cm). Of course, it would be helpful in this respect to have a fuller survey of the likely original height, format, and total length of ancient Egyptian literary scrolls.

For now, it is just useful to notice these initial distinctions in material format between ancient Egyptian scrolls bearing what we might now term "literary" texts and these larger scrolls bearing texts meant for mortuary or administrative purposes. Of course, as recent discussions have emphasized, we must be aware of the risks of anachronism in applying contemporary loaded terms like "literary" to ancient textual corpora.[8] Nevertheless, it appears that ancient writers themselves distinguished between formats for working scrolls bearing texts meant for ongoing reading, what I am terming "literary" texts, and formats used for texts intended for eternal deposit, administrative records, and other purposes, such as situational communication or legal records. This distinction in the materiality of what I am here terming "literary" scrolls connects to their intended use as part of an ongoing process of human reading. Put another way, what I am defining as "literary" texts here are trans-temporal textual complexes intended for human use (unlike other non-literary texts for human use meant to facilitate or witness to specific human interactions).[9]

This distinction, then, leads to the question of what sort of media-bearing artifacts these literary scrolls were. Earlier Egyptological

[8] See Burkard and Thissen 2015, 16–39, for a useful overview of reflections on applying the category of "literature" to Egyptian materials.

[9] I will not enter further here into questions of what sort of performance or memorization might be involved in such reading. For an earlier discussion, see Carr 2005. For an excellent recent discussion of issues of performance and reception of Middle Kingdom literature, see Parkinson 2011. Though this essay focuses on the material dimension of inscribed iterations of such texts, one might also consider (in another context) ways in which their size may have been shaped by constraints related to such oral performance and/or reception.

scholarship once concluded from the recycled quality of many such literary scrolls, especially those containing diverse selections of Egyptian literature (the "miscellanies"), that these recycled scrolls must be student exercises of low value. More recent work by Fredrik Hagen (2006), Chloé Ragazzoli (2019), and others, however, has noted numerous signs that most such literary scrolls, though often on reused materials, were created by skilled scribes and were highly valued. The scroll material, whether new or reused, was often of good quality; whatever markings were in the margins were often made by the scribe himself—not by a teacher—as he practiced difficult signs; and there are other signs that the *scriptor* was skilled at his craft and knew the texts well. If he was a student, he was an advanced student (this latter scenario would match that now posited for many Dead Sea Scrolls—namely, advanced student work).[10]

When we look more carefully at the nature of texts inscribed on these scrolls, it becomes ever more evident how misleading our assumptions from our present media context actually are. Yes, there certainly are instances of the apparent use of a single scroll artifact to bear a single written composition. Nevertheless, especially in the New Kingdom period (which is the best-documented period from ancient Egypt), we see a number of scrolls, especially the "miscellanies," that contain parts or all of multiple prior compositions. As shown in a particularly illuminating study by Chloé Ragazzoli (2019), the variants seen in these miscellanies show that many such texts appear to have been copied from memory, with only a minority explainable by the sorts of dynamics that typically characterize visual copying.[11] Even in earlier periods, we have multiple instances of scrolls being used to inscribe multiple works. The scroll thus served as a written performance, by a skilled scribe, of *part* of the

[10] Hagen 2006; Ragazzoli 2019, 49–50. For the Dead Sea Scrolls, see Popović 2023.

[11] Ragazzoli 2019, 68–69, 77, 294–300, building on a preceding wealth of scholarship in Egyptology on writing-supported memorization of texts. I survey some of that literature in Carr 2005, 71–75. For my proposal of "memory variant" as a term to designate such shifts (as opposed to some other proposals of "lexical variant," "semantic variant" and the like), see Carr 2011 (proposed examples on 41, 51–55, 58–65, 92, 100–1, 438).

literary repertoire that the scribe had internalized and thus mastered. Indeed, the partial nature of the literary excerpts often included suggests to Ragazzoli that such scrolls (and literary ostraca as well) were partial performances of a much larger corpus of literary texts that existed—as a whole—exclusively in memorized form in the minds of the skilled scribal class (2019, 274). A scroll containing one or more parts of this larger memorized corpus served some kind of subsidiary role in preserving that internalized corpus and/or demonstrating that scribe's or advanced student's mastery of it.

This is an initial indicator of the need to rethink the nature of a verbal "work" in relation to ancient written media. Whereas it is natural to think in contemporary contexts of a general one-to-one relation of a larger textual work, a "book," to a written media object, a book "copy," the pre-Hellenistic Egyptian evidence suggests a need to adjust our conceptuality and terminology to an environment in which a verbal work, such as the Teaching of Amenemhat, is often not "copied" per se but "iterated" in parts in written form in diverse ways. The term "iterated" should not be understood here as necessarily implying oral performance (though this was one common form of iteration). Within the context of this essay, "iteration" refers to the externalization of a given verbal work (teaching, tale, song) on written media, often from memory (at least for certain genres), whether initially on a separate scroll or alongside other works in partial (e.g., New Kingdom miscellanies) or complete form.

Egyptian evidence also provides particularly rich documentation of a phenomenon that I term "revision through extension."[12] For example, the scribe who produced Chester Beatty 4 seems to have added texts over time as they were available, perhaps because he did not have continuous access to these texts in a nearby archive (Ragazzoli 2019, 98). Notably in this and other cases of revision of an existing scroll, the scribe added new material at the end of the scroll, as needed, turning the scroll over and inscribing its verso progressively. This phenomenon of creating opisthographs is particularly characteristic of scroll cultures, like that in Egypt, that primarily used papyrus, since the verso side was still

[12] This is an adaptation of the apt phrase "revision through introduction" coined by Sara Milstein and explored in Milstein 2016.

quite inscribable. An existing literary papyrus scroll could be relatively easily extended through adding to its "end" by using any uninscribed portions of the recto and continuing on the verso. Such inscription on the verso was difficult, though not impossible, for ancient processed leather scrolls, which were typically inscribed on the formerly hairy side of the skin, while the flesh side was rarely inscribed.[13] Notably, it does not seem to have been common to extend such scrolls with additions of new textual material by gluing extra sheets onto them. Although this is rarely documented (e.g., Sallier 1), it appears that scribes generally did their gluing only in the production of an initial scroll in order to have enough writing material to complete a copy of a pre-existing text (e.g., Ahiqar).[14] Indeed, in one case a scribe seems to have run out of room on the scroll that he had started his copy of The Eloquent Peasant on (Berlin 3023, 4 m in length and around 16 cm in height), but rather than extending it he appropriated another separate scroll (Berlin 3025, 8+ m in length and 14 cm in height) to complete the copy.[15]

Though I have highlighted the material distinction between Egyptian literary scrolls and non-literary ones, I conclude this brief discussion of the ancient Egyptian evidence by noting that such literary scrolls were produced and used by scribes who produced other sorts of scrolls on a regular basis. We already see an initial indicator of this phenomenon in the way literary scrolls often were inscribed on reused papyrus from erased administrative records. Though of different size, both scroll types were longer and usually inscribed initially on the recto side, parallel to the papyrus fibers. Apparently, the scribes producing literary scrolls often had such administrative scrolls at hand, could appropriate them, cut them in half, and erase them so that they could be reinscribed with

[13] Opisthographs at Qumran are disproportionately on papyrus (compared to the overall distribution of papyrus scrolls in the corpus), but a few are on skins. For a useful overview and analysis, see Perrot 2020.

[14] For discussion of P. Sallier 1, see Ragazzoli 2019, 51, and see 52 of the same book for discussion of P. Sallier 4 as an interesting example of the ongoing use of a scroll for diverse inscriptions.

[15] For a detailed account of the process, see Parkinson 2009, 86–88.

literary texts. Moreover, the literary texts thus inscribed could themselves bear a relation to non-literary genres.

This phenomenon is illustrated, for example, in how the diverse texts collected in New Kingdom miscellanies are together framed in standard epistolary forms.[16] The writing of letters was a common part of the daily work of many ancient scribes, and the epistolary form embedded in such texts provided a means to illustrate mastery of that form or even a means to learn it. An epistolary form within the frame of the text served to provide it a kind of built-in situation in life or (German *Sitz im Leben*). Here, it is important to recognize an important difference between a valued text transmitted exclusively in oral form and a text that is transmitted, at least in part, in written form. An oral text requires embedding in a recognized institution (e.g., temple) and/or chain of authority, and an anonymous written text depends on similar connections. We see this set of social relationships built into many ancient literary texts, where they are framed as addresses by recognized figures, letters, and the like. These frames to miscellanies, wisdom teachings, etc. are what I call a "portable *Sitz im Leben*" for written media, since they are a way that ancient writers inserted a recognized social situation into a given written text. That built-in *Sitz im Leben* then could combine with aesthetic elements of the material (scroll) object itself (quality of material, script, margins) to make a claim on its potential readers, influencing them to imagine themselves in a social situation (often an originally oral situation) depicted in or recreated by the text.[17]

In these and other ways, the production and use of literary book rolls in ancient Egypt was embedded in a broader world of scribal textuality in the same language. The integration of such literary scroll production in this broader scribal environment meant that these different areas of textual production could be related to and mutually influence one another.

[16] See Ragazzoli 2019, esp. 104–10, 204, 215, for discussion of the letter form and the interaction of scribal social context and epistolary textual frames.

[17] Here I draw on a proposal of this concept in Carr 2022, 136–42.

Levantine Alphabetic Literary Scrolls—Evidence from Persian-Period Egypt and Earlier

When we turn our attention to pre-Hellenistic alphabetic scrolls from the Levant, the evidence is far less well preserved than in ancient Egypt. Though papyrus marks on bullae from Iron Age Jerusalem show that papyrus scrolls were used there, these and other scrolls from the Iron Age Levant are lost thanks to the generally damper climate of that area. We have no actual literary scrolls preserved, and there is only one Iron Age non-literary scroll preserved, a seventh-century papyrus palimpsest among the Murabbaʿat finds, with a list of names written over an erased copy of an earlier letter. Meanwhile, the dry climate of Egypt means that we do have a very few examples of alphabetic scrolls from that region, more specifically from the island of Elephantine. As in the case of the older Egyptian scrolls, these writers, whether Aramean or Judean, were producing literary scrolls in what I will describe as an "integrated" context, meaning by this a scribal environment where multiple forms of scroll production were, to a greater extent, integrated with the production of texts in the same language for administrative and legal purposes in a variety of settings, whether temple, governmental, or other.[18] Where the above-discussed ancient Egyptian scrolls were embedded in an Egyptian scribal context producing other genres of scrolls in Egyptian, so also these Aramaic literary scrolls were produced in a broader scribal context, this one oriented toward the Imperial Aramaic dialect of the Persian Empire. We do not have many literary scrolls from this broader context, but the ones that we do have are strategically important as comparison points for some later discussions. So I pause here to describe them in turn.

The first scroll considered here, Berlin P. 13446 along with a plate in the Cairo museum (EM JdE 43502), provides multiple illustrations of a phenomenon well documented in earlier Egyptian scrolls, the acquisition of materials for literary scrolls through erasing and reusing administrative records, a process perhaps encouraged by the fact that such administrative records tended to be on longer scrolls and were usually

[18] See Moore 2022a, 257–59, for careful arguments that the Berlin P. 13446 iteration of Ahiqar may reflect a Judean recension of the composition.

inscribed—like most literary scrolls—parallel to the papyrus fibers (Moore 2022b, 18–19). Across its recto, this relatively long (originally 6–7 m; Moore 2017, 175) and high (originally ~32 cm) scroll features a high-quality version of the Aramaic *Instruction of Ahiqar*. Notably, this copy, initially started through the erasure and reuse of a customs account scroll, was completed through the affixing of two sheets from a reused manuscript that previously had an earlier copy of Ahiqar on its verso (done in the same hand as the later copy) and a (different) customs account on its recto. So this artifact counts, in this respect, as two exemplars of the *Instruction of Ahiqar* produced by the same scribe. The earlier case features the inscription of Ahiqar in a perpendicular direction vis-à-vis the fibers on the verso of a scroll that bore a customs tax account, the scribe perhaps influenced here by his practice in writing contracts and letters transversa charta. The second case was a copy of this earlier version, likely created when the older one wore out. As James Moore suggests, the data suggests that the scribe initially started the new copy on an erased and reused customs account, copying most of Ahiqar from the older version. When he ran out of room on this initial roll, the scribe finished the new version by adding two sheets from the earlier one, erasing the contents of those sheets, and reusing them, since he had already used that part of the older Ahiqar roll to create the first part of the new copy. Moreover, this second copy of the *Instruction of Ahiqar* may also show influence from other kinds of scroll production, since its beautiful, large script and generous margins are held in common with deeds and contracts likewise written in large script and large margins, elements that may have marked all of these texts—both legal and literary—as "presentation quality" documents, thereby making an extra claim on their potential readers.[19] The final product is evidence of an ongoing process of copying and recopying literary materials on reused administrative materials, a process that, in this case, seems to have been done in the same hand, the two versions

[19] The term "presentation quality" documents and this paragraph's entire discussion are indebted to the discussion of this scroll in Moore 2017, 243–47.

likely having been written down within a few years of each other, within the career of a one scribe.[20]

The other major example of a Persian-period scroll bearing an Aramaic literary text is Berlin P. 13447, a scroll of approximately 3 meters in length and almost 30 centimeters in height that bears a copy of the Aramaic text of the Darius Inscription across the recto and two columns of the verso of a high-quality pristine roll of papyrus.[21] Where the Berlin P. 13446 versions of the *Instruction of Ahiqar* were inscribed on reused administrative records, Berlin P. 13447 illustrates a reverse direction of interaction of scroll media. In this case, the literary text seems to have been inscribed on an unused papyrus roll before the unused portions of the roll were used to record administrative records. Thus, within this Persian-period Aramaic environment, we may not just have scribal reuse of administrative records to produce literary scrolls, but Berlin Papyrus 13447 illustrates use of uninscribed parts of a literary scroll to record administrative records (Moore 2022b, 18–19).

Either way, both the Berlin P. 13446 copy of Ahiqar and the Berlin P. 13447 copy of the Darius Inscription are written on relatively large scrolls, both nearly 30 centimeters in height and several meters in length, and both scrolls have features that characterize high-quality literary (and other genre) scrolls in other ancient contexts: high-quality script, generous spacing, and good-size margins. Though we lack enough

[20] Porten and Yardeni 1993 (hereafter TAD 3), 23, on the same hand for both exemplars of Ahiqar. This example of two high-quality copies done within the career of a single individual shows that, on occasion, scrolls could be replaced within a few years. To be sure, there are well-grounded estimates that some scrolls could be usable much longer, though it is unclear how big a proportion. Ryholt 2019, 399, suggests that a century was the maximum average lifespan for a papyrus scroll, while Popović 2012, 562–64, surveys work in classics that suggests that some manuscripts had a "useful life" of 100 to 300 years, though the majority had far less. See also Houston 2009, 249–51, on some examples of literary manuscripts lasting multiple centuries, with a "significant minority" lasting a 100 years.

[21] As noted in Ragazzoli, 2019, 49–50, royal decrees were the main other Egyptian text type, besides mortuary texts, to be regularly written on unused papyrus rolls. In this respect, Berlin P. 13447 seems to reflect a similar practice in a Persian-period Aramaic context.

evidence to establish a broader typology of Aramaic literary scrolls, it is plausible to hypothesize that these two papyri represented relatively valuable written artifacts. Their visual appearance seems crafted to convey a certain prestige attached to the Aramaic literary traditions that they display.[22]

As noted above, unfortunately no other early Levantine literary scrolls have been preserved. Nevertheless, we have a set of inscriptions, the Deir ʿAlla plaster texts, that may provide indirect insight into both the format of earlier Levantine literary scrolls and their prestige. To be sure, these are wall inscriptions, not scrolls, and they originate from a time (ninth or possibly eighth century BCE) and place (the Transjordan) quite distant from the Persian-period Aramaic scrolls from Elephantine discussed above. Nevertheless, the Deir ʿAlla wall inscriptions contain a mix of literary texts—including a report of a divine vision (by Balaam son of Beor) and apparent wisdom-related maxims—written in a column format resembling that of their Aramaic literary scroll counterparts. They even roughly correspond to those later Aramaic materials in overall line length (~30 cm) and column height (~30 cm likely for combination A and possibly combination B).[23] Moreover, they are written in a highly professional Aramaic script in a Levantine dialect that shares numerous isoglosses with older Aramaic (Blum 2015, 24–25). These resemblances between our only three possible exemplars of pre-Hellenistic alphabetic literary scrolls are tantalizingly suggestive, even if inconclusive. For now, it can be said that these Deir ʿAlla plaster inscriptions on the one hand and the Elephantine Ahiqar and Darius-Memoranda scrolls on the other *may* be chronologically and geographically distant attestations of a broader tradition of Aramaic and Aramaic-adjacent literary scribal traditions.

[22] Another possible indicator of the prestige of the scroll that was inscribed with the Darius text is that, though the copy may have been damaged, it was not erased when memoranda were added to the scroll. Instead, the scribe just used uninscribed portions. On this issue, see the important forthcoming comprehensive discussion of the *Memoranda*, Moore 2024.

[23] Millard 1978, 24–25; Lemaire 1991, 43.

Be that as it may, one final thing to emphasize is how the scribal practices in the Elephantine and Deir ʿAlla literary scrolls both feature connections to Egyptian practices surrounding literary scrolls. All of these literary traditions adapt the multi-column structure of Egyptian literary rolls. All are written with the rush pen used in ancient Egypt. And the Deir ʿAlla texts even share with older Egyptian literary rolls the use of red tint ink for writing paratextual markings (Quack 2005, 249–50).[24] These indicators are consistent with evidence that Egyptian scribal practices played an important early role in the overall development of Levantine literacy, from the development of the early Semitic alphabet to the evident use of papyrus for Iron Age Judean documents (including the Iron age papyrus palimpsest found at Murabbaʿat), the use of Egyptian red tint in early Judean inscriptions (e.g., Kuntillet ʿAjrud), the borrowing of Egyptian words for key implements of writing, and the adoption of the Egyptian hieratic numbering system.[25] These disparate data from the Iron Age Transjordan, non-literary epigraphs from Judah and Israel, and Aramaic scrolls from Levantine writers at Elephantine all point to Egypt as the common reference point for Levantine scribality up through the Persian period.

Finally, in Amherst Papyrus 63 we see a distinctly different but also interesting interaction of Egyptian scribal practices and Aramaic textuality. This 3.5 meter fourth-century scroll renders a collection of Aramaic texts with Demotic script, roughly following formatting conventions of Demotic literary scrolls.[26] At the same time, its writing blocks are more irregular than contemporary book rolls containing Demotic literary texts, with lines written at a slant and little in the way of regular intercolumn or other margins. In this respect, as suggested by Joseph Cross in an unpublished paper, the scroll may be more like

[24] . For more possible pointers to Egyptian influence, see Lemaire 1986, 89; Weippert 1991, 176–77.

[25] All these elements likely through a Phoenician conduit. For work on reflections of Egyptian scribal practices and technology in the Hebrew language, see Zhakevich 2020, 160–68; Quack 2022, 84–88.

[26] For a useful discussion of the scroll and theories regarding its dating and background, see Holm 2022.

an informal collection, in the relatively phonetically rich Demotic sign system, of a selection of Aramaic texts penned by a scribe working out of an Egyptian primary system.[27] Whether written by an Egyptian or a (Demotically trained) Aramean, this scroll is a useful testimony to how textual and scroll traditions, from different culture areas which are often treated separately, could be more porous to each other than is easily comprehended through the specialized training our disciplines typically provide. Also, insofar as the prose tale of two brothers at its conclusion is the best candidate to be a later addition to the collection, Amherst Papyrus 63 provides additional potential evidence of the phenomenon of "revision by extension" that I discussed above vis-à-vis diverse Egyptian materials.

Early Greek Literary Scrolls

I now take a brief look at early Greek language literary scrolls, all of which date from the Greco-Roman period. For reasons of space, I confine myself to a few aspects of Greek scroll practices that are particularly relevant to study of scroll practices among Greco-Roman period Egyptian and Judean writers. The farther one moves into the Hellenistic and Roman periods, the more one sees the influence of Greek script and writing practices on their local scroll production. Greek became an increasingly dominant language of administration, while education in Greek literary texts became important for elites and mid-level officials functioning in this environment, especially in government contexts. Thus, Greek literary texts, like the older Egyptian and Aramaic texts discussed already, were created in what I've been describing as an integrated scribal environment. The broader dispersion of Greek scroll textuality meant that Greek writing practices had an impact beyond the Greek environment per se, also influencing the production of non-Greek literary scrolls in contemporary contexts.

[27] This idea is presented preliminarily in Cross, "Corpus" (Forthcoming), with a fuller argument provided in a paper by the same author, "Envisioning a Compiler at Work: Scribal Features of Papyrus Amherst 63" that was presented orally at the 2018 Annual Meeting of the Society of Biblical Literature and is currently being prepared for publication.

This influence, however, did not just go one way. Many Greek scrolls, after all, are written on Egyptian papyrus, and they adopt the column format found in Middle Kingdom and later Egyptian and Levantine literary scrolls. At the same time, Greek literary scrolls adapt that format in at least two striking ways. The columns generally are much narrower than their Egyptian and Aramaic counterparts, usually less than 13 centimeters for verse texts and less than 10 centimeters for prose texts (with letter space counts less than 20). In addition, there is a widespread tendency for Greek columns to be written at a forward slant, so that the right-written column leans in the direction of writing, with the lower lines written slightly to the left of the upper lines.[28]

In addition, Greek writers wrote these scrolls in a script that was more rectilinear than earlier Levantine scripts with a narrower pen than those used for earlier Egyptian and Levantine scrolls. As Drew Longacre notes in an important article in comparative manuscript studies, the rectilinear script of Greek epigraphs may have influenced Judean formal scripts. Moreover, it seems as if either the Greek calamus pen or certain modes of using it contributed to a tendency toward denser, smaller writing, not only in Greek scrolls, but in indigenous-language scrolls from the Greco-Roman period as well.[29]

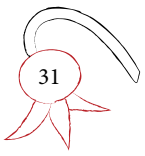
Meanwhile, Greek materials provide an important example of the limits and possibilities of transmitting large literary works on scroll media. This is a particular challenge in the Greek tradition because of the prominence within it of the Homeric epics, which were foundational in Greek educational and intellectual systems (Carr 2005,

[28] This data comes from that gathered in Johnson 2004, esp. 91–109, 153–55.

[29] Longacre 2021a, 12–24. As noted in personal conversations with James Moore and Joachim Quack, it is unclear the extent to which the shift in size that Drew Longacre discusses can be attributed to a shift in writing implement. In work underway now, Moore finds indicators of earlier use of a reed pen by scribes at Elephantine. Joachim Quack notes in a personal communication that a shift toward smaller writing occurs already in the Saite period in Egyptian texts. In a recent discussion of the writing implement shift, Quack argues that his preliminary judgment is that the shift toward the reed pen in Egyptian materials (including use of a thicker reed pen than is used with Greek materials) started already around the end of the second century BCE. See Quack 2015, 444–45.

100–1). These epics achieved a vast size amid largely oral transmission that far exceeded the carrying capacity of any normal literary scroll of the ancient world. It is not clear exactly when and how parts of the epics began to be inscribed, but it is virtually certain that no single scroll could or did contain the whole of either Homeric epic.[30] Instead, the existing evidence, partial to be sure, suggests that the diverse portions of that tradition were inscribed on scrolls of varying modest lengths until later in the Hellenistic period, when the 24-book system for dividing up the epics was applied to the Iliad and (by analogy) the Odyssey, with each "book," or sometimes a small combination of books, inscribed on a modest-length scroll (Van Sickle 1980, 7–12).

In this respect, the early writing of the Homeric epic tradition somewhat resembles a new and distinct illustration of the complex interchange of memory and inscribed artifact that Ragazzoli (2019) posits for the miscellanies especially prominent in the New Kingdom period. In both cases, the written media of scrolls were used to inscribe selective portions of literary traditions that were transmitted in large part by means of memory. On the one hand, one had a larger literary complex in the minds and mouths of the tradents—whether Homeric epic or classical Egyptian traditions. On the other hand, these tradents



[30] Biblical scholars may have been misled by a brief comment that a full Homeric manuscript is known in Driver 1948, 84. Thanks to a personal communication from Konrad Schmid, I received the following genealogy of this claim from the late Oxford classicist Peter Parsons, who traces this kind of claim to Birt 1882, who believed that the works of Greek authors were not originally divided into books and, therefore, at the earliest stage each work (say, the *History* of Thucydides) were copied complete on a single roll of enormous length. Parsons notes that "to support this he [Birt] cites (445) two literary references: Ulpian at Digest 32.52 mentions a roll containing the whole of Homer (perhaps just a hypothetical case); then in the fifth century AD the historian Malchus mentions a dragon skin 120 feet long on which both Homeric poems were written in gold." An examination of both references indicates that they are to mythical scrolls, and Parsons notes with regard to Birt that "nobody these days believes him: such huge rolls would have been impossibly cumbrous, and in the papyri that actually survive it's rare to find even two books of Homer on the same roll." I am very grateful to Konrad Schmid and Peter Parsons for providing this information.

produced scroll artifacts bearing selective parts of that broader tradition, artifacts representing hand-written performances of those subparts of the tradition.

Overall, William Johnson's foundational 2004 study of Greek book rolls, many of which contained parts or all of large literary works, suggests that most such scrolls did not exceed 15 meters in length, with rolls larger than that being excessively awkward and relatively rare. As in the case of the Homeric epic (and perhaps following the precedent established by that important example), writers could, and often did, avoid such awkwardness by using multiple scrolls to inscribe a given textual unit. There is even an example of a composition where the same work (Philodemus's *On Poems*) is copied over one long 12.3 to 14.8 meter scroll (PHerc 1425), while copied in a different, less dense, format across two scrolls totaling 16–18 meters, of which PHerc 1538 is the first part (Johnson 2004, 146–49). There are also multiple references within Greek literature of authors intentionally composing works meant to be transmitted in multiple scrolls, including the Jewish author, Josephus, who says that he composed *Against Apion* in two volumes because his first volume had reached an appropriate size (Ag. Ap. 1.322).

Johnson (2004, 148–49) notes that many of the large and unwieldy scrolls that exceed the normal "upper limit" of 15 meters for literary scrolls share high-quality script, larger script, and generous formatting that mark them as luxury scrolls, which are meant more for display than for regular reading. There is, for example, an unusually handsome, generously proportioned scroll from Oxyrhynchus containing four books of the Iliad in unusually fine script across 19 meters. And several other unusually large examples of early Greek scrolls are copies of parts of Herodotus or Thucydides, again marked as luxury copies by their extra-fine scripts, a mark of the extra expense put out to create them.[31]

[31] Van Sickle 1980, 7, notes the existence of early scrolls with luxurious formats, such as a scroll of the Iliad that features only 10 lines per column, but he nevertheless notes that even this format would still accommodate a 1,000-line book in 6.3 meters. Notably the late-fourth-century Derveni Papyrus is much more densely inscribed, with an estimated 30 lines per column, with lines averaging well over 35 letters a piece (based on column XXII, working from the publication of the

The extra prominence of luxury copies *among the largest scrolls* in the Greek materials provides a possible interesting perspective on unusually large literary scrolls found in other contexts. Johnson proposes that these luxury copies, relatively unwieldy as they are, served a display purpose analogous to contemporary coffee table books, which are meant more for display and brief consultation in living rooms than for any ongoing reading. So also, he notes the unusually large size of highly decorated and carefully treated synagogue Torah scrolls, which symbolize a valued tradition in how they are cared for and carried, but which are read only highly selectively in liturgical and ritual contexts. Their unusually large size is needed for them to bear the entire Torah tradition that they represent, and their grand size may even provide a material token of that tradition's extraordinary character.

Demotic Literary Scrolls from the Greco-Roman Period

The Demotic evidence provides an important initial illustration of the important shifts in production of literary scrolls that occurred as such non-Greek traditions were transmitted increasingly exclusively in temple and temple-adjacent contexts in cultural environments where government and non-temple business was conducted in Aramaic (especially in the Persian period) and Greek (especially into the Roman period).[32] The shift was particularly marked in the Egyptian instance because the Persian period represents somewhat of an interruption in the production of Egyptian literary scrolls up to that point, scrolls generally inscribed with hieratic script. Perhaps because of Cambyses's closing of temple scribal workshops in 525 BCE in the wake of a revolt and subsequent Persian suppression of native Egyptian temple-based

papyrus in Kouremenos et al. 2006, 8). Overall, the question of text density for early Greek scrolls is less clear than in other areas surveyed here, with a paucity of pre-Hellenistic evidence (for literary scrolls) and some of the best existing scholarship (e.g., Van Sickle 1980) using figures of line count rather than letter space to calculate relative lengths of literary works.

[32] On the disappearance of Demotic contracts in the Roman period, see Muhs 2005, 93. For an overview of the ups and downs of the administrative use of Demotic, see also the overview in Moje 2019.

traditions, the Persian period represents a break in the production of native-language Egyptian literary texts, though administrative texts continue to be produced in the Demotic scripts used previously for such texts (Hoffmann 2009, 368). When Egyptian production of literary texts fully resumes during the Ptolemaic period (or latter part of the Persian period) on the other side of this break, they were written in the Demotic script and Egyptian dialect, and there were other marked changes as well.[33]

To start, the complex of Egyptian literary traditions shifted. Where earlier Egyptian literature featured a mix of structured wisdom instructions and narratives, stylized letters, and other genres, Greco-Roman period Demotic literature was dominated by more loosely structured collections of wisdom maxims (e.g. Khasheshonqi [often known as Ankhsheshonq(y)]and Papyrus Insinger) and narrative complexes (Petese, Inaros, Setne) along with some large-scale religio-theological texts (Book of Thoth, Myth of the Sun's Eye) whose overall size well surpasses those of pre–Persian-period classical Egyptian compositions.[34] In important ways, these Demotic materials have a more (Story of Petese) or less (Inaros Cycle) loose, agglutinative quality, marking their status as collections of diverse materials featuring a similar character set within a broader narrative frame.[35] Moreover, and this is important for later consideration of contemporary Jewish traditions, these large Demotic compositions are often inscribed *as wholes* on sometimes extremely large scrolls (e.g., the Myth of the Sun's Eye on a 22–25 m scroll, a version of the Story of Petese running to around 20 m, and the Inaros Cycle with 46 densely written columns).[36] Indeed, these overall

[33] For a summary of problems with dating Demotic compositions by the date of their manuscripts, see Quack 2016, 24–27, and the overview of dating indicators in Hoffmann 2009. In addition, see Jay 2015 for arguments for a pre-Ptolemaic substrate to the Demotic Petition of Petese.

[34] Note also that the Book of the Temple, though originally hieratic, was translated into Demotic and transmitted on large scrolls. See Quack 2016, 268.

[35] For discussion of the genre of story collection in Demotic materials, see Holm 2013.

[36] The latter text is not yet published, but Kim Ryholt (2018, 168) provides a survey of the longest Demotic scrolls.

length measures may only partially encompass how much larger these Demotic complexes are than their pre-Hellenistic counterparts, since these scrolls often feature more lines per column (and possibly denser writing) than earlier Egyptian literary scrolls. Figure 1 provides images of the Berlin P. 3022 copy of Sinuhe and a similarly scaled image of column VII of the Leiden P. 384 copy of the Myth of the Sun's Eye. A very limited probe done with Joseph Cross suggests that the 32 lines of minutely written script in the Leiden P. 384 column typically contain about four times as many quadrats per centimeter as the more broadly written 12 lines per column of Berlin P. 3022.[37]

This Hellenistic period move toward the collection and copying of massive narrative complexes on single scrolls is new compared to pre-Persian Egyptian scribalism, where literary scroll compositions were of more modest length and often copied in only excerpt form. In those cases, Egyptian literary texts, albeit often in older dialects of Egyptian, were being memorized and transmitted in integrated scribal systems in both temple and non-temple contexts where a form of Egyptian was still being spoken and used for non-literary, non-temple written transactions. The greater level of interface between the Egyptian of the literary tradition and that of the production of scroll iterations of that tradition

[37] The method for calculating sign-space per centimeter is discussed and illustrated for Qumran materials below. Nevertheless, it can be noted here that this initial probe involved calculating an average number of quadrats per line across two lines of a given column of each manuscript, multiplying that average by the lines per column, and dividing the resulting estimated number of quadrats in the writing block by the width of that block plus associated intercolumn margin. Meanwhile, Ryholt 2018, 168, n. 50 notes that the extraordinarily dense writing of the Carlsberg P. 164 version of the Inaros Cycle (unpublished at the time of this writing) is so minutely written that it contains more text than the (already densely written) 124-column Leiden 384 version of the Myth of the Sun's Eye. Together, these figures would suggest that Carlsberg P. 164 thus would contain upwards of eight times or more textual information per centimeter of scroll length than Berlin P. 3022. Furthermore, a personal communication from Joachim Quack notes that the contrast in phonetic information per centimeter might be yet more pronounced if one took into account the fact that Greco-Roman Egyptian writing typically has more signs per square, but this area needs more research.

Figure 1: Berlin P. 3022 Sinuhe (14 cm column height, 12 lines) compared to Leiden P. 384 Myth of the Sun's Eye (20.5 column height, 32 lines)

Photo and permission of Berlin P. 3022 (Photo 14.P3022 F(2) Sinuhe) provided by the Staatliche Museen zu Berlin—Ägyptisches Museum und Papyrussammlung. Photo and permission for Leiden P. 384 provided by the National Museum of Antiquities, Leiden.

can be seen in the substantial attestation of elementary school exercise copies of that tradition on ostraca. As Joachim Quack observes, we see fewer such exercises, now in Demotic, during the Greco-Roman period (2016, 14–15).

This is just one of several reflections that Demotic literature was now being transmitted in more limited contexts of learned priests in Egyptian temples. As we move into the Greco-Roman period, finds at Tebtunis, Tanis, and elsewhere testify to the way many such temples featured texts in both Greek and Demotic. This suggests the likelihood of a sustained and complex interaction between the above-discussed Greek writing practices and the production of Demotic administrative and literary texts.[38] This coexistence and complex relationality militates

[38] For a nuanced survey of diverse find spots, most associated in some way with temples, see Ryholt 2019, especially (for evidence of Demotic and Greek mixed scribal environments) 400, 419–421 and (on association of the preserved literary

against an idea of a defensive Egyptian-language scribalism (Tait 2014, 328–29). Nevertheless, across the latter part of the first millennium BCE and especially toward the Roman period, Demotic literary scribalism took place in a narrower (temple) context and was less integrated with non-temple society and elite textual practices. By the first and second centuries CE, from which most copies of Demotic texts date, temple-associated libraries of Demotic texts reflect a literary and religious textual corpus produced in a preservationist environment by an elite group of textual professionals.

This environment sees the collection and inscription of some large, loosely organized and agglutinative, textual traditions like the Inaros Cycle and Petese Story Collection or large wisdom complexes like Khasheshonqi or the Great Wisdom Book (preserved on P. Insinger). Similar, yet distinct, from the case of written iteration of the Homeric epic tradition, these Demotic materials are complexly related to oral and oral-written practices of textual performance and transmission.[39] As suggested in work by Kim Ryholt and especially Jacqueline Jay, these materials show diverse relations to processes of memorization and performance. In some cases, such as the frame narrative for Khasheshonqi [and the Petese and Setne cycles], there are instances of documented variation that are so great that one could suppose that certain scroll versions of a composition are separate written iterations of tradition complexes as transmitted in exclusively oral and memorized form.[40]

temples with temples and their work) 457. Cf. also the more complicated case of the Ptolemeios and Apollonios archive in Ryholt 2019, 410–11, which may be a Greek-primary writing environment that reused older Demotic scroll material. On Demotic scribes working with both literary and non-literary texts, see Quack 2016, 11.

[39] See Quack 2016, 15–17, for a collection of instances where Demotic texts thematize oral and other contexts for textual transmission. Note also Cross, "Mouvance" (forthcoming).

[40] On Khasheshonqui, see Ryholt 2000, 114; Jay 2019, 257–61. For other traditions, note again Ryholt's comment at the locus cited above: "One strongly suspects that a story originally had an oral tradition and that it was committed to writing at different locations and at different times." This approach has been confirmed in further work by Jay 2016 for Story of Petese (214–16) and versions of Setne (249).

In other cases, Jay's analysis of overlapping sections of Inaros materials finds memory variants that could point to transmission of literary texts through (writing-supported) memorization (Jay 2016, 146–50). There certainly still was graphic transmission of extended texts, and there seems to have been particular care to attend to and comment on variants in religio-theological texts (Jay 2016, 236–37). Nevertheless, the increasingly published Demotic literary corpus seems a particularly productive arena for exploration of the ways different genres of literary texts could be related to ongoing transmission in a Greco-Roman-period scholarly elite developing and conserving an indigenous language textual corpus (Jay 2016, 2019).

Meanwhile, the Demotic evidence provides a useful comparison point with pre-Hellenistic Egyptian scrolls, showing how literary scroll practices seem to have developed during this Hellenistic-into-Roman context to transmit these often-large indigenous language textual complexes (Inaros Cycle, Story of Petese, Myth of the Sun's Eye, Insinger/Great Wisdom book). Certainly, longer scrolls were used sometimes in order to inscribe these large textual complexes as a whole. Nevertheless, other techniques are used to increase the carrying capacity of these scrolls. These include the occasional use of unusually tall scrolls allowing more lines per column, the placement of lines closer together, the use (especially in the Roman Period) of guidelines to allow compact formatting, the use of pagination (especially for high quality scrolls), and the use of smaller writing (Ryholt 2018, 168–72).

To trace just one of these techniques, the following chart (Chart 1) traces the proportion of height to width of pre-Hellenistic to Demotic literary scrolls.

The longer lines here indicate columns where the columns are taller than they are wide, while lines to the right that are below the '1' line represent scrolls where the columns are wider than they are high. The names of Demotic scrolls are in all capital letters to distinguish them. They dominate the thirteen spots representing scrolls with columns taller than they are wide, with the earlier Westcar Papyrus and Turin P. 1881 the main exceptions.

Demotic (and late Hieratic) rolls also were able to contain more text per centimeter because their columns often featured more lines, partly

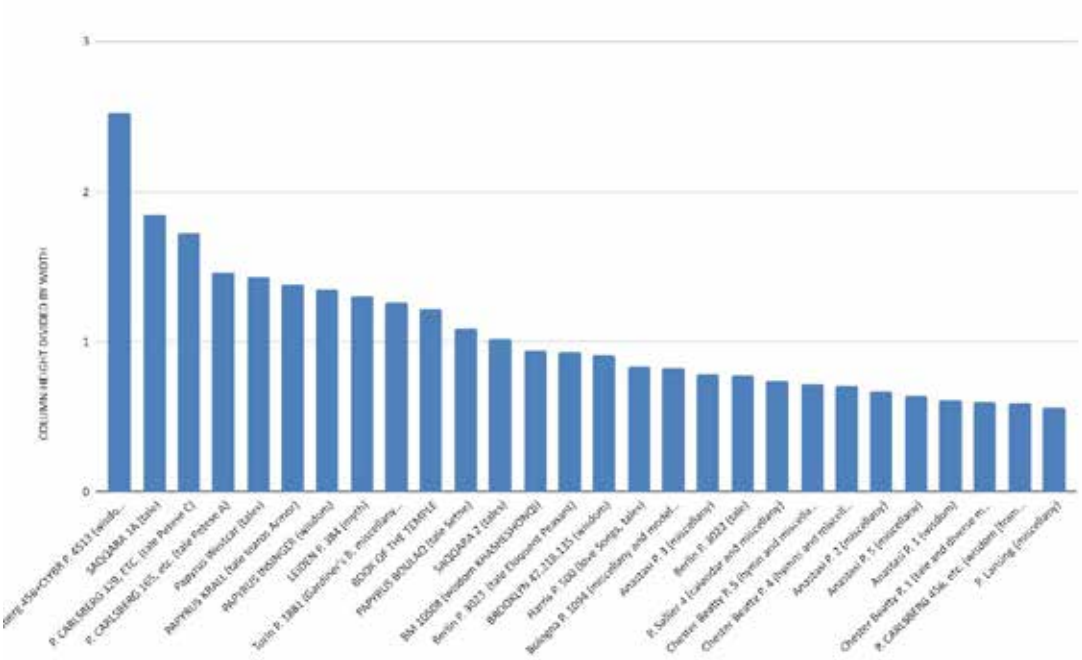


Chart 1: Column Proportions

because those columns were (often) taller and partly because the lines were placed closer together. The following chart (Chart 2) compares the line counts of columns in pre-Hellenistic and later Egyptians scrolls. Again, the ten scrolls with 20 or more lines are mostly later scrolls, again with the tall column Westcar Papyrus as an exception. These relatively tall columns with more lines allowed later Egyptian scrolls, especially the ones on the far left of each chart, to contain multiples more text per centimeter of their length than their counterparts on the right side of the chart.

We do not have as much data as would be ideal to develop a fuller comparison of later Egyptian scrolls (many still unpublished) with earlier Egyptian scrolls on this point. Nevertheless, one can start to get an idea of the difference in carrying capacity between the largest Greco-Roman period Egyptian scrolls and comparable scrolls from earlier periods by roughly estimating their 'cumulative line length'. This is a figure summarizing the cumulative total length of inscribable lines on a reconstructed scroll if one multiplies the scroll length (or reconstructed scroll length) by the number of lines per column by an inscribed ratio percentage figure (accounting some for intercolumn margin blank space) derived by dividing a typical column width by the

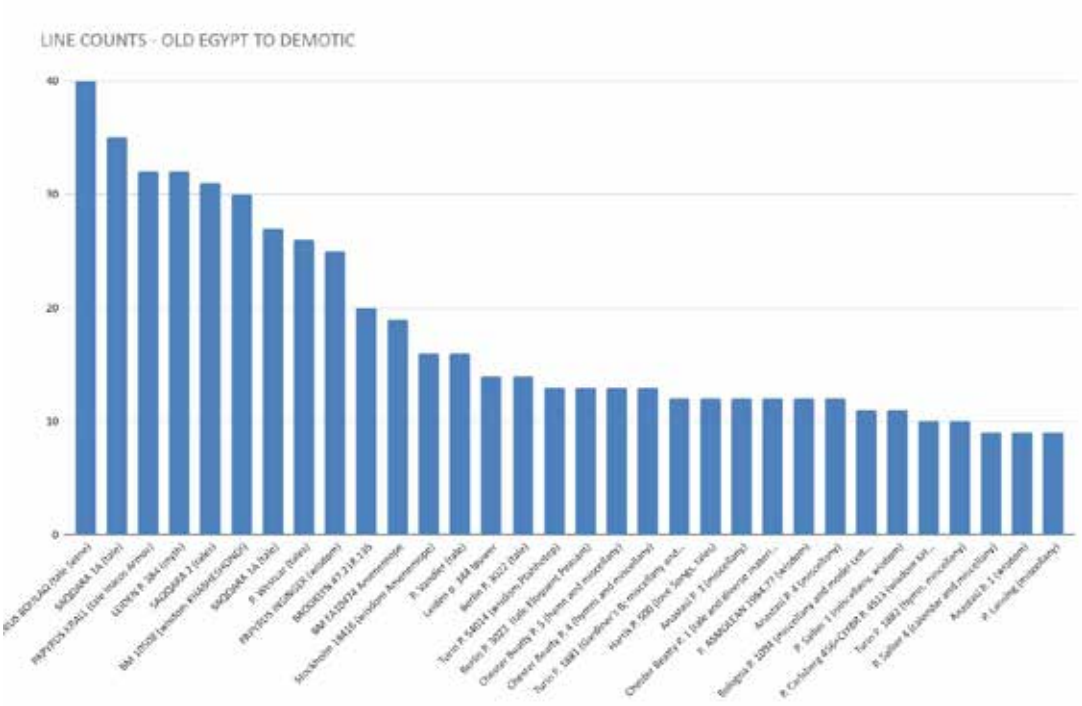


Chart 2: Line Counts Old Egyptian to Demotic

sum of that column width and an intercolumn margin. Each of these numbers often vary, and overall scroll length also can be uncertain. Nevertheless, even accounting for such uncertainties and variances, my initial estimates suggest that there is a quite significant apparent difference between estimated cumulative line length for the Leiden P. 384 copy of the Myth of the Sun's Eye (650+ meters of inscribable lines) or the Papyrus Krall copy of the Conflict over Inaraos's Armor (142 meters) and the highest such figures for pre-Hellenistic scrolls, such as 70 meters for Anastasi P. I or 65 meters for Papyrus Westcar, while the figures for most early Egyptian scrolls are in the 13-meter (Turin P. 1881) to 30-meter (Chester Beatty P. 4) range.[41]

Insofar as these figures hold up, it would suggest that later big scrolls like Leiden P. 384 or the Carlsberg P. 164 iteration of the Inaros Cycle

[41] These numbers are approximate, as they are roughly estimated from digital measures of photos from museum and other websites, and they are often scaled using the (sometimes misleading) figures reported in publications. Despite these uncertainties, the patterns are clear enough for these rough figures to serve illustrative purposes.

are not only just longer in raw number of meters than earlier scrolls (though they are that), but they are inscribed in such a way as to contain many times as much text for each meter as many of their pre-Hellenistic counterparts. This high-carrying-capacity form of scroll, of course, is not universal in the Demotic context. The above charts, for example, suggest that certain genres of Demotic texts, especially some wisdom texts, were inscribed in short-wide columns like their pre-Hellenistic counterparts, perhaps following old Egyptian models of similar-genre texts.[42] Nevertheless, the Greco-Roman period seems to be a time when scroll carrying capacity was radically expanded for at least certain kinds of Demotic texts, especially those written in new genres (e.g., the story collection). These high-carrying capacity scrolls were a substantially new sort of textual media object, one capable of serving as a platform for the development and conservation —within the preservationist Demotic scribal context—of a very different scale of literary text / literary complex than existed in earlier Egypt. And this does not yet account for possible shifts in text density in Demotic scrolls or the (occasional) transmission of Demotic materials across multiple scrolls (e.g., one iteration of the story of Petese).[43] The term "text density" is drawn from work by specialists in medieval Jewish codicology and refers to a variety of features (e.g., number of lines per page, characters per line, space between lines) that combine to determine how much text is inscribed within a given spatial area of writing media (codices or, in this case, scrolls). I will return later to questions of developments in text density in discussion of early Jewish scrolls.[44]

These figures are quite preliminary, but they point to possible fruitful directions for further research, both expanding the dataset with

[42] For more on the formatting of Demotic texts in relation to these earlier squat column formats and yet earlier tall ones, see Quack 2016, 10.

[43] For multi-scroll versions of the Story of Petese, see Ryholt 2005, 8. Furthermore, an oral report from Joachim Quack suggests that one exemplar of the Book of the Temple (a hieratic one) may have been inscribed across three scrolls, partly because this scroll was written in an unusually large hand on an unusually short/narrow scroll.

[44] Olszowy-Schlanger 2013; 2016, 93–94; 2019, 67–96; Del Barco 2020, 103.

firmer figures and clarifying the function and background of such high-carrying-capacity scrolls. In particular, it remains unclear the extent to which Greek writing practices, for example the use of tall-column, densely written scrolls often in multi-scroll formats, may have played some role in prompting similar strategies among Greco-Roman-period Egyptian scribes working in Demotic (and Hieratic).[45]

Indeed, it should be emphasized that much work overall remains to be done in building the foundation for further work on Demotic literary scrolls through publishing more of them and making scale photos of them publicly available. This will provide more data with which it will be possible to survey broader shifts in format and text density, shifts that initially seem apparent when comparing available Demotic materials with pre-Hellenistic Egyptian literary scrolls. More publication of Demotic literary scrolls may also make it possible to develop a typology of such scrolls. It might be possible, for example, to identify characteristics of prestige display copies of Demotic literary texts versus copies meant for more regular use. Ryholt (2018: 169) suggests that the page numbers on some of the longest scrolls may be marks of their prestige status, and many such long scrolls are written in a fine hand. Yet these scrolls do not consistently feature the generous margins and large writing that characterize luxury copies of Greek texts, partly because they seem formatted to carry so much text per linear centimeter. It remains to be determined whether there is an identifiable subcategory of luxury copies of Demotic scrolls and clarify the extent to which their distinctive features are similar to, or different from, those of luxury/prestige copies of Greek texts.

Greco-Roman Period Judean Literary Scrolls from the Dead Sea Region

The above discussion of Egyptian, Aramaic-Levantine, and Greek practices around literary scrolls provides a broader context for consideration

[45] Of course, it should be noted in this respect that this could be an inner-Egyptian development, since there are a few iterations of the Book of the Dead transmitted across multiple scrolls as well (Quirke 1999, 91). This was quite rare, however, and limited to a very different genre.

of the rich data from the Dead Sea Scrolls. This is a group of hundreds of largely literary scrolls discovered at sites around the Dead Sea, especially in caves near the settlement of Qumran on the Dead Sea's northwestern edge. These scrolls, now mostly leather but some papyrus, date from around the third century BCE to the second century CE.[46] They provide a precious glimpse into developments in Jewish Judean literary scroll practices across this period. Since my focus here is on an interdisciplinary approach, I will concentrate this discussion of Dead Sea Scroll texts on areas that connect with phenomena that I have discussed above.

To start, I suggest that this corpus of Hebrew Dead Sea scrolls provides another illustration of a relatively preservationist scribal context focused particularly on production and transmission of literary scrolls written in a language distinct from the dominant, or at least prominent, language used in contemporary administrative contexts and/or colloquial speech. In this case, the vast bulk of the Dead Sea Scrolls are Hebrew language compositions, with only a minority in the Aramaic and Greek languages that were more commonly used in everyday discourse and business in the region.[47] To be sure, there are few documentary texts and letters among the scrolls, some of which feature a documentary text inscribed on the verso perpendicular to a literary text inscribed on the recto (e.g., 4Q324+4Q355; 4Q460+4Q350).[48] Nevertheless, the proportion of documentary texts among the Qumran cave scrolls is small, and these scrolls appear to have been conserved by a group that came to identify itself with the priestly sons of Zadok.[49] As

[46] For an overview of the papyrus scrolls, see Tov 2004, 32–33 and appendix 2, 289–94. As noted by Eibert Tigchelaar (reporting a suggestion of some audience members who heard his talk) in Tigchelaar 2016, part of the lower proportion of papyrus materials in the Qumran finds may be an accident of their poorer preservation (Tigchelaar 2016, 4, n. 10, raises questions about this).

[47] For a survey of scholarship on the later Second Temple period and a proposal, see Ong 2016, 69–226.

[48] See Yardeni 1997, 283, for questions about the claimed Qumran provenance of some documentary texts said to have come from Cave IV.

[49] These comments relate to group self-perception and/or presentation as reflected in texts like the (later recensions of) the Community Rule. For careful

such, these Qumran literary scrolls, most of which were written in the archaic language of Hebrew, bear a similar (complex) relation to an indigenous temple complex that we see in the case of Demotic materials, especially in the Roman period. In both cases, it appears that priestly and/or priest-associated groups produced literary scrolls to preserve an indigenous literary tradition written in an archaic language (Hebrew or Demotic) that was in declining everyday use outside the temple(s).

Another thing that the Qumran corpus has in common with the roughly contemporary Demotic corpus and the Greek corpus as well, is the adaptation of the literary scroll medium to transmit unusually long texts containing older traditions. In the Greek tradition, we saw the use of multiple, often large scrolls used to inscribe portions of the mammoth, originally oral Homeric epic tradition and large-scale classical traditions like Herodotus or Thucydides. Among Demotic scrolls, we saw the use of very long scrolls, sometimes multiple scrolls, to inscribe agglutinative complexes of story cycles (Petese, Inaros, Setne), wisdom collections (Khasheshonqi), and mythic (Myth of the Sun's Eye) traditions. Now at Qumran, we see the use of long, tall, and densely written scrolls to inscribe large Hebrew literary works that have grown over time, one or more books of the Pentateuch, the books of the Psalms, and larger prophetic collections associated with Isaiah and Ezekiel. As work by Drew Longacre initially suggested and as has been confirmed in a broader survey that Asaf Gayer and I have done, the carrying capacity of these scrolls is on a different order from the above-discussed Elephantine literary scrolls like the copy of Ahiqar. Thanks to smaller script and an increased number of lines made possible by closer spacing and higher columns, some manuscripts at Qumran could bear upwards of ten times as many characters per linear centimeter as the Darius-Memoranda or Ahiqar scrolls could have.[50] Inscribed in such a

qualifications regarding past theories about the priestly and/or Essene origins of the group(s) transmitting the Qumran scrolls, see Collins 2010.

[50] This collaborative project is Gayer and Carr 2024. The work on the highest-carrying-capacity scrolls among the Dead Sea corpus was done by me using techniques and figures developed in that study. My methods for estimating carrying capacity are discussed below in relation to Qumran materials.

way, a densely written, large-format Qumran scroll could contain the entire Pentateuch on a semi-manageable length of around ten meters, where a scroll inscribed in the manner of the Elephantine Ahiqar or Darius-Memoranda examples would have required a completely unworkable 100+ meters.

Furthermore, as in the Greek case and possibly also the Demotic case, these unusually large Dead Sea literary scrolls share features characteristic of high-quality luxury or presentation-quality scrolls aimed for display and possible communal use. Much as William Johnson used script quality as an initial and primary criterion for Greek luxury scrolls, so also a recent article by Drew Longacre shows that the largest Psalm scrolls are distinguished by their unusually fine scripts, and my broader survey has confirmed this trend across other large Dead Sea scrolls.[51] This suggests that the focus by Emanuel Tov on margin size for identifying "luxury" scrolls at Qumran, focusing on manuscripts with preserved top or bottom margins more than 3 centimeters, may not be the best approach. For one thing, as Tov is acutely aware, margin size is only inconsistently preserved, so some of the most finely written scrolls with large writing blocks do not get included as candidates for presentation copies—such as 4QGen-Exod[a] (4Q1) or 4QGen[b] (4Q2).[52] In addition, intercolumn margins are also relevant, suggesting that a certain measure of white space per centimeter may be a better measure of manuscript quality. But more than that, it may make sense to follow William Johnson's example and focus initially on scrolls written in high-quality formal square, or high-quality paleo-Hebrew, scripts for initial candidates for deluxe, presentation-quality scrolls. Again, my quite initial survey suggests that many of the largest, most densely written scrolls at Qumran are also written in high-quality, normal-size paleo-Hebrew or square script. In this group, only the 4QExod-Lev[f] (4Q17) scroll is written in a proto-cursive script.

[51] Longacre 2021b. For William Johnson's reasoning for focusing initially on script quality as a criterion (albeit subjective) for *editions deluxe*, see Johnson 2004, 102.

[52] Tov (2021, 431) himself lists a "control group" of candidates to be luxury scrolls that lack large margins. He updates and revises his description of luxury scrolls in a revised version of his book *Scribal Practices* (= Tov 2004).

In my original presentation for the Leuven panel, I hypothesized that the production of large-capacity scrolls containing the whole Pentateuch might have been a phenomenon characteristic of the conclusion of the Second Temple period, with these large-capacity Pentateuchal scrolls perhaps standing as deluxe copies of an increasingly formalized scriptural tradition. This idea has not held up, however, as I have done rough estimates of letter space per linear centimeter capacity for the primary candidates to be such high-capacity scrolls, with "letter space" here following the convention (within Dead Sea Scroll scholarship) of counting both letters and spaces between words.[53] Working with a dataset formed of Dead Sea scrolls identified as luxury copies and/or scrolls with extra-large writing blocks by Emanuel Tov (and comparing them to the Berlin P. 13446 iteration of the Instruction of Ahiqar), I attempted, as far as possible, to estimate how many letter spaces per centimeter these scrolls could carry.[54]

I developed these estimates in the following manner. Where possible, I identified a fragment (or block of fragments joined by the editor) preserving a complete (or nearly complete) set of lines and associated intercolumn margin for a given column. I then calculated an average number of letter spaces per line for that column whether by counting and averaging the letter spaces for multiple lines or (in the case of biblical manuscripts) by developing a letter space count based on the block of biblical text thought to have been preserved in the given column. I used these figures to estimate the total number of letter spaces in the given column block—either the block of biblical text or the letter-space-per-line average multiplied by the number of column lines. The letter space per linear centimeter estimate was then generated by dividing the letter spaces for the column block by the width of the column combined with an associated intercolumn margin. The resulting (letter space per centimeter) figure indicated how many spaces

[53] For discussion of the concept of letter space, see Ben-Dov, Gayer, and Ratzon 2022, 79.

[54] My dataset focused on Emanuel Tov's list of scrolls with extra-large blocks in Tov 2004 and of some additional scrolls in his candidates for luxury scrolls in Tov 2022, 43.

Figure 2: Illustration of Contrasting Carrying Capacity Per (Linear) Centimeter: 32 Letter Spaces per cm in Column IV of Berlin P. 13446 (Ahiqar) vs. 113 Letter Spaces per cm in Column V of 1QIsa[a] (19.7 cm column height, 12 cm column width plus intercolumn margin).

Photo (by John Trevor) and permission for column V of the 1Qisaiah scroll (1QISACOL05_A8) is provided courtesy of the Institute for the Study of Ancient Cultures of the University of Chicago

Photo of plate D of Berlin P. 13446 and permission provided the Staatliche Museen zu Berlin—Ägyptisches Museum und Papyrussammlung.

would be contained in an average 1-centimeter vertical sliver across a given one centimeter length of scroll surface (taking into account inter-column margins and *vacat*s). Figure 2 gives images of portions of the Berlin P. 13446 copy of Ahiqar and the more densely written 1QIsaiah[a] scroll, with vertical lines roughly indicating the sort of vertical slice of writing block measured in each case.

Not every scroll in this dataset had enough material to measure even one column, especially non-biblical scrolls where it was more difficult to project total numbers of lines in fragmentary columns. Nevertheless, with those qualifications and noting how rough such projections can be (based on one column and often uncertain estimates), I arrived at the fol-

lowing list of 12 scrolls that are the best candidates for having around 200 or more letter spaces per centimeter: *4Q1/4QGen-Exod*[a]; ***4Q5/4QGen***[e]; ***4Q11/4QpaleoGen-Exod***[l]; ***4Q14/4Q[Gen-]Exod***[c]; 4Q17/4QExod-Lev[f]; *4Q23/4QLev-Num*[a]; ***4Q24b/4QLev***[b2]; ***4Q51/4QSam***[a]); ***4QIsa***[b]***/4Q56***; 4Q98a/4QPs[r]; ***4Q365/4QRP***[c]; and *4Q403/4QShirShab*[d].[55]

In contrast to my suppositions presented in the 2021 Leuven panel, this is hardly a list of late Second Temple deluxe copies of Pentateuchal scrolls. The only two scrolls that clearly fall in the common era, 4Q98a/4QPs[r] (if it has tall columns) and 4Q403/4QShirShab[d], are modest to small-size scrolls written in extremely small script that are each a case unto themselves. Otherwise, the scrolls in this list are dated by their editors to the late Hasmonean / early Herodian period (in **bold** in the list above) or earlier (4Q1/4QGen-Exod[a]; 4Q17/4QExod-Lev[f]; and 4Q23/4QLev-Num[a]).[56] Though a few have large margins preserved (e.g., 4Q11/4QpaleoGen-Exod[l]; 4Q13/4QGen-Exod[c]; and 4Q51/4QSam[a]), they are most united in being written in archaizing

[55] For some information on the measurements for this group of manuscripts, see Appendix 1 to this article. The designation 4Q24b/4QLev[b2] comes from Eibert Tigchelaar's argument for two manuscripts present among the fragments previously designated by the designation 4QLev[b] (Mus. Inv. 1077–79; see Tigchelaar 2021, 263–69). The measurements in this case come from fragment 9, which is among those with more minutely written portions of the later chapters of Leviticus. It should also be noted that it is quite uncertain whether 4Q98a/4QPsr belongs in this list. As noted in Jain 2014, 141, the original editors' supposition of a 60-line column for this manuscript (Peter Flint, Patrick Skehan, and Eugene Ulrich in DJD XVI, 151) is based on slender evidence. Similarly slender evidence (adduced by Jain) would yield columns of approximately 33 lines at 16.5 cm in height, which would mean considerably less carrying capacity per centimeter. For other information on the measurements for this group of manuscripts, see Appendix 1 to this article. As noted there, the date ranges assigned to these manuscripts by their editors on paleographic grounds are ever more questionable, and all of the measurements used here involve approximations and in some cases (e.g., 4Q5/4QGen[e], 4Q365/4QRP[c]) a particular level of guesswork. Though the overall trends noted here remain highly likely, precision is not claimed here and is virtually impossible to achieve.

[56] This correlates with Drew Longacre's (2014, 148–52) finding of Exodus manuscripts with large numbers of lines per column being relatively earlier.

(paleo-Hebrew) or otherwise formal script. Only the earliest scroll in the set, 4Q17/4QExod-Lev^{f} (dated to the third century BCE) is written in a proto-cursive script. Many scrolls at Qumran are written with such a high-quality script, so the predominance of formal scripts among these high-carrying-capacity scrolls may not be significant. Nevertheless, insofar as quality of script was the initial and primary criterion for William Johnson's identification of *editions deluxe* versions of textual traditions (see above), this could be a prompt to consider other criteria for quality of scroll production and whether high-carrying-capacity literary scrolls may have been distinguished by such characteristics as serving similar symbolic and/or display purposes to Greek *editions deluxe*.

Overall, it is difficult to draw more secure conclusions from this preliminary survey, especially given the above qualifications about problems in gathering data for many scrolls. Nevertheless, rather than agreeing with my hypothesis of a trend toward the production of high-capacity deluxe copies in the first or second century CE, this initial probe would suggest instead a move around the middle or the late first century BCE toward increased Judean use of this high-capacity scroll technology to produce especially large, complete copies of Pentateuchal books and a few other large biblical books. Indeed, in almost half of the cases (five of the above-listed high-capacity Dead Sea scrolls), this scroll technology seems to have been used to produce high-capacity scrolls that could carry multiple books in the Pentateuch on one material object. In the concluding section of this essay, I will return to this question of the transmission of the Pentateuch in a well-established five-scroll framework.

Meanwhile, the Dead Sea evidence relevant to a scroll approach is not confined to this limited list of relatively well preserved, high-capacity scrolls. Indeed, most of the Dead Sea Scrolls appear to have been modest-sized scrolls bearing parts or all of shorter compositions. If we turn our attention away from what my German colleagues would call *Traditionsliteratur* (books built up over time, like Genesis, Exodus, Isaiah, or Psalms), the relatively newer compositions found at Qumran are inscribed on scrolls in the same 3–9 meter range that we saw for early Egyptian compositions. Notably, the overall denser writing of these Greco-Roman period Jewish scrolls meant that scrolls in this 3–9 meter

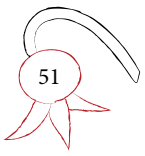
range could hold far more text than a comparable scroll inscribed in the manner of our known pre-Hellenistic scrolls. In this sense, the apparent Greco-Roman-period revolution in carrying capacity of literary scrolls (as well as the example of longer Greek works in the surrounding cultural context) may have prompted (or at least allowed for) an increase in size of new Jewish compositions.

Meanwhile, once a given composition was in the stream of tradition, it could be represented in a diverse range of ways. Much work remains to be done on the diverse purposes of scrolls and related formats and other features that might point to such purposes. Older treatments sometimes speak of the "liturgical" or "personal" purposes of minutely written small-format scrolls, but there does not seem to have been much further work providing background and data on what such liturgical or personal settings would have involved. According to Matthew Monger's (2022) survey of the Qumran evidence, almost half of the scrolls have 25 lines or less, and it seems that there is a particularly high proportion of copies of select portions of Psalms, Genesis, and Deuteronomy. Overall, Monger's work synthesizes an emergent consensus in Qumran scholarship that the relation of textual composition and written artifact was not one-to-one but fluid and variable. Though someone initially composing a text might produce a modest-sized initial scroll version of a text, later writers might produce partial iterations of the textual tradition for diverse purposes. An important direction for further research is more quantification of the proportion of such partial iterations of textual traditions, their distinctive formatting and script characteristics, and their likely purposes.[57]

A few remarks should be made about evidence at Qumran for how literary scrolls might be modified. As in the case of the Demotic materials mentioned above, we have some important examples at Qumran of multiple scroll iterations of literary compositions. In some cases, especially copies of compositions that were included in later scriptural compilations (Christian Old Testament, Jewish Tanakh), this evidence can be combined with other manuscript traditions and related textual iterations (e.g., 4QRP, 11QTemple) to form a broader picture of written

[57] Monger 2022, shared in preliminary form with me.

iterations of Jewish traditions featuring coordinating expansions, shifts in order, memory variants, and occasional larger-scale changes. In the case of the varied iterations of the more recently composed Community Rule (1QS), we see an apparent complex mix of diverse large-scale changes. Interestingly, we see some data analogous to the trend toward "revision by extension" seen in Egyptian materials, even though the community rule traditions are largely inscribed on leather, which lends itself far less to extended inscription by way of verso of the scroll. In at least one instance, the inclusion of another community rule tradition on the sheets at the end of 1QS, this may have been accomplished through adding leather sheets with additional compositions onto the end of the roll. In addition, there are a handful of examples of the practice of extending the writing on a literary scroll through adding a new literary work onto its uninscribed verso (these cases usually involving flipping the scroll horizontally). Notably, one of the most promising examples, 4Q509/4Q496/4Q506, is a papyrus opisthograph that seems to feature an intentional combination of excerpts, in this respect resembling the New Kingdom miscellanies discussed above (Aksu 2022). And, in addition, there are several other scrolls that may feature multiple compositions on their recto.[58]



Finally, I should note that the Qumran evidence preserves evidence for different forms of revision of existing compositions. In at least one case, the apparent addition of several columns to the version of the community rule tradition sees in 1QS, this might have been enabled (at an earlier point) through the sewing of one or two additional sheets to the beginning of a scroll bearing an earlier iteration of the tradition (one similar to 4QS^{b} and 4QS^{d}) (Metso 1997, 2000).[59] In other cases, however, the Dead Sea materials—sometimes combined with evidence from other manuscript traditions for early Jewish texts—provide broad

[58] Some major candidates are listed in Tov 2004, 39.

[59] I discuss this case in Carr 2011, 83–88. It should be noted, however, that there is no division between sheets in the 1QS version between columns IV and V (the closest seam is between V and VI), so that any such material explanation of the addition of a new sheet to the beginning of the rule tradition would need to suppose such a change in a pre-1QS stage.

documentation of other changes that could be done to literary compositions in their middle. Given the dynamics of writing scrolls, it is likely that the more substantial of these changes were not done to an existing literary scroll, but when a completely new iteration was produced. Notably, in contrast to some of the more profound divergences that are reported to exist between some early and late iterations of Demotic traditions (see above on Petese and Khasheshonqi), the documented examples of textual development in early Judaism still feature extensive verbally parallel sections (even if sometimes differently arranged), thus suggesting a value on relatively close verbal transmission of these written traditions (albeit with memory variants) and the likely use of writing and writing-supported verbatim memorization (or graphic copying) to achieve such close verbal transmission.

General Conclusions

Looking back over this admittedly brief survey of five ancient areas of scroll practices, there are important lines of continuity and difference, both of which might inform models for the formation of biblical and other early Jewish texts. Most of the surveyed contexts provide evidence for the initial inscription of cohesive compositions on modest-sized scrolls (typically under 10 m), though the early Greek evidence (and a few Demotic scrolls) provides important exceptions to this. In addition, all of the areas surveyed show a complex relationship between verbal literary work and written artifact, with scroll media often serving as a space for written performance (often from memory) of literary works in partial form, combined with other works, and/or across multiple scrolls. In this sense, the identity of a given literary "work" in these contexts is not necessarily located in its existence in discrete material "copies" but—at least for some kinds of texts—may be based in the status and ongoing stability of the work as a discrete entity in the collective memory of textual-scribal experts. Meanwhile, I have also discussed elements that distinguish the above sets of scroll practices from each other. In particular, I have argued that there may be ways that temple- and/or priest-connected preservationist scribal contexts

of Greco-Roman-period Egypt and Judah seem to have developed—perhaps somewhat prompted by Greek writing technology and practices with large-scale scrolls and/or multi-scroll compositions—forms of high-carrying-capacity scrolls that then served as platforms for large-scale collections of indigenous-language (non-Greek) literary traditions.

All of this, of course, represents a preliminary report on work in progress. It is based on initial data-gathering that was aimed at identifying potentially fruitful questions and approaches. With that said, I conclude with some observations on the potential implications of this initial work on potential models for the formation and early use of the Bible.

I start where I began this essay, with the origins of this approach in a panel where I proposed a scroll approach as an answer to the question of how one might improve the tradition-historical approach that I have advocated for understanding the prehistory of the Pentateuch. The first important learning that I received from this approach—extrapolating initially from evidence provided by well-preserved Dead Sea scrolls (1QIsaiah^{a} and 1QS)—was the need for major caution about presupposing that the early scribes would have created and, later, redacted, massive compositions like a document containing much of the non-P material from Genesis to Joshua, or a Deuteronomistic history containing much of Deuteronomy through 2 Kings, or even an overall Priestly source including much of the material assigned to P across Genesis to Numbers. Depending on how one delimited the material included in such compositions, they would have needed scrolls extending into the tens of meters to inscribe (in the manner of 1QIsaiah^{a} or 1QS), far longer than most ancient literary scrolls. If we are to suppose such tradition complexes existed early on as identifiable compositions, they would either have been inscribed partially in diverse contexts (e.g., like early Homeric epic materials) or, at most, as multi-scroll compositions (first attested for literary materials in Hellenistic-period Greek, Demotic, and Hebrew texts). This would have significant implications with regard to my work so far. It would reinforce some ideas I had initially proposed about the multi-scroll origins of P, while it would raise questions about some arguments I had advanced—even relatively

recently—about evidence for a proto-Pentateuch composition that connected non-P Genesis and non-P exodus-Moses materials.

These insights have been refined with a broadened focus on non-Hebrew-focused ancient literary scroll practices. As noted above, thanks to work by Drew Longacre and a collaboration with Asaf Gayer, it is clear just how approximate my initial estimates of these issues of scroll length were, based as they were on figures derived from relatively densely inscribed scrolls (again 1QIsaiah[a] and 1QS) from among the Greco-Roman-period Dead Sea Scrolls.[60] It now appears that our attested evidence for pre-Hellenistic scrolls, especially for the carrying capacity of our few pre-Hellenistic literary scrolls (e.g., Ahiqar and the Darius text), suggests that these earlier scrolls with alphabetic literary texts contained about one-fourth as much text per linear centimeter as 1QIsaiah[a] or 1QS and one-eighth as much as the largest carrying-capacity scrolls found at Qumran (e.g., 4Q11/4Qpaleo-Gen-Exod[l] or 4Q14/[4Q[Gen-]Exod[c]). And though this evidence for pre-Hellenistic literary scrolls is meager (Ahiqar, Darius-Memoranda, and indirect evidence from Deir ʿAlla), Asaf Gayer's and my broader survey of text density across a broader range of genres of scroll texts confirms Drew Longacre's initial proposal that Hellenistic- and later-period Jewish scrolls were inscribed far more densely than pre-Hellenistic scrolls.

Though one must be cautious not to put too much weight on these preliminary figures from patchy evidence, this initial work suggests some significant potential implications for mine and others' models of the prehistory of the Pentateuch and other biblical texts. *If* one envisions an ancient Hebrew literary scroll that was inscribed with a carrying capacity like that of the Elephantine Ahiqar scroll (or Darius-Memoranda scroll), for example, our existing Pentateuchal books would have required large to over-large scrolls by ancient standards, ranging from Leviticus at around 14 meters to Genesis at 24 meters of inscribed

[60] In Carr 2020, 611, n. 61 I noted the need to revise the figures used in that article with analysis of pre-Hellenistic materials and cited work on digital reconstruction by Jonathan Ben-Dov, Daniel Stökl Ben Ezra, and Asaf Gayer as exemplary (see now also Ben-Dov, Gayer and Ratzon 2022). The article with Asaf Gayer (2024) is a step forward in this direction.

scroll length. This is not impossible, especially if parts of these texts were copied on the verso of papyrus rolls.[61] We have some examples of such large scrolls among the later Demotic and Greek scrolls. Insofar as these figures for the carrying capacity of pre-Hellenistic scrolls hold up, they could suggest that the current distribution of Pentateuchal material across five scrolls represented the use of a minimum number of scrolls—inscribed in a length and/or format on the outer limits of ancient scroll capacity—needed to contain the mass of P and non-P material that they now do. At this point, it would have been relatively unlikely that multi-book copies of Pentateuchal books would have been produced (requiring a minimum of 30+ m to inscribe), let alone a pre-Hellenistic copy of the Pentateuch as a whole. And this whole reality can well explain the firmly entrenched concept of the Pentateuch as a five-scroll composition, an idea embedded in multiple terms for it—for example, the *Penta*-teuch, or the rabbinic *humashim*—(even in later media contexts where the Pentateuch came to be transmitted on one written artifact, whether synagogue scroll or later Bible book) and echoes of its five-scroll composition in the five-book, Torah-oriented final redaction of the scriptural Psalter. Up to now, this *five-scroll* characteristic of the Pentateuch has not been adequately focalized by my own theories of Pentateuchal composition or others. A five-scroll structure would not have been necessary for the Pentateuch if it had been finalized in the later Hellenistic period when high-carrying-capacity scrolls were possible. Then the whole narrative complex could just be

[61] We should not assume, however, that there was much, if any, copying of large portions of such books on the verso of scrolls, even papyrus rolls. In most cases, scribes producing a version of a text would inscribe all of it, or almost all of it, on the recto of the scroll. The Berlin P. 13446 copy of Ahiqar, for example, is completely contained on the recto, and all but two columns of the Darius text are contained on the recto of Berlin P. 13447. And this is just to name two examples of a more widespread phenomenon. Even in scribal cultures where scribes were known to add to such literary scrolls with additional writing on the verso, they rarely used much of the verso for initial inscription. Even massive scroll exemplars, such as the Leiden 384 copy of the Myth of the Sun's Eye (more than 20 m) are copied exclusively on the recto (this example was mentioned to me orally by Joachim Quack).

put on one scroll. The five-scroll structure of the Pentateuch is a product of pre-Hellenistic scribalism.[62]

The same can be said, by the way, for reconceptualizing the background of the book of Psalms, the book of the Twelve Prophets, and large collections of material associated with prophetic figures like Isaiah, Jeremiah, and Ezekiel. For example, if the book of Isaiah was inscribed in a manner similar to the Ahiqar scroll, it would have required an almost 30-meter scroll (inscribed all or mostly on the recto) and the book of Psalms would have needed a scroll surpassing that number.[63] This could well explain why the redaction of Psalms now in the Bible bears signs of once being divided across five books, likely five scrolls. Again, inscribed in the manner of the Ahiqar scroll, the portions of the biblical book of Psalms that fall into each of its five books would have required a scroll extending to just few meters, well within the normal length range of ancient literary scrolls.[64]

This all just would provide important background to the scroll structure already prominently foregrounded in one major biblical complex (the Pentateuch) or signaled by colophons in another (the book of Psalms, echoing the five-scroll structure of the Pentateuch). Yet it also might provide some *general* guidelines for looking at possible earlier written (scroll) sources standing behind Pentateuchal and other books. Though our slender evidence does not provide us with hard numbers,

[62] In a forthcoming essay (2024), Drew Longacre uses this kind of data to make a similar case about the move from multiple books of Psalms to the current Psalter. This essay was shared with me in prepublication form as "Size Does Matter: Manuscript Format and Literary Criticism in the Persian and Hellenistic Periods." Longacre's essay and mine and Asaf Gayer's work (Gayer and Carr, 2024) represent separately-conceived, parallel projects that adjust preliminary conclusions about literary scroll length in Carr 2020 using data mainly from one (Longacre) or more (Gayer and Carr) pre-Hellenistic scrolls (building on Longacre's 2021 article).

[63] For the prophetic material, see already Mastnjak, 2018, 2020, 2023. For Psalms, see the above-cited essay by Longacre (2023).

[64] I refrain here from publishing my own more specific calculations, since this part of my research, though done independently, parallels and intersects with excellent work along these lines on the book of Psalms carried out by Drew Longacre (2023).

our existing evidence for the carrying capacity of pre-Hellenistic literary scrolls suggests that a longish 10-meter literary scroll inscribed in the manner of Ahiqar (around 30 ls per linear cm) could have contained at least 30,000 letter spaces. Working with round letter space (ls) numbers to indicate their approximate nature, the non-P Jacob story (~17,000 ls) and non-P Joseph story (~22,000 ls) both fall well within that number, as do the materials assigned to P in Genesis (~21,000 letter spaces). Notably, the Priestly materials assigned to both Genesis and Exodus together (~61,000 ls) well exceed the 30,000 ls number, which—while not decisive—might raise questions about the hypothesis of a one scroll Pg source that included Priestly materials up to the Tabernacle account, let alone a *single scroll* Pg that extended further. This does not, however, rule out the idea that what scholars have called a "Priestly source," in the singular, might actually have been a multi-scroll composition. And there are some literary indicators within the Priestly materials themselves, such as the distinctive expanded genealogy structure of P in Genesis and the apparent new beginning represented by P materials at the outset of Exodus (Exod 1:1–5), that suggest a multi-scroll background to P, indeed one that may have provided an initial framework for four of the five scrolls in the five-scroll Pentateuchal composition (cf. Carr 2018, 101–2).

These reflections aim to indicate potential implications of a refined scroll approach for mine and others' work in Pentateuchal theory, focusing in this case on questions of scroll length. Yet the broader survey of non-Hebrew scroll practices above suggests some other potential insights that I will now briefly summarize.

First, starting around the outset of the Hellenistic period, there seems to have been a trend across multiple contexts—Greek, Demotic, and Judean—toward the production of large, complete copies of older, often agglutinative textual complexes (Homeric epics, Inaros Cycle, Pentateuch) on large scrolls that were large in length and/or height compared to pre-Hellenistic exemplars. Often these big scrolls appear to be prestige copies that served special purposes in later Greco-Roman contexts (whether Greek, Egyptian, or Judean). In at least the case of Judean scrolls, the unusually high text density of these high-capacity Greco-Roman-period scrolls allowed them to collect on one scroll, or

at least more easily collect on one scroll, large textual complexes—for example, the Pentateuch (~310,000 ls), Psalms (~100,000 ls), Isaiah (~85,000 ls)—that would have been difficult, if not impossible, to transmit on one written media object in the pre-Hellenistic period. Thus, for example, with the shift toward far more densely written scrolls in the Hellenistic period, we see the possibility of inscribing multiple Pentateuchal books on one large-format, densely written scroll, even all five of them. Indeed, my calculations suggest that it would have been possible to inscribe the Torah on a large-format scroll of 11–13 meters if done in the style of 4Qpaleo-Gen-Exod^{l} (~277 ls per cm) or 4Q Lev^{b2} (~240 ls per cm).

Second, though much more can and should be done to clarify the nature and purpose of such large copies, a potentially fruitful future research direction would be to explore the socio-cultural background of the production of relatively large carrying capacity literary scrolls across these diverse contexts. It may be significant that many of these large-scale copies emerged in what I have preliminarily termed "preservationist" scribal contexts—Hellenistic-into-Roman-period Egyptian temple complexes and the Second Temple Judean Dead Sea Scrolls. As such, these unusually large and often carefully prepared literary scrolls may play both an archival and symbolic role in conserving and celebrating literary traditions written in an indigenous language that was becoming increasingly marginalized in the broader societal context. As discussed above, the Greek-oriented scholarly traditions in that broader context produced often high-quality, large-scale iterations of Greek literary traditions, including the routine transmission of some works (Homeric epics, etc.) across multiple scrolls. A fruitful line of research would be further exploration of how this Greek literary culture and its scroll-writing practices played a role in shaping Greco-Roman-period literary scroll practices in non-Greek and/or bilingual Greek–indigenous-language contexts (and possibly vice versa).[65] It appears that there were crucial ways that Greek writing technology

[65] I have some preliminary reflections on multi-scroll transmission in Carr 2020, 603–4. Note also reflections by Menahem Haran on multi-scroll composition and the catch-phrase phenomenon in tablet media contexts in Haran 1985.

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played a role in enabling the creation of high-carrying-capacity scrolls in the Judean (and perhaps Demotic?) scholarly contexts. Moreover, engagement with Greek culture may have encouraged the Judean and Egyptian use of such high-capacity scrolls as material anthologies or archives, collecting indigenous-language traditions in massive, somewhat agglutinative, and not necessarily literarily cohesive ways. But amidst these complex interactions there may be important ways that the Judean and Demotic contexts diverged from their Greek counterparts, for example in more often using average to small margins for high-capacity, prestige scroll copies of large traditional complexes of older traditions.

Such questions highlight the importance of a sustained exploration of the complex, often bilingual, sociocultural scribal background for the production of different types of literary scrolls, whether the above-discussed types of large-capacity scrolls or other kinds. This essay has included some research probes focused on the primary data of formatting and text density found in the scrolls themselves. It can be deepened through more attention to find spots (e.g., Ryholt 2019), pointers to reading communities in marginal notations and other indicators,[66] and the use of that and other data to investigate the background to developments in scroll practices and test preliminary hypotheses such as those ventured above. For now, the main point is that there are certain patterns and developments in scroll practices, formatting, and text density that are potentially quite relevant for the study of the formation of the (Hebrew) Bible, whatever their background.

It should be stressed that the focus across much of this essay on complete scroll copies of literary works, whether possible early, pre-Hellenistic scroll iterations of Hebrew traditions or later Greco-Roman large-scale scroll collections of Hebrew or other traditions, could obscure the fact that scroll technology also could be used in more fluid ways in relation to literary traditions. My survey started with early Egyptian scholarly contexts where scrolls often were used to transmit multiple literary works or (especially in the New Kingdom) portions of literary works that were in the stream of tradition and part of a broader corpus known in memorized form by elite scholars. It concluded with mention of how

[66] For example, Johnson 2010; Popović 2017.

the Qumran corpus preserves a substantial array of smaller-scale scrolls of diverse formats that preserve subsections of longer Hebrew works. In some cases, such as the Carlsberg 304 et al. copy of the Khasheshonqi framework narrative or a possible separate copy of the Joseph story in 4Q9 (4QGen[j]), it seems that writers could create scroll iterations of scenes or other compositional subsections of larger works, whether as a student exercise and/or abbreviated reformulation of a known tradition.[67] Much remains to be done in clarifying the particular purposes of these diverse scroll types. A number of terms are in circulation—for example, "anthology," "archive," "liturgical," "personal"—with a need for more sustained reflection on the extent of fit of these terms to ancient contexts and social practices, and on why and how scrolls were produced. What is already clear, however, is that active scholarly contexts did not feature an assumed one-to-one relationship of scroll to composition. Though it seems likely to me that full written compositions likely were inscribed at least initially on a given scroll exemplar, all kinds of different forms of iteration of such textual traditions became possible if and when they were adopted into a broader scholarly stream of tradition.

And this variety in the forms of scroll iteration may become more common at the other end of the transmission process, especially where some textual compositions were developed amidst the more preservationist scribal contexts of the later Hellenistic and Roman periods. Insofar as there was a tendency in this time to collect indigenous-language traditions on high-carrying-capacity scrolls in temple- or priest-associated contexts (a supposition that requires further testing and clarification), the resulting compilations may not always be particularly tightly structured or coherent by contemporary standards. This may require us scholars of these ancient texts to be attuned to the different types and levels of coherence, developing more precise terminology to characterize them. Though we certainly still see narrative art in some Greco-Roman-period indigenous-language compositions, it may be forcing things to find design in more massive and/or loosely

[67] For the former possibility (for 4Q9), see Tigchelaar 2022. For the Khasheshonqui framework narrative, see Ryholt 2000.

structured textual cycles created in a more preservationist/archival/anthological mode.[68]

Third, I have commented above on certain patterns of modification that are documented in scroll media. It was always possible, of course, to add modifications to any point of a scroll composition if one was producing a completely new iteration, and it was theoretically possible to extend a composition by adding new sheets, even though it seems that this was almost exclusively done just to finish copying the full extent of an already existing literary composition. Nevertheless, we also have some evidence, especially in scroll cultures using papyrus, for extending existing literary scrolls at their conclusion, sometimes progressively, by adding new sections or works onto the uninscribed part of the scroll's verso. The documented cases of this, to be sure, are somewhat limited, and they often involve the addition of materials that are relatively unrelated to the work being supplemented. Nevertheless, insofar as scroll media, especially papyrus scroll media, offered an occasionally utilized option for ancient scribes to extend a scroll for different purposes, this phenomenon of "revision by extension" would provide a material historical background to longstanding hypotheses among biblical scholars about numerous biblical books having later material toward their conclusions (2 Samuel 21–24; Judges 17–21; Psalms 151 [LXX] and 151–54 [Syriac]; Jeremiah 52 [//2 Kings 24:18–25:30]; Isaiah 36–39 [//2 Kings 18–20]). In particular, this phenomenon of "revision through extension" could provide a material historical framework for understanding the background of apparent appendix-like materials clustered around diverse endings of the Priestly material: Leviticus 27; Leviticus 17–26; Numbers 33–36; the documented reshaping of the Exodus tabernacle materials; and perhaps also the appendix-like materials at the end of the Sinai pericope (Numbers 5–10).[69] Like debris left on a beach at high tide, appendix-like materials may reflect ancient scroll end-points, even

[68] I would note that this is not just an issue for the later materials. Ragazzoli 2019, 292–93, discusses the unusually high level of compositional coherence in Papyrus Lansing compared to the bulk of less clearly structured miscellanies.

[69] I work in this direction in Carr 2012, 28–29; 2018, but for fuller development, see Röhrig Forthcoming.

when some (like Numbers 5–10) occur midway in a present biblical scroll. Moreover, insofar as this phenomenon seems most typical of (though not exclusive to) papyrus-oriented scroll practices, it would suggest a dating of such extensions of biblical books in a time when papyrus remained a dominant medium for Hebrew literary scrolls.

Such are some preliminary ideas about how a "scroll approach" might inform hypotheses for how biblical books developed, especially multi-scroll compositions. In another context, a related thing to explore would be how a scroll approach might inform theories about the literary design of ancient compositions. In my 2020 article, I pointed to reflections by John Van Sickle and James Nati about how literary texts on scroll media are read in serial form, and how this mode of appropriation lends itself more (at least for visual appreciation) to literary patterns within a small series of columns rather than a work as a whole.[70] To that, I now would add questions pertaining to multi-scroll compositions. Are there ways that literary complexes spanning multiple scrolls tend to be connected in substance to one another? Are there differences between how this happens, depending, say, on whether the literary complex initially emerged in an exclusively oral context (e.g., as is often supposed for the Homeric epics) or whether it was compiled out of preexisting written materials (e.g., as is often supposed for the Pentateuch)?[71] These questions exemplify a range of fruitful avenues for further exploration within (and without) biblical study.

Finally, I have tried along the way to indicate some potentially fruitful questions for scroll research outside the Bible. In particular, I would argue that the concept of letter spaces per linear centimeter (or the quadrat or other equivalent for Egyptian sign systems) could be a

[70] Van Sickle 1980, 5–7; Nati 2020, 20–25.

[71] Cf. on this point, evocative reflections along these lines in Jay 2016, 153–54 on the Inaros Cycle as a more tightly constructed composition than the Homeric "Cycle" where links are imposed on oral material. I plan work along these lines on ways in which a multi-scroll Priestly (P) work shows signs of connection across scrolls and distinction between them. Note also work by Joseph Cross on distinctions between different levels of narrative cohesion seen in the Inaros Cycle versus the Prebend of Inaros and Armor of Inaros compositions, preliminarily discussed in a forthcoming article (Cross, "Mouvance").

helpful figure for comparing the textual carrying capacity of scroll and other written media across multiple periods and culture areas, more helpful than mere scroll length or word count. Moreover, it could be helpful to develop a prioritized range of reliable measures of such carrying capacity, from the above-summarized "cumulative inscribed line space" figure in relation to diverse Egyptian scrolls to different sorts of "letter space per linear centimeter" carrying-capacity estimates that become more reliable the more they can be based on secure measurements of larger blocks and/or numbers of columns. Different sorts of measures will be useful for different purposes, because the numbers of scrolls that can be used for comparison of carrying capacity will necessarily be lower the more the measures are limited to scrolls preserving complete columns or series of columns.[72] And the same could be said for measures of formatting that might be specific to prestige scroll iterations of literary compositions. For example, a measure of square centimeters of white space per linear centimeter of scroll length (including top and bottom margins along with intercolumn margins) would be one way to compare amount of space left uninscribed in literary scrolls (providing a ready means to rank scrolls on a spreadsheet and compare them). Moreover, this figure, like the letter space (or quadrat space for Egyptian) per linear centimeter figure, could be determined in different ways, depending on the amount of preserved data in the scroll dataset—for example, just comparing square centimeters of uninscribed space across one preserved column and margins [for a broader set of fragmentary scrolls] versus measuring square centimeters of uninscribed portions across larger blocks of a smaller set of better-preserved scrolls.

Scroll research has come a long way since the earlier publications by Haran and his precursors. For example, the substantial attestation of very long literary papyri in the Greek and Demotic corpora show the problems with Haran's idea that leather scrolls were needed for

[72] Of course, it is possible that digital reconstruction could somewhat expand a given dataset, insofar as it could reliably project the broader shape of a more partially preserved scroll. There may be a risk, however, of circular reasoning, since a given scholar's reconstruction would be producing the carrying-capacity data used for broader comparisons.

longer literary documents (Haran 1983, 1986). Moreover, these diverse scroll corpora show multiple problems with Haran's idea that there was a strong correlation between single compositions and single scrolls (Haran 1984). And the raw material for this work continues to grow. Unlike areas with a longer history of work with a given block of data, cross-disciplinary insights from scroll research promise to develop and change rapidly. This progress report on scroll research exemplifies this point, refining and correcting as it does my own earlier formulations.

Even now, I should stress that the measures given in this essay varied in minor ways as they were redone, and the carrying-capacity measures given here would shift with changes in assumptions about lines per column and letter spaces. Though I stand by the basic points made in this essay, I also would emphasize that the letter space per centimeter figures here are approximate and that this whole business—despite the plethora of numbers—is not an exact science.[73] The figures that I have provided give a usable idea of comparative scroll lengths in different periods and contexts. Nevertheless, one should avoid, or at least use great caution, in using them (or similar figures) to reconstruct the likely sizes of individual column blocks and/or sheets in reconstructed documents. With those qualifications, I remain hopeful that the formulations and questions advanced here will prove useful, prompting productive work in biblical studies and related fields of scroll research.

[73] See notes to Appendix I below that indicate particular difficulty in producing usable figures for some of the high-capacity scrolls surveyed here. These are just samples of issues I encountered looking at a broader group of large-format Dead Sea scrolls and are unavoidable in work with often-fragmentary scroll materials.

Appendix I: Data Used for Comparison of Dead Sea Scroll Manuscripts with Persian-Period Literary Scrolls

Key to all Sheets

Overall, items in bold are potential markers of luxury scrolls.
Column A—Scrolls (and part measured): with the exception of the first three scrolls in the comparison sample, these scrolls are ordered from highest carrying capacity (per linear centimeter) to lowest. As possible, notes are given on the fragments (abbreviated frg) and/or column used for measures.
Column B—Leather Quality: these are comments (if given) by the original editors.
Column C—Script: these descriptions are largely dependent on the original publications in DJD. Date ranges given to scripts by editors are given by way of column C.
Column D—Approximate Date: these are those given by the original editors as standardized in Daniel Webster's "Chronological Index of the Texts from the Judaean Desert" (DJD XXXIX, 371–75). Though there are significant issues with the paleographic method used to arrive at the date ranges in the index and with Webster's index in particular (see Tigchelaar 2020, esp. 269–71), the index provides a comprehensive reference point, independent of this author, for points made here. Exceptions are noted in footnotes.
Columns E and F—Top and Bottom Margins: these are measurements where some margin is preserved, often partial (and often variable).
Column G—Average Letter Spaces Per Line in Measured Block: most of these counts were done by using Accordance to extract an unpointed (Masoretic) text corresponding to the material reconstructed (by the editor[s]) for the measured block, stripping that text of all numbers and other non-letter markers, using Microsoft Word to get a count of letters and spaces between them for the whole block, and dividing the resulting figure by the number of lines in the block. In the cases of the first three scrolls in the comparison points, these letter space counts were

done by hand by me, using the text or, as necessary (for Berlin P. 13446 and Berlin P. 13447), some text reconstructed by the editors (TAD 3,32 and 66, respectively).

Columns H and I—Column Width and Intercolumn Margin: these measurements were done using GIMP open-source software, generally with scale photographs or (if scaled photographs were unavailable) with the Scripta Qumranica tool or (if photos were not available in that tool) with digital photos scaled using measurements of photo dimensions reported by the editors. Though separate measurements are given here for column and intercolumn width, the combination of the two is more relevant to the questions considered here (carrying capacity per linear centimeter) and less variable (since column width and intercolumn width vary by length of line, while the total remains more stable).

Columns J and K—Lines in Column and Height of Column: these figures were drawn from the original editions.

Column L—Letter Spaces per (Linear) Centimeter of Scroll Length: this figure was calculated by multiplying Column G (average letter spaces per line) by Column J (lines in column) and dividing the result by the sum of Columns H and I (column width and intercolumn margin), with the result rounded to the nearest integer.

Comparison Points to Later High Carrying Capacity Judean Literary Scrolls

Scrolls (and part measured)	Writing material	Script	Approximate Dates	Top Margin	Bottom Margin	ls per line	Column Width	Inter-column Margin	Lines in column	Column Height	ls per (linear) cm of scroll
Berlin P. 13446 - Wisdom of Ahiqar (col. 4)	**Well prepared**	Aramaic **book-hand**	450			63	25.6	3.5	15	27.4	32
Berlin P. 13447 - Darius-Bisitun (col. 7)[1]	**Well prepared**	Aramaic **book-hand**	450			64	28.3	2.5	17	23.4	35
1QIsa[a] (medium-large format Qumran scroll; col. 5)		**Semi-formal**	125-100 BCE	1.9	**2.8**	51	11	1	29	19.7	123

[1] The ls and column width measurement for this scroll is taken from [Yardeni's extensively reconstructed] text of col. 7 in TAD 3, p. 66. The scale in Yardeni's drawing was confirmed using the scaled photo from the Elephantine Texts and Scripts database (https://elephantine.smb.museum/)

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High Carrying Capacity Judean Literary Scrolls from the Hellenistic into Roman Period Dead Sea Scrolls (part 1)

Scrolls (and part measured)	Leather	Script	Approximate Dates	Top Margin	Bottom Margin	ls per line	Column Width	Intercolumn Margin	Lines in column	Column Height	ls per (linear) cm
4QPs[r] 4Q98a (col. 1)[2]	**Well prepared**	**Formal**	30 BCE - 68 CE	-	0.6	39	7	0.6	60	33	308
4QShirShabb[d] 4Q403(frg. 2)		**Formal**	30 -1 BCE	1.1	-	65	9.8	1.1	50	15.4	298
4QpaleoGen-Exod[l] 4Q11 (frgs. 7 and 20)[3]	Poorly prepared?	**practiced**	100-25 BCE	**-**	**4**	51	9.4	1.5	60	30	281
4QLev-Num[a] 4Q23 (various frgs)[4]	Not well prepared	**formal**	150-100 BCE	1.7	1.4	81	10.7	2.4	43	33	266
4QExod-Lev[f] 4Q17 (frg 2)		Proto-cursive archaic	250-200 BCE	-	1.4	51	11.8	1	60	31.2	239
4QGen[e] 4Q5 (frg 8)[5]	**Thin and polished**	**formal**	50-25 BCE	—	-	58	11	1.2	50	34	238
4QGen-Exod[a] 4Q1 (frg 19ii)[6]	**Moderately thick, polished**	**formal with semi-formal influences**	125-100 BCE	1.8	1.9	64	11	1.2	42	23	220
4QLev[b2] 4Q24b (frg. 9)[7]	Not well prepared	**formal early Hasmonean**[8]	75-50 BCE	2.6	2.5	66	10.4	1.5	41	30.75	227

[2] See above, n. 55, for qualifications on column height, line count and resulting ls per cm figure for this scroll.
[3] Ls is from frag 20 lines 6-8. Column measure is from frag 7 line 7 with 1.5 intercolumn measure to seam on the right of frg. 7.
[4] The SQ tool was used for column and margin measures (of frags. 35, 32ii, 36 and (for top) 51 and (for bottom) 68.
[5] The column width for 4Q5/4QGen[e] was extrapolated from several partial lines of fragment 8 (lines 6, 8, 9, 10), comparing the space taken by existing text with a similar space needed for reconstructed text. The block height for the same scroll was calculated from multiplying the 6.5 centimeters needed for lines 2–12 by 5 and adding 0.7 centimeters for the last line.
[6] The column line count comes from Tigchelaar 2023, 19.
[7] See Tigchelaar 2021 for designation of this scroll and treatment of its parts.
[8] The date range given here follows that given by Tigchelaar 2021, 265–67, for fragments 9–25 (for now 4QLev[b2]) versus Webster's index (for 4Q24/4QLev[b]).

High Carrying Capacity Judean Literary Scrolls from the Hellenistic into Roman Period Dead Sea Scrolls (part 2)

Scrolls (and part measured)	Leather	Script	Approximate Dates	Top Margin	Bottom Margin	ls per line	Column Width	Inter-column Margin	Lines in column	Column Height	ls per (linear) cm of scroll
4Q[Gen-]Exod[c] 4Q14 (frgs 32 ii, 34, 33ii; VI:39-43)	**well-prepared on recto**	**formal**	50-25 BCE	**4**	**3.6**	79	13.7	1.6	43	38	222
4QIsa[b] 4Q56 (frgs 10, 13)	**stately ms**	**formal**	50-25 BCE	2.4	-	57	10.7	1.3	45	24	214
4QRP[c] 4Q365 (variable)[9]	**well prepared**	**formal**	50-1 BCE	2	2.2	61	11.825	1.175	45	30	211
4QSam[a] 4Q51 (frg. a-e for col. 3)	**writing on hair side of polished leather backed by papyrus**	**formal book-hand; highly skilled**	50-25 BCE	**2.7**	**3.3**	51	9.8	1.1	43	30.1	200

[9] Because the text included in this non-biblical scroll is not known, it is especially difficult to reconstruct its column format (see Tov et al. 1994, 255). The ls and intercolumn margin used here is from average given by Tov and White in DJD XIII; column width from fragment 12 in PAM 43370, column iii, line 6.

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Sample of Next Tier of Potential High Carrying Capacity Judean Greco-Roman Period Literary Scrolls

Scrolls (and part measured)	Leather	Script Quality	Approximate Dates	Top Margin	Bottom Margin	ls per line	Column Width	Inter-column Margin	Lines in column	Column Height	ls per (linear) cm of scroll
4QEzek[a] 4Q73 (frg 3)	**Well pre-pared on recto**	Semi-formal	50-25 BCE	**3**	**-**	57	11	1.2	42	29	196
4QIsa[a] 4Q55 (frg 11 ii; ls from lines 27-29)	**Well pre-pared**	**formal**	50-25 BCE	**2.8**	**3**	67	11	1.2	35	25	192
4Q[Gen-]Exod[b] 4Q13 (frg 6; col 6)	**Well prepared**	semi-formal round	30 BCE - 20 CE	-	-	63	15.4	1.6	50	50	185
4QIsa[g] 4Q61 (frgs 1-8)	average prep	**formal**	50-0 BCE	1.7	2.2	55	11	1	40	31	183
MasDeut (col. 2)		**formal expert**	0-30 CE*[10]	**3.5**	-	41	8.5	1.2	42	33	178
4QIsa[e] 4Q59 (col. 5; frgs 4-10; lines 1-7)	**Well prepared**	**semi-formal**	50-0 BCE	2.2	**3**	72	14	1.05	35	27	167
4QRP[b] 4Q364 (frg 4b, lines 2-9)	**Well prepared**	**formal or transitional formal**	75-50 BCE	2.2	2.2	48	10.4	1.35	40	33	163
MasEzek (average of columns 1-3)		**bookhand expert**	0-30 CE*[11]	**2.8**	**-**	37	8.4	1.4	42	39.5[12]	157
MurXII Mur 88 (col 9)		**careful**	100-125 CE	**4.5**	**4.5**	60	13	2	39	26.6	156
4QGen[b] 4Q2 (possibly Mur? col 1, frg 1)	course	**Formal Skilled hand**	0-100 CE	3.4	-	53	12.3	1.6	40	35	153
4QIsa[c] 4Q57 (frgs 9ii, 11, 12 i, and 52)	**Well prepared**	**formal developed**	33-66 CE	2.4	2.4	56	13.7	1.3	40	25	149

[10] Though Shemaryahu Talmon (1999) identifies this scroll as early Herodian, Émile Puech's (2003) review of the volume suggests a late Herodian (turn-of-the-millennium) date.
[11] Though Talmon (1999, 24) identifies this scroll as "early Herodian bookhand," Eibert Tigchelaar (2005, 273–74) suggests that a late Herodian date is more likely.
[12] This speculative column height figure equals 1.7 multiplied times 22.6 from a measure of the first 24 (of a reconstructed original 42) lines per column.

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