

ABSTRACT

Manuscripts are important because they provide information about ancient times.

Historians use manuscripts to understand ancient peoples and what they believed was worthy of being recorded. Even the manner in which a manuscript is written can tell scholars about a culture. Paleography is the study of handwriting for the purpose of dating manuscripts. Dating back to the seventeenth century, paleography was originally done using only the eyes, but modern technology has facilitated new paleographical research methods. This project began as a test of new technology developed by Mount Holyoke Professor Michael Penn and Smith College Professor Nicholas Howe that uses digital handwriting analysis tools to compare the hands of different manuscripts with the result of matching the script styles of undated manuscripts with dated manuscripts.

I conducted paleographical research using a database of 200 digitized, securely dated Syriac manuscripts ranging from the fifth to the eleventh century. These manuscripts were collected from libraries across the globe for the purposes of this project. Syriac is a form of the ancient language of Aramaic. In traditional Syriac paleographical scholarship, there are two early scripts: Estrangela and Serto. For the purposes of this project, I call this system of dividing Syriac into two hands the “Standard Model.” Using my sizable manuscript database, I challenge the standard model by using securely dated manuscripts to illustrate its flaws. I also propose a new paleographical schema for Syriac manuscripts: The Bush Model. My new model has more specific script categories that apply to a smaller date range, therefore, scholars will now be able to date manuscripts more accurately than ever before. While my project is only a case example in a particular linguistic tradition, the larger goal of this project is to serve as a model for other language groups that wish to use this software.

A CHALLENGE TO SYRIAC PALEOGRAPHY

USING DIGITAL TOOLS TO CONTEST CURRENT SCHOLARSHIP

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ACKNOWLEDGEMENTS

I would like to thank Michael Penn for letting me join the “Modern Technology / Ancient Manuscripts” project. Not only did my time as a research assistant serve as the gateway or background for this project, but it has also showed me that I am capable of being a leader. I also should thank Michael for letting me steal his data and research and make it my own. I hope that the work I did will serve as a good starting point for future research assistants, although I am bitter that I will not be able to continue doing the research myself.

I owe much gratitude to Jordan Crouser and Sarah Abowitz from Smith College for creating my visualizations and helping me to see the data in a new way. I hope that my words have done justice to the visuals. A large thank you to the 5 College Digital Humanities for funding this project and bringing attention to digital humanities research in the Pioneer Valley. I hope that 5CollDH will be able to bring more attention to digital humanities projects, and that such projects will be more accepted in the future.

Last, but not least, I must thank my family for supporting me in my academic endeavors. My parents and grandparents worked hard so that I could go to an amazing school like Mount Holyoke College, and I hope that I have made them proud with this work. Thanks for being there through all the tears and frustration and that time I messed up all the figure numbers twice... I could not have produced this paper without all of the people mentioned above. Thank you again for your help and support throughout this incredible, challenging, eye-opening, 3-year-long process.

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INTRODUCTION

The following is a part of a larger digital humanities project which began in 2009 with the collaboration of Mount Holyoke Professor Michael Penn, Smith Professor Nicholas Howe, and their students. The goal of the project was to create a digital tool to help scholars analyze ancient manuscript handwriting. The software compares letters from a new manuscript to an internal database, produces a list of dated manuscripts with the most similar letter forms, notes any manuscripts written by the same scribe, and helps scholars to isolate a date range of any undated manuscript. The most desirable outcome of the project is to create a software capable of analyzing any number of written languages, not limited to the Latin alphabet. Mount Holyoke and Smith students collaborated to create this software, which must be populated with securely dated manuscripts in order to produce a comparative letter database. The “Modern Technology / Ancient Manuscripts” project began by using Professor Penn’s research on Aramaic manuscripts from the fifth through eleventh centuries to conduct the initial test of the software.

Compiling a Letter Database

A target list of manuscripts was compiled using Sebastian Brock's article, "A Tentative Checklist of Dated Syriac Manuscripts up to 1300," which can be seen in Figure 1.¹ Syriac is a dialect of Aramaic, which was used as the lingua franca of the Middle East in Late Antiquity; less than 200 dated manuscripts from the fifth through eleventh centuries still exist today. Mount

Date	Manuscript	Hatch	Place	Content
411 Nov	Add.12150 = <i>Cat.</i> p.633	I	Edessa*	Patr. G
459/60	Add. 14512 = <i>Cat.</i> 250	II		Bibl. OT
462 Apr	St Petersburg, <i>Cat.</i> no. 1	III	*	Patr. G
463/4	Add. 14425 = <i>Cat.</i> 5	IV	Amid*	Bibl. OT
473 Apr	Vatican Syr. 160	V		Hagiography
474 Sep	Add.17182 = <i>Cat.</i> 403	VI	Edessa*	Patr. S
500/1	Add.14528 = <i>Cat.</i> 1030		Mabbug	Canon Law
509 Apr	Add.14542 = <i>Cat.</i> 417	VII	Mon. Pa'nur*	Patr. G
510 Oct	Dayr al-Surian Syr. 10		Edessa	Bibl. NT G
510/11	Add.17126 = <i>Cat.</i> 526	VIII	Mabbug	Patr. S
512 Jan	Add.17182 = <i>Cat.</i> 404	IX		Patr. S
518 Nov	Add.14571 = <i>Cat.</i> 413	X	*	Patr. S
522 Dec	Vat. syr. 111	XI		Patr. S
528 Apr	Vat. syr. 140	XII	Edessa	Patr. G
530/40	Add.14459 = <i>Cat.</i> 68	XIII		Bibl. NT G
532 May	Add.14445 = <i>Cat.</i> 26	XIV	B.Meri, Mon. Orientalis	Bibl. OT
532 Jun	Add.17176 = <i>Cat.</i> 1072	XV	*	Hagiography
533/4	Add.14479 = <i>Cat.</i> 86	XVI	Edessa	Bibl. NT
533/4	Add.12175 = <i>Cat.</i> 637			Patr. G
534 Jun	Sinai Syr. 46	XVII		Hagiography
535 May	Add.14530 = <i>Cat.</i> 1029	XVIII	Kafra d-Barta, Mon. Eusebius	Canon Law
540/1	Add.17107 = <i>Cat.</i> 23	XIX	Edessa	Bibl. OT
543 Dec	Sinai M27N			Bibl. OT
545 Apr	Add.14431 = <i>Cat.</i> 14			Bibl. OT
548 Jul	Vat.syr.12	XX	Edessa	Bibl. NT
550/1	Add.14610 = <i>Cat.</i> 638	XXI		Patr. G
552 Feb	Vat.syr.112	XXII	Sarmin*	Patr. S
553 Sep	Add.12166 = <i>Cat.</i> 491	XXIII	Edessa	Patr. G
554 Dec	Add.14635 = <i>Cat.</i> 414			Patr. S
557 Apr	Add.14558 = <i>Cat.</i> 466	XXIV		Patr. G
pre 562	Add.12156 = <i>Cat.</i> 648			Patr. G
563 Aug	Vat.syr.143	XXV	Mon. of John of Nerab	Patr. G
564 Apr	Vat.syr.137	XXVI		Patr. S
564 Aug	Vat.syr.104	XXVII	Barbaron, Mon. Quryaqos*	Patr. G
565 Feb	Add.17157 = <i>Cat.</i> 505	XXVIII	Edessa	Patr. S
569 May	Add.14597 = <i>Cat.</i> 648	XXX	Sarmin, Mon. John Nerab	Patr. S G
569 May	Add.14599 = <i>Cat.</i> 547	XXIX	Mon. B. Mar Shila* Skeuis	Patr. G
576 Jul	Vat.syr.142			Patr. G
581 Jun	Add.17169 = <i>Cat.</i> 451	XXXI	*	Patr. S
581 Jul	Vat.syr.138	XXXII		Patr. S
pre 583	Add.14464 = <i>Cat.</i> 70		Mon. Mar Zakkai	Bibl. NT G
584 Jul	Add.12160 = <i>Cat.</i> 472	XXXIII	Mon. Gubba Barraya*	Patr. G
586 Feb	Florence, Laur.Plut.I.56	XXXIV	Mon. John, B. Zagba*	Bibl. NT G
586 Oct	Add.14609 = <i>Cat.</i> 1089		Mon. of Speculis	Hagiography
587/8	Add.12158 = <i>Cat.</i> 556		Mon. of Maki	Patr. G
593 Dec	Add.17152 = <i>Cat.</i> 477	XXXV	*	Patr. G

Figure 1: In 2012, Oxford Professor Sebastian Brock published a list of all early Syriac manuscripts that ended with a scribal note specifying when that manuscript was written. Our project used this as a target list for manuscript acquisitions.

¹ Brock, Sebastian. "A Tentative Check List of Dated Syriac Manuscripts up to 1300." *Hugoye* 15.1 (2012): 21-48. Print.

Holyoke students ordered digital copies of manuscripts from libraries around the world, photographed Syriac manuscripts from the collections of Harvard and Cambridge Universities, and also traveled to the British Library in London in 2014 in order to handle and collect images of the world's largest collection of these manuscripts. Figure 2 represents the proportion of all the manuscripts of which this project has images in relation to the number of extant securely dated manuscripts mentioned in the Brock catalog. It also shows the number of manuscripts that we should be able to add to our manuscript database over the next few years. Out of all of manuscripts listed by Brock from the fifth through eleventh centuries, we believe that we will not be able to obtain only 11.

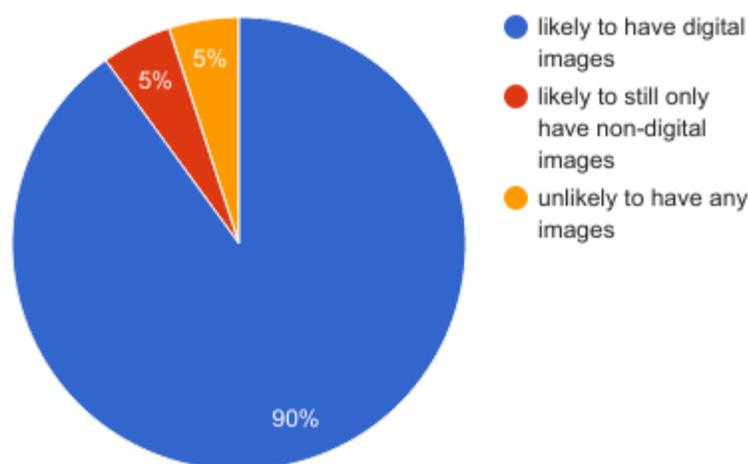


Figure 2: This pie chart represents the number of manuscript that we have in our database from the fifth through eleventh centuries as compared to those listed in the Brock article. We are likely to have digital images of 90% of the manuscripts produced between the fifth through eleventh centuries, and we are unlikely to be able to get digital images of only 5% of manuscripts produced in that time period.

The fall of 2014 is when I came into the picture. I was taking “Introduction to the New Testament” with Professor Penn, and read an article about “Modern Technology / Ancient Manuscripts” in a Mount Holyoke College newsletter. That same day, I went to office hours and asked how I could get involved. The project fascinated me because of my experience in book and paper conservation at the Museum of Fine Arts Boston Library. For the previous two summers, I had learned about preservation through digitization of paper, and I was interested in seeing what

could be done with digitized documents in a research context. As a Medieval Studies major, the project was also appealing because of the opportunity to study the medieval Near East. Most Medieval Studies courses focus on Western Europe and the traditional canon of Middle English literature. The “Modern Technology / Ancient Manuscripts” project allowed me to learn about a different part of medieval history and culture, and draw comparisons between manuscript production and decoration in the East and West.

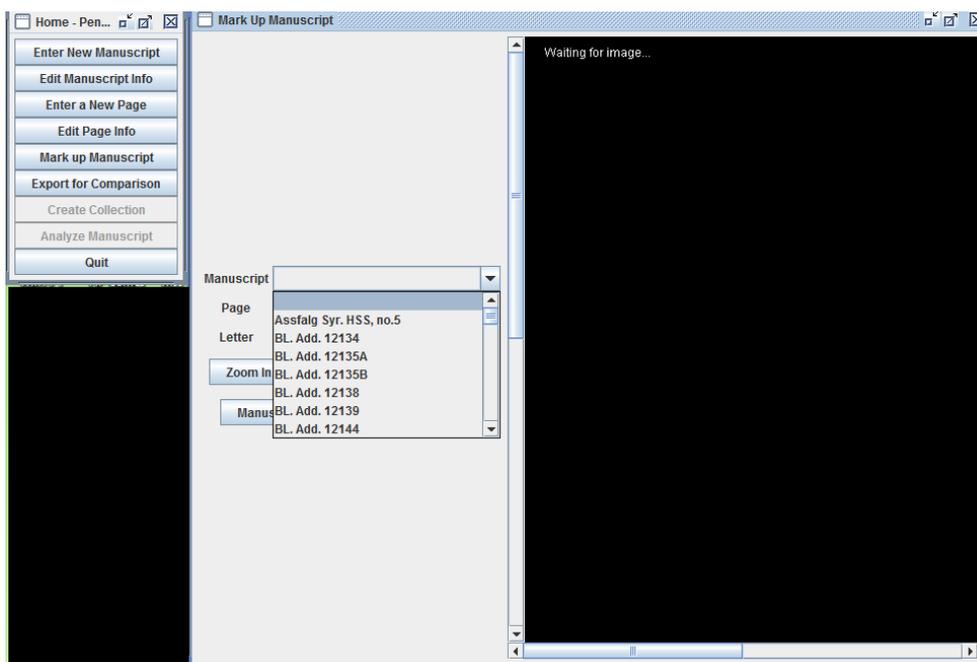


Figure 3: The first step of marking up a manuscript on the Mount Holyoke College server requires the research assistant to select which manuscript out of all the manuscripts in the image database she will be marking up. The manuscripts were assigned to each RA on a workflow chart.

I began as a research assistant, building the letter database by manually selecting examples of every letter on the manuscript server. There is an online interface of letter images, created by Professor Howe and Smith students and maintained by the Mount Holyoke College Library, Information, and Technology Services (LITS) team. Research Assistants uploaded these images onto the server, which held our images, as can be seen in Figure 3. To do so, one chooses the manuscript to mark up, then the folio number, and selects a letter to identify. One typically

identified six to ten examples of each Syriac letter form in a manuscript for a total of nearly 300 identifications per manuscript. Figures 4 through 6 illustrate these steps:

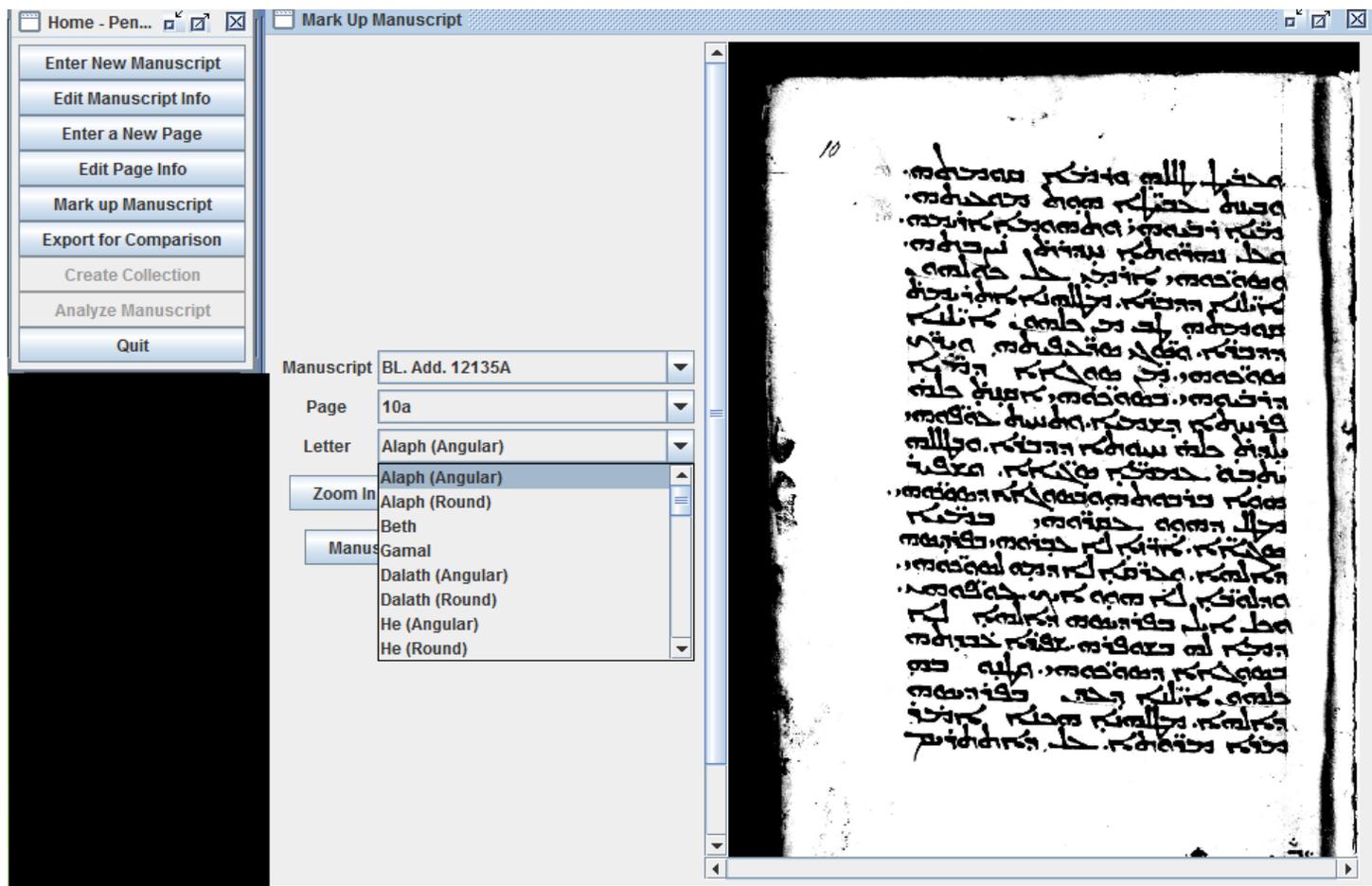


Figure 4: Next, the RA would select a letter to identify within the manuscript. She will have to go through every Syriac letter, and determine whether the forms of certain letters, such as alaph and dalath, are present in their Estrangela (E) form or in their Serto (S) form.

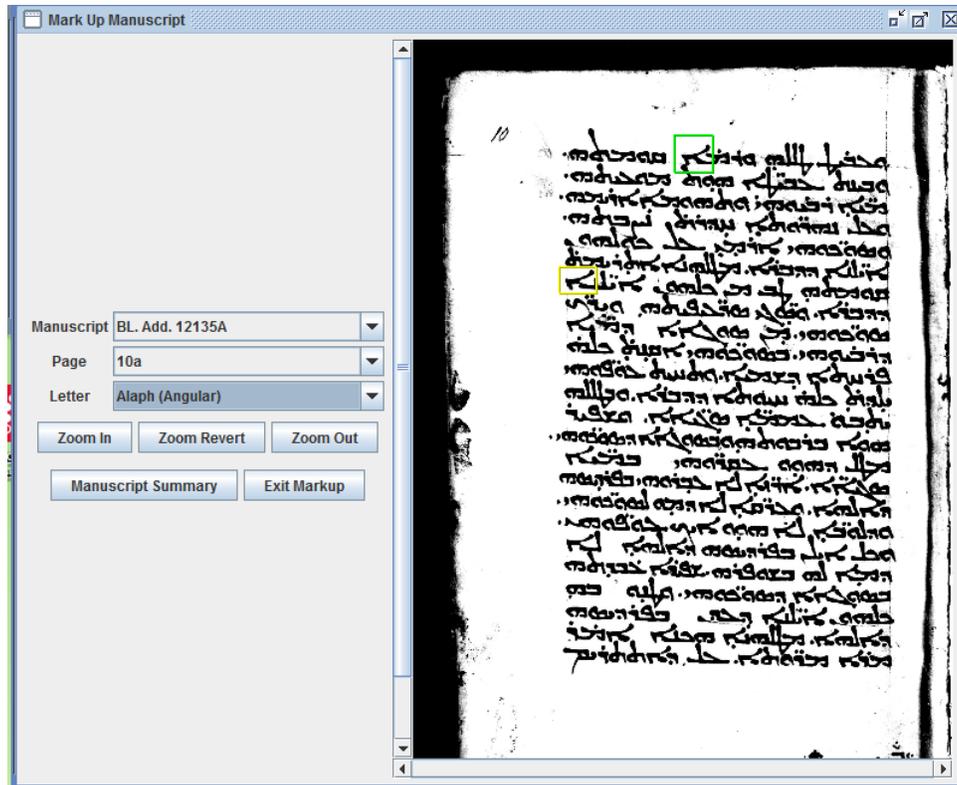


Figure 5: In order to select a letter, one must click on the upper left corner of the desired letter, and drag the box around the letter, making sure not to cut off any portion of the letter. The yellow box represents an incomplete box, while the green box is completed.

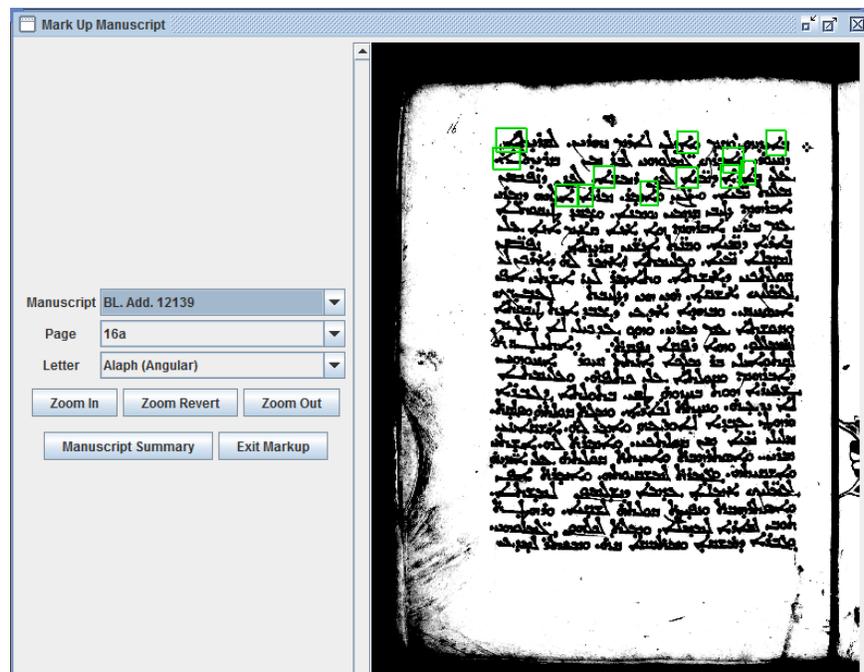


Figure 6: A research assistant is expected to select six to ten images of each letter. For more common letters, like alaph, this can be done on one manuscript page. Less frequently used letters, like sadhe, may only appear once a page and require the RA to spend more time picking through every manuscript page to find six or so examples.

At the time I joined the project, we had images of more than 200 manuscripts, and I marked up 112 of them over the school year. The collection of manuscript images continues to this day, and I will be going to the British Library this summer to photograph later Syriac manuscripts in order to expand the database further. In the fall of 2015, we had collected enough letter data that we could start to proofread and edit the collected letter images. My first task was to help Professor Penn proofread each of the 71,000 identified letters, to make sure that there were no misidentified letters, bad examples, or stray marks left on the page. The proofreading process took over a month, and by spring semester, we had compiled flash drives for each Syriac letter, each containing several thousand images of that letter. We also used Google Drive, as can be seen in Figure 7, to share images with international students who were working on the data clean-up effort.

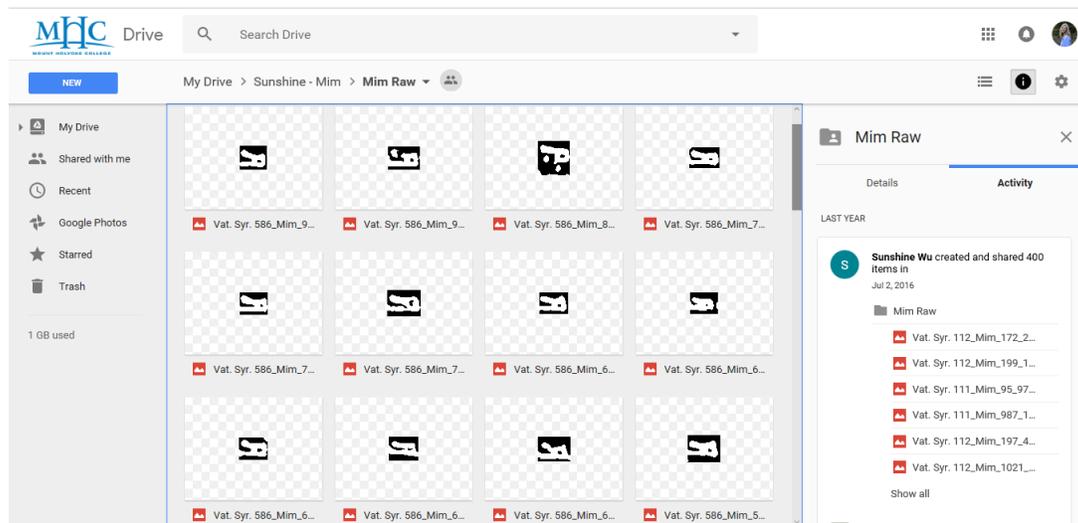


Figure 7: This Google Drive database of raw, unedited letter images was sent to a research assistant in China to edit over the summer. Domestic RAs used USB drives to hold the letter image database. Each RA was assigned one letter to edit.

To clean up the data, I trained and supervised 18 Research Assistants in a process which involved using GIMP 2 image editing software to remove any trace of other letters or marks surrounding the letter in question. The editing process can be seen below in Figures 8 through

11. Letter trimming allows the computer software to analyze the letters and average all letter examples into one ideal form of the letter, without being confused by stray marks. I also created an online training module for future Research Assistants using the project management system Trello. I myself participated in the letter trimming process during the semester, but over the summer, I transitioned to the role of supervisor; I was responsible for distributing the letter files, tracking the Research Assistants' progress in an online workflow, answering Research Assistants' questions, and proofing their work after they submitted their completed files.

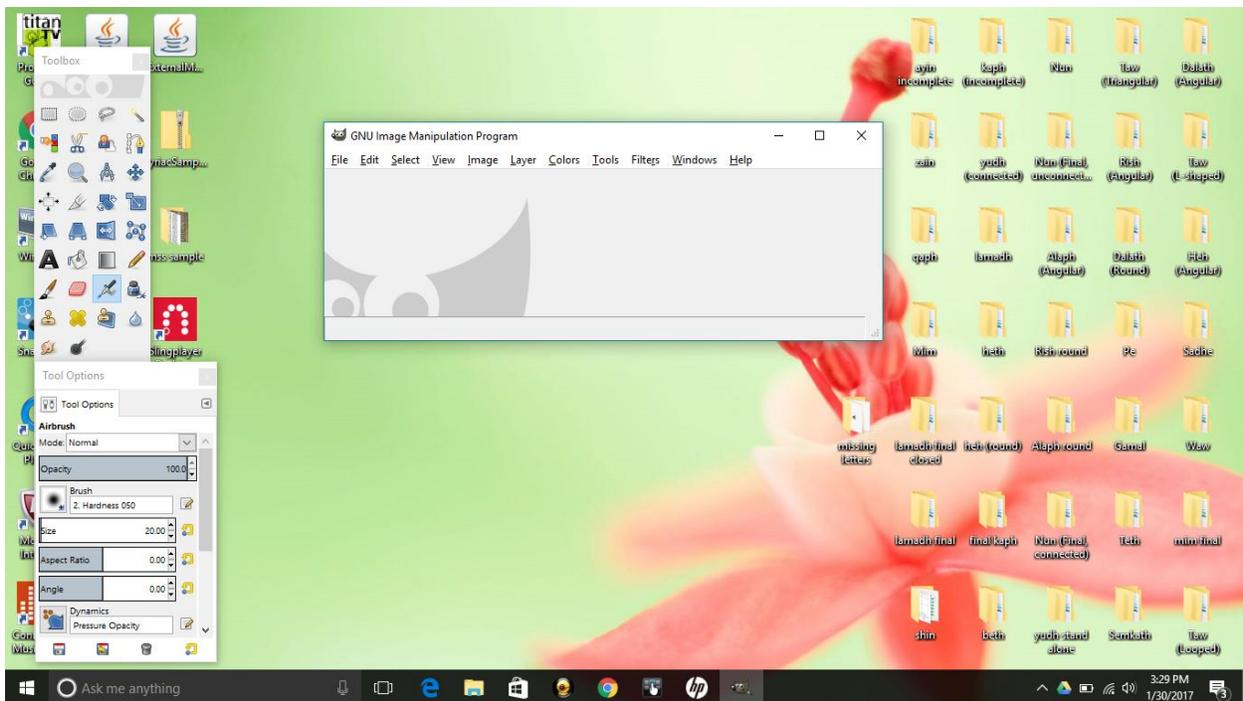


Figure 8: GIMP Software was used to edit images because it is free and compatible with both Apple and PC products. Each research assistant downloaded the software and received a training how to use GIMP to edit their letter.

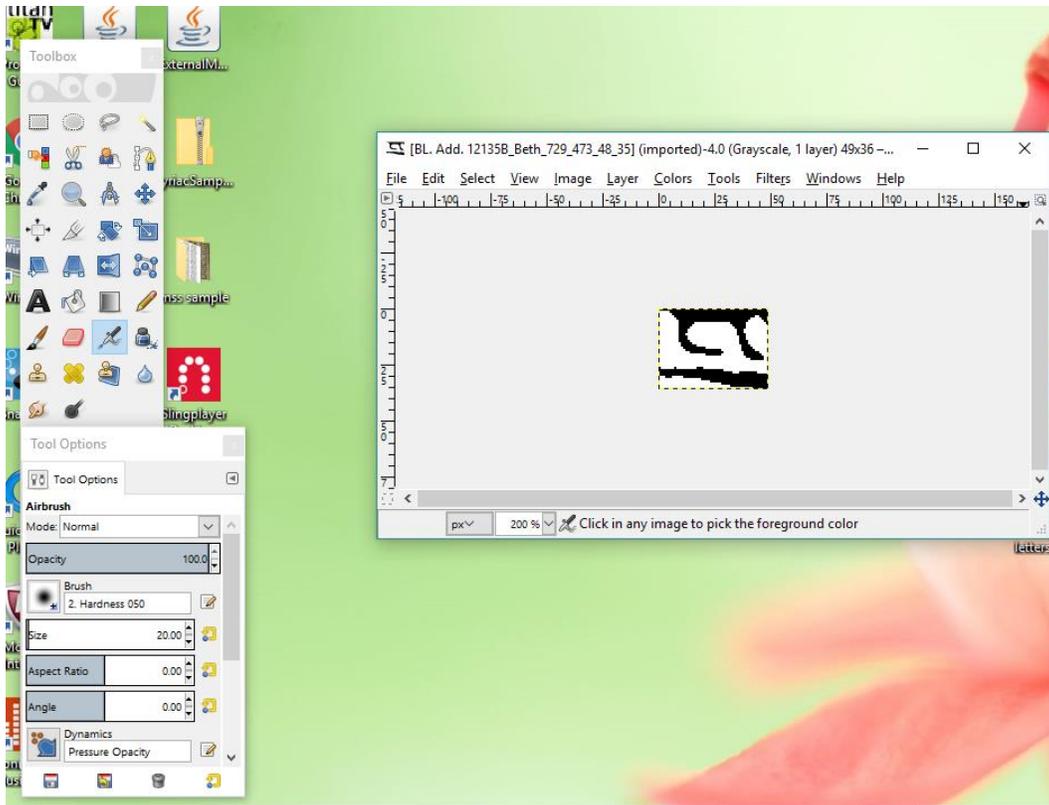


Figure 9: The first step of data clean-up was to select a raw image file and open it in GIMP. The letter above is called beth. The letter is white and the background is black. There are pieces of other letters in this image that need to be removed before the image file can be sent to Professor Howe for further use.

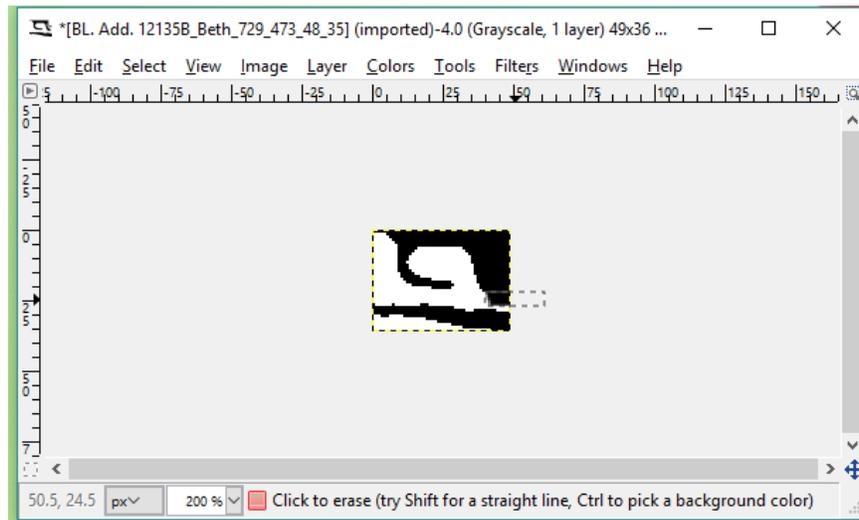


Figure 10: After selecting the eraser tool and changing the color preferences so that black is the dominant color, the RA erases any extraneous marks, leaving just the desired letter.

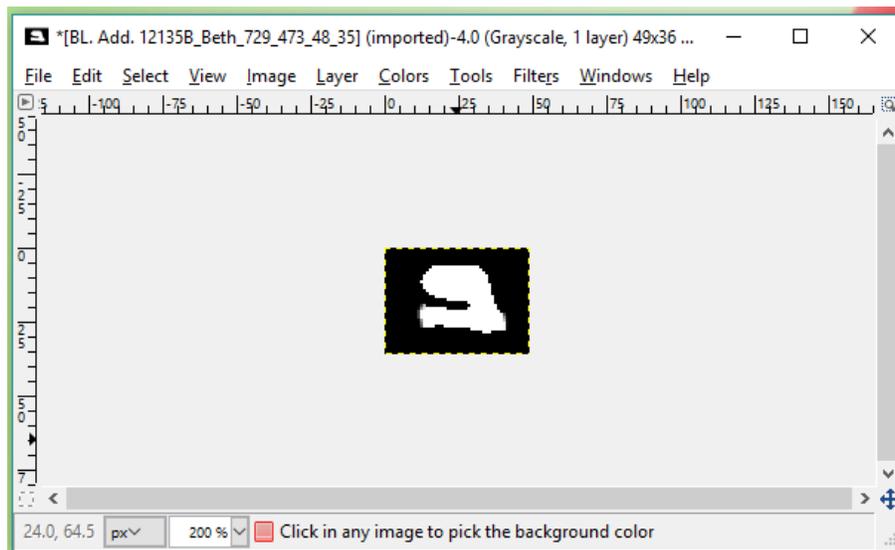


Figure 11: Having erased all extraneous lines from the image, the letter itself is all that should be left. The RA now saves the edited image back to the USB drive in the "Final" folder, and deletes the file for the raw image.

By the fall of 2016, we had edited over 71,000 images, allowing Professor Howe to build a script chart by averaging the letter forms from each manuscript into an ideal letter. This meant that all the images of alaph, for example, from the manuscript BL. Add. 12150 would be assimilated by the computer into an ideal outline of what the average alaph looks like in said

manuscript. The computer then chooses the example of an actual alaph written by the scribe that is closest to this average form; it then pastes this most representative example in the chart. This chart allowed Professor Penn and me to see the change in script over time and pinpoint key changes in the history of Syriac handwriting.

Analyzing Project Data

At this point, I had developed my own interest in Aramaic paleography, especially looking at the changes in script style. It is the analysis of this data and its implications that form the basis of my thesis. The first data source was the automatically-generated script chart. This application allows the user to select the securely dated manuscript(s) and the letter(s) to view, as shown in Figure 12. Because of this, the uses of the script chart are manifold: it can be used to show all the letters in a single manuscript (Figure 13), show the development of a single letter over time (Figure 14), or compare the development of multiple different letters, including those that substantially change shape from the two main Syriac script forms of Estrangela and Serto (Figure 15).

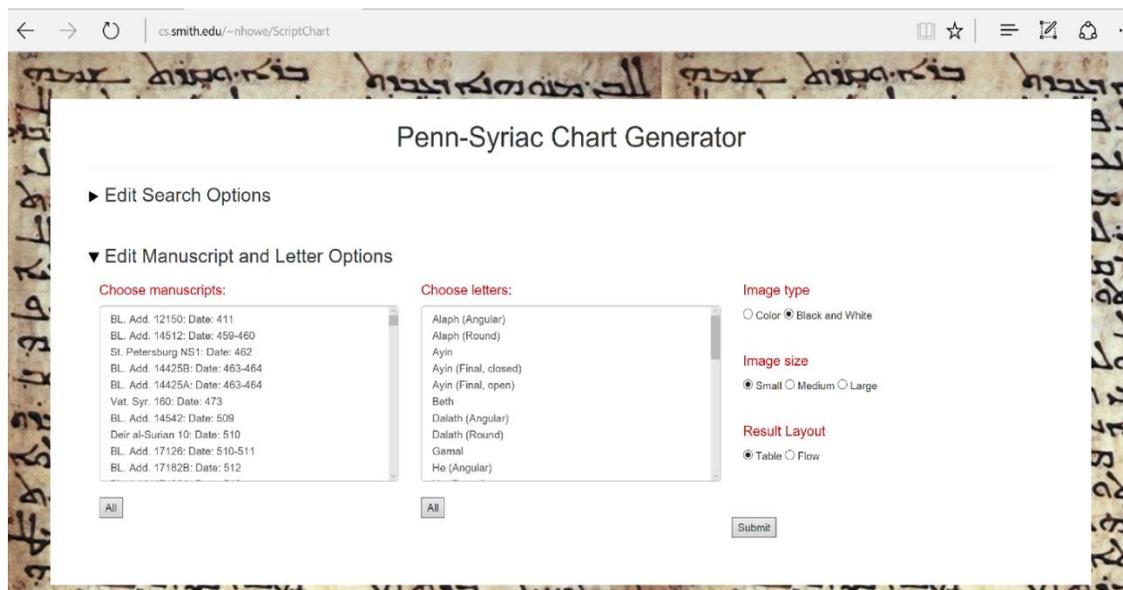


Figure 12: The interface of the Penn-Syriac Chart Generator allows for the user to select which manuscript(s) she would like to view from a chronological list of securely dated manuscripts. She then selects which letters to view images of and the format of the resulting chart. I only used table format for my research.

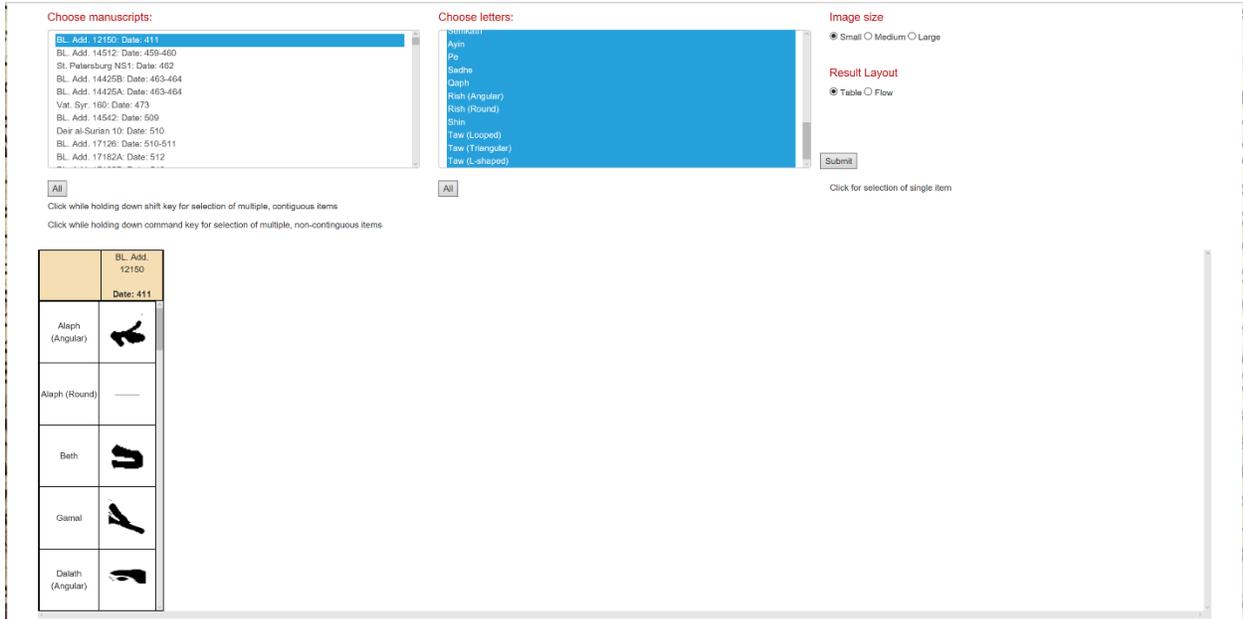


Figure 13: To generate this chart, I selected the manuscript BL. Add. 12150 and all letter forms. This is important because the user is able to quickly view the types of letters used in a single manuscript. The dash next to alaph (Round) shows that there are none of that letter form present in the manuscript.

► Edit Search Options

▼ Edit Manuscript and Letter Options

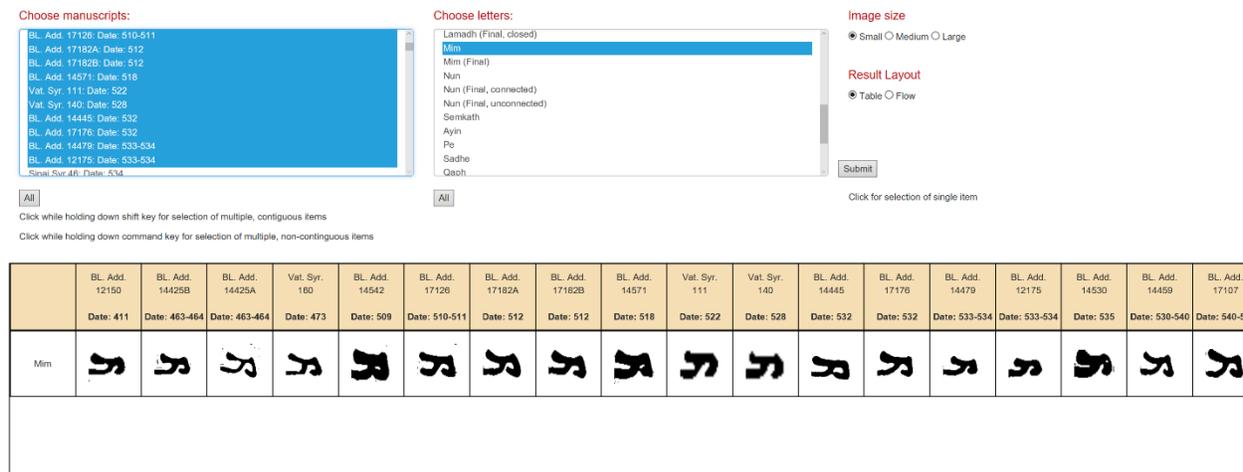


Figure 14: I selected all manuscripts and the letter mim, which generates a chart of all mim existing in dated manuscripts. This function of the chart is significant because it allows the scholar to pinpoint the earliest date of certain letter forms and track their prominence over time.

Penn-Syriac Chart Generator

► Edit Search Options

► Edit Manuscript and Letter Options

	BL Add. 12150 Date: 411	BL Add. 14425B Date: 463-464	BL Add. 14425A Date: 463-464	BL Add. 17126 Date: 510-511	BL Add. 17162B Date: 512	BL Add. 14571 Date: 518	Val. Syr. 111 Date: 522	BL Add. 14445 Date: 532	BL Add. 17176 Date: 532	BL Add. 14479 Date: 533-534	BL Add. 12175 Date: 533-534	BL Add. 14530 Date: 535	BL Add. 14459 Date: 530-540	BL Add. 17107 Date: 540-541	BL Add. 14431 Date: 545	BL Add. 14610 Date: 550-551	Val. Syr. 112 Date: 552	BL Add. 12106 Date: 553	BL Add. 14635 Date: 55
Alaph (Angular)																			
Alaph (Round)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beth																			
Gamma																			
Dalath (Angular)																			

Figure 155: This is the top of a chart with all manuscripts and all letters selected. By viewing the script chart with all letters and all manuscripts selected, one can combine both previously described functions of the script chart and track the presence of letter forms over time while also seeing the individual script style used in each manuscript.

There are manuscripts of which we do not yet have digital images, but which images have been published in other sources. I used published images of these manuscripts such as the Deir al-Surian manuscripts to supplement the data collected in the chart. Published images are kept in an external letter interface that I have used for reference to conduct research.

In the fall and winter of 2016, I conducted research on and off the Mount Holyoke College campus as I began to analyze this data. My first step was to compile numerous Excel Spreadsheets to consolidate the letter data found in the script chart. I have been working with Smith College Professor of data science Jordan Crouser and with his student, Sarah Abowitz, a Smith first year computer science major. We developed a series of visualizations allowing me to effectively analyze the development of the ancient Syriac script. This work is unprecedented because prior to the “Modern Technology / Ancient Manuscript” project, there was no compilation of Syriac script data, nor a way to view manuscripts side-by-side. Working with the world’s largest letter database of Aramaic provides me with the unique opportunity to analyze the language’s development over time.

Connection to the Larger World of Digital Humanities

My initial fascination with this project because of its use of medieval manuscripts has not waned. But through my evolving role, I have been introduced to the world of digital humanities. This newfound interest has come to shape my own future. I will be pursuing a degree in library science next year with a focus in digital humanities. I hope that I will be able to build other kinds of digital libraries and collections similar to the one used in this project to make groundbreaking research possible. The connection between my project and the broader world of digital humanities was facilitated by the way of a 5 College Digital Humanities (5CollDH) fellowship, which I was awarded in Fall 2016. This grant allowed me to expand my focus on Syriac paleography to the bigger question of how modern technology can help paleographers and challenge existing methods and theories. The 5CollDH fellowship supported a research trip to the Folger Library in Washington DC in January of 2017, in which I spoke with manuscript curators, paleographers, online content engineers, and the digital media director. I learned through these meetings how the tools developed by “Modern Technology / Ancient Manuscripts,” could be applied to Early Modern manuscripts, and how the Folger’s staff members sought to answer many of the same questions I did through different methods. I shared my project with them, and I received advice on new ways to think about and organize my information. I also had productive conversations about movement toward the digital humanities in an academic library and special collections context, and the future of library science itself.

During my DC trip, I also met with Catholic University of America Professor Aaron Michael Butts. A scholar of Syriac, comparative linguistics, and Early Christianity, Professor Butts and I discussed the project and identified interesting manuscripts in which both scripts are used simultaneously. He also directed me towards additional literature and suggested ways to present my results in writing. My 5CollDH-funded trip expanded my ideas on how to look at,

understand, and present data, and ultimately enriched my thesis by broadening my view of the work I have been doing.

This introduction placed my thesis research within the larger context of Professors Penn and Howe's project, my two years as a research assistant, and my grant-funded trip to DC. The following chapters, however, focus exclusively on my own thesis research that I conducted between August 2016 and April 2017. Chapter 1 analyzes the development of the two main Syriac scripts, Estrangela and Serto. Chapter 2 will expose the problems with the prevalent Syriac paleographical schema. Chapter 3 will analyze more recent paleographical scholarship. Chapter 4 examines a new dating paradigm and possible correlations between script and genre. I end with a brief epilogue that highlights the new discoveries made about Syriac handwriting and opportunities for further research.

This project has allowed me to combine my love of medieval history and material culture with the exciting field of digital humanities. My three years of work on this project have truly shaped where I see myself in the future and my stance on digitization in libraries, museums, and archives. I believe that inter-institutional databases such as the one built for this project will transform scholarship. Increased access to documents will allow for groundbreaking work such as the work in which I have participated during my time at Mount Holyoke. I am grateful to have had the opportunity to be a part of the "Modern Technology / Ancient Manuscripts" project and to have been able to do original research using its resources.

CHAPTER 1: WHAT IS SYRIAC PALEOGRAPHY?

What is Paleography?

Paleography can be defined as “The study and description of ancient and medieval manuscripts, documents, and systems of writing, including the knowledge of the various characters used at different periods by the scribes of different nations and languages, their usual abbreviations, etc.”¹ The study of handwriting is based upon the fact that no two people write in the same way, therefore it must be possible to distinguish between scribes based on their handwriting alone. According to Malachi Beit-Arie, there are five components to paleography, including, “isolation of paleographical units, isolation of different hands producing a paleographical unit, defining the type of script, [and] localizing and dating.”²

It was in the seventeenth century that paleography began to be considered a science due to the influential work *De Re Diplomatica* by Dom John Mabillon (1632-1707), the leader of the Benedictine School of St. Mauer.³ Mabillon’s work focused on the Latin language and determining between authentic ancient documents and forgeries.⁴ Latin continued to be the major focus of paleographic study for many centuries after the publication of this work. Eighteenth-century advancements in Latin paleography included the division of Latin scripts into majuscule, minuscule, and cursive, and also the collection of every known variety of Latin handwriting and

¹ Harrod, Leonard Montague., and Ray (Raymond John) Prytherch. *Harrod's Librarians' Glossary of Terms Used in Librarianship, Documentation and the Book Crafts and Reference Book*. Vol. 5. N.p.: Gower Limited, 1984. Print. 571-2

² Beit-Arie, Malachi. *The Making of the medieval Hebrew Book: Studies in Paleography and Codicology*. Jerusalem: Magnus Press, Hebrew University, 1993. Print. 11-36

³ “Part I: The Auxiliary Sciences. III. Paleography.” *The Catholic Historical Review*, vol. 2, no. 3, 1916, pp. 367–372. www.jstor.org/stable/25011451.

⁴ Marcos, Juan-Jose. "Fonts for Latin Paleography." 5 (2017): n. pag. Plasencia, 2 Jan. 2017. Web. <http://guindo.pntic.mec.es/jmag0042/LATIN_PALEOGRAPHY.pdf>.

its systemization.⁵ However, paleography remained a limited field until the advent of photography, which allowed inscriptions and manuscripts to be reproduced easily, and thus made more accessible to scholars.

It was not until the nineteenth century that the connection between script and history was made by Leopold Delisle and Ludwig Traube, who, through the study of Latin philology, discovered the concept of the scriptorium. This advancement in the field allowed for better dating and geographic locating of a script, and also paved the way for future paleographical studies.⁶ By 1912, the Latin written language could be divided into no less than 25 different scripts, which are identified in Sir Edward Maunde Thompson's work *An Introduction to Greek and Latin Paleography*.⁷ The goals of paleography now focus on the dating and localization of a document, and this is becoming easier with the advent of new technology and tools that help scholars to measure the qualities of a script and quickly compare them to securely dated and located manuscripts. For the purposes of this project, the Syriac language was used to conduct digital paleography.

History of Syriac

The Syriac alphabet was developed from the Aramaic alphabet.⁸ Aramaic is a Semitic language, specifically from the Afro-asiatic language family. Its closest relations are Hebrew and Phoenician, which also belong to the Northwest Semitic group of languages. Aramaic originally used the Phoenician script, and, like Hebrew, is read from right to left. The earliest extant Aramaic is in the form of inscriptions from 900-700 BCE in today's Syria and Northwest Turkey; these belong to the dialect, or phase of the language known as Old Aramaic (925-700

⁵ Bischoff, Bernhard. *Latin Paleography: Antiquity and the Middle Ages*. Cambridge: Cambridge UP, 1989. Print. 1

⁶ Bischoff, 1-3.

⁷ Thompson, Edward Maunde. *An Introduction to Greek and Latin Palaeography*. Oxford: Frowde, 1912. Print. ix

⁸ Thackston, W. M. *Introduction to Syriac*. Cambridge, MA: Dept. of Near Eastern Languages and Civilizations, Harvard U, 1983. Print. xvii

BCE). There is little known about the Aramaeans from this time period aside from references found in the Hebrew Bible and the Assyrian Annals, which tell us that they first settled around the River Khabur and then broke up into other settlements. Old Aramaic is characterized by the script found in the Tell Halaf inscription, the Bir Hadad inscriptions, and the 'Ein Gev jar inscription, among others.⁹ Over time, most of these factions become assimilated into the Assyrian Empire.

The next phase of the language was Imperial Aramaic (700-200 BCE), this term was coined in the 1920s to describe the time when the language was used as the official tongue of the Persian Empire, but has come to represent its period of dominance in the Assyrian Empire as well. Aramaic was no longer an ethnic language, having superseded Akkadian as the official language of the Empire. Aramaic replaced Akkadian because of its adoption of the square script (Ashuri), and the fact that it did not need clay tablets. Examples of Imperial Aramaic can be found in the form of letters, contracts, legal proceedings, literary texts, and graffiti.¹⁰ The language peaked during its tenure as the official language of the Persian Empire, where it became standardized. Aramaic was used in Egypt, Arabia, Palestine, Syria, Assyria, Babylonia, Armenia, the Indus Valley, and parts of Asian Minor during this phase.¹¹ However, after the conquest of Alexander the Great, Greek became the dominant language of governance, reducing Aramaic to the language of the people.

At this point, the standard form of the language divided into numerous dialects, including Nabatean, Jewish Literary Aramaic, Palmyran, Old Syriac, and Hatran, during the phase called Middle Aramaic (200 BCE–200 CE). Each dialect also developed its own script. This phase is

⁹ Fitzmyer, Joseph A. *A Wandering Aramean: Collected Aramaic Essays*. Chico, CA: Scholars Press, 1979. Print. 61.

¹⁰ Ibid.

¹¹ Ibid.

contested by scholars, because it seems that these divisions may predate the third century BCE. However, they are not attested to in literature before this point.¹² The division between Imperial and Middle Aramaic may change as more evidence comes to light. It was during this period in which Aramaic became linked to Christianity because Jesus spoke Aramaic, and some of the earliest portions of the Jewish Bible were written in the language. In fact, the majority of extant Middle Aramaic literature is religious in nature.¹³ The earliest evidence of Old Syriac is from the first and second centuries CE, and is confined geographically to Edessa.¹⁴ These examples include mosaic inscriptions, tomb inscriptions, and a receipt of sale.¹⁵

More dialects appeared in the final phase of the Aramaic language, Late Aramaic (200 – 700 CE). These dialects are divided into Western: Jewish Palestinian Aramaic, Samaritan Aramaic, Christian Syro-Palestinian Aramaic, and Eastern: Syriac, Jewish Babylonian Aramaic, and Mandaean.¹⁶ In the third century, Syriac became the language of the entire Eastern wing of the Christian church.¹⁷ The end date of this period is set at the Muhammadan Conquest, and the resulting spread of Arabic through the new Islamic Empire, which eventually superseded Aramaic in popularity. However, neither Aramaic nor Syriac became extinct, as both languages are still used to this day (A following phase called Modern Aramaic could be argued).¹⁸ A characteristic of Late Aramaic is the confluence of Greek words that make their way into

¹² Fitzmyer, Joseph A. "The Aramaic Language and the Study of the New Testament." *Journal of Biblical Literature* 99.1 (1980): 5-21. Print. 11.

¹³ "The Aramaic Language." *The Aramaic Language*. Comprehensive Aramaic Lexicon Project, n.d. Web. 12 Apr. 2017. <http://cal1.cn.huc.edu/aramaic_language.html>.

"Aramaic Language." *Wikipedia*. Wikimedia Foundation, 10 Apr. 2017. Web. 12 Apr. 2017. <https://en.wikipedia.org/wiki/Aramaic_language>.

Fitzmyer, "A Wandering Aramean." 61-2.

¹⁴ Brock, Sebastian. *An Introduction to Syriac Studies*. Piscataway: Gorgias, 2006. Print." 23.

¹⁵ Fitzmyer, "A Wandering Aramean." 61-62

¹⁶ Fitzmyer. "A Wandering Aramean." 62.

¹⁷ "The Aramaic Language."

¹⁸ Fitzmyer. "A Wandering Aramean." 62.

Aramaic literature of the time. Despite the fact that the geographic reach of Aramaic was, at this time, diminishing, local groups and religious sects continued the linguistic tradition.

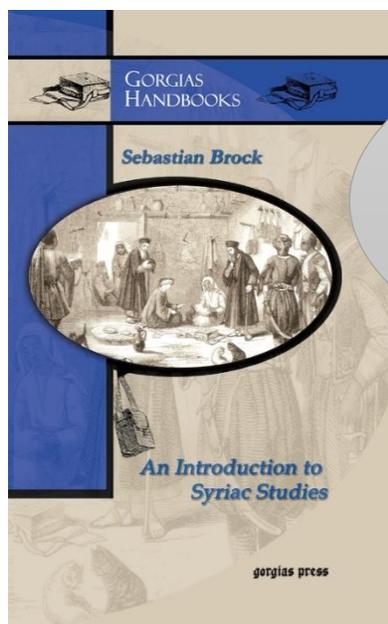
A Brief Description of Syriac

There are 22 letters in the Syriac alphabet, and each letter has four forms: final position, middle position, initial position, and stand alone. For the majority of Syriac letters, these forms will be similar if not identical. Only a few letters, kaph and nun for instance, vary in final position form. There are two early Syriac scripts, Estrangela and Serto, which will be discussed in greater detail below.¹⁹ In this paper, I will use the letter E to denote letter forms that fit the definition of Estrangela, and S for those that fit the definition of Serto. I will also discuss two sets of letters: Primary and Secondary. Primary letters are those that change substantially in shape between their E and S forms (alaph, dalath, rish, he, tau, waw, mim). Secondary letters change less in form between the two scripts (gamal, teth, shin, qoph). I call this system of script identification the “Standard Model.”

The Standard Model

Illustrated by the following charts and Figures 16 to 19, the majority of Syriac scholars subscribe to the system described above, which I call the “Standard Model.” These charts come from the most widely-used textbooks on Syriac grammar, and show the differences between Estrangela and Serto based on letter form. These texts also demonstrate the prevalence of the Standard Model within Syriac scholarship.

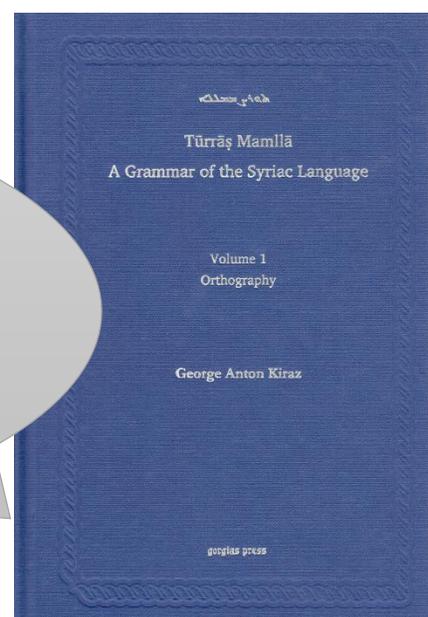
¹⁹ There is a later Syriac script called East Syriac that did not develop until after the time period covered in this paper.



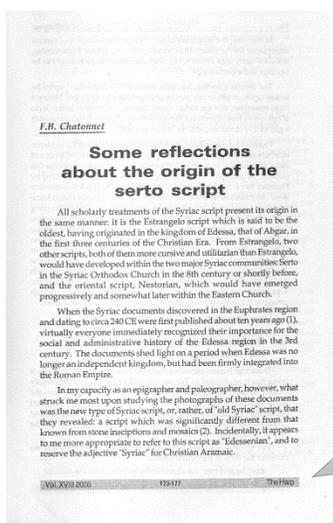
"during the course of the eighth century there emerged, side by side with it, a new and more compact script developed from an earlier cursive script, known from three legal documents from the early 240s and a few colophons, or end notes, by scribes of manuscripts otherwise written in estrangelo. The new script is known as serto." (p.23)

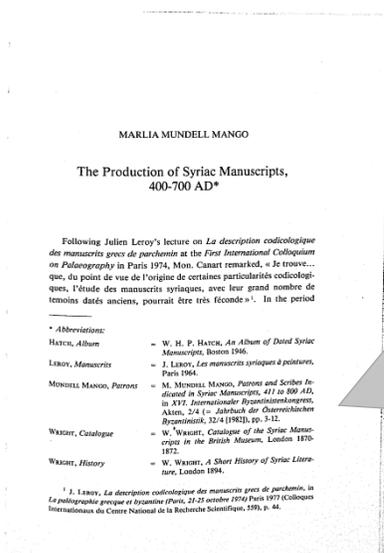
"The Serta ('linear', sometimes 'simple/common linear') or W. Syr. script appears in W. Syr. MSS after the 7th century. More compact than Estrangela... it is a 'formalized version' of an earlier cursive hand found in the legal parchments of the 240s, inscriptions, and early colophons." (216)

In the 8th century: "the Estrangela script begins to fall out of use and Serta, in West Syriac circles, starts to replace it." (21)



"All scholarly treatments of the Syriac Script present its origin in the same manner: it is the Estrangelo script which is said to be the oldest, having originated in the kingdom of Edessa, that of Abgar, in the first three centuries of the Christian Era. From Estrangelo, two other scripts, both of them more cursive and utilitarian than Estrangelo, would have developed within the two major Syriac communities: Serto in the Syriac Orthodox Church in the 8th century or shortly before..." (173)





As mentioned above important changes in Syriac book production occurred in the seventh century. One, the indication of vowels, has been discussed; the others are the introduction of cursive script and incised rulings and a shift in parchment size. The cursive script, called Serta in an abbreviation of *serta peshitta* (i.e. simple writing) is said to be first used in the text (as opposed to the appended notes) of a codex in 731/2.” (173)

“For the text of codices the Estrangela style of writing apparently had no rival in Syria and Mesopotamia until the first half of the eighth century, when the Serta script seems to have made its appearance as a book-hand... The Serta script, which is also called Jacobite from the name of the sect which used it, is more cursive and less angular than the Estrangela.”

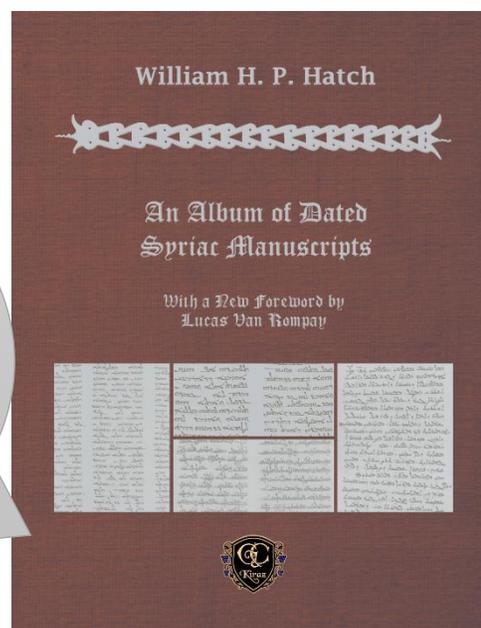


Table of the Alphabet

Name	Estrangelo			Serta				
	Unattached	Joined to the left	Joined to the right and left	Joined to the right				
Alaf	Ⲁ	Ⲁ			Ⲁ	Ⲁ		
Beth	Ⲃ	Ⲃ	Ⲃ	Ⲃ	Ⲃ	Ⲃ	Ⲃ	Ⲃ
Gamal	Ⲅ	Ⲅ	Ⲅ	Ⲅ	Ⲅ	Ⲅ	Ⲅ	Ⲅ
Dalath	Ⲇ	Ⲇ			Ⲇ	Ⲇ		
He	Ⲉ	Ⲉ			Ⲉ	Ⲉ		
Waw	Ⲋ	Ⲋ			Ⲋ	Ⲋ		
Zai(n)	Ⲍ	Ⲍ			Ⲍ	Ⲍ		
Heth	Ⲏ	Ⲏ	Ⲏ	Ⲏ	Ⲏ	Ⲏ	Ⲏ	Ⲏ
Teth	Ⲑ	Ⲑ	Ⲑ	Ⲑ	Ⲑ	Ⲑ	Ⲑ	Ⲑ
Yodh	Ⲓ	Ⲓ	Ⲓ	Ⲓ	Ⲓ	Ⲓ	Ⲓ	Ⲓ
Kaf	Ⲕ	Ⲕ	Ⲕ	Ⲕ	Ⲕ	Ⲕ	Ⲕ	Ⲕ
Lamadh	Ⲗ	Ⲗ	Ⲗ	Ⲗ	Ⲗ	Ⲗ	Ⲗ	Ⲗ
Mim	Ⲙ	Ⲙ	Ⲙ	Ⲙ	Ⲙ	Ⲙ	Ⲙ	Ⲙ
Nun	Ⲛ	Ⲛ	Ⲛ	Ⲛ	Ⲛ	Ⲛ	Ⲛ	Ⲛ
Semkath	Ⲝ	Ⲝ	Ⲝ	Ⲝ	Ⲝ	Ⲝ	Ⲝ	Ⲝ
'E	Ⲟ	Ⲟ	Ⲟ	Ⲟ	Ⲟ	Ⲟ	Ⲟ	Ⲟ
Pe	Ⲡ	Ⲡ	Ⲡ	Ⲡ	Ⲡ	Ⲡ	Ⲡ	Ⲡ
Ṣadhe	Ⲣ	Ⲣ			Ⲣ	Ⲣ		
Qof	Ⲥ	Ⲥ	Ⲥ	Ⲥ	Ⲥ	Ⲥ	Ⲥ	Ⲥ
Resh	Ⲧ	Ⲧ			Ⲧ	Ⲧ		
Shin	Ⲩ	Ⲩ	Ⲩ	Ⲩ	Ⲩ	Ⲩ	Ⲩ	Ⲩ
Taw	Ⲫ	Ⲫ			Ⲫ	Ⲫ		

Figure 16: This chart from Takamitsu Muraoka's, "Classical Syriac for Hebraists" demonstrates the Standard Model with images of each letter in its E and S forms. This chart provides a visual for the textual descriptions on the previous two pages.

Aramaic Alphabets

cursive scripts

	Estrangela (classical) <i>(p. 59)</i>	Serto <i>(p. 173)</i>
,	ܘ	ܘ
b	ܒ	ܒ
g	ܓ	ܓ
d	ܕ	ܕ
h	ܚ	ܚ
w	ܘܘܘ	ܘܘܘ
z	ܙ	ܙ
h	ܚ	ܚ
t	ܛ	ܛ
y	ܝ	ܝ
k	ܟ	ܟ
l	ܠ	ܠ
m	ܡ	ܡ
n	ܢ	ܢ
s	ܣ	ܣ
g	ܓ	ܓ
p / f	ܦ	ܦ
š	ܫ	ܫ
d	ܕ	ܕ
q	ܩ	ܩ
r	ܪ	ܪ
š	ܫ	ܫ
t	ܛ	ܛ
t	ܛ	ܛ

Figure 18: Chart from Joshua Rudder's, "Learn to Write Aramaic: A Step-By-Step Approach to the Historical and Modern Scripts." This chart is another visualization of the Standard Model and speaks to the dominance of this model in both textual and visual depictions of Syriac script.

TABLE 8. LATER SEMITIC SCRIPTS

TRANSCRIPTION + SYRIAC (OR ARABIC) EQUIVALENTS	SYRIAC ESTRANGHELA	SYRIAC EASTERN	SYRIAC WESTERN
,	ܘ	ܘ	ܘ
b	ܒ	ܒ	ܒ
g	ܓ	ܓ	ܓ
d	ܕ	ܕ	ܕ
h	ܚ	ܚ	ܚ
w	ܘܘܘ	ܘܘܘ	ܘܘܘ
z	ܙ	ܙ	ܙ
h	ܚ	ܚ	ܚ
t	ܛ	ܛ	ܛ
z	ܙ	ܙ	ܙ
y	ܝ	ܝ	ܝ
k	ܟ	ܟ	ܟ
l	ܠ	ܠ	ܠ
m	ܡ	ܡ	ܡ
n	ܢ	ܢ	ܢ
s	ܣ	ܣ	ܣ
g	ܓ	ܓ	ܓ
p / f	ܦ	ܦ	ܦ
š	ܫ	ܫ	ܫ
d	ܕ	ܕ	ܕ
q	ܩ	ܩ	ܩ
r	ܪ	ܪ	ܪ
š	ܫ	ܫ	ܫ
t	ܛ	ܛ	ܛ
t	ܛ	ܛ	ܛ
Others:			

Figure 19: Chart from Sebastian Brock's, "The Hidden Pearl Volume 1: The Ancient Aramaic Heritage." This chart further demonstrates the prevalence of the Standard Model in both textual and visual definitions of Syriac script.

Estrangela

Syriac Scholar and Oxford University Professor Sebastian Brock wrote that the earliest extant dated manuscripts from the early fifth century CE are written in a script called Estrangela. He states that the term “Estrangela” came from the Greek *strongulos*, meaning rounded because of the script’s “formalized character.”²⁰ Syriac-American Syriacist and deacon of the Syriac Orthodox Church, George Anton Kiraz, disagrees with Brock, stating that the term came from the Arabic for “script of the Gospel,” because of the religious nature of the earliest extant manuscripts. Kiraz also writes that Estrangela appears in all ancient manuscripts prior to the eighth century, and after a fall from popularity during that century, Estrangela continued to be used for headings and the numbering of quires in Syriac manuscripts to this day.²¹

Estrangela is known to be a cursive script because most letters connect to each other within a word. There are only eight letters that do not connect with the following letter to the left.²² That said, it is also an angular script, especially in comparison with the later Serto script. The letter forms are open and squared off, as opposed to rounded. An example of an Estrangela

²⁰ Brock, “An Introduction to Syriac Studies.” 23.

²¹ Kiraz, George A. *Turas Mamlla: A Grammar of the Syriac Language*. Piscataway, NJ: Gorgias, 2012. Print. 215-6.

²² Thackston, xvii.

manuscript is seen in Figure 20. All of the letter forms are characteristic of the Estrangela script and represent a perfect example.

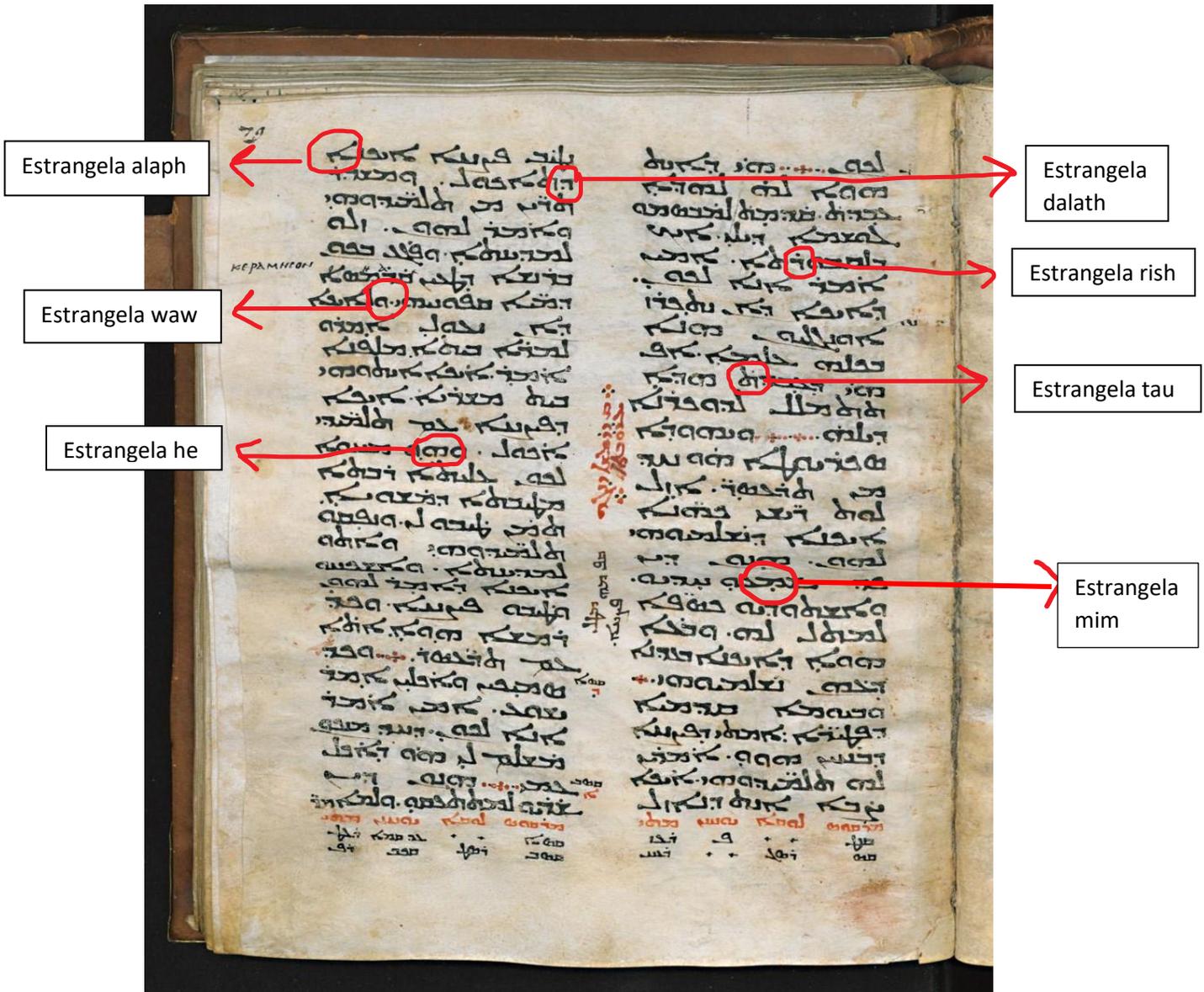


Figure 20: This is an image of Florence 1.40, an example of an estrangela manuscript. Every letter is representative of what an estrangela letter form should look like.

The Estrangela letters are as follows:

ARAMAIC EQUIVALENT	FINAL/ALONE FORM	INITIAL/MEDIAL FORM	NAME OF LETTER	VALUE
Ⲁ		Ⲁ	ālap*	, -a, -e
ⲁ	ⲁ	ⲁ	bēt	b
Ⲃ	Ⲃ	Ⲃ	gāmal	g
ⲃ	ⲃ	ⲃ	dālar*	d
Ⲅ	Ⲅ	Ⲅ	hēt*	h
ⲅ	ⲅ	ⲅ	wāw*	w, o, u
Ⲇ	Ⲇ	Ⲇ	zayn*	z
ⲇ	ⲇ	ⲇ	hēt	h
Ⲉ	Ⲉ	Ⲉ	ṭēt	t
ⲉ	ⲉ	ⲉ	yod	y, i, ē
Ⲋ	Ⲋ	Ⲋ	kāp	k
ⲋ	ⲋ	ⲋ	lāmad	l
Ⲍ	Ⲍ	Ⲍ	mim	m
ⲍ	ⲍ	ⲍ	nun	n
Ⲏ	Ⲏ	Ⲏ	semkat	s
ⲏ	ⲏ	ⲏ	ē	ē
Ⲑ	Ⲑ	Ⲑ	pē	p
ⲑ	ⲑ	ⲑ	ṣādē*	ṣ
Ⲓ	Ⲓ	Ⲓ	qop	q
ⲓ	ⲓ	ⲓ	rēš*	r
Ⲕ	Ⲕ	Ⲕ	šin	š
ⲕ	ⲕ	ⲕ	taw*	t

is one optional digraph:

Figure 21: Using the chart from Kiraz's "The New Syriac Primer," and letter images taken from our manuscript database that were selected and edited by Research Assistants, I compiled this visual of real examples of E letter forms.

Serto

The word "Serto" means linear, which describes the verticality of this script, which, according to Kiraz, begins to appear in manuscripts after the seventh century. Kiraz calls this script a "formalized version" of an earlier cursive hand found in the legal parchments of the 240s, inscriptions, and early colophons," which only became distinct script in the seventh

century.²³ Brock, however, disagrees with Kiraz, and states that the Serto script did not emerge until the eighth century.²⁴ Françoise Briquel Chatonnet, who catalogued the Syriac manuscripts at the National Library of France, argued that Serto developed in the sixth century in the geographic context of people using cursive, but that it was not used for copying until later.²⁵

Characteristics of the Serto script include a more rounded shape to the letters. Letters that were open in the Estrangela script (waw, mim) are now closed. The number of strokes required to make letters, such as alaph, is reduced, simplifying the writing process. As previously mentioned, the script can be defined by verticality. Instead of horizontal letter width as can be seen in the Estrangela script, Serto has vertically long letters; those letters that were wider have been shrunk, or, like semkath, for example, tilted so as to take up less horizontal space. The letters that change the most substantially from Estrangela to Serto are alaph, he, tau, dalath, and rish. Vat. Syr. 464, as seen below in Figure 22 is an example of a Serto manuscript.

²³ Kiraz, "Turas Mamlla." 216.

Kiraz, George Anton. *The New Syriac Primer: An Introduction to the Syriac Language with a CD*. Piscataway, NJ: Gorgias, 2007. Print. 139.

²⁴ Brock, "An Introduction to Syriac Studies," 23.

²⁵ Briquel-Chatonnet, Françoise. "Some Reflections about the Origin of the Serto Script." *The Harp: A Review of Syriac and Oriental Studies* (2005): 173-77. Print. 174.

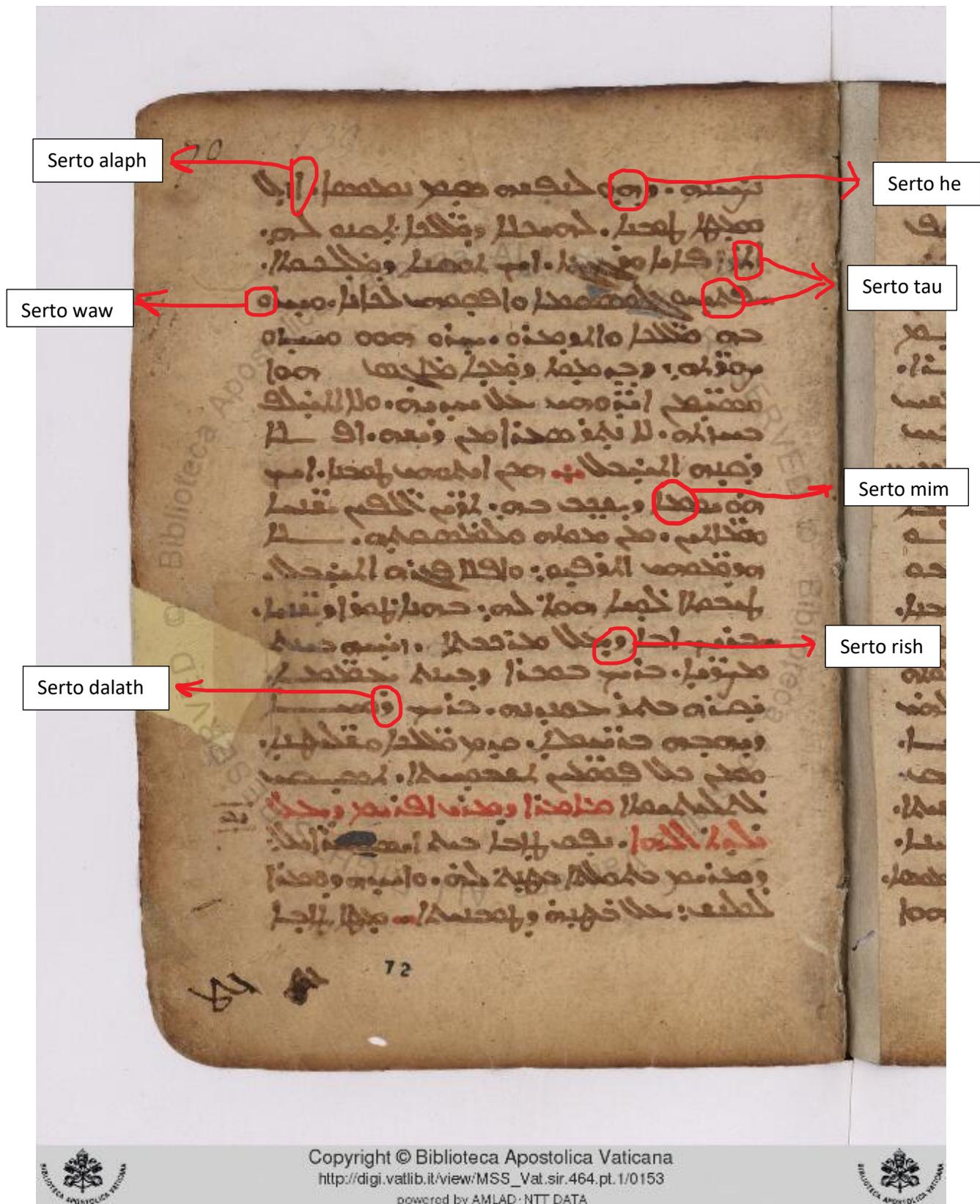


Figure 22: Vat. Syr. 464 is a perfect serto manuscript with all S letter forms.

lamad-ālap

The Jacobite (West Syriac) letters are as follows. Note particularly the various forms of *dālat*, *rēš*, *kāp*, and *taw* and the double lines of the final ^c*ē* and *lāmad*.

ALONE	FINAL	MEDIAL	INITIAL	NAME
	Ⲁ		Ⲁ	<i>ālap</i>
Ⲃ	Ⲅ	Ⲇ	Ⲃ	<i>bēt</i>
Ⲅ	Ⲇ	Ⲉ	Ⲅ	<i>gāmal</i>
	Ⲉ	Ⲋ	Ⲉ	<i>dālat</i>
	Ⲋ	Ⲍ	Ⲋ	<i>hēt</i>
	Ⲍ	Ⲏ	Ⲍ	<i>wāw</i>
	Ⲏ	Ⲑ	Ⲏ	<i>zayn</i>
Ⲑ	Ⲓ	Ⲕ	Ⲑ	<i>hēt</i>
Ⲓ	Ⲕ	Ⲗ	Ⲓ	<i>tēt</i>
Ⲕ	Ⲗ	Ⲙ	Ⲕ	<i>yod</i>
Ⲗ	Ⲙ	Ⲛ	Ⲗ	<i>kāp</i>
Ⲙ	Ⲛ	Ⲝ	Ⲙ	<i>lāmad</i>
Ⲛ	Ⲝ	Ⲟ	Ⲛ	<i>mim</i>
Ⲝ	Ⲟ	Ⲡ	Ⲝ	<i>nun</i>
Ⲟ	Ⲡ	Ⲣ	Ⲟ	<i>semkat</i>
Ⲡ	Ⲣ	Ⲥ	Ⲡ	^c <i>ē</i>
Ⲣ	Ⲥ	Ⲧ	Ⲣ	<i>pē</i>
Ⲥ	Ⲧ	Ⲩ	Ⲥ	<i>šādē</i>

INTRODUCTION TO SYRIAC

ⲑ	ⲑ	ⲑ	ⲑ	<i>qop</i>
ⲓ	ⲓ	ⲓ	ⲓ	<i>rēš</i>
ⲕ	ⲕ	ⲕ	ⲕ	<i>šin</i>
ⲗ	ⲗ	ⲗ	ⲗ	<i>taw</i>

Figure 23: I created this image using the Serto script chart from Kiraz's "New Syriac Primer," and images taken from our manuscript letter database to create this visual that shows the standardized and actual appearances of S letter forms.

Conclusion

The Standard Model is the most prevalent way of classifying Syriac scripts. It has been used for decades by scholars and can be found in textbooks, scholarly journal articles, and manuscript catalogs. Estrangela manuscripts use all E forms of the letter of the Syriac alphabet, while Serto manuscripts contain only S forms, which developed in the eighth century. Despite the consensus among the more well-known texts about the credibility of the Standard Model, there are several aspects in which that model is incorrect, which will be discussed in greater detail in the next chapter. Because of these problems, the Standard Model does not provide a reliable basis for further research.

CHAPTER 2: WHY IS THE STANDARD MODEL WRONG?

As stated in the previous chapter, the current manner of describing Syriac script types is wrong. From the definitions of the scripts, Estrangela and Serto, to the chronological framework they belong to, every part of the Standard Model is flawed. Specifically, the Standard Model suffers from five systemic flaws: manuscripts that have both S and E forms of the same letter, the appearance of S and E forms of different letters within one manuscript, all S letter forms do not appear in the eighth century as asserted by the Standard Model, individual S letter forms develop at different times, and scholars cannot agree on how to classify Syriac manuscripts. These five problems and their implications will be discussed in detail below.

Problem 1: Manuscripts having both S and E forms of the same letter

According to the Standard Model, any given letter in a manuscript will appear in either E or S form. That is, if one finds an example of an E alaph in a manuscript, one should expect to that every other alaph in said manuscript would also take on E form; if an S he is used in a manuscript, all other he in that manuscript will also be S form. The first challenge to this model is that in many cases, a manuscript will contain both the E and S forms of a letter. Figure 24 shows that these are not simply occasional occurrences.¹ Rather, no less than 20 of the 178 securely dated manuscripts display at least one letter in both its E and S form. This is especially prevalent between the ninth and eleventh centuries, when a full 18% of securely dated manuscripts show such overlap. Such violations of the Standard Model are not confined to these later centuries. For example, as seen in Figure 25, the most famous of Syriac manuscripts, BL. Add. 12150, has both round and angular dalaths and rishs. Securely dated to 411 CE, this is the

¹ View interactive version:

https://public.tableau.com/views/SyriacLettersproblem1/Sheet1?:embed=y&:display_count=yes

earliest known Syriac manuscript and already demonstrates a major flaw with the Standard Model. It is most common for a manuscript to use both the Estrangela and Serto forms of alaph, but both forms of rish, dalath, he, and tau also appear in some manuscripts.² The appearance of both E and S letter forms cannot be explained by a change in scribe; the letter forms appear to be used variably by a singular scribe and often two forms of the same letter can appear within the very same word.

Figure 26 shows an example of a manuscript that, upon first glance, appears to be obviously Serto. It contains S forms of rish, dalath, he, tau, alaph, mim, and waw – all of the letters that, according to the Standard Model, indicate that a manuscript is in the Serto script. However, upon looking closely, it is clear that the E form of alaph is also present. In this example, E alaph is used in the final position, while the S form is used in the middle and first position of words. This manuscript is BL. Add. 14548 and it is securely dated to 790 CE. This places the manuscript at the end of the period in which Serto supposedly emerges. Furthermore, this is the first dated use of a S alaph, which implies that this letter form was not popularly adopted until after the eighth century; a claim that can be substantiated by looking at Figure 24. This figure charts the usage of E and S forms over time for the primary letters, showing the relationship between the use of just E forms, just S forms, and both E and S forms for each letter.

In Figure 26, there are more S alaphs than E alaphs, but there are examples where this is not the case. Figure 27 is Vat. Syr. 14, which is securely dated to 956 CE and represents an

² Both forms of alaph: BL. Add. 14548, BL. Add. 17125, BL. Add. 14668A, BL. Add. 14650, BL. Add. 12167, BL. Add. 17130, BL. Add. 18819, Deir al-Surian 37, BL. Add. 14668B, BL. Add. 17111, BL. Add. 17174, Vat. Syr. 14, Deir al-Surian 22, BL. Add. 14488, BL. Add. 14489, BL. Add. 14510, BL. Add. 14679.

Both forms of rish: BL. Add. 12150, BL. Add. 14471, BL. Add. 14429, BL. Add. 17170, Syriacus Secundus.

Both forms of dalath: BL. Add. 12150, BL. Add. 14471, Har. Syr. 14.

Both forms of he: BL. Add. 7157, BL. Add. 17170, Syriacus Secundus.

Both forms of tau: BL. Add. 14679, Vat. Syr. 467.

instance of E being the dominant form of alaph with S forms scattered throughout. The scribe of this later manuscript used S forms of rish, dalath, he, mim, and waw, and the E form of tau.



Figure 24: This visual charts the use of E and S forms of primary letters over time. Each dot represents a manuscript, and each row represents a letter. E letter forms are on the bottom of each row, and S letter forms are at the top. This visualization plots the first occurrence of S forms of each primary letter.

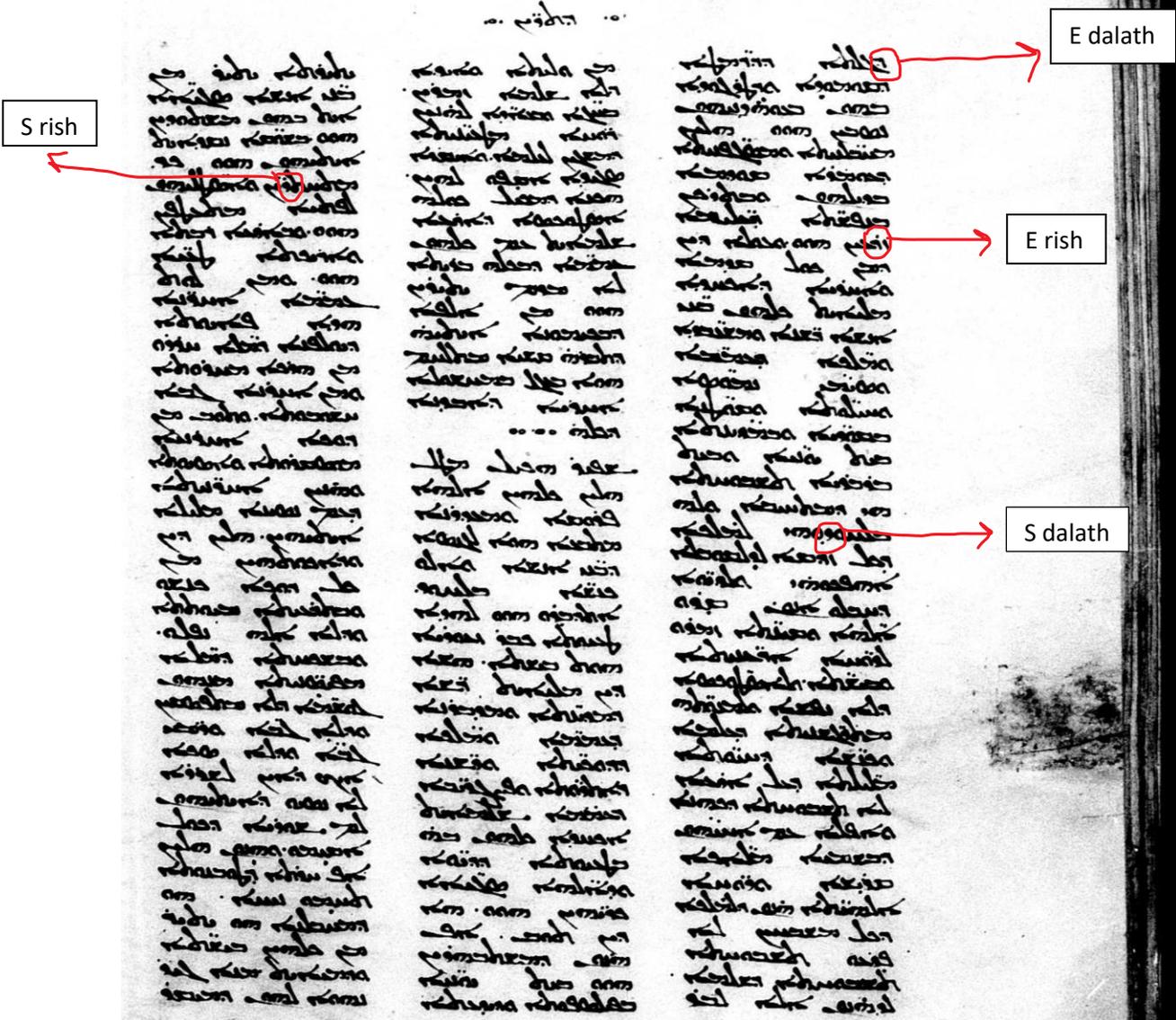
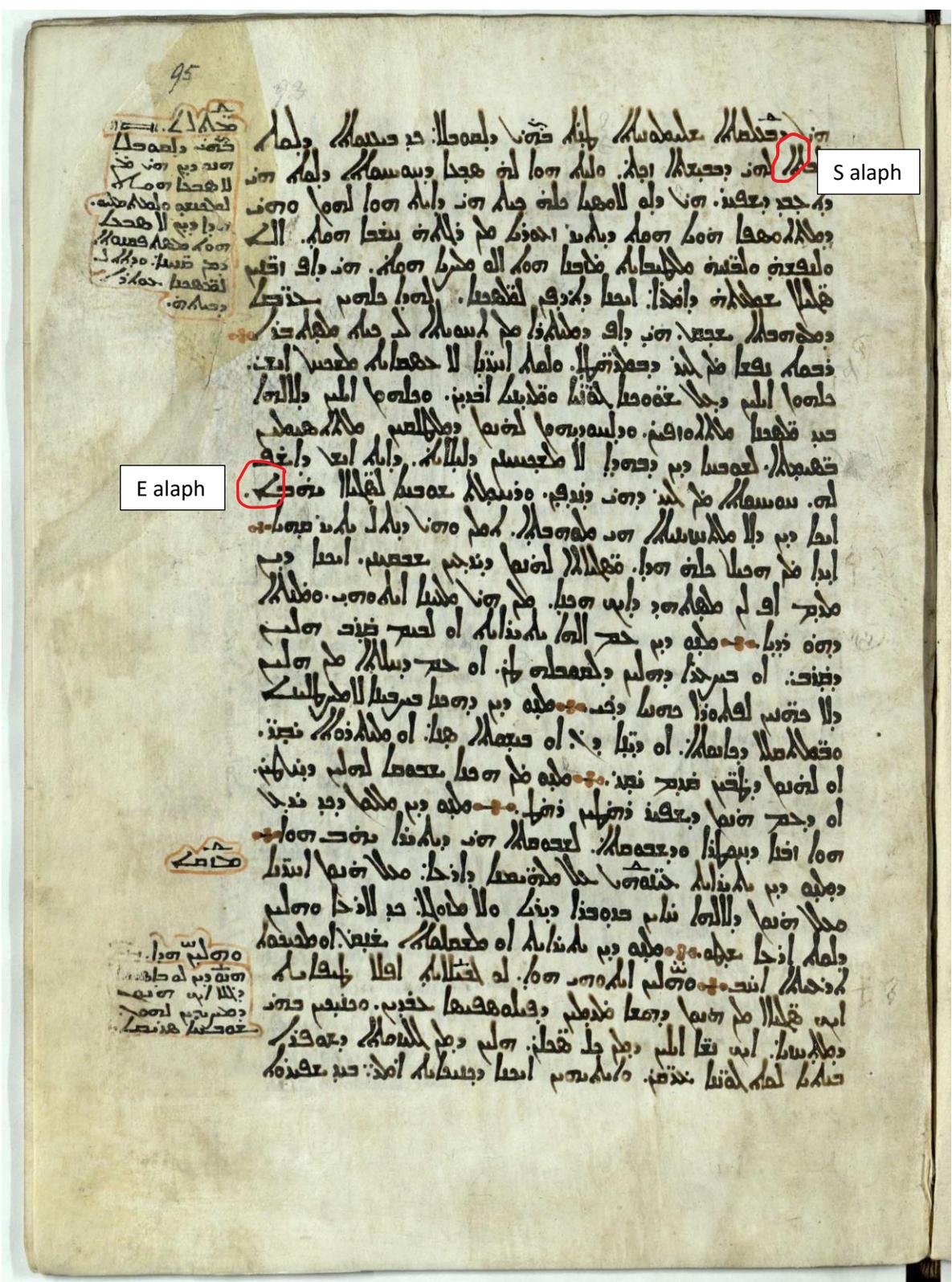


Figure 25: BL. Add. 12150, securely dated to 411 CE, uses both S and E forms of the letters dalath and rish. In other words, according to the Standard Model, it should only have one form of these letters, but in reality, it uses both the E and S forms interchangeably.



E alaph

S alaph

Figure 26: BL. Add. 14548 is securely dated to 790 CE. It demonstrates the use of both E and S forms of alaph in what most would define as a Serto script. According to the Standard Model, it should only have one alaph form, and that form would be S, but in reality, it uses S and E forms.

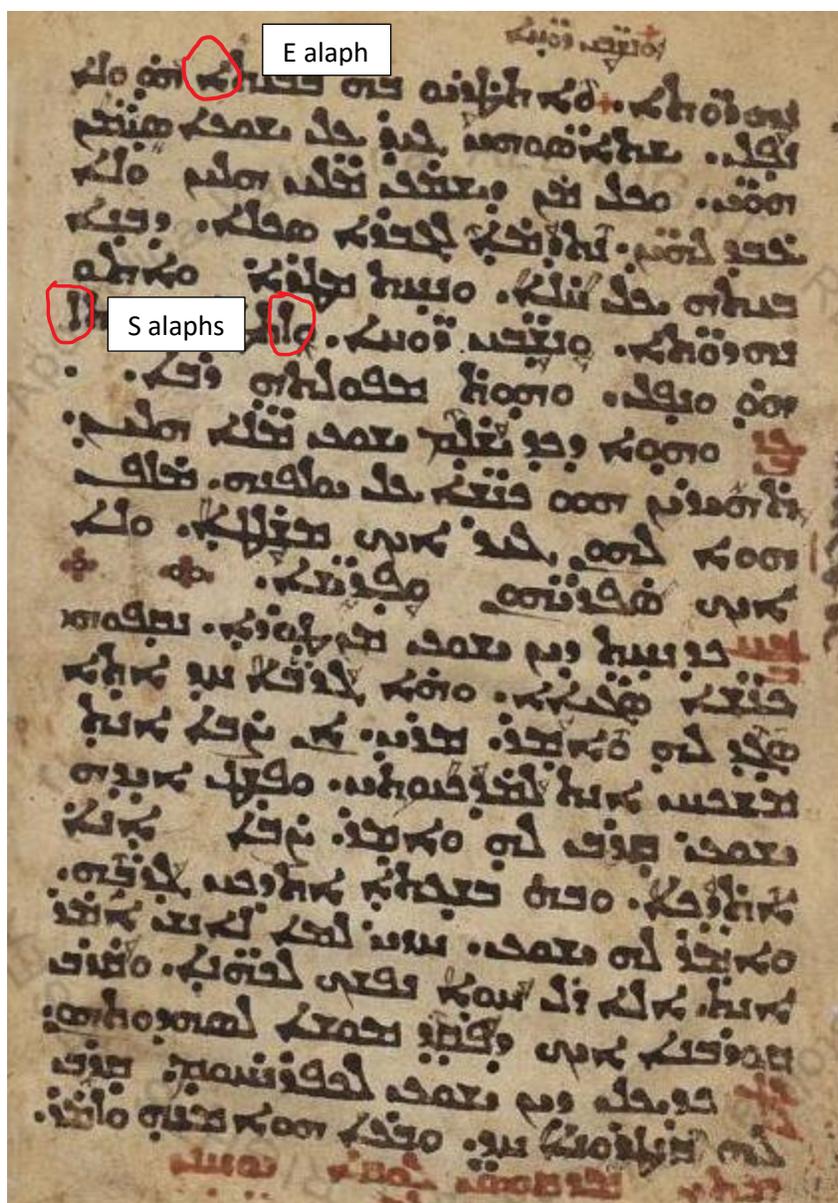


Figure 27: Vat. Syr. 14 is securely dated to 956 CE and uses mostly E alaphs, but a few S alaphs were also used on this page.

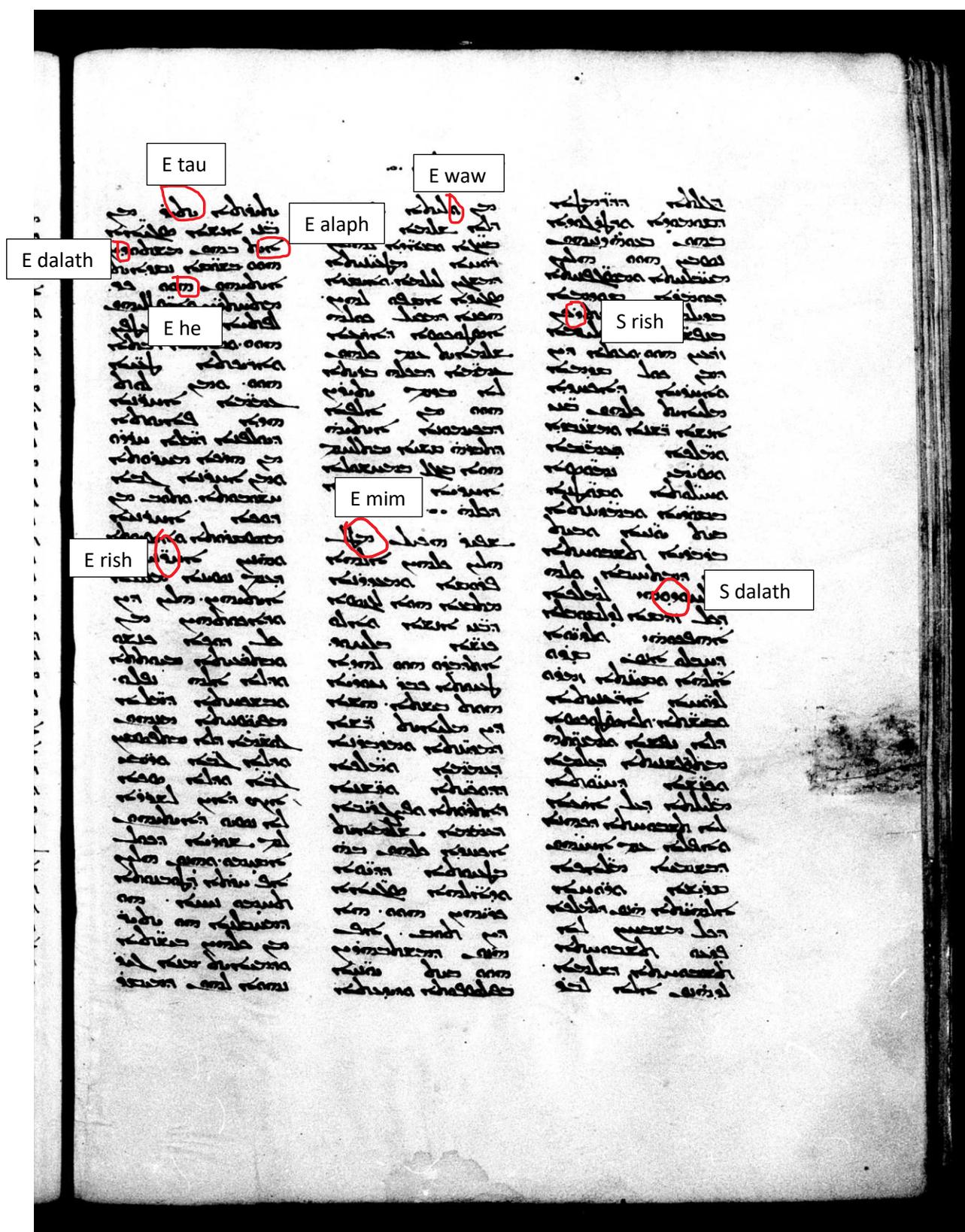
The combination of S and E letter forms of the same letter within a manuscript defies the logic behind the two exclusive categories of early Syriac scripts. A key component of the Standard Model is that Estrangela and Serto are entirely separate categories that do not overlap with each other. The fact that there are occurrences of every variable letter having both forms on a single manuscript demonstrates that the two scripts cannot be defined as exclusively E forms

(for Estrangela) or S forms (for Serto) - especially since many scribes used both forms of the very same letter.

Problem 2: Appearance of E forms of some letters and S forms of other letters within one manuscript

As defined by the Standard Model, any given manuscript should have either E forms of *all* the letters or S forms of *all* the letters. That is, if the manuscript has an E alaph, for example, so too its rishs dalaths, hes, taus, and so forth should all be E forms, and therefore in Estrangela script. Or, if a manuscript has an S form of alaph, so follows rish, dalath, he, etc. should all be S and thus in Serto script. However, in reality, E forms of certain letters and S forms of other letters often coexist in the same manuscript. For example, manuscripts that most scholars would identify as Estrangela will have a mixture of E and S letters. Similarly, manuscripts that most scholars would categorize as Serto will not only have S forms, but E as well.

These mixed-script manuscripts are not uncommon. An example of this is BL. Add. 12150, the most famous and oldest extant, securely dated Syriac manuscript. As we earlier saw in Figure 25, this manuscript would traditionally be identified as using the Estrangela script because it used E alaph, he, tau, mim, waw, rish and dalath. However, this manuscript also contains S forms of dalath and rish. Thus, BL. Add. 12150, seen in Figure 28, compounds two of the problems of the Standard Model of Syriac script, making it clear that this is not a problem that developed over time. The problem of mixed scripts has existed since the fifth century, from some of the earliest dated manuscripts of the Syriac tradition. It is a problem that the most famous manuscript in the Syriac tradition is not consistent with the Standard Model.



E tau

E waw

E alaph

E dalath

E he

S rish

E mim

E rish

S dalath

Figure 28: BL. Add. 12150, securely dated to 411 CE, is the oldest extant securely dated Syriac manuscript, which also makes it the most famous. It uses a mixture of E and S forms: E forms of alaph, he, tau, rish, dalath, mim and waw, but also frequent S forms of dalath and rish.

Another example of mixed E and S forms can be found in Figure 29, BL. Add. 12139, securely dated to 999 CE. Notably, this manuscript contains E alaph and tau, mixed with S dalath, rish, he, mim and waw. Based on the Standard Model, this manuscript should not exist. The importance of manuscripts such as BL. Add. 12139 is that their existence disproves the reigning theory of Syriac script styles. This pattern of E alaph and tau, S dalath, rish, he, mim, and waw is one of the most dominant patterns of deviation – 53% of securely dated manuscripts with a mix of E and S letter forms follow this pattern. However, not all mixed form manuscripts obey a pattern. There are examples of manuscripts with many other combinations of E and S letter forms.

These are not infrequent challenges to the Standard Model, their prevalence is illustrated by the following visualization. Consider Figure 30, which shows a chart in which each line represents a manuscript. The top row of the chart is E letter forms, the bottom row S, and the middle row, occurrences of both. Each column represents a variable letter: alaph, dalath, he, rish, tau, and waw.³ Thus, a manuscript that can be defined by the standard definition of Estrangela would be represented by a line straight across the top of the chart. A manuscript with all S forms of our variable letters (alaph, dalath, rish, he, tau, mim, and waw) would be represented as a straight line across the bottom of the manuscript. The color of the lines is determined by its date. The blue manuscripts are early and the orange manuscripts later. In Figure 30 the lowest chronological boundary is BL. Add. 12150 at 411 CE, and the uppermost boundary is 1099.

³ Mim is combined with waw in this chart. The two letters almost always take on the same form in a manuscript, and therefore can be combined for the purposes of this chart.

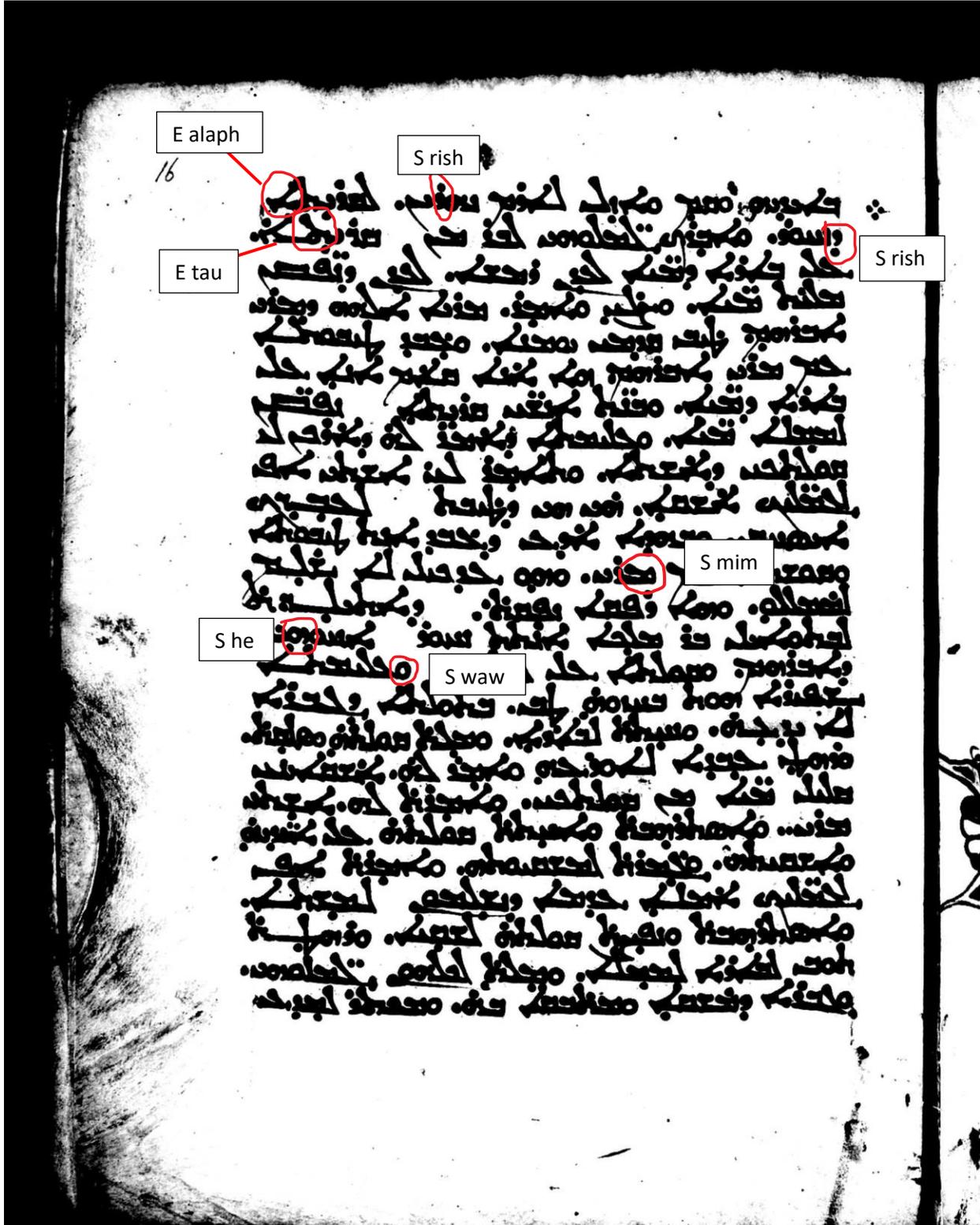


Figure 29: BL. Add. 12139, securely dated to 999 CE, includes E alaph and tau, and S rish, dalath, he, and waw, following a common pattern for manuscripts with E forms of some letters and S forms of other letters.

Figure 30 shows the chart that would result from using the Standard Model to predict occurrence of E and S forms in many manuscripts: straight lines at the top for Estrangela manuscripts, which would have all E forms, and straight lines at the bottom representing Serto manuscripts, which would have all S forms.⁴ The top lines would be multicolored (blue and orange) because Estrangela is found in the earliest manuscripts and continues throughout and past the 11th century, whereas the bottom lines would be mostly shades of orange as Serto is thought to have originated in the eighth century, and would therefore take on the color used for the later manuscripts.

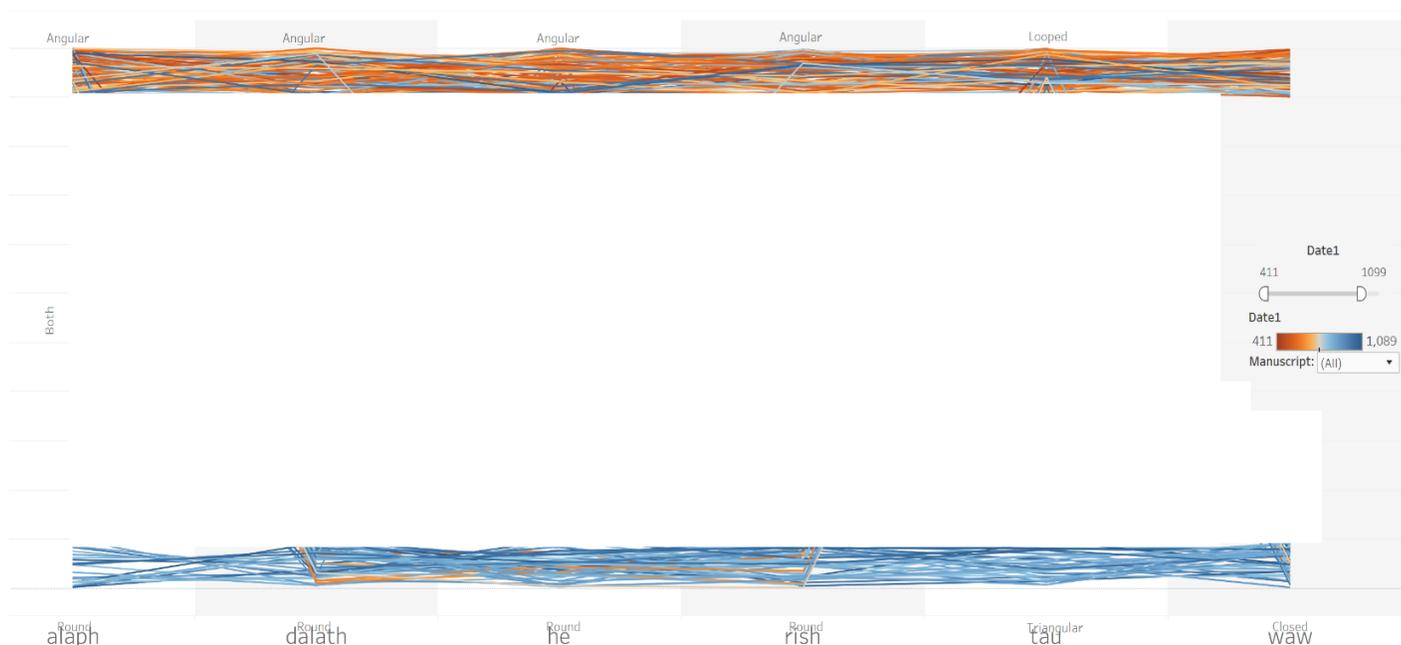


Figure 30: This image represents what the Standard Model would predict as representing the occurrence of E and S letter forms across all securely dated manuscripts – either all E letter forms or all S letter forms (in manuscripts occurring after the 8th century). This is a hypothetical image.

⁴ This is a hypothetical diagram. It was made by editing an image of Figure 31.

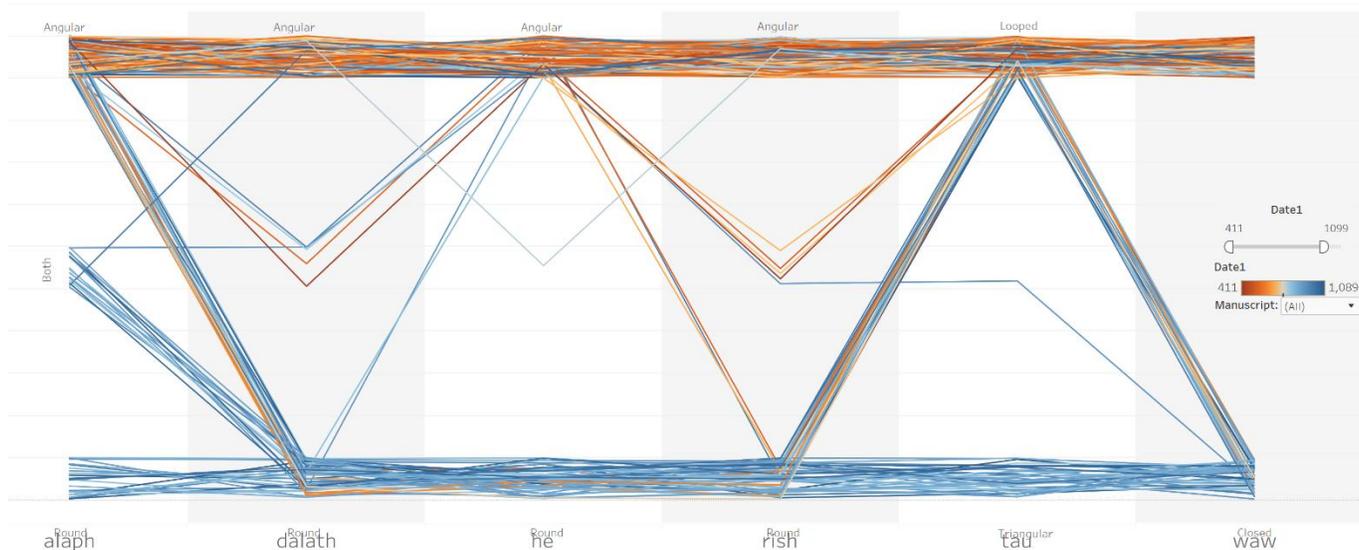


Figure 31: This chart accurately maps the use of E and S forms in each securely dated manuscript. Each line represents a manuscript, and whenever that line crosses through the center of the diagram, that manuscript diverges from the Standard Model. The top of the chart represents E letter forms and the bottom of the chart represents S letter forms. Orange lines are earlier manuscripts, and the bluer the line gets, the younger it is. This diagram only shows securely dated manuscripts from 411 to 1099.

In reality, when the use of E and S forms in manuscripts is plotted, it looks like Figure 31.⁵ Each line that crosses through the center of this chart represents a manuscript that disproves the Standard Model's insistence that Syriac manuscripts use either exclusively E forms or S forms.

As Figure 31 illustrates, such violations of the Standard Model's central premise are not rare. In fact, 28% of all securely dated manuscripts contain both E and S forms of letters. Clearly, this is not just an exception to a rule, but rather an indication that the Standard Model is fundamentally flawed. The fact that 28% of all securely dated manuscripts pass through the center of this chart highlights the prevalence of the issue. More detailed analysis indicates that this is a problem that only compounded over time. In the first few centuries from which we have securely dated manuscripts (411-600 CE), only four manuscripts have mixed E and S forms, constituting 6% of the manuscripts made in that period. This is depicted in Figure 32.

⁵ Link to the interactive version:
https://public.tableau.com/views/SyriacLetters/Dashboard1?:embed=y&:display_count=yes

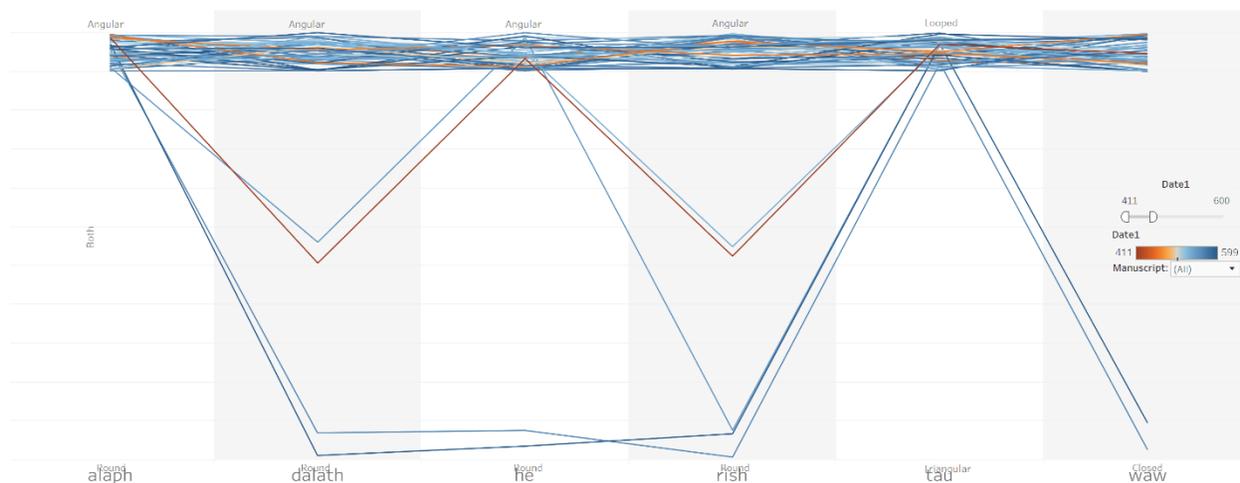


Figure 32: This chart shows the data when isolated to the dates 411 - 600 CE. Only 4% of securely dated manuscripts from this time period contain mixed E and S letter forms.

However, the number of mixed-script manuscripts produced vastly increases in the next two centuries up to 23% of manuscripts produced between 600 and 800 CE. This date range is shown in Figure 33. This is the period that Syriac scholars Kiraz and Brock have identified as the rise of the Serto script.

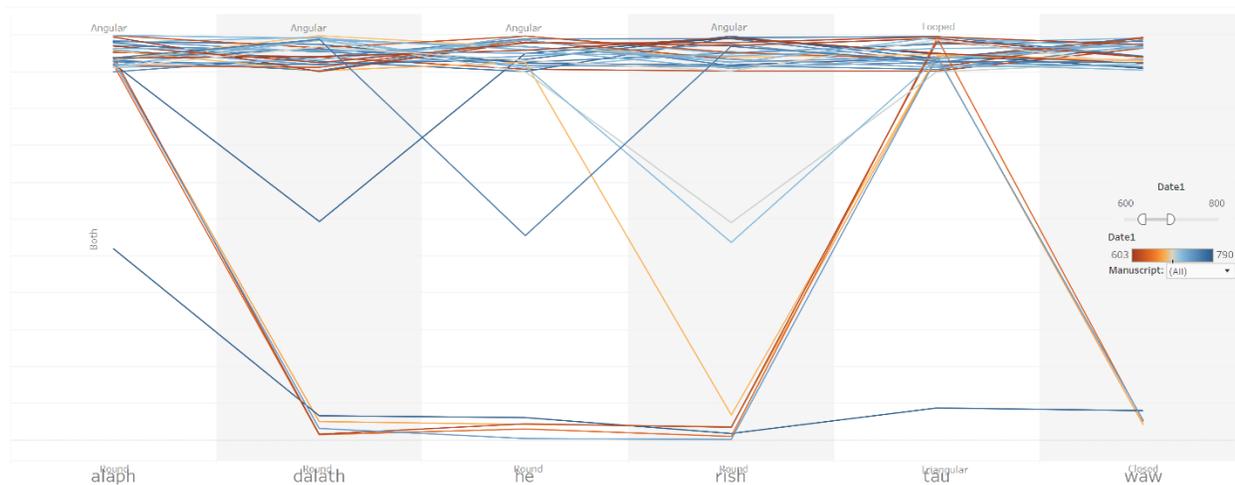


Figure 33: This image shows the usage of E and S forms in manuscripts produced between 600 and 800 CE. There were more manuscripts produced in this time period with mixed E and S forms, as seen by the increase in number of lines crossing through the center of the graph. 23% of all securely dated manuscripts produced had mixed E and S forms.

The proportion of manuscripts with mixed E and S forms continues to rise in the ninth and tenth centuries. 43% of all securely dated manuscripts produced in those centuries have mixed E and S forms. This can be seen in Figure 34.

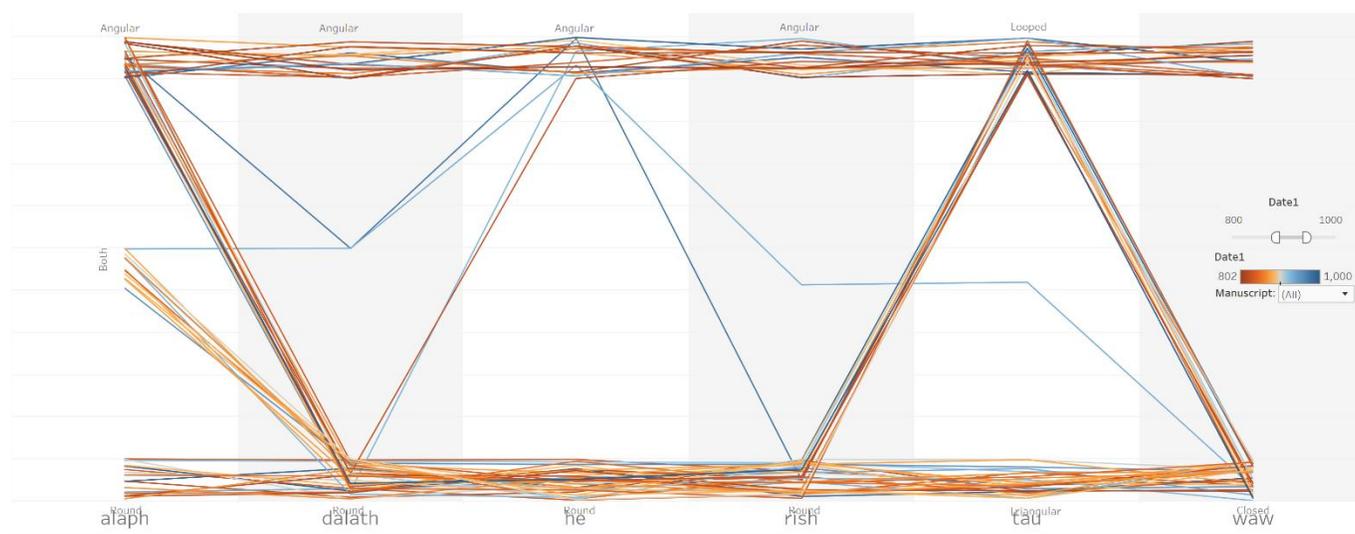


Figure 34: This chart shows all securely dated manuscripts produced between 800 and 1000 CE. There are even more manuscripts that contain mixed E and S letter forms, demonstrated by lines that cross through the center of the chart. Close to half of the manuscript produced in these two centuries had mixed E and S letter forms.

Problem 3: All S Letters do not all appear within the eighth century

In the previous chapter, we saw images of the Serto alphabet from various well-known textbooks. These images suggest that all Serto letter forms were invented and adopted at the same time, usually dated to the eighth century. Figure 35 shows another example of a Serto alphabet from the Amsterdam Centre for New Testament Studies. This chart, as well as the one used previously, demonstrate this assumption. However, most scholars know that a number of these letter forms do not appear until later than the eighth century. The letter forms in question are gomal, qoph, shin, and teth (the secondary letters). The problem with this is not that it was previously unknown and must be resolved, but rather that scholars do know about this but continue to present information in a manner in which propagates the assumption that all S forms developed at the same time.

		separate	final	middle	init		kb
ܐܠܦ	ܐܠܦ	ܐ	ܐ	ܐ	ܐ	'	1
ܒܬܐ	ܒܬܐ	ܒ	ܒ	ܒ	ܒ	b, β	2
ܓܘܡܐ	ܓܘܡܐ	ܓ	ܓ	ܓ	ܓ	g, γ	3
ܕܠܐܬܐ	ܕܠܐܬܐ	ܕ	ܕ	ܕ	ܕ	d, δ	4
ܗܐ	ܗܐ	ܗ	ܗ	ܗ	ܗ	h	5
ܘܘܐ	ܘܘܐ	ܘ	ܘ	ܘ	ܘ	v, w	6
ܙܐܝܢܐ	ܙܐܝܢܐ	ܙ	ܙ	ܙ	ܙ	z	7
ܫܘܬܐ	ܫܘܬܐ	ܫ	ܫ	ܫ	ܫ	ch, ç	8
ܩܘܦܐ	ܩܘܦܐ	ܩ	ܩ	ܩ	ܩ	q	9
ܝܘܕܐ	ܝܘܕܐ	ܝ	ܝ	ܝ	ܝ	y	10
ܟܘܦܐ	ܟܘܦܐ	ܟ	ܟ	ܟ	ܟ	k, χ	20
ܠܡܘܕܐ	ܠܡܘܕܐ	ܠ	ܠ	ܠ	ܠ	l	30
ܡܘܡܐ	ܡܘܡܐ	ܡ	ܡ	ܡ	ܡ	m	40
ܢܘܢܐ	ܢܘܢܐ	ܢ	ܢ	ܢ	ܢ	n	50
ܫܘܡܩܐܬܐ	ܫܘܡܩܐܬܐ	ܫ	ܫ	ܫ	ܫ	s	60
ܐܝܐ	ܐܝܐ	ܐ	ܐ	ܐ	ܐ	'	70
ܦܐ	ܦܐ	ܦ	ܦ	ܦ	ܦ	p, f	80
ܩܘܦܐ	ܩܘܦܐ	ܩ	ܩ	ܩ	ܩ	q	90
ܩܘܦܐ	ܩܘܦܐ	ܩ	ܩ	ܩ	ܩ	q	100
ܩܘܦܐ	ܩܘܦܐ	ܩ	ܩ	ܩ	ܩ	r	200
ܩܘܦܐ	ܩܘܦܐ	ܩ	ܩ	ܩ	ܩ	sh, š	300
ܩܘܦܐ	ܩܘܦܐ	ܩ	ܩ	ܩ	ܩ	t, θ	400

fonts used: Serto Malinkara JK 2010, after Eb. Nestle version 1.2

Figure 35: The Amsterdam Centre for New Testament Studies published this image as representative of the Syriac alphabet, with the Serto alphabet in the left side of each column.

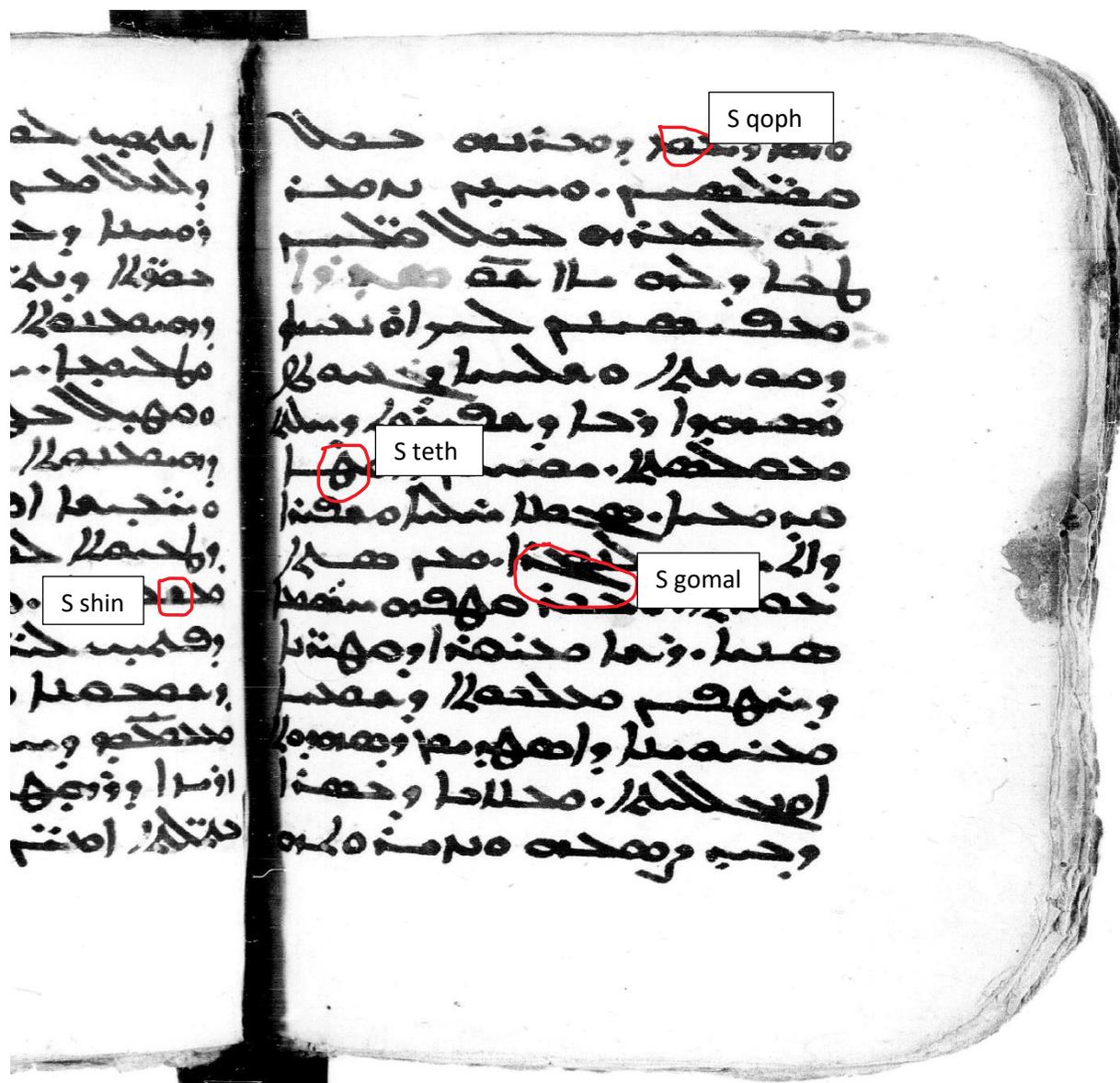


Figure 36: Par. Syr. 169, securely dated to 938 shows the first examples of S teth, qoph, gomal, and shin. Because this manuscript was made after the eighth century, this proves that all S forms did not develop at the same time.

In fact, gomal, qoph, shin, and teth all developed in the tenth century or later. Figure 36 shows the first appearance of the S forms of gomal, qoph, shin, and teth in Par. Syr. 169, which is securely dated to 938 CE. Prior to this date, only the E form of these four letters appeared even in manuscripts most scholars would define as Serto manuscripts. By comparing the letters seen in Figure 36 with those in the chart in Figure 37, it becomes clear that the Serto alphabet used in textbooks by scholars is the one that was only established in the tenth century at the earliest. The

S forms of these four letters do not become prevalent until the 13th century, as can be seen in Figure 37. Figure 37 is a screenshot from the Syriac Script Table developed by Professors Penn and Howe and discussed in the introduction. It shows the letters gomal, qoph, shin, and teth (in that order) in the 13 latest securely-dated manuscripts in my dataset, ranging in date from 1088 to 1265. This table shows that the S form of all four letters do not become popular until the

	BL. Add. 17127 Date: 1088	BL. Add. 17213 Date: 1100- 1101	BL. Add. 14679 Date: 1102	Cam. Add. 1700 Date: 1166	BL. Add. 17224 Date: 1173	Har. Syr. 141 Date: 1208	Cam. Add. 2918 Date: 1217- 1218	Cam. Add. 1972 Date: 1218	BL. Add. 17253 Date: 1222- 1223	Vat. Syr. 464 Date: 1233- 1234	BL. Add. 17256 Date: 1249- 1250	BL. Add. 14686 Date: 1255	Cam. Add. 1967 Date: 1265	S forms
gomal														
teth										IMAGE NOT AVAILABLE				
qoph														
shin														

Figure 37: This is a screenshot of a the Syriac Script Table developed by Professors Penn and Howe. It shows the latest 20 securely dated manuscripts of which we have digital images. This section of the chart shows that some S letter forms do not appear until the thirteenth century

thirteenth century. The E form of each of these letters is predominantly used through the eleventh and twelfth centuries, even in manuscripts scholars generally categorize as Serto. Another early use of the S forms of these letters occurs in the securely dated manuscript Cambridge Add. 1700, from 1166. The manuscript Cam. Add. 2918, dated to 1217 marks the point when the S forms of gomal, qoph, shin, and teth become used in the majority of securely dated manuscripts from that time period..

Although many scholars recognize that the S forms of some letters (gomal, qoph, shin, and teth) did not appear until centuries after the supposed emergence of Serto, this is not communicated in literature about the language. Tables such as that seen in Figure 35 demonstrate the misinformation that is being propagated by Syriac textbooks. The manner in which the Serto

alphabet is portrayed in scholarly literature suggests that all S forms developed at the same time, during the seventh or eighth centuries, however this is not the case, as can be seen in Figures 36 and 37. The S forms of gomal, qoph, shin, and teth are first seen in the tenth century, two centuries after all S forms allegedly developed, and these forms do not become commonly used until the thirteenth century. It is a problem that the thirteenth-century form of Serto is being described as the eighth-century version of the script in textbooks.

Problem 4: Individual letters develop S Forms at different times

As described in the previous section, the S forms of the secondary letters all developed well after the eighth century, which is an issue in that the Serto alphabet as found in textbooks does not truly exist until the tenth century. This problem is compounded by the fact that the letters whose S forms do exist in the eighth century (alaph, dalath, rish, he, tau, mim and waw) all develop at different times, and often before the eighth century. BL. Add. 12150 again proves this point with the appearance of the S forms of dalath and rish in 411 CE. Dalath and rish are the first S forms to develop of all the variable letters. Of the securely dated manuscripts produced before 800 CE, 12% use S forms of rish and/or dalath.

He, mim, and waw were the next letters to appear in their S form first in the manuscript Vatican Syr. 137, which is securely dated to 564 CE, again well before the supposed birth of Serto in the eighth century. As shown in Figure 38, Vat. Syr. 137 uses the S forms of dalath, rish, he, mim, and waw, but E forms of alaph and tau. This is one of the dominant patterns of deviation from the norm. S he is found in seven of the 82 securely dated manuscripts produced before 800 CE, which is 9% of all securely dated manuscripts produced before the supposed development of the Serto script. Similarly, 7% of all securely dated manuscripts made prior to 800 CE use the S form of waw or mim.

8% of securely dated manuscripts produced before 700 CE use S forms of dalath, rish, he, mim, and/or waw. The S forms of alaph and tau did not develop until significantly later than dalath, rish, he, mim, and waw. The first appearance of the S forms of alaph and tau are in the manuscript BL. Add. 14548, securely dated to 790 CE, seen in Figure 39.

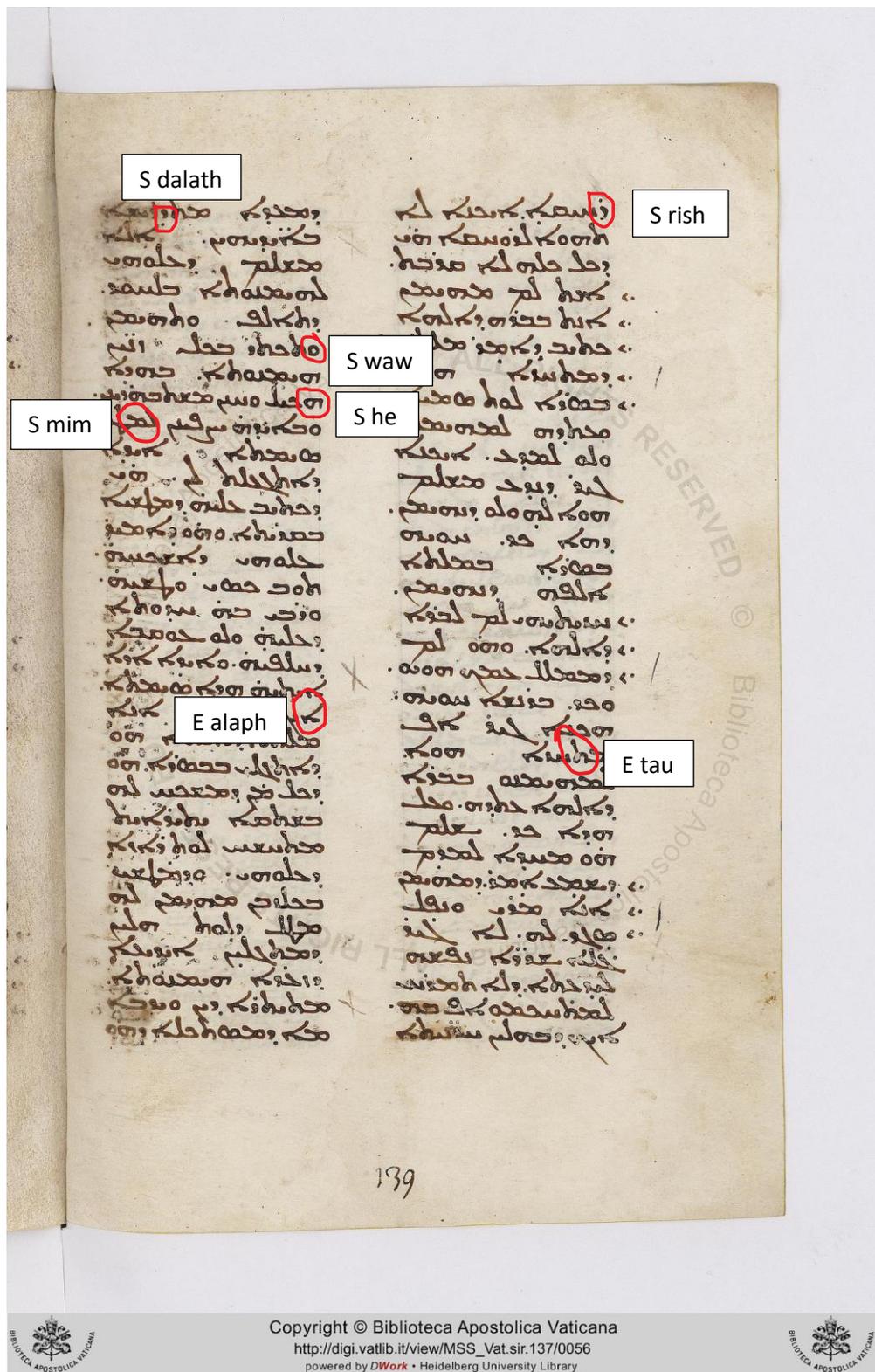


Figure 38: Vat. Syr. 137, securely dated to 564 CE shows the first appearance of the S forms of he, mim, and waw. It also uses the S form of dalath and rish, which had already developed by this time. But the scribe still uses E forms of alaph, and tau

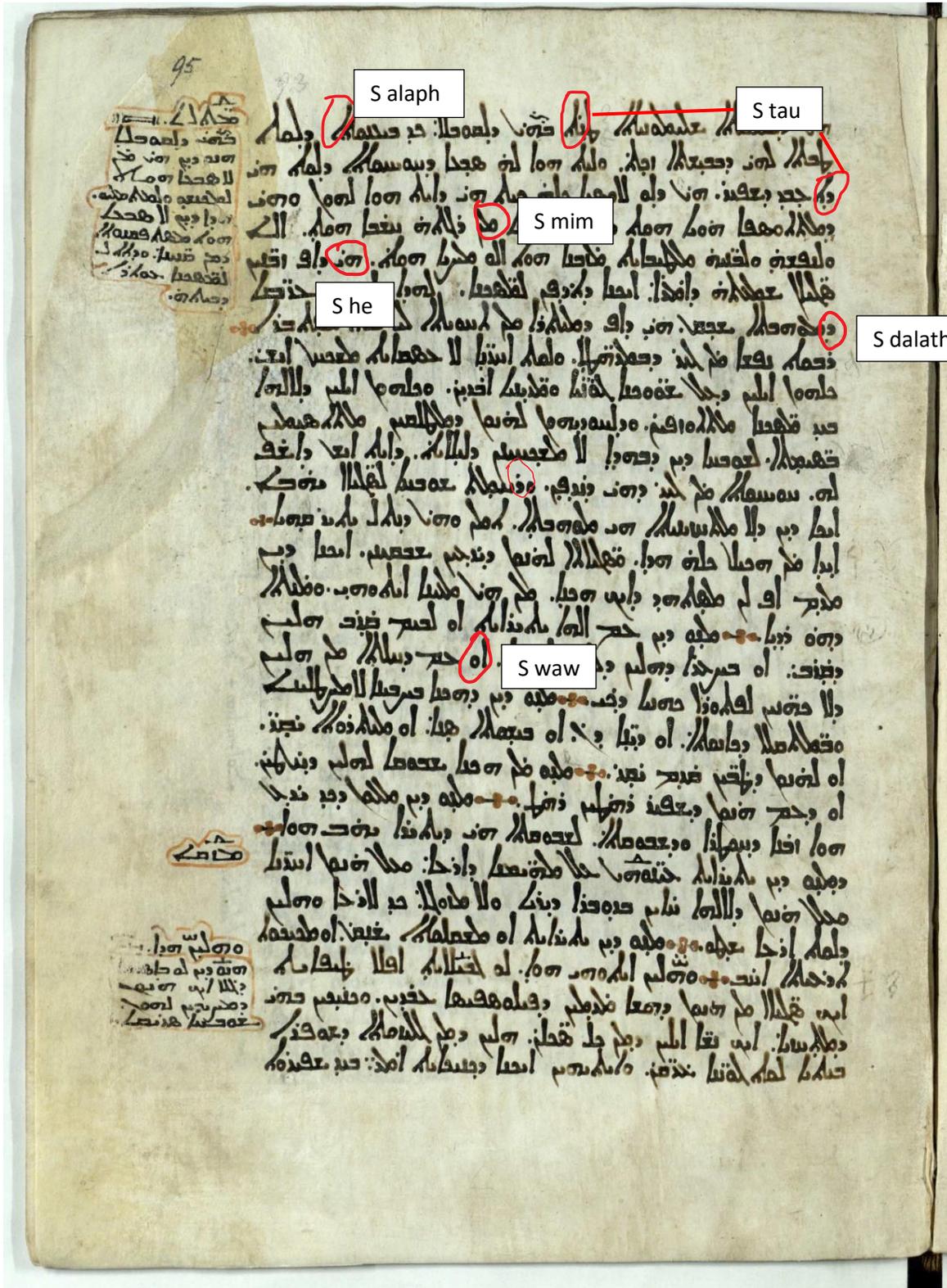


Figure 39: BL. Add. 14548 shows the first use of the S forms of alaph and tau. It also uses the S forms of dalath, rish, he, mim, and waw, making this the first manuscript that fits the Standard Model of Serto.

The S forms of alaph and tau do not appear in a securely dated manuscript until the eighth century, two centuries after the first appearance of the S forms of dalath, rish, he, mim, and waw. The S forms of alaph and tau do not become commonly used until the mid-ninth century. 24% of all securely dated manuscripts produced in the ninth century use the S form of alaph, which increases to 32% in the tenth century. The S form of tau shows a similar pattern, with 29% of all securely dated manuscripts made in the ninth century using S forms, increasing to 53% in the tenth century. As previously discussed, the S forms of other letters, such as gomal, qoph, shin, and teth, do not appear until the tenth century. Therefore, there are four distinct dates in which different S letter forms first appear in securely dated manuscripts: 411 (dalath, rish), 564 (he, mim, and waw), 790 (alaph, tau), and 938 (gomal, qoph, shin, teth). Rather than the development of the Serto script in the eighth century, the letter forms that make up the Standard Model's definition of this script all appear at different times and only two of the ten first appear in the eighth century. The Serto script cannot be defined as developing in the eighth century if the letter forms that characterize the script appear in intervals.

Problem 5: Scholars do not agree on script classification

In order to determine the impact of problems one through four on the manner in which scholars use and understand the Syriac scripts Estrangela and Serto, I compiled a quiz that was sent to five scholars in the field: David Mitchelson is an assistant professor of Christianity at Vanderbilt Divinity School. He is the founder of Syriac.org, an online clearinghouse of digital tools for the study of Syriac Christianity. Aaron Michael Butts is an assistant professor in Northwest Semitics at the Catholic University of America and co-editor of the main reference encyclopedia in Syriac studies. Thomas Carlson is assistant professor of history at the University of Oklahoma and specializes in Middle Eastern history and Syriac Christianity. Adam McCollom

is a post-doctoral researcher at the University of Vienna and previously was the chief cataloger of Syriac manuscripts at St. John's University. Ayda Kaplan is a recent Ph.D. from the University of Leuven where she completed a dissertation on Syriac paleography.

I first compiled images of 14 manuscripts that fit the Standard Model's definition of either Estrangela or Serto. Within these, there were eight that would traditionally be classified as Estrangela (containing all primary E forms), and six that fit the definition of Serto (containing all primary S forms). Then, I picked 21 manuscripts that demonstrated the above-named problems, having either the S and E form of a particular letter, or a mixture of S forms of certain letters and E forms of other letters within one page. Next, I mixed all the manuscript images together so that they were in random order, and placed each image on a slide within a 33 slide PowerPoint Presentation.⁶ The written instructions for the quiz asked the scholars to look at a manuscript image, and first choose between Estrangela and Serto to define the script used. Then, they were asked if they would change their answer to Medial script if given the chance (Medial is a term that some in the field use to describe both a certain combination of E and S letters). This looked like:

Manuscript 1:

1. If you could only choose between Serto and Estrangela to define this manuscript, which would you choose?
 - a. Serto
 - b. Estrangela
2. If a third category, medial, is introduced, how do you now define the manuscript?
 - a. Serto
 - b. Estrangela
 - c. Medial

⁶Originally, there were 35 images, but I have only used the data from 33 of these. Two of the manuscripts were removed because the images I chose were not properly edited and included two different hands in the images shown.

Manuscript Name	My Classification	A	B	C	D	E
BL Add 17126	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela
BL. Add. 17182B	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela
Vat. Syr. 13	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela
BL. Add. 7157	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela
BL. Add. 7157	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela
BL. Add. 12160	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela
BL. Add. 14428	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela
BL. Add. 14448	estrangela	estrangela	estrangela	estrangela	estrangela	estrangela

Figure 40: This chart shows the manuscripts that were used as the control Estrangela category and the responses of the scholars to these manuscripts. The control Estrangela category only included manuscripts that used all E forms and would be considered Estrangela per the Standard Model.

Figure 40 shows the results for the Estrangela control manuscripts. There was consensus between the scholars that all the Estrangela control manuscripts were, in fact, Estrangela. This is in accordance with Franklin & Marshall College Professor Garth I. Moller, who, in his article, *Towards a New Typology of the Syriac Manuscript Alphabet*, argues that there is general agreement in Syriac scholarship about what should be considered Estrangela.⁷ However, following Moller's argument, there was less agreement about what would be categorized as Serto between the scholars.

Figure 41 shows the scholars' responses to the manuscripts I identified as Serto by the Standard Model. I expected the results for the control Serto category to be the same as Estrangela – consensus among the scholars and agreement with the Standard Model because of the presence

Manuscript Name	My Classification	A	B	C	D	E
BL Add 14623	serto	serto	serto	serto, medial	serto, medial	serto
BL. Add. 12153	serto	serto	serto	estrangela, medial	serto, medial	serto, medial
BL. Add. 14580	serto	serto	serto	serto	serto, medial	serto
BL. Add. 14582	serto	serto	serto	serto	serto, medial	serto
BL. Add. 14651	serto	serto	serto	serto	serto, medial	serto
BL. Add. 14651	serto	serto	serto	serto	serto, medial	serto

Figure 41: This chart shows the answers of the 5 scholars to the manuscripts that fit the Standard Model definition of Serto, and include all primary S forms.

⁷ Moller, Garth I. "Towards a New Typology of the Syriac Manuscript Alphabet." *Journal of Northwest Semitic Languages* 14 (1988): 153-97. Print. 158.

of only S letters. In this chart, any deviance from the expected response is written in pink. When the scholar answered differently on question two than question one for a given manuscript, both responses are written. The results of the survey, as seen in the above figure were unexpected to me. Scholar D, in fact, identified all of these manuscripts as Medial, while Scholar C initially named one as Estrangela. The scholars were never in complete agreement about script identification, and at best only four of the five scholars agreed on the script identification. These results agreed with Moller’s hypothesis that, “there is a great deal less agreement as to what counts as Serta,” which can be seen in the variance in the scholars’ responses.⁸

The results were even more divergent when it came to manuscripts with a combination of E and S forms. I used the term “mixed” on the chart to describe any manuscript with a combination of E and S forms so that there would be no confusion with textbook definitions. Again, in Figure 42, words written in pink are those that deviated from my classification of the script.

Manuscript Name	My Classification	A	B	C	D	E
Vat. Syr. 14	mixed	estrangela, medial	serto, medial	estrangela	estrangela, medial	estrangela, medial
Vat. Syr. 137	mixed	estrangela, medial	estrangela, medial	estrangela	estrangela	estrangela, medial
BL. Add. 14679	mixed	serto	serto	estrangela, medial	serto, medial	serto
BL. Add. 12139	mixed	estrangela, medial	estrangela	estrangela	estrangela, medial	estrangela
BL. Add. 17110	mixed	estrangela, medial	estrangela	estrangela	estrangela, medial	estrangela
BL. Add. 17174	mixed	serto	serto	serto, medial	serto, medial	serto, medial
Dam. Patr. 12/13	mixed	estrangela, medial	estrangela, medial	estrangela	estrangela, medial	estrangela
BL. Add. 14686	mixed	estrangela, medial	estrangela, medial	estrangela	estrangela, medial	estrangela
BL. Add. 17125	mixed	serto	serto	estrangela, medial	serto, medial	serto, medial
BL. Add. 17256	mixed	estrangela, medial	estrangela, medial	estrangela	estrangela, medial	estrangela
BL. Add. 12165	mixed	estrangela, medial	estrangela, medial	estrangela	estrangela, medial	estrangela
Vat. Syr. 152	mixed	estrangela, medial	estrangela	estrangela	estrangela, medial	estrangela
BL. Add. 14471	mixed	estrangela, medial	estrangela	estrangela, medial	estrangela, medial	estrangela
BL. Or. 8731	mixed	estrangela, medial	serto	estrangela, medial	estrangela, medial	estrangela, medial
Vat. Syr. 467	mixed	estrangela, medial	serto, medial	estrangela	estrangela, medial	estrangela, medial
BL. Add. 14579	mixed	estrangela, medial	estrangela, medial	estrangela	estrangela, medial	estrangela
BL. Add. 14515	mixed	estrangela, medial				
BL. Add. 14650	mixed	serto	serto	serto, medial	serto, medial	serto, medial
BL. Add. 12152	mixed	estrangela, medial	serto, medial	estrangela, medial	estrangela, medial	estrangela

Figure 42: The chart lists the manuscript name, and my classification of the manuscript. I used the term “mixed” rather than medial on the chart to describe any manuscript with a combination of E and S forms so that there would be no confusion with the textbook definition of medial. Words written in pink are those that deviated from my classification of the script.

⁸ Ibid.

It is clear that there is little consensus between the scholars. There were few identifiable patterns for classification by the scholars, each had their own manner of identifying the script used. One scholar, for example, tended to categorize scripts as Estrangela and then medial, whereas another often identified scripts with mixed E and S forms as only Estrangela. The medial option was chosen 40% of the time (including the control Serto manuscripts), and 62% of the time that I identified the script as mixed. Scholars A, B, C, D, and E only agree on one of the 19 manuscripts with mixed E and S forms (BL. Add. 14515). On most of the manuscripts, the scholars are divided with three agreeing on one identification while two agree on a different one. 79% of the time, the majority of the scholars chose Medial, acknowledging the presence of mixed E and S forms. 14 of the 19 manuscripts have responses that have agreement between two or more scholars on a Standard Model definition of the script seen (either Serto or Estrangela).

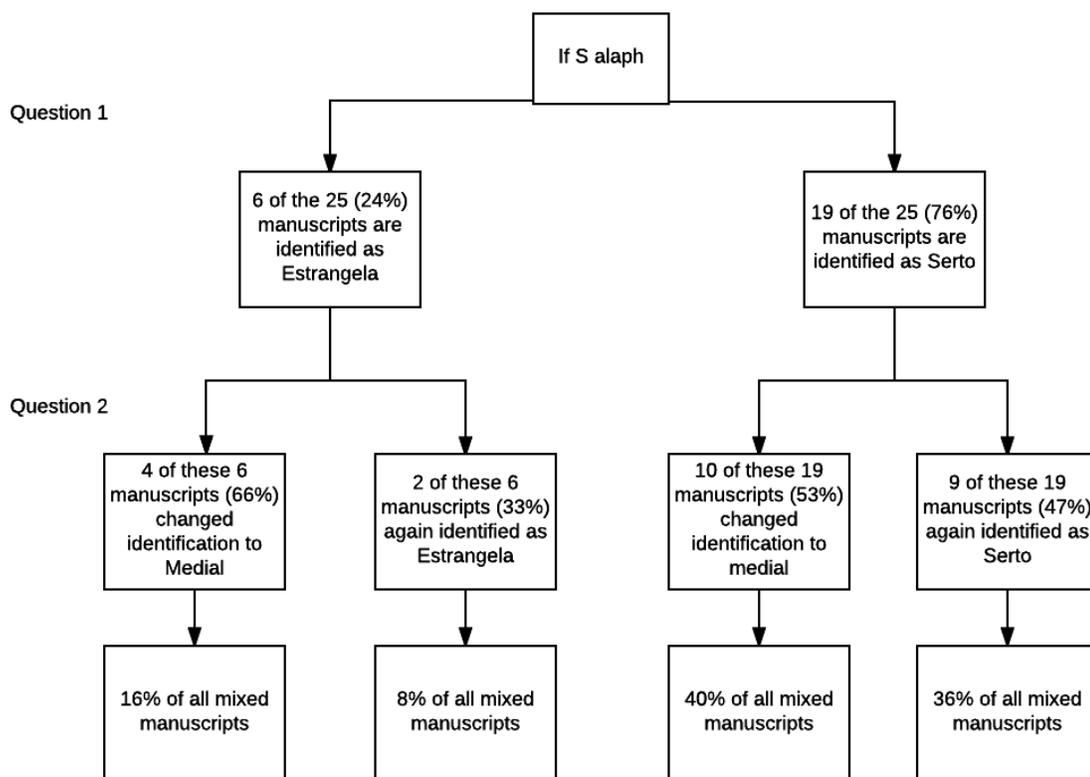


Figure 43: This is a flow chart describing how the five scholars reacted when presented with a manuscript with S alaph. The scholars most often chose to identify this manuscript as Serto after question one and Medial after question two.

When S alaph was present, the scholars were more likely to identify a manuscript as Serto (i.e. Vat. Syr. 14, BL. Add. 14679, BL. Add. 17174, BL. Add. 17125, BL. Add. 14650).

Figure 43 shows the results of the survey when the five scholars were presented with an S alaph. The scholars were most likely to identify the script as Serto in question one, however almost a quarter of the script identifications deviated from that norm. In response to question two, Medial was the most popular answer. Clearly, the Standard Model is not working if scholars cannot agree on one identification of the script. Because the mix of E and S forms found in these manuscripts do not fall within the definitions of Estrangela or Serto, the five scholars were not able to agree on one definition. 56% of the mixed E and S form manuscripts that had S forms of alaph were identified as medial, 36% identified as Serto, and 8% identified as Estrangela.

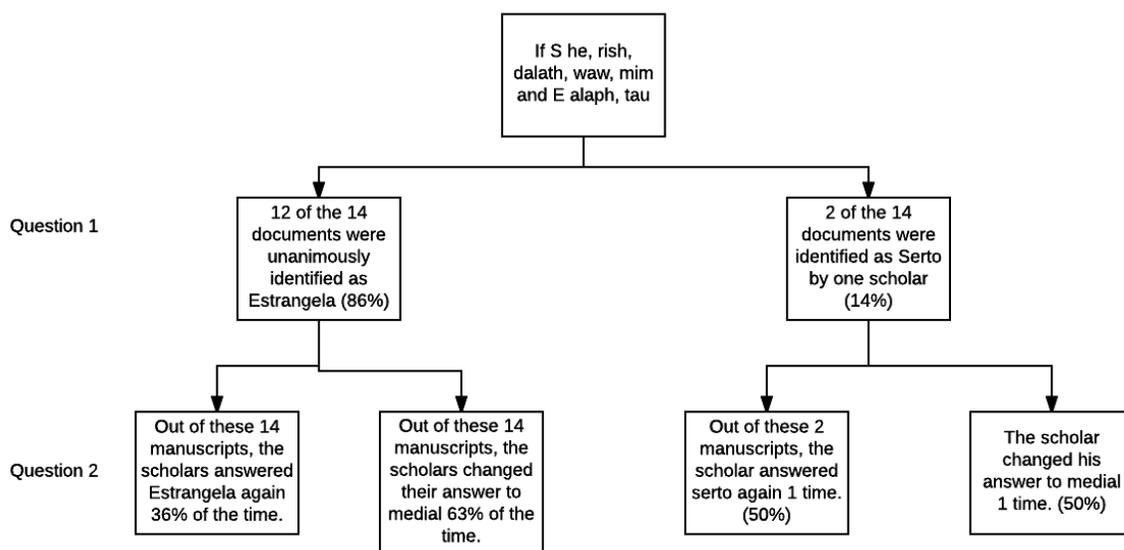


Figure 44: This chart shows the responses of the scholars when S forms of he, rish, dalath, waw, and mim were present in the manuscript alongside E forms of alaph and tau. In most cases, the scholars identified the script as Estrangela at first and then as medial. Only very rarely was Serto chosen to identify this script pattern.

Combinations of E and S forms that did not include S alaph and tau (for example, S he, rish, dalath, mim, and waw, with E alaph and tau) were more often identified as Estrangela. This can be seen in Figure 42. Most the time, the manuscript was identified as Estrangela in question one and then Medial in question two. In spite of this, the fact that so many manuscripts were

identified as Estrangela is concerning. These manuscripts contained at least five S forms, but were still identified as Estrangela rather than Serto. The added category of Medial is necessary in order to fix some of these issues, and many scholars used Medial in order to place mixed E and S form manuscripts, however this category did not have a common enough usage by the scholars to make it a viable option to fix the Standard Model.

It seems that each scholar has his or her own way of identifying the scripts, as each has their own pattern. Scholar A tends to identify a mixed manuscript as Estrangela first and then as medial, whereas scholar E identifies mixed manuscripts as Estrangela more often than medial. Clearly, there is confusion in the field about how to identify a manuscript that does not fit the Standard Model. There was very little consensus on the manuscripts aside from the Estrangela control manuscripts. When presented with mixed E and S form manuscripts, scholars only agreed one out of 19 times – there is a problem with the Standard Model.

Conclusion

There are many problems with the Standard Model of Syriac script definitions. E and S forms of one letter are used interchangeably by a single scribe; E and S forms of different letters can appear in a single manuscript page written by a single scribe; not all S forms appear during the eighth century, and in fact each form develops at a different date. Finally, scholars do not agree on script identifications, even when an intermediary category is available. The Standard Model is not adequate to define Syriac scripts. As shown in future chapters, there are distinct intermediary patterns that exist which can also be divided chronologically. Some scholars have also noted these patterns and attempted to integrate them into the Standard Model. But I believe that the only way to have useful, appropriate categories is to throw the Standard Model out and start over.

CHAPTER 3: EVALUATING ALTERNATE MODELS

Other scholars have also grappled with the previously discussed problems with the Standard Model. I am not the first to notice that there are scripts that do not fall easily into a single category.¹ John F. Healy, of the University of Manchester, concluded that early S letter forms needed to be inspected in closer detail, but he does not do this himself.² So too, manuscripts that defy the Standard Model often get filed as minor repairs or exceptions to the norm because prior to this project, scholars were able only to look at one manuscript at a time. This restriction made it very difficult to see the prevalence of deviation from the Standard Model.

Some scholars have sought to define an intermediary category to explain these deviations. Although a handful of scholars have noted deviations from the Standard Model, such scholars have tried to assimilate these deviant manuscripts into the Standard Model, rather than create a new model. Even then, these occasional objections have remained in hard-to-find journal articles and have not affected introductory textbooks to Syriac or general Syriac reference works. In part, this is due to previous scholars having access to a much smaller set of securely dated manuscripts. However, once one examines the majority of securely dated manuscripts, as done in this project, it becomes clear that no modification of the Standard Model or minor tweak will fix

¹ Healey, John F. "The Early History of the Syriac Script: A Reassessment." *Journal of Semitic Studies* XLV/1 (Spring 2000): 55-67. Print.

Palmer, Andrew. "The Syriac Letter-Forms of Tūr Abdīn and Environs." *Oriens Christianus* 73 (1989): 68-89. Print. 74-6.

Brock, Sebastian, and Lucas Van Rompay. *Catalogue of the Syriac Manuscripts and Fragments in the Library of Deir-al Surian, Wadi Al-Natrun (Egypt)*. Leuven: Uitgeverij Peters En Departement Oosterse Studies, 2014. Print.

Kaplan, Ayda. "The Shape of the Letters and the Dynamics of Composition in Syriac Manuscripts (fifth to Tenth Century)." *Ruling the Script in the Middle Ages: Formal Aspects of Written Communication (Books, Charters, and Inscriptions)*. Ed. S. Barret, D. Stutzmann, and G. Vogeler. Turnhout: Brepols, 2016. 379-98. Print.

² Healey, 56.

the current understanding of the Syriac script. The truth is that manuscripts very rarely stick to the Standard Model, making the Standard Model outdated and, frankly, misleading. In a few cases, alternate models have been proposed. This chapter will evaluate three of those models: Andrew Palmer's introduction of the category "Medial," Sebastian Brock and Lucas Van Rompay expansion upon this idea, and Ayda Kaplan's introduction of four new scripts.

Palmer - Medial

Palmer, in his article, "The Syriac Letter-Forms of Tūr Abdīn and Environs," maintains the use of Standard Model definitions of Estrangela and Serto, but adds a new category to this model. He describes a "Medial script" which has "rounded and closed," mim, semkath, waw, he, dalath, and rish. Or in other words, contained S forms of those letters, including the primary letters of dalath, rish, he, and waw. Palmer was the first to use the term "Medial" to describe this script, a term which he adopted from Latin paleography. Palmer states that Medial script was in use from the eighth century onward.³ An example of a manuscript Palmer would identify as Medial is BL. Add. 12152, pictured in Figure 45. This manuscript is dated to 837 CE, placing it in Palmer's time period of post-eighth century. It has E forms of alaph and tau, and S forms of mim, semkath, waw, he, dalath, and rish. A decade later, Françoise Briquel Chatonnet suggests that this



Figure 45: BL. Add. 12152, securely dated to 837 contains S forms of he, dalath, rish, waw, semkath, and mim and E forms of alaph and tau. This manuscript fits Palmer's definition of medial perfectly.

³ Palmer, 76-8.

hand is an Edessenian script that represents an intermediary stage between Estrangela and Serto.⁴ John F. Healey also states that this script is an informal version of Estrangela.⁵ Both scholars use the same pattern of E and S letters to categorize this script. As noted in previous chapters, this is one of the most common deviant patterns of mixed E and S letters, and appears in over 50% of securely dated manuscripts that have both E and S forms. Therefore, adding medial to the Standard Model does account for a large percentage of manuscripts that deviate from the Standard Model.

However, Palmer's model does have problems of its own. For example, Palmer only lists the letters: mim, semkath, waw, he, dalath, and rish. He does not account for manuscripts in which only some of these letters are present in their S forms, for example BL. Add. 12150, which has S forms of dalath and rish, but no other letters (Figure 46). Furthermore, BL. Add.

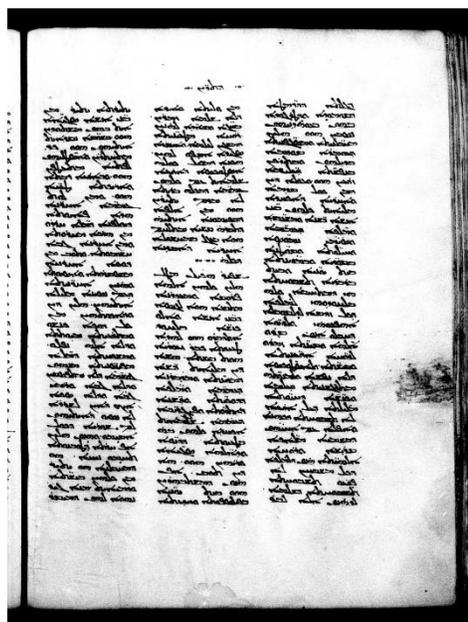


Figure 46: BL. Add. 12150 is an example of a manuscript that does not fit in Palmer's schema. It has S forms of dalath and rish, but E forms of every other letter. Palmer does not account for a mixture of the letters he identifies as designating medial script.

⁴ Briquel Chatonnet, 176.

⁵ Healey, 65

12150 is from the fifth century – Palmer writes that medial begins in the eighth century. A better example of this issue with the schema can be found in BL. Add. 17110, securely dated to 599 CE and pictured in Figure 47. Therefore, the chronological component of Palmer’s model is also incorrect. Another problem with Palmer’s model is that he does not account for when both E and S forms of one letter are used at the same time. For example, what would BL. Add. 14548, which has both E and S forms of alaph be classified as? Or, how would BL. Add. 14471 with both forms of rish and dalath (and S he, waw, and mim be identified)? Both manuscripts can be seen in Figure 48.

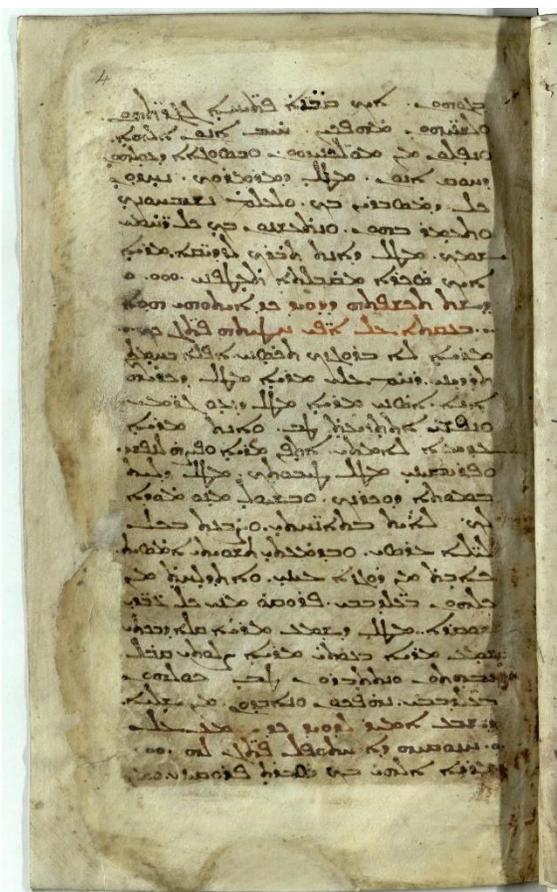


Figure 47: BL. Add. 17110, securely dated to 599 contains S forms of he, dalath, rish, waw, semkath and mim. According to Palmer, this manuscript should be identified as Medial, but it is dated to prior to the eighth century. Palmer’s article asserts that Medial did not exist at that time.

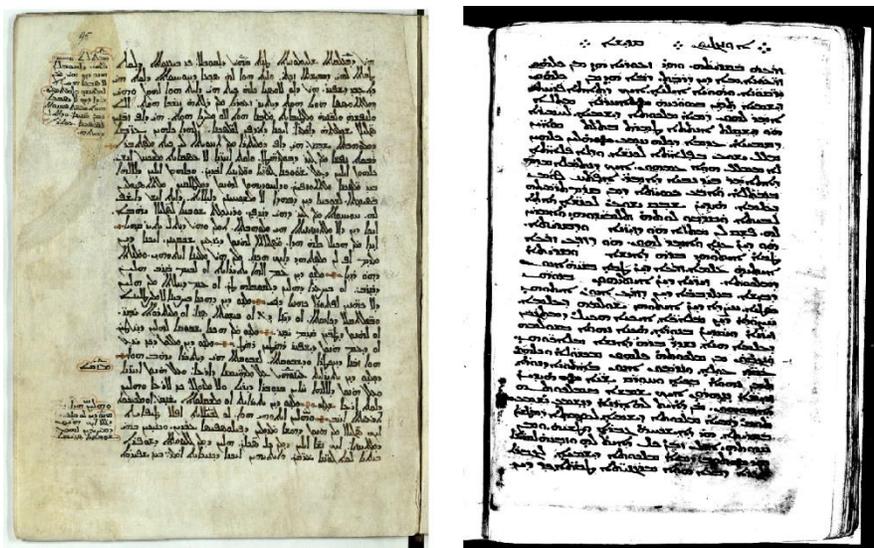


Figure 48: LEFT: BL. Add. 14548 with E and S forms of alaph. RIGHT: BL. Add. 14471 with E and S forms of dalath and rish. Neither of these manuscripts is accounted for by Palmer's script schema.

Palmer, Briquel Chatonnet, and Healey identify a major pattern of deviance from the Standard Model and label this Medial script. Palmer's Medial is a significant improvement over the Standard Model of just Estrangela and Serto, but it does not solve all the problems of the Standard Model. There are many patterns of deviance that go unaddressed in Palmer's article, and the chronology is incorrect. Although Medial is a substantial improvement, our dataset lends itself to a more nuanced model.

Brock and Van Rompay

Sebastian Brock and Lucas Van Rompay expanded on the idea of Medial in the 2014 text *Catalogue of the Syriac Manuscripts and Fragments in the Library of Deir-al Surian, Wadi al-Natrun (Egypt)*, by modifying the preexisting Standard Model to include the new category of Medial Estrangela, and dividing Serto into early and later hands.⁶ This schema defines

⁶ Brock and Van Rompay, xxi-xxii.

Estrangela as having open (E) forms of he, waw, and mim, existing from the fifth century onwards and becoming rare in and after the tenth century (Figure 49).

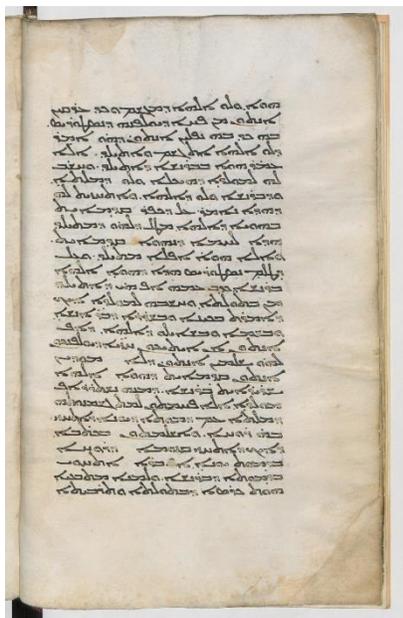


Figure 49: BL. Add. 17126 is an example of Brock and Van Rompay's Estrangela. This manuscript uses E forms of all letters, and the open bottom of waw and mim are especially clear in this manuscript.

Medial Estrangela differs from Estrangela in that it has closed (S) forms of he, waw, and mim.

All other letters take E form as can be seen in Figure 50. According to Brock and Van Rompay,

Medial Estrangela was in use from the eighth or ninth century onwards.



Figure 50: Berlin Syr. 26 is an example of a Medial Estrangela manuscript. This manuscript uses S forms of mim, waw, and he and E forms of alaph and tau. This manuscript is securely dated to the eighth century.

Early Serto adds the S forms of alaph and tau to the S forms found in Medial Estrangela (he, waw, mim). Early Serto developed in the eighth century and continued to be used until it was mostly replaced by Later Serto. Brock and Van Rompay's Early Serto fits the Standard Model definition of Serto, and Figure 51 is an example of a perfect Early Serto manuscript.

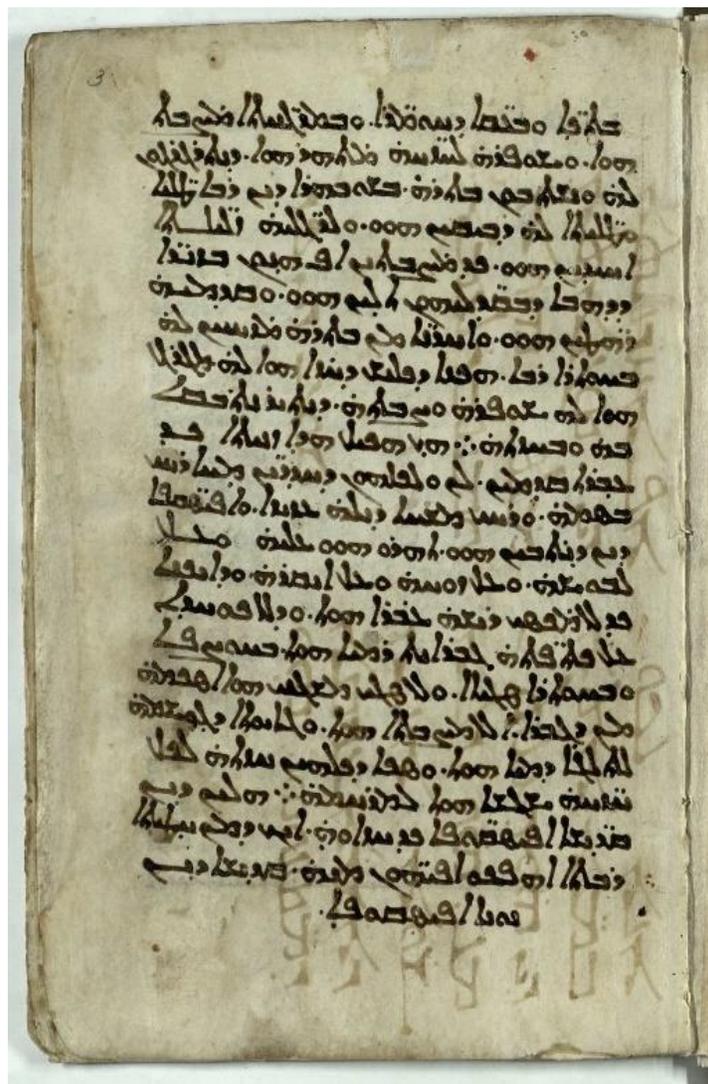


Figure 51: BL. Add. 14651, securely dated to 850 is an example of an Early Serto manuscript. It has S forms of alaph, tau, he, mim, and waw.

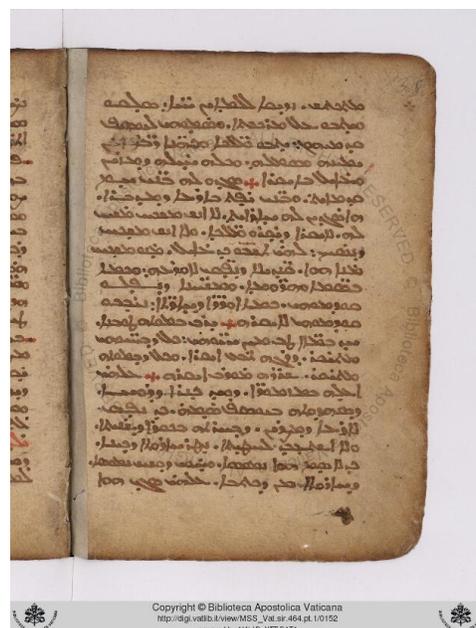


Figure 52: This twelfth-century manuscript, Vat. Syr. 464, has S forms of shin, beth, and qoph. This is an example of Later Serto as defined by Brock and Van Rompay.

Later Serto, which is present from the twelfth century onwards, adds the S forms of shin, beth, and qoph. This script is represented by Figure 52.

Brock and Van Rompay also suggest the addition of a Transitional category for when both E and S forms of alaph are used in a single manuscript, or when alaph and tau do not both take S form in a manuscript but only one of those letters does (i.e. S form of alaph and E form of tau with S forms of he, waw, and mim).⁷ Figure 53 is an example of a Transitional manuscript.

⁷ Brock and Van Rompay, xxi-xxii.



Figure 53: Vat. Syr. 152 uses both E and S forms of alaph and tau. It also has S forms of he, waw, and mim. It is securely dated to 979 CE. This is an example of a Transitional manuscript in Brock and Van Rompay's schema.

This script schema successfully addresses the chronological issues with the Standard Model, especially the fact that different S letter forms emerge at different times. The category of Later Serto especially represents this correction in that it addresses the S letter forms (qoph, shin, beth) that do not appear in securely dated manuscripts until the twelfth century. However, this does not account for the existence of what should be considered Medial Estrangela manuscripts prior to the eighth century. For example, Vat. Syr. 137 and BL. Add. 17110, both securely dated to the sixth century, should be defined by Brock and Van Rompay as Medial Estrangela

manuscripts, but they do not align with the chronology of this schema. Vat. Syr. 137 is pictured in Figure 54.



Figure 54: Vat. Syr. 137, securely dated to 564, uses S forms of he, waw, and mim, which means that Brock and Van Rompay should define this manuscript as Medial Estrangela. However, because this manuscript was made in the 6th century, it falls outside the dates given by Brock and Van Rompay for this script style.

The insistence of the Standard Model on the development of Serto in the eighth century, and the reluctance of scholars to rethink this is a major problem. Even this script schema, which somewhat successfully addresses the problem of S forms developing at different times, use of both E and S forms of one letter, and use of E and S forms of different letters interchangeably, does not resolve the fixation on the eighth century. To correct this script schema, Medial Estrangela should begin in the sixth century.

Another issue with this model is that it ignores dalath and rish, two of the primary letter forms. I believe that Brock and Van Rompay did not include dalath and rish as primary letters for the identification of Syriac script because of the problem of BL. Add. 12150. This manuscript, which uses both E and S forms of dalath and rish, and is the oldest securely dated manuscript (411 CE), would upset the dates of the entire model. By ignoring those two letters, the scholars avoid the problem of addressing the appearance of S letter forms in the early fifth century. This evasion of BL. Add. 12150 is common in Syriac scholarship. Furthermore, S he, waw, and mim never appear in a securely dated manuscript without S dalath and rish. Therefore, they should be added to this schema.

Overall, this is a better schema than the Standard Model because the script categories somewhat successfully address the problem of S forms developing at different times. The only case in which this is not successful is in the assertion that Medial Estrangela developed in the eighth century. I believe that the addition of dalath and rish as primary letters in the identification of a script would also benefit this model. I also believe that the category of Transitional deserves more attention than the cursory sentence it receives in this text. The use of both E and S forms of alaph and tau is extremely common among the securely dated manuscripts in my dataset, and should be addressed more thoroughly. In conclusion, Brock and Van Rompay present a more

useful schema than the Standard Model, but because this was presented as one paragraph in a catalog of manuscripts, it does not get the attention that it deserves.

Kaplan

In a recent article, Ayda Kaplan introduces an entirely new schema. Her model is similar to that of Brock and Van Rompay but it divests itself from the Standard Model by using different language to name the scripts. Kaplan states that her approach is based on Latin paleography in which different forms derive from one script and develop autonomously.⁸ This idea is influenced by Chatonnet and Healey's arguments that Serto was developed from a regional form of Estrangela.⁹

Kaplan's four Syriac scripts are Monumental, which is the Standard Model definition of Estrangela, having all E forms (Figure 49). Monumental Semi-Cursive is defined as having S dalath, rish, he, and waw. According to Kaplan, upon first glance, a Monumental Semi-Cursive manuscript will look like what she terms a monumental manuscript. By this, she means that the letters will be less rounded and more angular in appearance. This category is comparable to Brock and Van Rompay's Medial Estrangela, but Kaplan adds the letters dalath and rish. Figure



Figure 55: BL. Add. 18819 is an example of Cursive Semi-Monumental. It has both E and S forms of alaph, and S forms of dalath, rish, he, waw, and mim. It also has E forms of gomal and shin.

⁸ Kaplan, 385.

⁹ Kaplan, 384.

50 is also an example of a Monumental Semi-Cursive manuscript. Cursive Semi-Monumental has the roundness of the Serto script (Formal Cursive, in Kaplan's words), but contains E and S forms of any letter, and E (monumental) forms of gomal and shin. This category is not comparable to any from Brock and Van Rompay. It has a similar definition to that of Transitional, but many Transitional manuscripts do not have the rounded appearance of a Cursive Semi-Monumental manuscript (as seen in Figure 53). A good example of a Cursive Semi-Monumental manuscript can be found in Figure 55. Finally, Formal Cursive is Standard Model Serto (S forms of every letter, including gomal and shin). Figure 56 depicts Kaplan's script model.

Kaplan also attempts to address the question of why both E and S forms may be found in a single manuscript. She writes that in order for a scribe to justify a manuscript column properly, he may have used an S letter form to condense the space a word took up, or an E form to elongate the word. In this way, the scribe had agency in choosing which letter form he was using.¹⁰ This is especially important when considering the problem of BL. Add. 12150, the first manuscript to use S forms of dalath and rish. This manuscript has three columns, meaning that justification was essential when the scribe composed the manuscript page, and may account for the use of the more compact S forms.

¹⁰ Ibid.

Letters	Phonetic	Monumental/ <i>Estrangelo</i>	Monumental semi-cursive	Cursive semi- monumental	Formal cursive/ <i>Serto</i>
<i>Olaph</i>	'	Ⲁ	Ⲁ	Ⲁ	Ⲁ
<i>Beth</i>	b	Ⲃ	Ⲃ	Ⲃ	Ⲃ
<i>Gomal</i>	g	Ⲅ	Ⲅ	Ⲅ	Ⲅ
<i>Dolath</i>	d	Ⲇ	Ⲇ	Ⲇ	Ⲇ
<i>He</i>	h	Ⲉ	Ⲉ	Ⲉ	Ⲉ
<i>Waw</i>	w	Ⲋ	Ⲋ	Ⲋ	Ⲋ
<i>Zain</i>	z	Ⲍ	Ⲍ	Ⲍ	Ⲍ
<i>Heth</i>	ḥ	Ⲏ	Ⲏ	Ⲏ	Ⲏ
<i>Teth</i>	ṯ	Ⲑ	Ⲑ	Ⲑ	Ⲑ
<i>Yudh</i>	y	Ⲓ	Ⲓ	Ⲓ	Ⲓ
<i>Koph</i>	k	Ⲕ	Ⲕ	Ⲕ	Ⲕ
<i>Lomadh</i>	l	Ⲗ	Ⲗ	Ⲗ	Ⲗ
<i>Mim</i>	m	Ⲙ	Ⲙ	Ⲙ	Ⲙ
<i>Nun</i>	n	Ⲛ	Ⲛ	Ⲛ	Ⲛ
<i>Semkath</i>	s	Ⲝ	Ⲝ	Ⲝ	Ⲝ
<i>'E</i>	'	Ⲟ	Ⲟ	Ⲟ	Ⲟ
<i>Phe</i>	f	Ⲡ	Ⲡ	Ⲡ	Ⲡ
<i>Ṣodhe</i>	ṣ	Ⲣ	Ⲣ	Ⲣ	Ⲣ
<i>Qoph</i>	q	Ⲥ	Ⲥ	Ⲥ	Ⲥ
<i>Rish</i>	r	ⲧ	ⲧ	ⲧ	ⲧ
<i>Shin</i>	š	ⲩ	ⲩ	ⲩ	ⲩ
<i>Taw</i>	t	ⲫ	ⲫ	ⲫ	ⲫ

Figure 56: This chart was taken from Kaplan's article. It shows images of each letter from each of her four Serto script categories.

This schema seems to address problems of the Standard Model, however, there are some issues. For example, the definition of Cursive Semi-Monumental is very vague. Kaplan defines the script as looking rounded and having both E and S forms of a single letter. The main feature of this category, then, is its physical appearance. There are manuscripts that have S forms of alaph but do not have a rounded appearance. For example, BL. Add. 17174, as seen in Figure 57.

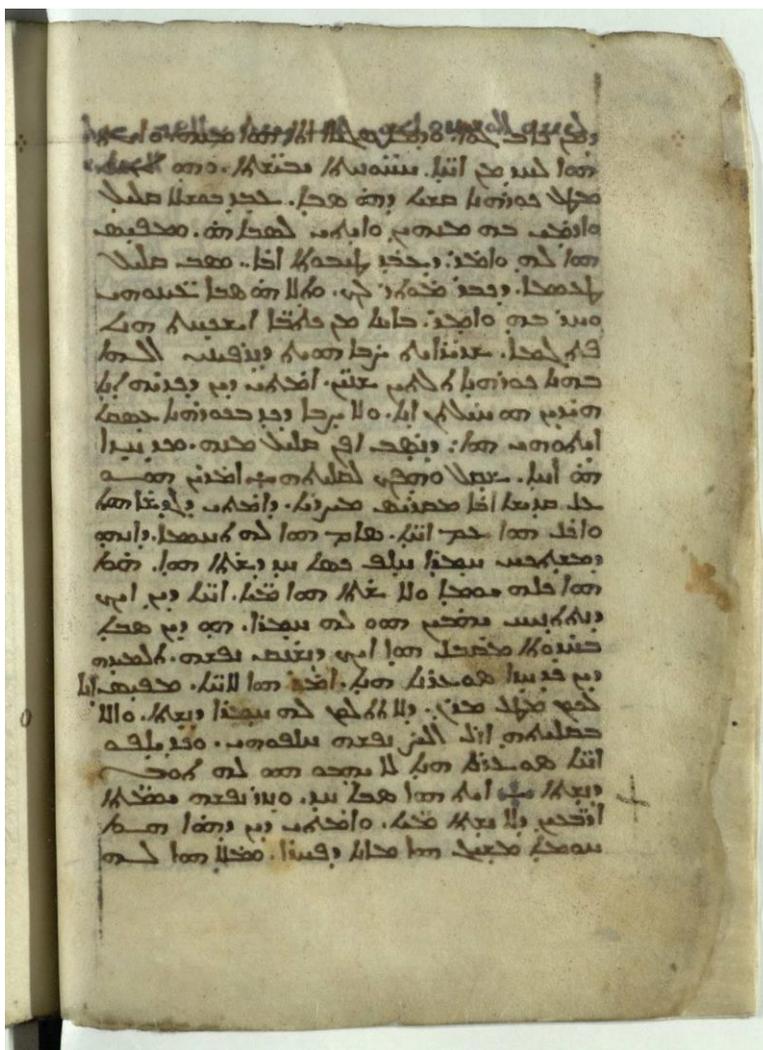


Figure 57: BL. Add. 17174 uses both E and S forms of alaph, and S forms of he, dalath, rish, waw, mim, and tau. However, this manuscript does not appear to be in a cursive hand upon first glance, which makes this difficult to define in Kaplan's schema.

The most common letter to have both E and S forms present is alaph. This is addressed more successfully in Brock and Van Rompay's Transitional script. Cursive Semi-Monumental has a vague and confusing definition. The vagueness of the definition does not aid it in making the category broad and applicable to many manuscripts. I believe that Kaplan's model would be improved by discussing alaph and tau, which seem to be implied as the letters that would define the Cursive Semi-Monumental category. More specificity in the definition of Cursive Semi-Monumental would be helpful.

Another problem is that there are no dates in this model. One of the most important goals of paleography is to date manuscripts, thus the lack of dates renders this schema useless. Kaplan's reluctance to provide dates is understandable because dates are the pitfall of most other Syriac script schemas. Furthermore, Kaplan was using a small set of manuscripts – only those available at the British Library, which may have made it more difficult for her to come up with dates.

Bush Model

The integration of dates with a mix of Kaplan, and Brock and Van Rompay's schemas allow for a new and more accurate proposal, the Bush Model:

Estrangela: Standard Model Estrangela, E forms of all letters. Used throughout time. Figure 58.

Medial Estrangela: S forms of he, dalath, rish, waw, mim, or any combination thereof. Medial Estrangela may include both E and S forms of any of the above listed letters. These manuscripts take on the appearance of an Estrangela manuscript despite the inclusion of S forms. The first appearance of this script is BL. Add. 12150 in 411 CE, but this script does not become commonly used until the sixth century. Figure 59.

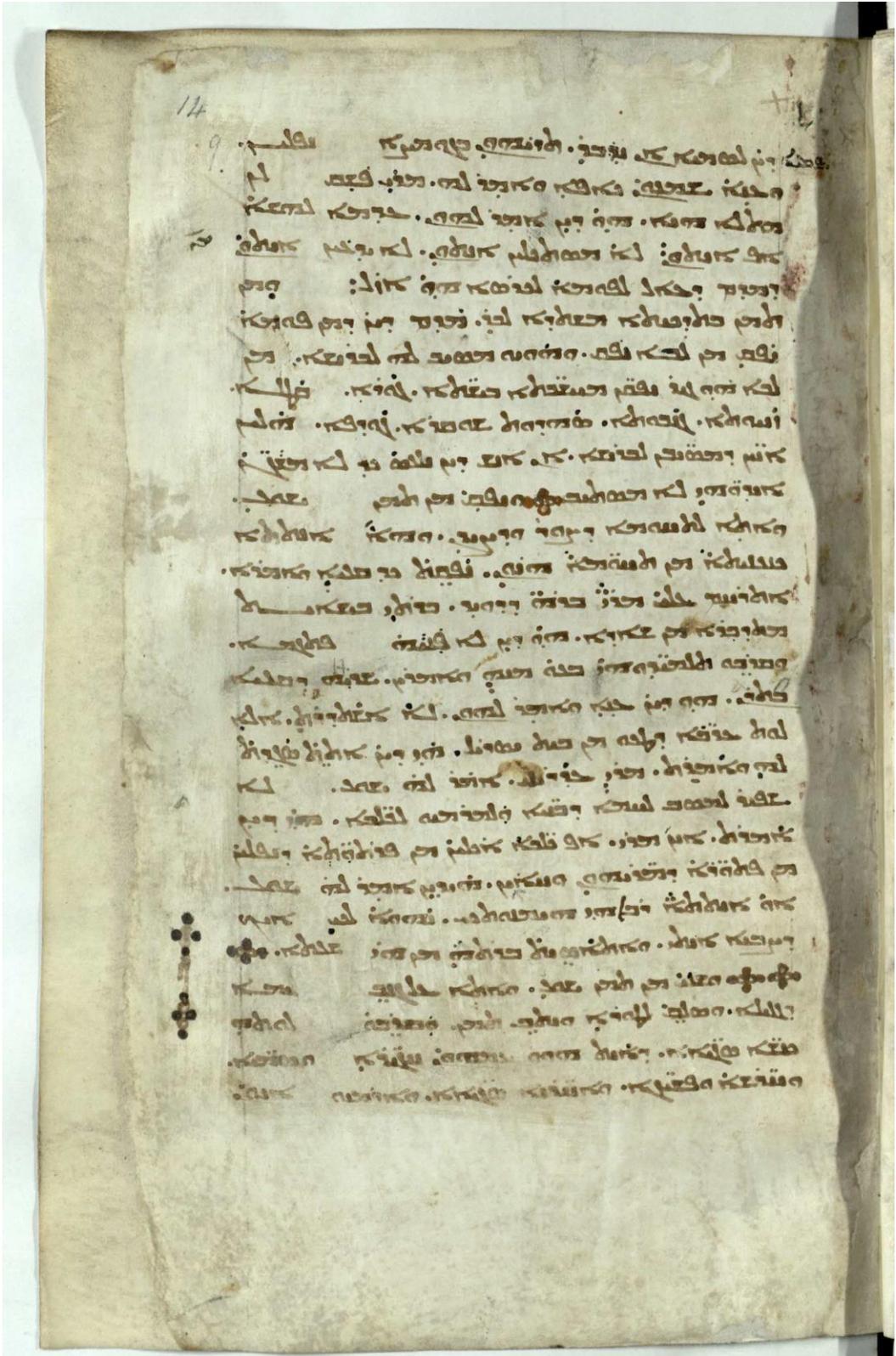


Figure 58: BL. Add. 14448, securely dated to 699 CE is an example of a Bush Model Estrangela hand. It uses E forms of every primary and secondary letter.

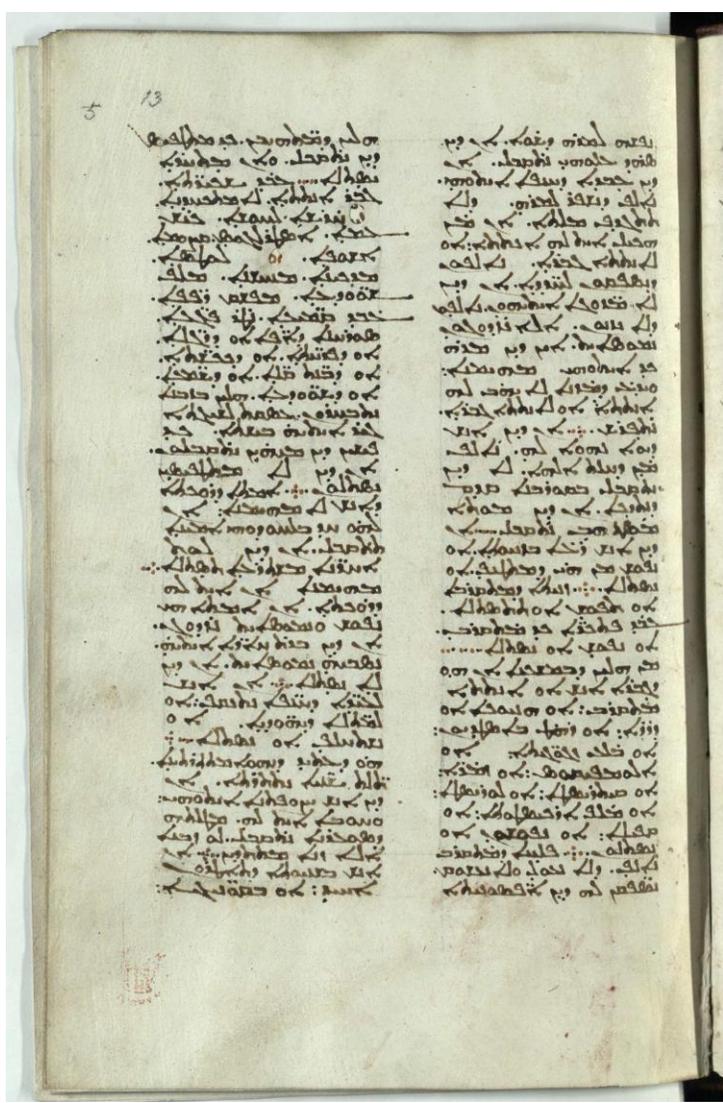


Figure 59: BL. Add. 14526, securely dated to 641 CE is an example of Bush Model Medial Estrangela. This manuscript has S dalath, rish, he, waw, and mim, and E alaph, tau, and secondary letters.

Early Serto: S forms of he, dalath, rish, waw, mim (all). Alaph, and tau may appear in both E and S forms in an early Serto manuscript, but at least one must appear in S form to be considered Early Serto. These manuscripts generally look more rounded (like later Serto) but do also look like an Estrangela manuscript. An Early Serto manuscript will always use the E forms of gomal,

shin, qoph, and teth. The first appearance of this script is in 790 CE, and is commonly used after that date. Figure 60.

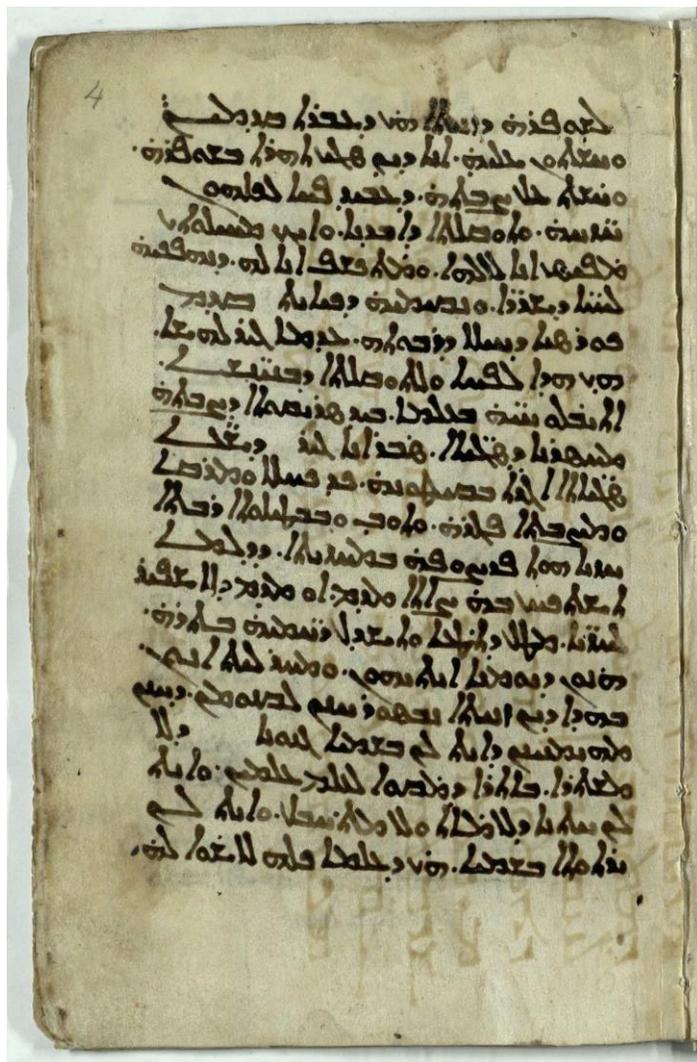


Figure 60: BL. Add. 14651, securely dated to 850 CE is an example of Bush Model Early Serto. This manuscript uses S forms of all primary letters, and E forms of all secondary letters.

Later Serto: S forms of he, dalath, rish, waw, mim, alaph, and tau (all). S forms of gomal, shin, qoph, and teth. Later Serto develops in the tenth century and is popularized in the thirteenth century. Figure 61.

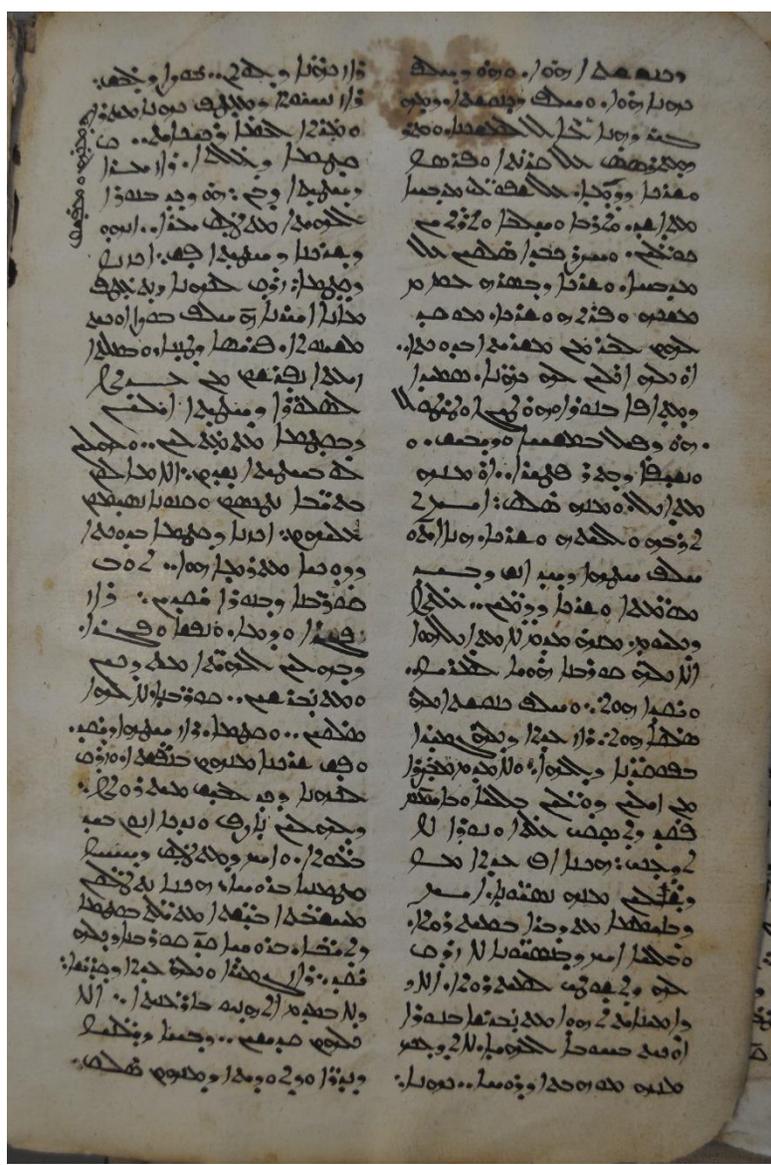


Figure 61: Cam. Add. 1972, securely dated to 1218 CE, is an example of a Later Serto manuscript in the Bush Model. This manuscript has 5 forms of all primary and secondary letters.

This new schema fixes the problems with the Standard Model addressed in Chapter 2. Scholars have been moving towards a new schema for decades, but without the ability to look at a large number of securely dated manuscripts at the same time, it was difficult to come up with a sufficient solution. Only with our large number of manuscripts and technological tools did this become possible. However, the dates in the Bush Model are defined only by securely dated

manuscripts, so if this schema is to be used for dating undated manuscripts, the dates given should be considered general suggestions. There is the possibility that an Early Serto hand may appear before 790 CE in an undated manuscript. However, Figure 62 demonstrates that the dates provided by the Bush Model are more accurate than those found in the Standard Model, and should be able to isolate dates of undated manuscripts to a smaller period than prior to its

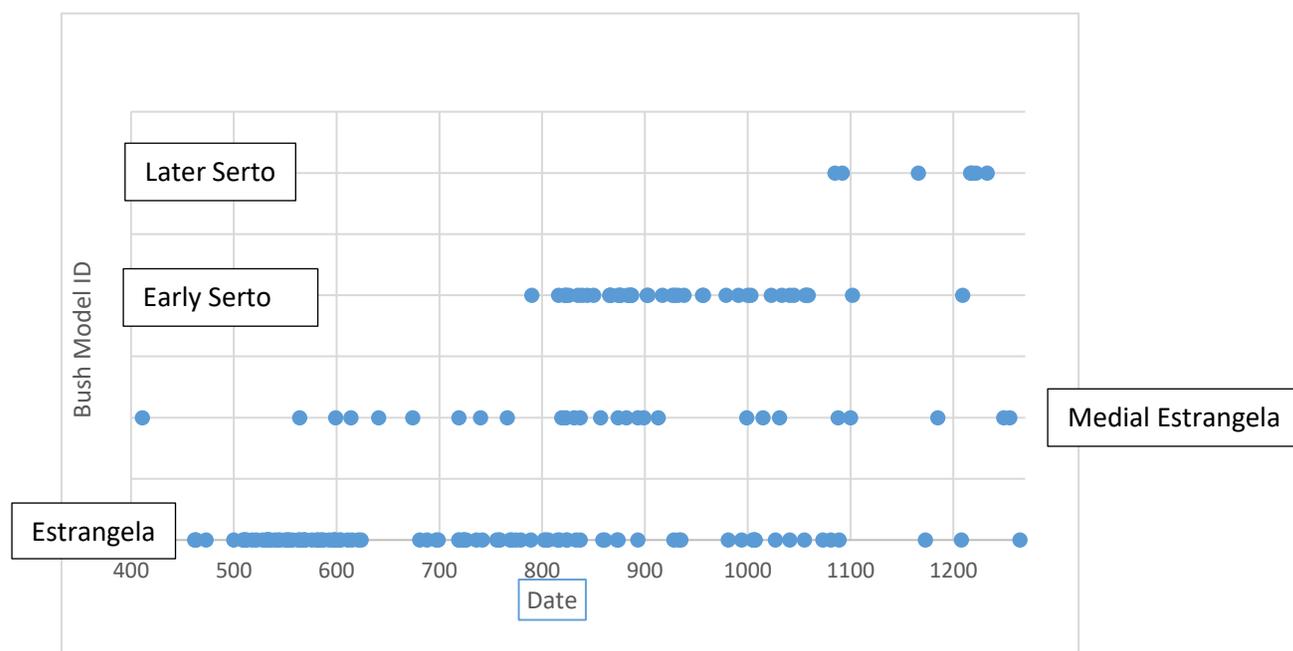


Figure 62: This image charts the occurrences of each script type named in the Bush Model over time for our dataset of securely dated manuscripts. Each dot represents a manuscript. Clusters of dots represents periods in which each script style was popular. Because we do not have sufficient data after the 10th century, the Later Serto data is lacking.

development. Figure 62 shows the distribution of manuscripts as classified by the Bush Model. In this chart, every dot represents a manuscript, and the rows represent each script type. This chart shows the dates at which each script type was dominant.

Conclusion

Recent scholarship has acknowledged the need for a new Syriac paleographical system. Scholars with access to larger collections, for example Kaplan with the British Library, have been able to spot the flaws in the Standard Model. In spite of this, there are still problems with all of the most recent remodels of Syriac scripts. This project has the largest dataset of securely

dated Syriac manuscripts from the fifth to the eleventh century, which gives me the authority to propose a new model: The Bush Model. This model proposes corrections for the five problems with the Standard Model as discussed in the previous chapter and also improves upon the Brock and Van Rompay, and Kaplan models. Furthermore, the Bush Model provides a more accurate dating system than previous models. This new model will hopefully allow scholars to better categorize Syriac scripts and date undated manuscripts to a more concise range. The next chapter will discuss the real world pay-offs of the Bush Model on the dating of Syriac manuscripts.

CHAPTER 4: MARKEDNESS OF SYRIAC LETTER FORMS

Introduction

As discussed previously, the prevalence of the Standard Model in Syriac Paleography has led to problems with the dating of manuscripts. The previous two chapters exposed the failure of the Standard Model to accurately define and categorize scripts. This chapter will focus on the real-world applications of these data: dating of manuscripts. The vast majority of extant Syriac manuscripts are undated, and because the Standard Model only gives two categories of script, and one of them, Estrangela, is used throughout time, it was previously only possible to date Serto manuscripts, and the most specific that could be was post-eighth century. The proposed Bush Model is able to more accurately and specifically date Syriac manuscripts because of the introduction of more script categories associated with specific dates. In this paper, I have discussed two groups of letters – primary (alaph, dalath, rish, he, tau, mim and waw) and secondary (gomal, qoph, shin, and teth) – that, when in E or S form, help to identify a manuscript's script and isolate a date range. I will discuss each letter and its markedness in terms of dating a manuscript.

Markedness, in linguistics, is the “way words are changed or added to give a special meaning. The unmarked choice is just the normal meaning. For example, the present tense is unmarked for English verbs.”¹ For the purposes of this paper, I have adapted this concept to paleography. An unmarked letter or letter form does not give any information as to the dating of a manuscript. For example, the letter zain appears the same in Estrangela and Serto manuscripts, therefore, based on just this letter alone, a scholar would not be able to date a manuscript. Thus,

¹ Borgatti, Stephen P. "Markedness." *Markedness*. Boston College School of Management, 2000. Web. 15 Apr. 2017. <<http://www.analytictech.com/mb119/markedne.htm>>.

zain is unmarked. Letters such as our primary and secondary letters are marked. An S gomal is marked because it only appears in manuscripts after a certain date, therefore this letter form has a special significance in the manuscript and helps the scholar to date said manuscript. This chapter will explain the markedness of the primary and secondary Syriac letters and letter forms.

Secondary Letters

When gomal, qoph, shin, and/or teth appear in their S form, the manuscript was created in the tenth century or later. The script chart pictured below demonstrates the fact that these secondary letters' E forms continued to be used throughout the centuries, rather than be replaced by S forms. Therefore, E gomal, qoph, shin, and teth are not marked letter forms, while the S forms of each of the secondary letters are. According to the Bush Model, if a manuscript includes an S gomal, qoph, shin, and/or teth, it will be in Later Serto hand, and can be dated to the tenth century or later.

BL. Add. 17127 Date: 1088	BL. Add. 17213 Date: 1100- 1101	BL. Add. 14679 Date: 1102	Cam. Add. 1700 Date: 1166	BL. Add. 17224 Date: 1173	Har. Syr. 141 Date: 1208	Cam. Add. 2918 Date: 1217- 1218	Cam. Add. 1972 Date: 1218	BL. Add. 17253 Date: 1222- 1223	Vat. Syr. 464 Date: 1233- 1234	BL. Add. 17256 Date: 1249- 1250	BL. Add. 14686 Date: 1255	Cam. Add. 1967 Date: 1265
									IMAGE NOT AVAILABLE			

Figure 63: This image is taken from the Penn-Syriac Script Chart and demonstrates the fact that securely dated manuscripts do not use S forms of secondary letters until the tenth century and later. The S forms of these letters are more rounded than the E forms. The E forms of secondary letters continue to be used throughout time.

The late appearance of the secondary letters (gomal, qoph, shin, and teth) was not expected, therefore this project does not have a strong dataset after the eleventh century. We do not have many manuscripts from the twelfth or thirteenth centuries, so even though our script chart shows that the S forms of secondary letters become more common in the thirteenth century, there could be a number of manuscripts that use these forms prior to the thirteenth century. In order to test this hypothesis, I used *An Album of Dated Syriac Manuscripts*, by William Henry Paine Hatch. This text catalogs 200 securely dated Syriac manuscripts and provides black and white facsimiles of one page from each manuscript.

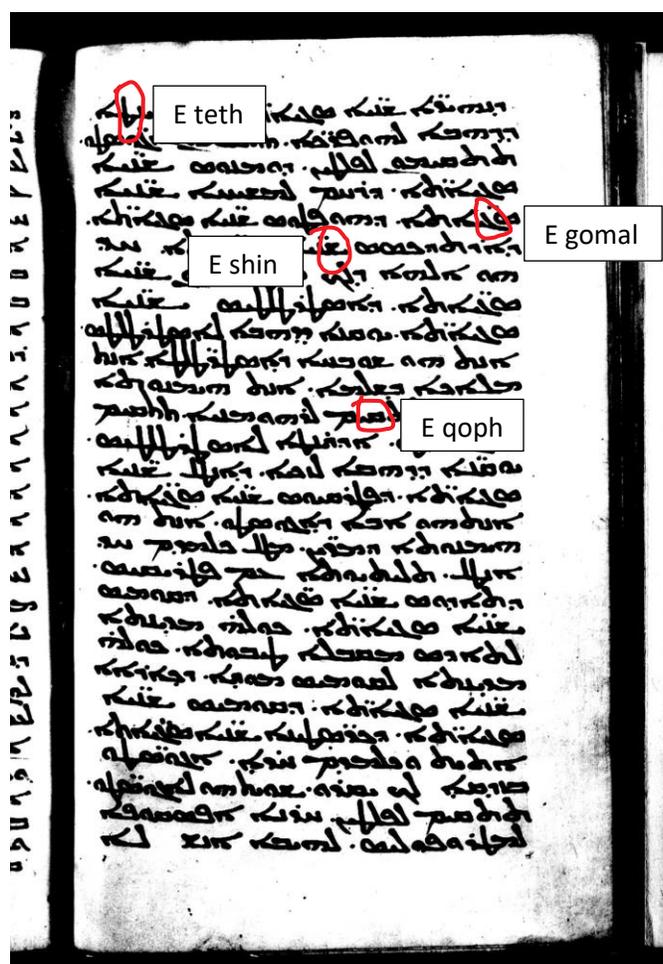


Figure 64: This manuscript represents manuscripts that use all E letter forms, characterizing the Estrangela script.

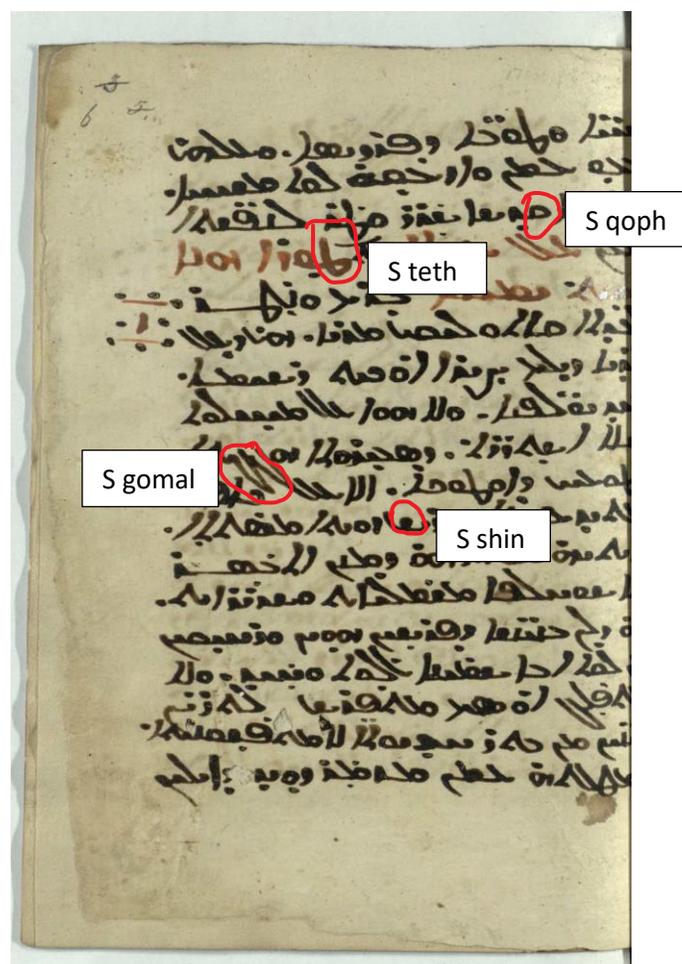


Figure 65: This tenth century manuscript represents a manuscript with all S forms, including the secondary letters. This manuscript is Bush Model Later Serto.

Using the Hatch text, I was able to supplement my data with more twelfth- and thirteenth-century manuscripts. The earliest manuscript to show S forms of teth, qoph, and shin in the Hatch text is BL. Add. 14734, which is also included in our dataset. This manuscript is securely dated to 1085 CE, and represents the second appearance of S gomal, qoph, shin, and teth in securely dated manuscripts. The page of this manuscript selected by Hatch does not include any examples of gomal, but from our digital images, we do know that BL. Add. 14734 uses the S form of gomal. There are no earlier manuscripts in Hatch that use S forms of secondary letters. However, Hatch is more useful in establishing the popularity of S secondary letters in the twelfth and thirteenth centuries. Out of the 27 twelfth and thirteenth century Syriac manuscripts present in Hatch, 41% use S forms of secondary letters. Another 41% of manuscripts out of the 27 use only E letter forms. The remaining 15% (four of the 27) use S forms of primary letters and E forms of the secondary letters. This is a pattern that we see repeated in our smaller and less comprehensive dataset of 22 manuscripts from the twelfth and thirteenth centuries,² 45% used the S forms of secondary letters, while 27% used E forms of primary and secondary letters, and another 27% used E forms of secondary letters with S forms of primary letters. There were similar percentages in both sets of manuscripts using S forms of the secondary letters, which shows the rise in popularity of these letter forms that were not used at all in securely dated manuscripts prior to the tenth century.

However, these conclusions are based on an incomplete dataset. Using Sebastian Brock's *A Tentative Checklist of Dated Syriac Manuscripts up to 1300*, it becomes clear that even including the Hatch text, we are still lacking sufficient data to make any certain claims. I only

² The majority of these manuscripts come from Professor Michael Penn's trip to the Vatican in March. These manuscripts have not been marked up or added to our database. I have used Professor Penn's notes on the manuscripts to supplement my research and have not seen images of most of these manuscripts.

have images of 62 of the 299 manuscripts securely dated to the twelfth and thirteenth centuries. This is only 21% of the total number of manuscripts from the twelfth and thirteenth centuries listed in Brock's catalog. In spite of this lack of evidence, we do know that S forms of secondary letters do not show up prior to the tenth century. Our dataset includes more than 90% of extant, securely dated manuscripts from the fifth through eleventh centuries, therefore we can state with great certainty that S forms of secondary letters did not appear until after this time.

Additional research on secondary letters and Syriac scripts after the twelfth century is necessary to refine their markedness. In contrast, for the primary letters (alaph, dalath, rish, he, tau, mim, and waw), we have much stronger data that provides sufficient nuance that it is useful to look at the relevance of each of these letters individually.

Primary Letters

Alaph

The S form of alaph first appears in 790 CE. In this manuscript, the E and S forms of alaph are both used interchangeably. Therefore, any manuscript with the S form of alaph can be dated to

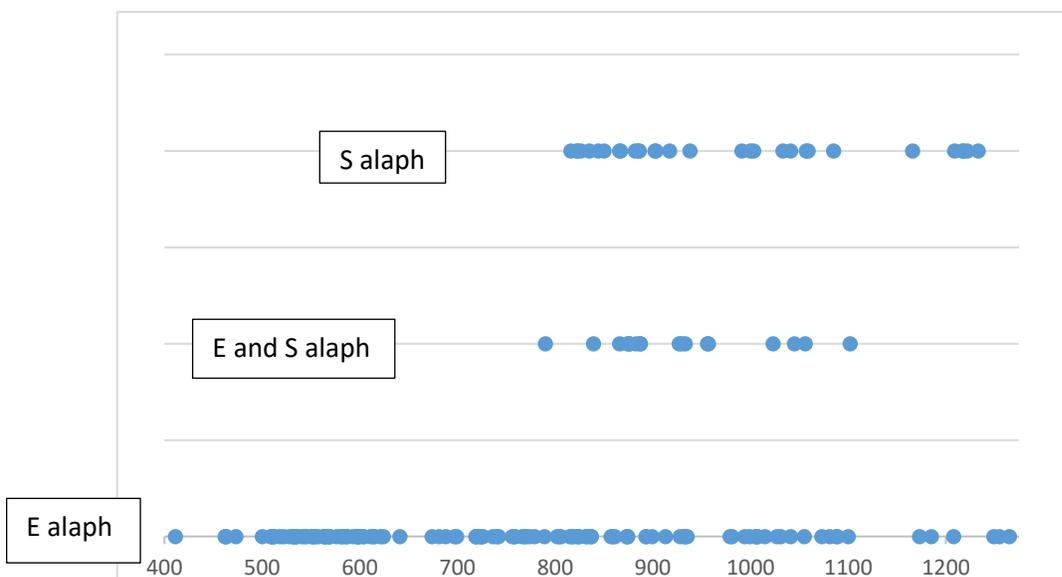


Figure 66: This chart shows the usage of E and S alaphs between the 5th and 13th centuries in the manuscripts that we have.

the eighth century or later. This includes manuscripts that have both E and S forms of alaph. When both forms of alaph are present, that manuscript dates from the eighth century or later, but this combination is most popular between the eighth and eleventh centuries. When only the S form of alaph appears, that manuscript can also be dated to after the eighth century. The first securely dated manuscript with only S alaph dates to 816 CE.³ The first use of S alaph is followed by other instances of S alaphs relatively quickly. There are only 26 years between the first two appearances of S alaph in our securely dated manuscripts, and only four securely dated manuscripts fill that gap. This shows that the S form of alaph was adopted quickly across space.

Figure 66 shows a scatter plot of the use of alaph within all securely dated manuscripts. The bottom line represents E alaph, which is used first, and continues to be used by scribes through the centuries. Because the E form of alaph is used throughout time, the presence of an E alaph in a manuscript is unmarked and does not give any information toward the dating of a manuscript. It is clear that the S form of alaph develops in the eighth century and is used consistently after its first appearance. The center line of the chart plots the usage of both E and S forms of alaph in a manuscript. The top line represents the use of just S alaph. The use of E and S alaph and the use of just S alaph begin around the same time. However, the use of just S alaph is more common than the use of both E and S alaph. Figure 66 is meant to show the correlation between the uses of the E and S forms of alaph, but it appears as if there is no correlation between the two – the use of E alaph does not decline when S alaph is introduced. If a

³ We only have a small percentage of the manuscripts that existed and we do not have manuscripts from every year, therefore the dates given are approximate, based upon those found in securely dated manuscripts. Any undated manuscript could defy the proposed dating schema, but there is no way in which to check this. The dates given are based on the existing dataset, of which this project has the largest and most comprehensive, thus the dates provided in this paper are likely more accurate than those found in previous scholarship.

manuscript contains an S alaph, it could be either Early Serto or Later Serto based on the Bush Model.

Dalath and Rish

The first occurrence of the S forms of dalath and rish is in the earliest extant securely dated Syriac manuscript, BL. Add. 12150 (411 CE). This manuscript uses both E and S forms of these two letters. Dalath and rish almost always take on the same form in any single manuscript, which is why they are combined in one section in this chapter. Because S dalath and rish are present in the earliest Syriac manuscript, they are not marked letters. The S forms of these letters do not give scholars any information as to the date in which a given manuscript was produced.

The next use of S rish and dalath after BL. Add. 12150 in 411 occurs in 564 CE. Again, this information is only from securely dated manuscripts, so any number of S dalaths and rishes could appear in undated manuscripts between 411 and 564. However, given that this project holds more than 90% of securely dated manuscripts produced between the fifth and eleventh centuries, and none of those 29 manuscripts between the first and second occurrences of the S dalath and rish include those letter forms, it is safe to say that the use of S dalath and rish did not

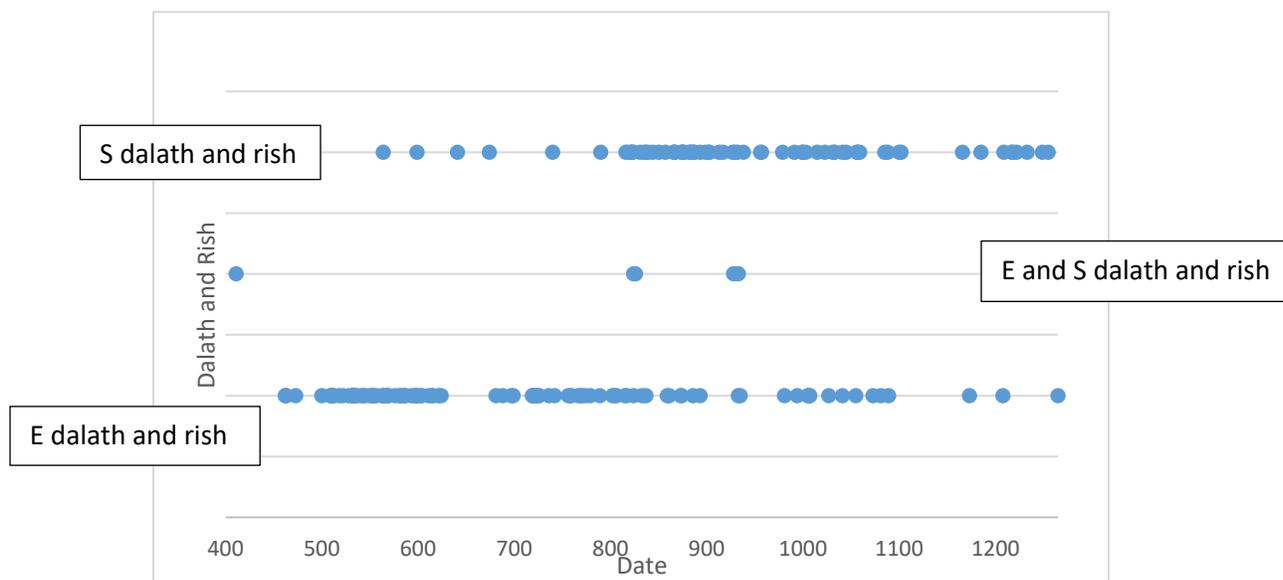


Figure 67: Scatter plot of the use of E and S forms of dalath and rish from our manuscript dataset.

become more common until after the sixth century. The clustering of points after 819 shown in Figure 67 demonstrates that S dalath and rish did not become popularly used until the ninth century. Although we can glean the above from the data, S and E dalath and rish are not the most helpful marked letters when it comes to dating a manuscript because both E and S letter forms are present throughout the centuries. They are not entirely unmarked, however, because there is a correlation between the use of S dalath and rish and later manuscripts, thus it is more likely that the presence of S dalath and rish indicate a later date. In the Bush Model, a manuscript that includes an S dalath or rish can be classified as any script style except for Estrangela. Therefore, the presence of an S dalath or rish is not helpful in determining the hand of a manuscript.

The gap between the first and second appearance of S dalath and rish can be explained by Kaplan's idea that the justification of a manuscript determined a scribe's choice of letter form. Kaplan argued in her recent article that a scribe would use the E form of a letter to take up more space, or the S form of a letter if he was running out of space in a line of text.⁴ BL. Add. 12150 is a three-columned text, which is relatively uncommon in the Syriac canon. Because of the three-columned nature of this manuscript, the scribe had less space per line, perhaps causing him to use the more compact S forms of dalath and rish.

He

The S form of he makes its first appearance in a securely dated manuscript in 564 CE. Therefore, any manuscript that includes the S form of he can likely be dated to after 564. The S form of he is marked in this regard, but is not an extremely helpful marked letter. The E form of he is used throughout time, but in our data, we see a significant tapering off of the use of E he after 1089 CE.

⁴ Kaplan, 390-5.

There are 35 years between the first and second occurrences of S he, in which this project holds images of 17 manuscripts. However, according to the chart below, S he does not become commonly used until around 816 CE. Thus, it is certain that a manuscript with S he was created after 564, and likely after 816. S he is marked because it determines that a manuscript was written after 564. According to the Bush Model, a manuscript with E he is Estrangela, but a manuscript with S he can be Medial Estrangela, Early Serto, or Later Serto.

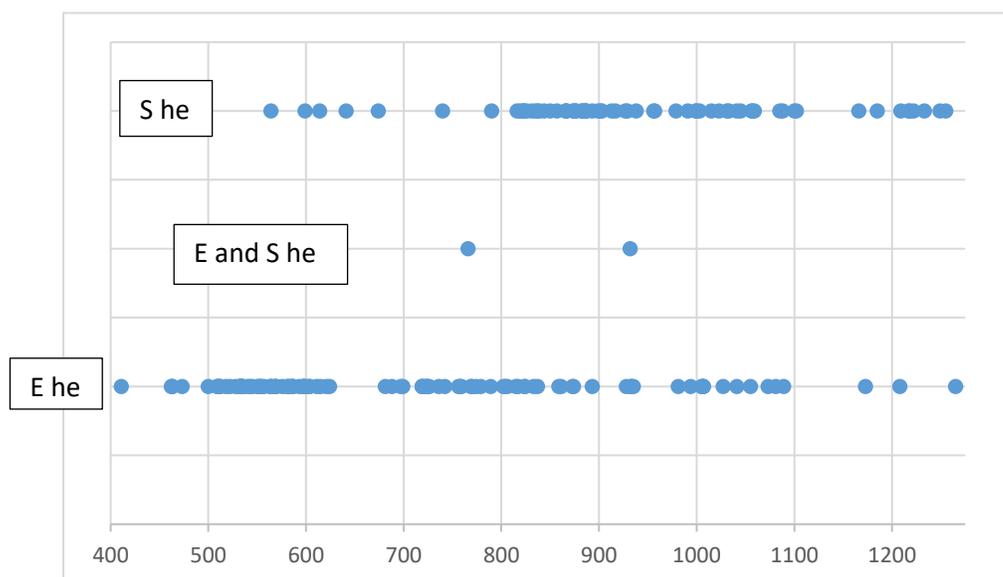


Figure 68: This scatter plot charts the uses of the E and S forms of he from the 5th through 13th centuries in our entire dataset.

Tau

The first appearance of S tau in a securely dated manuscript is in 790 CE. Therefore, S tau is marked in that its presence determines that a manuscript will likely have been written after 790 CE. E tau is used throughout time, therefore it is not marked. The second appearance of S tau is in 816, with only four securely dated manuscripts extant between the two dates, it appears that S tau became commonly used rather quickly. The use of both E and S tau in a manuscript is uncommon, but two of the three occurrences date to the twelfth century. This project has too small a sample size of manuscripts after the eleventh century to hypothesize about the popularity of the use of E and S tau in manuscripts after that date. According to the Bush Model, a

manuscript with E tau can be Estrangela or Medial Estrangela, while a manuscript with an S tau can be Early Serto or Later Serto. Therefore, both E and S tau are helpful and marked for categorizing the hand of a manuscript, but only S tau is marked in helping to date a manuscript.

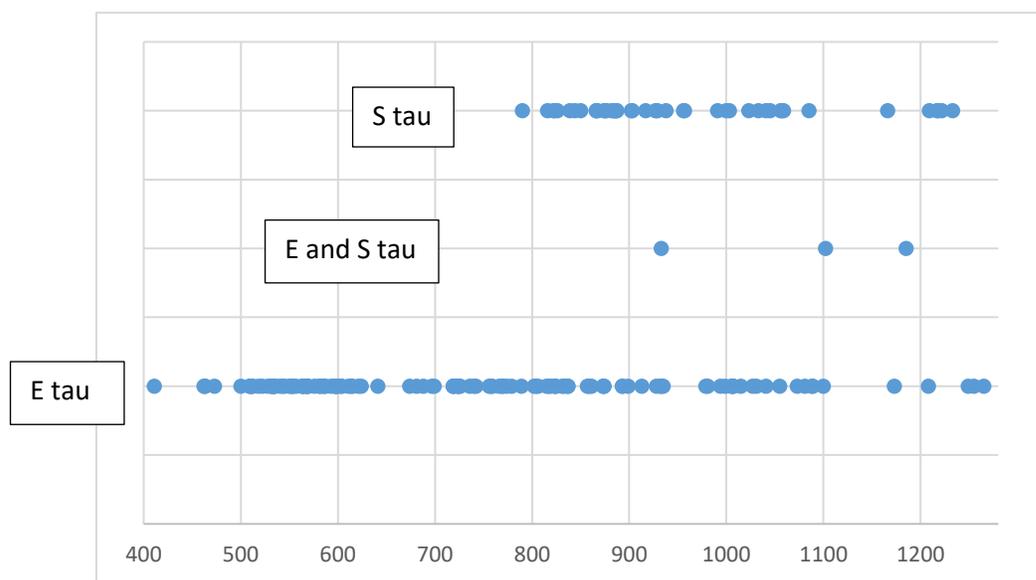


Figure 69: This scatter plot depicts the use of E and S tau throughout time.

Waw and Mim

Waw and mim, like dalath and rish, almost always take on the same form in any given manuscript. There are only three occurrences of an E form of one letter and the S form of the other within the 182 securely dated manuscripts in the dataset. One of which is the first appearance of S waw in 564 CE accompanied by E mim. The first S mim appears in 599 CE (with the second appearance of S waw). The other two cases of a mixture of S and E waw and mim occur in 614 and 1081. In every other instance, waw and mim are either both E or both S.

As noted earlier, the first appearance of S waw is in 564 CE, therefore S waw is marked because any manuscript containing an S waw will have been produced during or after the sixth century. Any manuscript with an E waw may have been written at any period in time, therefore E waw is not marked. 35 years passed between the first and second appearances of S waw in securely dated manuscripts. Within this time period, there are 17 manuscripts that use E waw.

The adoption of the S form of waw was relatively slow. Based on the following chart, S waw did not become commonly used until the ninth century.

The first S mim appears in 599 CE, thus any manuscript that contains an S mim was likely created after 599 CE. The second use of S mim in a securely dated manuscript is in 614, where it is paired with an E waw. There are only 15 years separating these two appearances of S mim, and we only hold three manuscripts between those dates. There could have been more uses of S mim or waw between these dates but we do not have evidence to attest to that. It is interesting to note that two of the three times that E and S forms of waw and mim are mixed are within the first three uses of the S forms of one of these letters. This could be explained as a transitional period between the uses of the E forms and the S forms before the two letters became linked. Like waw, S mim does not become popularly used until the ninth century. Therefore, a manuscript that contains S mim and waw is more likely to have been produced in or after the ninth century. Contrasting this, the chart shows a tapering off of usage of the E forms of waw and mim during and after the tenth century.

The Bush Model states that if a manuscript contains an S form of waw and/or mim, that manuscript could be either Medial Estrangela, Early Serto, or Later Serto. Therefore, S waw and mim are marked in dating a manuscript, but are less marked in determining the script type. The presence of E waw and mim denote a manuscript as Estrangela.

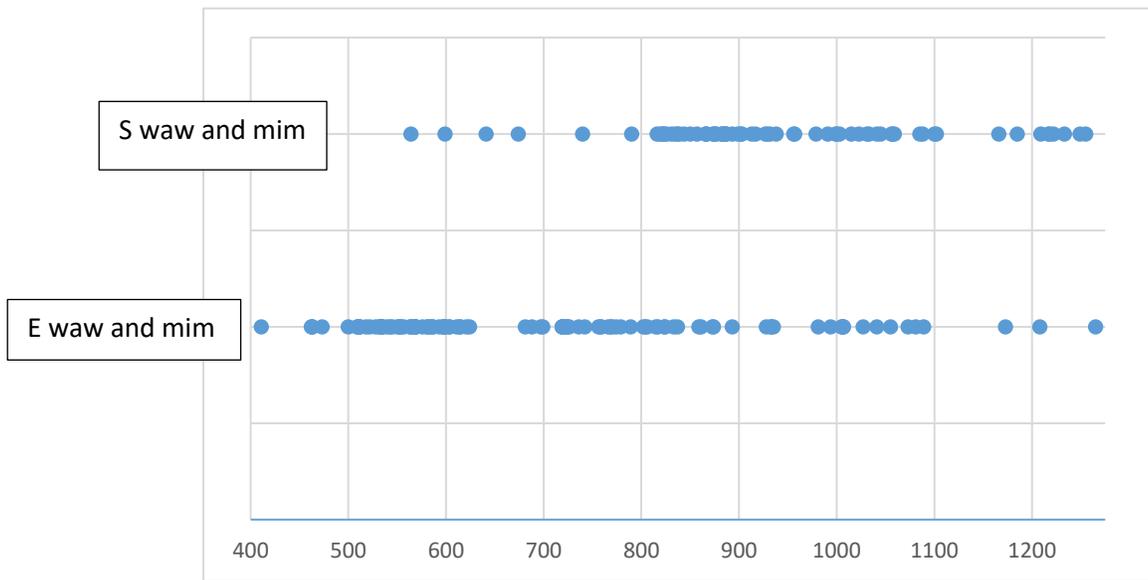


Figure 70: This scatter plot shows the use of E and S waw and mim over time.

Checklist

The markedness of Syriac letters allows for the development of a checklist that Syriac scholars may be able to use when confronted with an undated manuscript. This checklist, which takes the form of a flow chart, should help the scholar both categorize the hand according to the Bush Model and isolate the date of the manuscript more precisely than the Standard Model.

The user of the flow chart can proceed stepwise as follows:

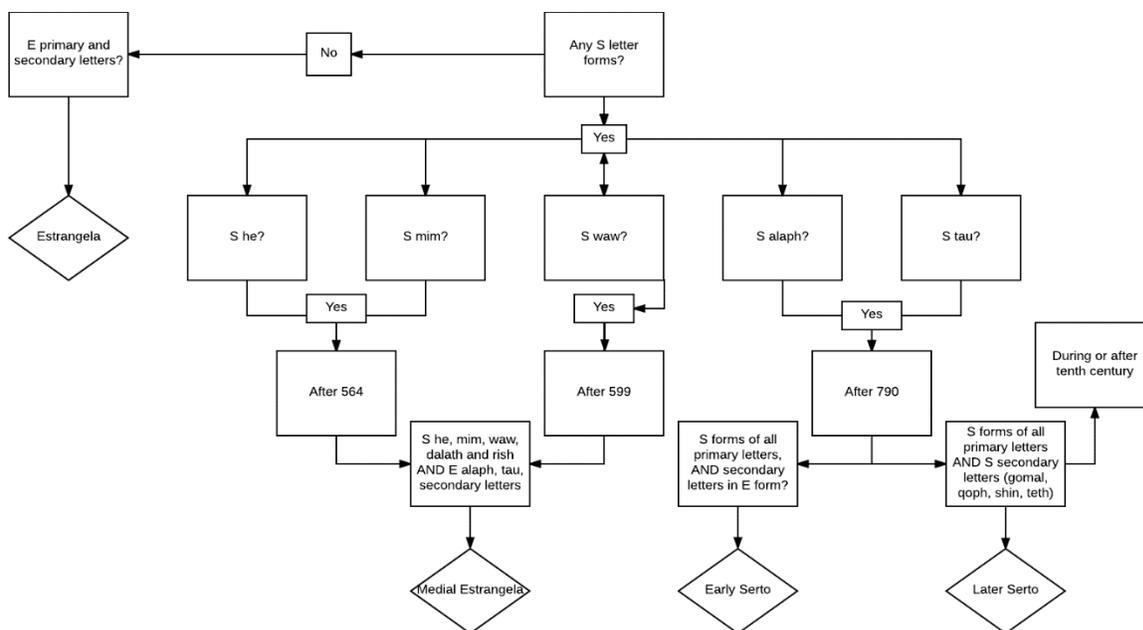


Figure 71: This flow chart can be used by scholars of Syriac to date undated manuscripts and identify their script style according to the Bush Model. One can use this chart by discerning which letter forms are used in a particular manuscript. For example, if a manuscript had *S dalath, rish, and he*, the scholar would start at “Any S letter forms?” She would then follow the box to *S he*, which would tell her that that manuscript was likely produced after 564 CE, and lead her to the box that identifies this manuscript as *Medial Estrangela* by the Bush Model.

Markedness by Genre

The initial plan for this chapter was to look at markedness by date. But at this time, there are preliminary results on markedness by genre, meaning the biblical or non-biblical content of the manuscripts. More research must be done on this in order to find a definitive correlation between genre, script, and chronology. Based on my initial analysis of the Brock list of manuscripts, which catalogs the content of the majority of securely dated manuscripts, it becomes clear that biblical manuscripts tend to use E letter forms while other manuscripts more often use S letter forms of primary letters.

As shown by Figure 72, of the 59 securely dated, biblical manuscripts used in this study, 43 of them use only E forms, and thus would be classified as *Estrangela* by the Bush Model. That is, 72% of biblical manuscripts produced between the fifth and eleventh centuries are written in *Estrangela*. Most biblical manuscripts that are not written in *Estrangela* were written during or

after the ninth century. Only two securely dated, biblical manuscripts produced prior to 800 CE use S forms. Of those biblical manuscripts that use a fully Estrangela script, 19% were produced in the ninth century, 31% in the tenth century, and 38% after the tenth century, when our data is less comprehensive. In other words, if a manuscript is biblical in content and was produced prior to the tenth century, it is very likely that that manuscript will be written in Estrangela script.

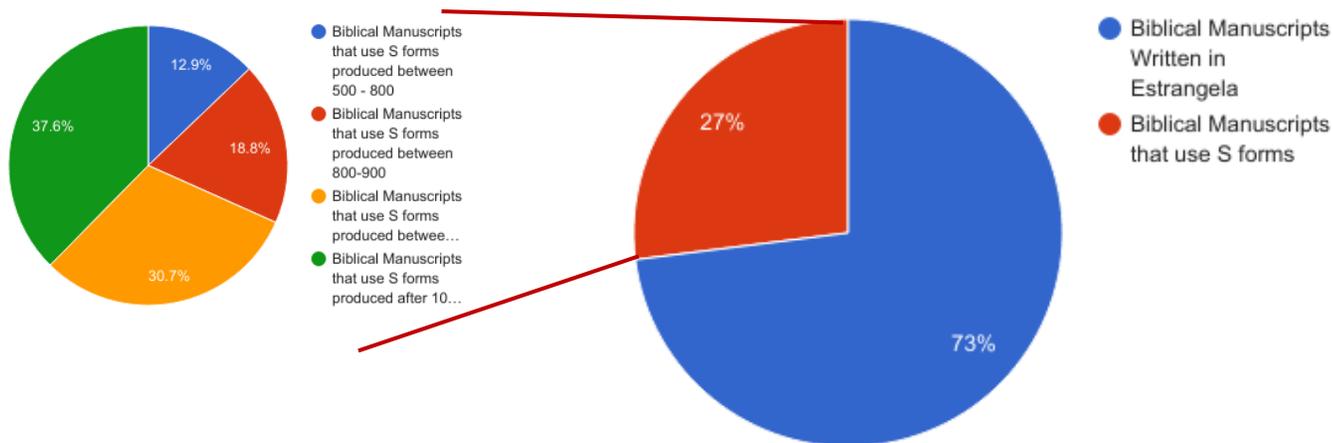


Figure 72: These pie charts represent the usage of Estrangela script (all E forms) in securely dated, Biblical manuscripts. The vast majority of biblical manuscripts use Estrangela script. Of those manuscripts that use S forms, most were produced after the year 800.

Non-biblical manuscripts in the Brock list include categories such as Hagiography, Liturgy, and Patristic literature. For the purposes of this project, I combine all three of these into one category of securely dated, non-biblical manuscripts. These manuscripts are more likely to use S forms of letters than biblical manuscripts. Of the 105 securely dated, non-biblical manuscripts used in this project, 51 use S forms of some letters, which is almost 50% of securely dated, non-biblical manuscripts. That is, they are more than twice as likely to use S forms than their biblical counterparts.

Figure 73 shows the correlation between genre, script, and date of a manuscript. This chart divides the securely dated manuscripts of which Brock has provided the genre into biblical and non-biblical manuscripts. The second column divides each section into dates that relate to

the Bush Model. Prior to 550 roughly correlates to the dominant use of Estrangela, before the development of the marked primary letters S he, waw, and mim. The period between 550 and 750 correlates with the era between the first use of S he, waw, and mim, and the first use of S alaph and tau. This period would be consistent with the first 200 years of the Bush Model's Medial Estrangela. Between 750 and 900 corresponds to the period after the appearance of S alaph and tau, but before the first uses of the S secondary letters (gomal, qoph, shin, and teth). This period correlates with the first 150 years of Early Serto. After 900, manuscripts may include S forms of the secondary letters. The numbers in the columns Estrangela, both, and Serto refer to the number of occurrences of any letter in E form, both E and S forms, or S form, respectively. For example, a biblical manuscript from 575 with all E forms would add six (alaph, dalath, rish, he, tau and waw)⁵ points under the Estrangela heading to the 550-750 row. A manuscript that uses S forms of dalath, rish, and he, and E forms of alaph and tau would add two points to the Estrangela column and three points to the Serto column. The darker the color of the box, the larger the number of manuscripts that used that particular form. Thus, it is possible to compare the distribution of letter forms in biblical and non-biblical manuscripts by comparing the color of the E both with that of the S box.

Figure 73 demonstrates that prior to the tenth century, biblical manuscripts preferred the use of E letter forms. In and after the tenth century, the use of S forms increased, but still did not overtake the use of E forms. Non-biblical manuscripts also favored the use of E letter forms prior to 750. At this point, it became more likely that a non-biblical manuscript would use S letter forms than E letter forms. The shift in letter form distribution after the development of S alaph and tau is telling. Biblical manuscripts took another 200 years to reach an almost even

⁵ In this case, waw and mim are counted as one letter because they almost always take the same form in a manuscript.

distribution of E and S letter forms, while non-biblical manuscripts transitioned quickly from dominant E letter form usage to dominant S letter form usage. There must be a reason for the delayed adoption of S letter forms in biblical manuscripts as compared to their quick adoption in non-biblical manuscripts.

		Estrangela	both	Serto
Biblical	<550	54		
	550-750	86	2	8
	750-900	56	2	14
	>900	69	5	58
Non-Biblical	<550	87	3	
	550-750	158	1	15
	750-900	80	9	115
	>900	46	11	117

Figure 73: This chart tracks the usage of E and S letter forms in biblical and non-biblical manuscripts over time. Each letter forms counts as one point, therefore, if a manuscript uses all E letter forms, it would add 6 points to the Estrangela box of the appropriate time period and genre. Non-biblical manuscripts shift quickly between the dominant use of E forms and S forms in the eighth and ninth centuries, prompting the question: why don't we see the same transition in biblical manuscripts?

Biblical	<550	100%	-	-
	550-750	90%	2%	8%
	750-900	78%	3%	19%
	>900	52%	4%	45%
Non-Biblical	<550	97%	3%	-
	550-750	91%	0.50%	9%
	750-900	39%	4%	56%
	>900	26%	6%	67%

Figure 74: This image relates the percentages associated with Figure 74. Each box is directly related to the corresponding box in Figure 73.

The connection between the Syriac language and the Early Christian Church could explain the slower transition between E forms and S forms in biblical literature. Many scholars have argued that the name, “Estrangela,” derives from the Greek for gospel character.⁶ This could be because of the common use of the Estrangela script in biblical contexts. It is hard to know if the Estrangela script had the reputation of being a book hand or more formal script in the Middle Ages, but its common usage in biblical texts suggests such an interpretation. S letter forms have a tendency of being more compact and rounder than E letter forms. Scholars today consider Serto to be a cursive version of Estrangela. Cursive forms often conserve space and are a quick and efficient means of writing.

The letter alaph supports this interpretation – multiple strokes in its E form and only one in its S form, the S alaph is more compact and easier to write than its E form. Thus, the S form may have been a more informal manner of constructing the letter. The time and effort required to draw the extra strokes of the E form may have been thought of as unnecessary in certain contexts. If the text that was being copied was biblical in nature, the scribe would be less likely to take short-cuts in his transcription. The act of copying a biblical text was considered holy in nature, an act of devotion, thus, the scribe would likely have copied the text exactly as written rather than changing the letter forms. This is especially important in the context of the Christian Church, where the Bible is considered to be the word of God, and altering any of the words could be a grave sin. The scribes of non-biblical texts, on the other hand, would have no incentive to copy the exemplar letter-for-letter. In fact, these scribes may have preferred to use quicker-to-write S letter forms so that they could produce manuscripts more time-effectively and efficiently. This theory may explain the quick adoption of S letter forms in non-biblical manuscripts,

⁶ Nestle, Eberhard. “Syriac grammar with bibliography, chrestomathy and glossary.” Translation by R. S. Kennedy. London: Williams & Norgate (1889). 5.

especially after the development of S alaph in the eighth century. This also suggests that scribes initially saw Estrangela and Serto as having different levels of prestige.

Conclusion

The use of certain marked letters from both our primary and secondary letters can help to determine the date of a Syriac manuscript more specifically than was previously possible with the Standard Model. The Bush Model creates a schema within which this dating system lives. But still the question remains of why S forms rose to popularity and were used interchangeably with E forms throughout the centuries. One explanation for this was raised in the “Dalath and Rish” section of this chapter which deserves more attention. Kaplan asserts that the interchangeable nature of E and S forms are due to the active choice of the scribe. She argues that in order to make a manuscript aesthetically pleasing, a scribe would use different letter forms in order to evenly space a line of text.⁷ If he needed to fill more space, he would select the larger E form, but if the scribe was looking to conserve space, he would use the more compact S form. This argument is appealing because of BL. Add. 12150, which is the first manuscript in which S forms are used. This manuscript is also one of the few that have three columns, making conservation of space necessary.

This argument implies that scribes were aware of E and S forms of letters before their decision to use them. The preliminary results of markedness by genre also suggest that scribes thought of Estrangela and Serto scripts differently, and that Estrangela, and therefore E forms, were considered more valuable. It gives the scribes agency to choose E and S forms and in the rise of the Serto script. Thus, it must be considered that certain S forms existed prior to the fifth century for the scribe to actively select to use S dalath and rish in 411 CE. However, I find it

⁷ Kaplan, 395.

hard to believe that all primary S forms were known in the fifth century, because S he, waw, and mim do not appear until the sixth century, more than 100 years after the first use of S dalath and rish in securely dated manuscripts. I believe that the development of S letter forms happened gradually over time, but that scribes did have agency in choosing to use these forms to aid in justifying and beautifying a manuscript.

Kaplan's argument supports my theory that scribes had agency in the transition between the dominant use of E letter forms and S letter forms in non-biblical manuscripts in the tenth century. The genre of the exemplar would have determined the amount of freedom the scribe had in choosing whether to use an E or S form. Perhaps the aesthetics of the page combined with the speed of transcription factored into the scribe's choice of letter form. Genre and geographic markedness require more research in order to reach a conclusive hypothesis.

CONCLUSION

Summary

The digital humanities are inherently a visual field, which makes this a visually-based project. My work with a data visualization expert made the diagrams and charts used in this paper especially important. Therefore, this conclusion, like the paper as a whole, will be a combination of visuals and text to serve as a reminder of the content of each chapter.

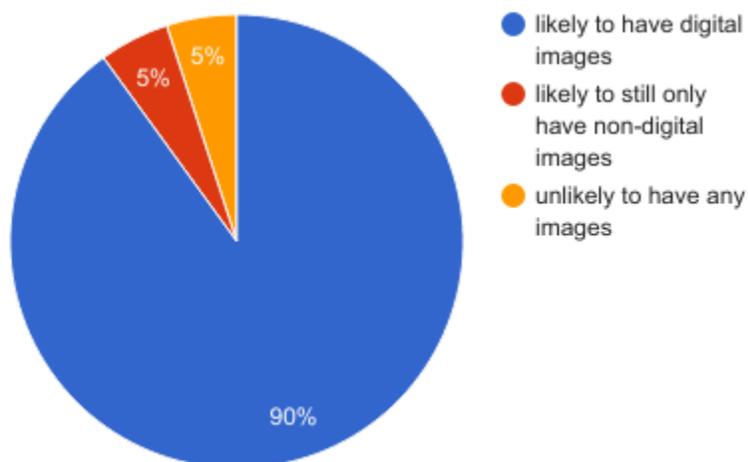


Figure 75: This pie chart represents the introduction because it shows that this projects has a visual image of 90% of all securely dated Syriac manuscripts that were produced between the fifth through eleventh centuries, making it the most authoritative database of Syriac manuscripts for this time period.

Syriac paleography has been ruled by the Standard Model for decades, but only now that the largest and most comprehensive database of securely dated manuscripts from the fifth through eleventh century has been compiled, can this model truly be tested. Figure 75 is a summary of introduction because it demonstrates the authority of the dataset used in this project. My thorough examination of the Standard Model has revealed that it is insufficient to describe and catalog Syriac manuscripts. Figure 76 represents the definition of the Standard Model and its prevalence as established by Chapter 1.

TABLE 8. LATER SEMITIC SCRIPTS			
TRANSCRIPTION + SYRIAC (OR ARABIC) EQUIVALENTS	SYRIAC ESTRANGHELA	SYRIAC EASTERN	SYRIAC WESTERN
a	ܐ	ܐ	ܐ
b	ܒ	ܒ	ܒ
g	ܓ	ܓ	ܓ
d	ܕ	ܕ	ܕ
h	ܚ	ܚ	ܚ
w	ܘ	ܘ	ܘ
z	ܙ	ܙ	ܙ
h	ܗ	ܗ	ܗ
b	ܒ	ܒ	ܒ
t	ܬ	ܬ	ܬ
z	ܙ	ܙ	ܙ
y	ܝ	ܝ	ܝ
k	ܟ	ܟ	ܟ
l	ܠ	ܠ	ܠ
m	ܡ	ܡ	ܡ
n	ܢ	ܢ	ܢ
s	ܣ	ܣ	ܣ
.	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ
g	ܓ	ܓ	ܓ
p / f	ܦ	ܦ	ܦ
s	ܣ	ܣ	ܣ
d	ܕ	ܕ	ܕ
q	ܩ	ܩ	ܩ
r	ܪ	ܪ	ܪ
s	ܣ	ܣ	ܣ
t	ܬ	ܬ	ܬ
l	ܠ	ܠ	ܠ
Others:			

Estrangelo				
Name	Final Position	Middle Position	Initial Position	Stand-alone Position
ܐ	ܐ	ܐ	ܐ	ܐ
ܒ	ܒ	ܒ	ܒ	ܒ
ܓ	ܓ	ܓ	ܓ	ܓ
ܕ	ܕ	ܕ	ܕ	ܕ
ܚ	ܚ	ܚ	ܚ	ܚ
ܘ	ܘ	ܘ	ܘ	ܘ
ܙ	ܙ	ܙ	ܙ	ܙ
ܗ	ܗ	ܗ	ܗ	ܗ
ܒ	ܒ	ܒ	ܒ	ܒ
ܬ	ܬ	ܬ	ܬ	ܬ
ܙ	ܙ	ܙ	ܙ	ܙ
ܝ	ܝ	ܝ	ܝ	ܝ
ܟ	ܟ	ܟ	ܟ	ܟ
ܠ	ܠ	ܠ	ܠ	ܠ
ܡ	ܡ	ܡ	ܡ	ܡ
ܢ	ܢ	ܢ	ܢ	ܢ
ܣ	ܣ	ܣ	ܣ	ܣ
ܘܢܩܘܠܐ	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ
ܓ	ܓ	ܓ	ܓ	ܓ
ܦ	ܦ	ܦ	ܦ	ܦ
ܣ	ܣ	ܣ	ܣ	ܣ
ܕ	ܕ	ܕ	ܕ	ܕ
ܩ	ܩ	ܩ	ܩ	ܩ
ܪ	ܪ	ܪ	ܪ	ܪ
ܣ	ܣ	ܣ	ܣ	ܣ
ܬ	ܬ	ܬ	ܬ	ܬ
ܠ	ܠ	ܠ	ܠ	ܠ

Table of the script				
Name	Estrangelo			Serto
	Unattached	Joined to the left	Joined to the right and left	Joined to the right
Alaf	ܐ	ܐ		ܐ
Beth	ܒ	ܒ	ܒ	ܒ
Gamal	ܓ	ܓ	ܓ	ܓ
Dalath	ܕ	ܕ		ܕ
He	ܚ	ܚ		ܚ
Waw	ܘ	ܘ		ܘ
Zai(n)	ܙ	ܙ		ܙ
Heth	ܗ	ܗ	ܗ	ܗ
Teth	ܬ	ܬ	ܬ	ܬ
Yodh	ܝ	ܝ	ܝ	ܝ
Kaf	ܟ	ܟ	ܟ	ܟ
Lamadh	ܠ	ܠ	ܠ	ܠ
Mim	ܡ	ܡ	ܡ	ܡ
Nun	ܢ	ܢ	ܢ	ܢ
Semkath	ܣ	ܣ	ܣ	ܣ
'E	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ	ܘܢܩܘܠܐ
Pe	ܦ	ܦ	ܦ	ܦ
Sadhe	ܣ	ܣ	ܣ	ܣ
Qof	ܩ	ܩ	ܩ	ܩ
Resh	ܪ	ܪ	ܪ	ܪ
Shin	ܣ	ܣ	ܣ	ܣ
Taw	ܬ	ܬ	ܬ	ܬ

Figure 76: This image represents Chapter 1 because it demonstrates the prevalence of the Standard Model in Syriac scholarship. It also shows the letter forms that make up the Standard Model definitions of the Estrangela and Serto scripts.

I note five specific problems with the Standard Model in this paper: manuscripts that have both S and E forms of the same letter; the appearance of E forms of some letters and S forms of other letters within one manuscript by a single scribe; all S letters do not all appear within the eighth century; individual letters develop S forms at different times; and that scholars do not agree on script classification by the Standard Model. Figure 77 illustrates the second problem in this list: that E forms of some letters and S forms of other letters appear within one manuscript by a single scribe. Any line that passes through the center of this chart represents a manuscript in which this “problem” occurs. The Standard Model cannot hold up to the challenge of these five problems, meaning that an alternate theory must be considered.

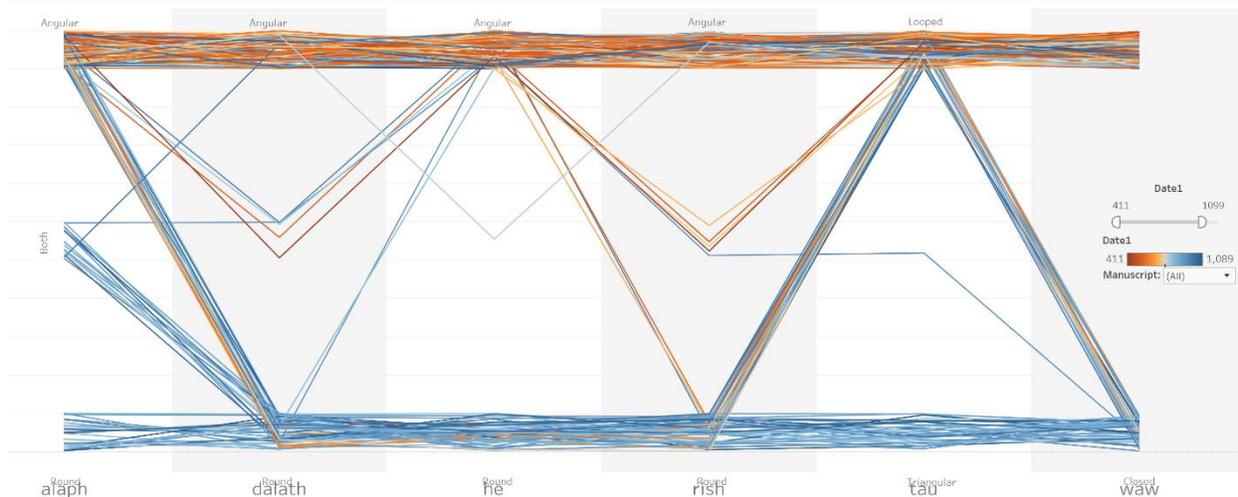


Figure 77: As in Chapter 2, this chart challenges the Standard Model's assumption that Estrangela manuscripts will use all E forms of alaph, dalath, rish, he, tau, waw, and mim (which is combined with waw in this chart); and that a Serto manuscript will use only S forms of those letters. Contrary to the standard model, manuscripts use both E and S forms of letters in a single manuscript. Any line that passes through the center of this chart defies the Standard Model. The sheer magnitude of lines that pass through the center prove the inadequacy of the Standard Model.

Recently, a few scholars of Syriac paleography have attempted to propose new script schemas. These new models note the appearance of both E and S forms of letters in a single manuscript, and attempt this by adding additional categories to the Standard Model. This addition does solve some of the problems of the Standard Model, but ignores others. Other scholars have attempted to do away with the Standard Model entirely by generating entirely new names for Syriac scripts. Although these attempts do appear in scholarship, they only take the form of articles in obscure journals or a few paragraphs in a catalog, leading to them being ignored or overlooked by other scholars in the field. The Bush Model offers solutions to the five problems discussed above, and makes the dating of Syriac manuscripts more precise than ever before possible. Figure 78 is representative of Chapter 3 by showing how a new script schema, The Bush Model, makes the dating of Syriac manuscripts more accurate than ever before. The authoritative dataset of this project should lend credence to the Bush Model, which will hopefully be used by scholars to isolate the dates of undated Syriac manuscripts.

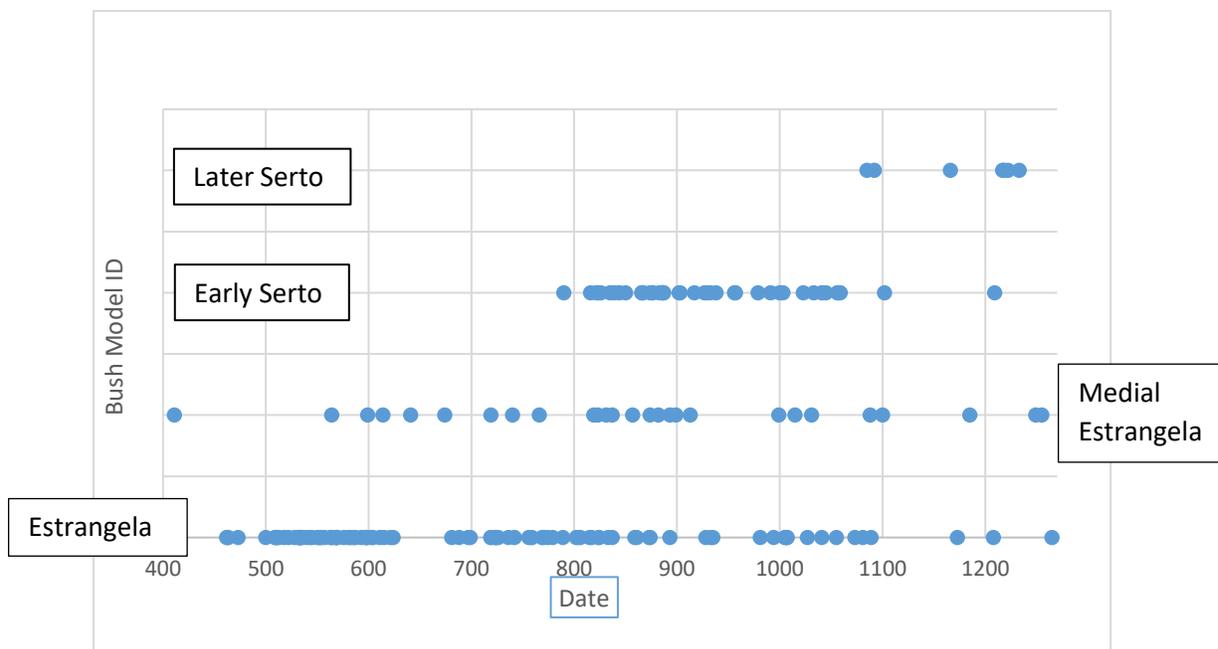


Figure 78: The Bush Model represents Chapter 3 because it exemplifies the theme of alternate models of Syriac script. The Bush Model makes the dating of Syriac manuscripts more accurate than ever before because of the divisions between different scripts. It is clear when each script type is first used and when it gains popularity, therefore the dating of undated manuscripts is more precise than with the Standard Model.

Another manner in which the Bush Model makes dating Syriac manuscripts more accurate is through the concept of markedness. A letter form is marked if its presence can help a scholar to isolate the date of a manuscript. For example, the presence of an S tau means that a manuscript was likely produced after 790 CE. This manuscript would also belong to the Bush Model category of Early Serto. The first appearance of each S letter form informs the scholar about the potential date of a manuscript. Figure 79 summarizes Chapter 4 because it shows the appearance of marked letters and their distribution over time. Not only are manuscripts marked by letter, but also by genre. The majority of biblical manuscripts use all E forms, and thus the Estrangela script, while non-biblical manuscripts are more likely to use S forms, especially after the eighth century. More research on the correlation between genre, script, and date is necessary to come to a definitive conclusion, but the preliminary data suggests a strong relationship between genre and script style.

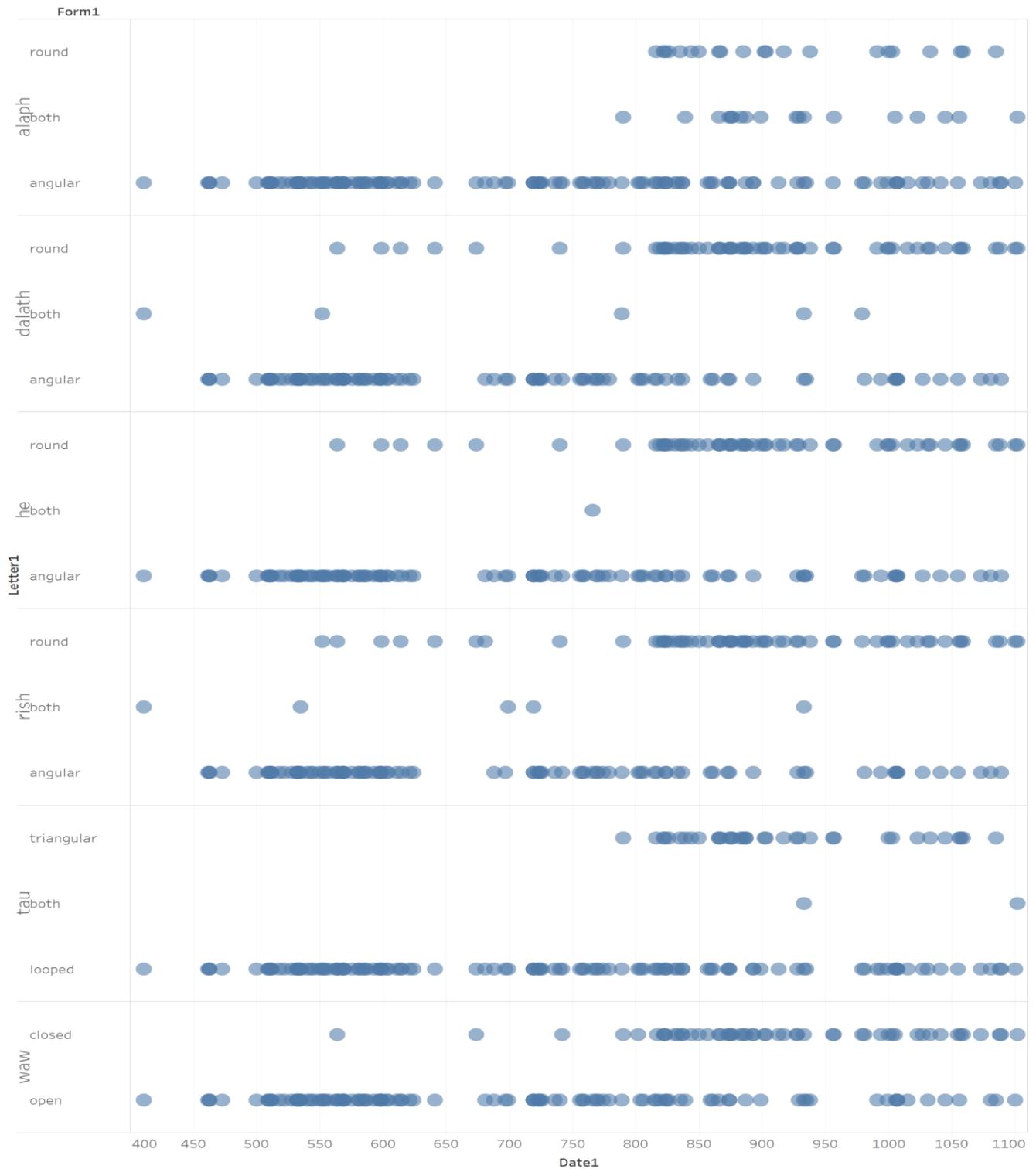


Figure 79: This image represents Chapter 4 and the concept of markedness because it shows the first usage of each S letter form and the date at which S letter forms of the primary letters became the dominant form used. This chart can help a scholar to determine the date of an undated manuscript using the principle of markedness and the formulation of E and S letter forms in any undated manuscript.

Further Research

There are more opportunities for further research in markedness by geography. There is preliminary data for the places of production for about 60 securely dated manuscripts, but there are about 40 different scriptoria in this list. There are generally two or fewer manuscripts produced at each scriptorium. Only one, Edessa, has more than five. If the locations of undated manuscripts with digital images were added to this geographic dataset, then it would be more possible to track the dispersion of letter forms geographically. This could be a potentially important dataset, showing networks of scriptoria and, in the future, could show the spread over time and space of S letter forms. However, this will not be possible until the dataset is more comprehensive.

Another step for this project includes the expansion of the dataset to later manuscripts. As previously mentioned, the dataset used grows weak after the eleventh century. By accumulating more manuscripts from the twelfth and thirteenth centuries, future research assistants will be able to trace the popularity of the secondary S letter forms (gomal, qoph, shin, and teth). Further research on later manuscripts could also show the decline in usage of E letter forms over time. It would be interesting as well to see if biblical manuscripts use more S forms in later centuries. I would like to see further tests of the Bush Model with undated manuscripts and with scholars in the field. If a survey similar to that sent out to scholars as a test of the Standard Model were conducted on the Bush Model, it would prove that the Bush Model's script categories are more functional and useful than those of the Standard Model.

This project is just a test of new digital handwriting analysis software with one linguistic tradition. The groundbreaking results of this project attest to the potential for use of digital humanities research methods in paleography. As the digital humanities are a developing field,

my hope is that projects such as this one will help to prove that the digital humanities have a place in universities and cultural institutions worldwide.

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