The Syriac Galen Palimpsest:

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Articles and notes

The Syriac Galen Palimpsest: Research Methods and Latest Discoveries*

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Summary

In this article, we provide an update on the progress of the AHRC-funded *Syriac Galen Palimpsest Project*, which is directed by Peter E. Pormann at the University of Manchester. We also present a newly identified folio from Book 3 of Galen's *On Simple Drugs*—a book hitherto not known to be represented in the manuscript. We offer some preliminary conclusions about the original medical manuscript's codicological structure, particularly the composition of its quires and the sequence of hair and flesh sides of parchment. Finally, we outline our approach to analysing the undertext's palaeography, with reference to the methodology devised by Ayda Kalpan.

The Syriac Galen Palimpsest (SGP) project is a major ongoing research project funded by the United Kingdom Arts and Humanities Research Council (AHRC) at the University of Manchester under the auspices of its Principal Investigator Peter E. Pormann.[1] Work on SGP started in 2009 at the Walters Art Museum (Baltimore, MD), where its private owner had deposited it for conservation and research. Sebastian Brock identified it as containing a Syriac translation of Galen's *On Simple Drugs*. This was subsequently confirmed by Siam Bhayro, who proposed to name the manuscript the 'Syriac Galen Palimpsest'—this has since been commonly used.[2]

Prior to the launch of the Manchester SGP project in September 2015, a number of identifications of individual folia from Books II, IV, VI, VII, VIII, and IX were made, principally by Robert Hawley and Grigory Kessel.[3] This

* This is the written version of a paper read by N. Smelova and N. Afif at the conference *Comparative Oriental Manuscript Studies: Looking Back—Looking Ahead*, Hamburg, 26 September 2016.

1 Full title: *The Syriac Galen Palimpsest: Galen's* On Simple Drugs *and the Recovery of Lost Texts through Sophisticated Imaging Techniques* (September 2015 to February 2020); AH/M005704/1.

2 Bhayro and Brock 2012/2013.

3 Bhayro et al. 2012; Bhayro et al. 2013; Hawley 2014; Kessel 2016, 488–490.

process of identification was greatly facilitated by the use of the latest imaging technologies. SGP was disbound and conserved by staff at the Walters Art Museum, after which a set of high-resolution multispectral images for each individual bifolium was produced by a team of imaging scientists. This included pseudo-colour treatment and spectral imaging with the application of UV illumination and monochrome or colour filters (red, green or blue). The computational post-processing method used was Principal Component Analysis (PCA).[4]

Within the framework of the Manchester project, the application of Canonical Variate Analysis (CVA) by William Sellers considerably improved the readability of the undertext, not only in the gutter region but also directly beneath the overtext.[5] Software developed subsequently by Corneliu Arsene enables relatively quick CVA processing and eases adjusting the images and enhancing particular areas in order to aid further identifications and transcriptions of the undertext.

This article presents the latest philological and codicological research done on SGP and outlines a proposed approach to the study of its palaeography.

Identifications

Several folios from Books VI–VIII have been identified with the aid of a transcription of BL Add. 14,661, which also contains Sergius of Rēš ʿAynā's Syriac translation of Galen's *On Simple Drugs*.[6] This transcription was produced by Robert Hawley within the framework of the ERC-funded Floriental project, which is based in Paris.[7] Various recent studies have demonstrated that both manuscripts contain the same version of Books VI–VIII, but with minor variants.[8] However, the person responsible for the Syriac translation of Books I–V, i.e. the first 'theoretical' part of the treatise, remains unclear. Bhayro and Brock concluded, on the basis of Sergius's own account, that Sergius must have translated both parts of Galen's *On Simple Drugs*—something that apparently escaped Ḥunayn's knowledge.[9] The Manchester project, therefore, is currently focussing on identifying and transcribing over one hundred folios whose text is not paralleled by BL Add. 14,661.

4 These results are openly accessible on the Digital Galen web domain hosted by the University of Pennsylvania Libraries; <http://digitalgalen.net> (accessed 14 October 2016).

5 Bhayro et al. 2013.

6 For the most complete list of identifications made between March and July 2016, see Afif et al. forthcoming.

7 Full title: *Floriental—From Babylon to Baghdad: Toward a History of the Herbal in the Near East* (September 2011 to August 2017); ERC-2010-StG-263783.

8 Bhayro and Brock 2012/2013, 32 ff.; Hawley 2014; Bhayro and Hawley 2014, 293–297.

9 Bhayro and Brock 2012/2013, 40.

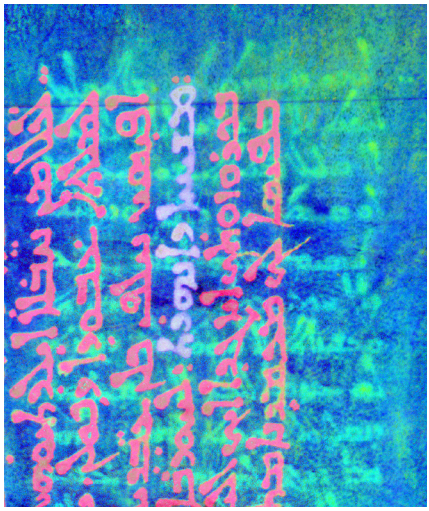


Fig. 1. SGP, ff. 9v-12r, col. A (right), the top (CVA processed image).

SGP folios identified thus far come from Books II and IV–IX. The number of identified bifolia is currently eighty-four out of a total of two hundred and thirty-one folios. The two tables given below show the first identification from Book III.

SGP ff. 9v–12r contains the end of chapter 19 and the beginning of chapter 20 of Book III. In this section, Galen explains some mortal effects of cold and warm medicines. The top portion of the right-hand column (col. A) corresponds to the Greek text in Kühn's edition, XI, 602. The text was identified by means of the verb ܥܡܠ 'to bear', the noun ܐܘܣܟܐ 'wood' and the verb ܩܛܠ 'to kill'. Part of the sentence can be recognised: '... or if you put on it fresh and humid wood' (see Table 1).

Table 1. Book III, chapter 19

σμικρὰ τῷ πλήθει ληφθέντα,	... ܕܙܥܘܪ ܒܣܝܡܐ ܕܡܫܬܩܠ
καθάπερ οὐδ' εἰ πολλῇ φλογὶ	..... ܕܠܐ ܗܟܝܠ
βραχὺ καταχέεις ὕδωρ,	..... ܡܠܐ ܕܠܐ
ἢ ξύλον ἐν ἐπιθείης ὑγρόν τε καὶ χλωρόν.	ܐܘ ܐܘܣܟܐ ܕܚܕܬ ܘܪܛܝܒ
ὥσπερ γὰρ εἰ	... ܚܕ ܡܠܐ ܐܦ
μὴ θερμασίαν ἔχοι δαψιλῆ,	... ܕܠܐ ܒܣܝܡ
καταθραύουσάν τε καὶ ποδηγοῦσαν	... ܠܐ ... ܕܒܪܝܪ
αὐτὸ μέχρι τῆς καρδίας, ἀδύνατον	... ܠܐ ܠܒܒܐ ܕܡܐ
ἀναιρεῖν ἐστιν, οὕτως εἰ τὸ καταθραῦον	... ...
αὐτὸ καὶ ποδηγοῦν…	... ... ܕܡ
Kühn, XI, 602 (Book III, chapter 19)	

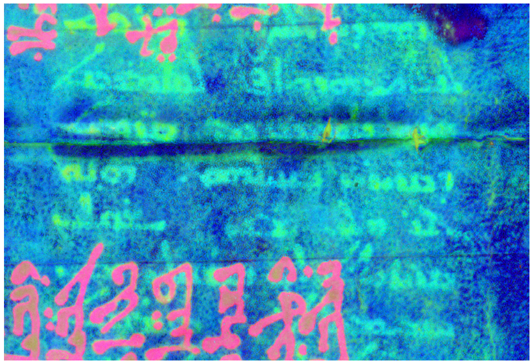


Fig. 2. SGP, ff. 9v-12r, col. A, gutter region (CVA processed image).

Although this portion is only partially legible, some Syriac words definitely match the Greek text. The gutter region, on the other hand, is rather more legible and provides an evidence for the identification from Book III. The Syriac text reads: 'It is also necessary to remind in this place of the medicines that are considered (lit. called) by elders cold by nature...' (see Table 2).

Table 2. Book III, chapter 20

<u>μὲν οὖν ἐν τῷδε κἀκείνου</u> <u>μεμνῆσθαι χρὴ, τοῦ καὶ τὰ</u> <u>ψυχρὰ τῇ φύσει φάρμακα</u> δεόντως <u>ὑπὸ τῶν ἀρχαίων εἰρῆσθαι</u> <u>δυνάμει ψυχρά</u>. <u>λαμβάνει γάρ</u> πως καὶ <u>ταῦτα</u> <u>τὸ ψύχειν</u> ἐξ ἡμῶν, ὥσπερ καὶ <u>τὸ θερμαίνειν</u> τὰ θερμά. Kühn, XI, 602 (Book III, chapter 20)	… ܕܝܢ ܐܠܝܨ ܐ ܗܪܟܐ ܠܡܬܥܗܕܘ ܐܦ ܠܣ̈ܡܡܢܐ ܗܢܘܢ ܕܐܡܝܪܝܢ ܡܢ ܩܫ̈ܝܫܐ ܕܩܪܝܪܝܢ ܒܚܝܠܗܘܢ. ܗܢܘܢ ܕܝܢ … … ܡܩܒܠܝܢ ܩܪܝܪܘܬܐ ܐܝܟ ܕܡܩܒܠܝܢ … ܫܚܝܢܘܬܐ

Codicology of the original manuscript

The dimensions of SGP in its present form are 175 x 127 mm. The bound manuscript consists of 225 leaves (the last folio number is 226 as a misfoliation occurred after f. 209). A further six folios were identified by Grigory Kessel in the Vatican Library, the Bibliothèque nationale de France, the Library of the Monastery of St Catherine on Sinai, and the Houghton Library of Harvard University. This makes a total of two hundred and thirty-one leaves, organised in twenty-nine quaternions, as demonstrated by Kessel.[10] In order to produce the codex, the original bifolia were trimmed on the sides, cut in half in the gutter field, rotated by ninety degrees and then folded up, so that one bifolium

10 See Kessel 2016, 473 and the table on 481–482; see also Afif et al. forthcoming.

would provide two bifolia, or four folios of the secondary manuscript.[11] The ruling for the new manuscript was made with a dry hard point marking the horizontal borders of the first and the last lines as well as the vertical borders. Various portions of the text often stray beyond these borders.

The codicology of the original medical manuscript can be assessed using the multispectral and processed images of each folio. Although the original ruling can be difficult to discern, the text layout is clearly visible. There are two columns per page, with the writing justified on the right-hand side. Some initial letters in the right-hand column (col. A), however, such as , and , are often extended further into the margin. The number of lines per column varies typically between thirty-nine and forty-three. In ff. 34r–35v, which contains a list of plants from Book VI, the approximate number of lines per column is thirty-three. Free space on these lines is filled with ornamental dots, something that can also be observed on ff. 16r–21v.

Preliminary conclusions regarding the structure of the quires can be made by examining the parchment and identifying its flesh and hair sides.[12] This is particularly relevant for sets of consecutive bifolia identified throughout the manuscript, especially within Books VI and VIII (see Table 3).

Table 3. The Skeleton.

Book of Galen's *On Simple Drugs*	**Kühn's edition**	**SGP**	**Flesh or hair**
One	XI 379–458	not represented	
Two	XI 459–473		
	XI 474–475	10r–11v	hair
	XI 476–478	10v–11r	flesh
	XI 478–479	8r–13v	hair
	XI 479–481	8v–13r	flesh
	XI 482–503		
	XI 504–505	23v–30r	hair
	XI 505–506	23r–30v	flesh
	XI 506–508		
	XI 509–510	225r	flesh
	XI 511–539		
Three	XI 540–601		
	XI 602–603	9v–12r	hair

11 Exactly the same process was applied while making the Archimedes Palimpsest, as described in Netz et al. 2011, I, 44.

12 This was made possible by the availability of the colour photographs of SGP that were produced at the Walters Art Museum before its disbinding and conservation; <http://www.thedigitalwalters.org/Data/OtherCollections/html/PC4/> (accessed 14 October 2016).

	XI 603–604	9r–12v	flesh
	XI 604–618		
Four	XI 619–651		
	XI 652–654	18v–19r	hair
	XI 655–656	18r–19v	flesh
	XI 656–658		
	XI 658–659	Vat. sir. 623, 227v–Houghton Library syr. 172, 1r	flesh
	XI 660–669		
	XI 670–672	40r–45v	flesh
	XI 673–703		
Five	XI 704–757		
	XI 758–760	7r–14v	flesh
	XI 760–762	7v–14r	hair
	XI 763–775		
	XI 776–778 (?)	15r–22v	hair
	XI 778 (?)–781	15v–22r	flesh
	XI 782–785		
	XI 786–788	48r–53v (?)	hair
Six		48v–53r	flesh
		34v–35r	hair
		34r–35v	**flesh**
		16r–21v	**flesh**
	XI 789–791	16v–21r	hair
	XI 791–792	157r–164v	flesh
	XI 792–794	157v–164r	hair
	XI 794–796	17r–20v	flesh
	XI 796–798	17v–20r	hair
	XI 798–800	1v–4r	flesh
	XI 800–802	1r–4v	hair
	XI 802–804	Vat. sir. 647, ff. 38v–6r	flesh
	XI 804–805	Vat. sir. 647, ff. 38r–6v	hair
	XI 806–854		
	XI 855–856	109v–116r	hair
	XI 857–859	109r–116v	flesh
	XI 860–869		
	XI 870–872	176r–177v	hair
	XI 872–(874)	176v–177r	flesh
	XI (875)–877	55r–60v	hair
	XI 878–881	**55v–60r**	**flesh**
	XI 882–884	**104v–105r**	**flesh**
	XI 884–886	104r–105v	hair
	XI 887–(888)	41r–44v	flesh

	XI 889–892		
Seven		118v–123r	flesh
		118r–123v	hair
		198r–203v	flesh
	XII 1–4	198v–203r	hair
	XII 4–7	70r–77v	flesh
	XII 7–9	***70v–77r***	***hair***
	XII 9–12	***112r–113v***	***hair***
	XII 12–14	112v–113r	flesh
	XII 14–17	159v–162r	hair
	XII 17–19	159r–162v	flesh
	XII 19–21	200v–201r	hair
	XII 21–(24)	200r–201v	flesh
	XII 24–27	Vat. sir. 647, 39v–5r	hair
	XII 28–41		
	XII 42–44	102r–107v	flesh
	XII 44–46	102v–107r	hair
	XII 46–49	165r–172v	flesh
	XII 49–51	165v–172r	hair
	XII 52–55		
	XII 56–59	96v–97r	flesh
	XII 60–62	96r–97v	hair
	XII 63–66		
	XII 67–(68)	47r–54v	hair
	XII 69–72	47v–54r	flesh
	XII 72–75	72v–75r	hair
	XII 75–77	72r–75v	flesh
	XII 77–80	101r–108v	hair
	XII 80–82	101v–108r	flesh
Eight			
	XII 83–84	192v–193r	flesh
	XII 85–88		
	XII 89–92	57v–58r	flesh
	XII 93–99		
	XII 100–103	173v–180r	flesh
	XII 104–106	***173r–180v***	***hair***
	XII 106–108	***136v–137r***	***hair***
	XII 109–111	136r–137v	flesh
	XII 112–120		
	XII 121–123	160r–161v	hair
	XII 123–125	160v–161r	flesh
	XII 126–140		
	XII 141–143	183v–186r	flesh

	XII 143–145	***183r–186v***	***hair***
	XII 145–148	***166v–171r***	***hair***
	XII 148–150	166r–171v	flesh
	XII 150–153	214r–221v	hair
	XII 153–156	214v–221r	flesh
	XII 157–158		
Nine	XII 159–171		
	XII 172–173	73r–74v	flesh
	XII 174–185		
	XII 186–(187)	49v–52r	flesh
	XII 188–197		
	XII (198)–199	128v–129r	hair
	XII 200–203		
	XII 203–(204)	2r–3v	flesh
	XII 204–206	2v–3r	hair
	XII 207–208		
	XII 209–210	BnF syr. 382, 10v–88v	hair
	XII 211–215		
	XII 216–217	206v–212r	hair
	XII 218–244		
Ten	XII 245–309	not represented	
Eleven	XII 310–377	not represented	

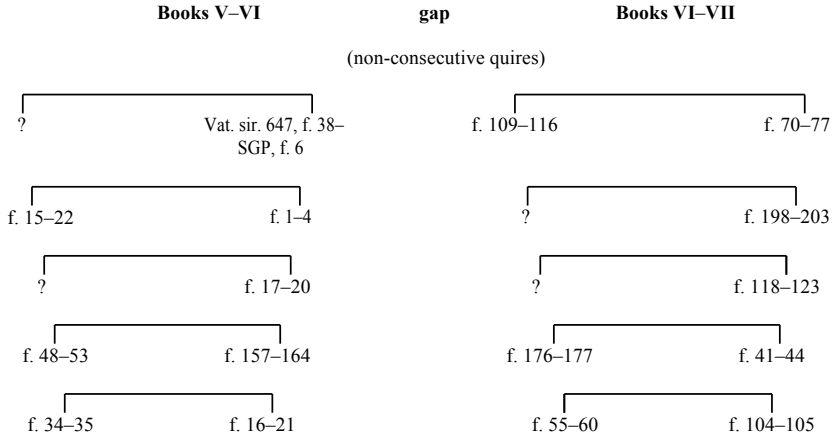
This analysis has revealed the following consistent structure: a flesh side is always facing a hair side. Although this contradicts Gregory's rule, it is a common feature with most Syriac parchment manuscripts.[13] We would suggest, therefore, that the leaves were folded flesh side inwards, and two flesh sides facing each other would thus mark the middle of a quire and a single bifolium. Two such occurrences have been identified in Book VI (ff. 34r–35v + ff. 16r–21v, and ff. 55v–60r + ff. 104v–105r). Likewise, when there are two hair sides facing each other, this would represent the last and the first leaves of two adjoining quires. There are three examples of this: one in Book VII (ff. 70v–77r + ff. 112r–113v), and two in Book VIII (ff. 173r–180v + ff. 136v–137r, and ff. 183r–186v + 166v–171r). Following this approach, it would appear that, at present, we have at least four partially preserved but well-defined quires and ten bifolia of the original medical manuscript (see Scheme 1).

The standard type of quire in the original medical manuscript is quinion (i.e. made up of five bifolia, or ten folios).[14] As Sebastian Brock has demon-

13 Borbone, Briquel-Chatonnet, and Balicka-Witakowska 2015, 255–256.

14 It is possible, however, that, in the section covering Book VIII, there is at least one quaternion, whose outer leaves are ff. 136v–137r and 183r–186v. Therefore the manuscript may have had a mixed quire structure, which is not unknown in the Syriac

Scheme 1. Selected quires of the original medical manuscript (provisional).



strated, such an arrangement is very common for Syriac manuscripts, particularly those created in the ninth and tenth centuries.[15] We hope that future discoveries of parallel creases and other shared features on the parchment will further research on the original bifolia of SGP.[16]

Palaeography of the original manuscript

We propose to produce a palaeographical analysis of SGP, which will be based on the method developed by Ayda Kaplan in her PhD thesis at the Catholic University of Louvain in 2008.[17] Kaplan revised the traditional classification of Syriac scripts and presented a new categorisation comprising four major variants. Her categories relate to the morphology of letter variations and their frequency in the same graphic context.[18] Some categories include a combination of monumental and cursive elements and represent an evolution in Syriac writing. Kaplan's approach, which is based on a comparative examination of a large corpus of manuscripts, is particularly relevant to the palaeographical

tradition. See Borbone, Briquel-Chatonnet, and Balicka-Witakowska 2015, 226. Further identifications from Book VIII in SGP should shed more light on this.

15 Brock 2015, 159; Briquel-Chatonnet 1998, 155–162; Borbone, Briquel-Chatonnet, and Balicka-Witakowska 2015, 225–226.

16 Compare the codicological analysis of the Archimedes Palimpsest; see Netz 2011, I, 58.

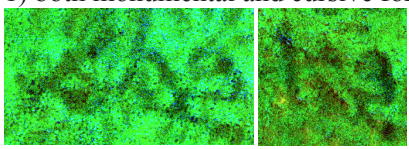
17 Kaplan 2008; see also Idem 2013; Idem 2015.

18 Kaplan 2015, 314–315.

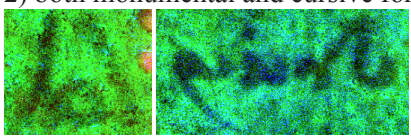
study of the undertext of SGP, because it provides a solid basis for dating manuscripts that lack a colophon.

Our initial examination shows that SGP displays features of both the cursive and formal Estrangelo scripts, with some letters showing both a cursive and monumental form. The following examples are taken from ff. 7v–14r (Book V), left-hand column (col. B; the images are CVA processed). The following observations are instructive:

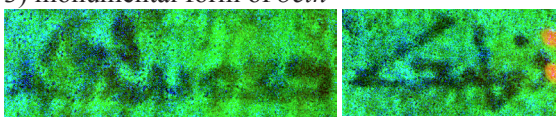
1) both monumental and cursive forms of *alaf*



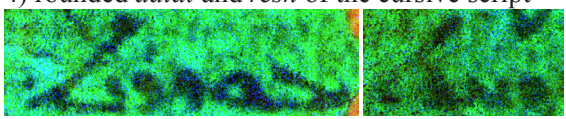
2) both monumental and cursive forms of *taw*



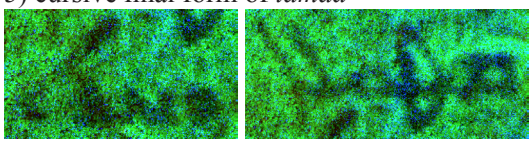
3) monumental form of *beth*



4) rounded *dalat* and *resh* of the cursive script



5) cursive final form of *lamad*



Our preliminary observations indicate that, according to Kaplan's typology, the script of SGP's undertext corresponds to an intermediary stage in the evolution of Syriac writing, and should be dated to around the mid-ninth century.[19] A more extensive analysis will be undertaken, so this remains a tentative conclusion at this point.

19 Kaplan 2013. A ninth-century date for SGP's undertext was first proposed in the Hiersemann sales catalogue; see Hiersemann 1922, 13–14, pl. XI; see also Bhayro et al. 2012, 261, n. 1.

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