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DECIPHERING METHODS IN THE PROJECT "DELICATE – THE DEVELOPMENT OF LITERACY IN THE CAUCASIAN TERRITORIES"[1]

Over the last 20 years, considerable progress has been made in the analysis of the oldest written materials of the three languages Georgian, Armenian and Caucasian Albanian in palimpsest form, and the results have provided substantial new insights into their historical development. These insights, which have hitherto been confined to the individual languages, are now for the first time ever to be brought into a cross-language synthesis, which will yield a completely new view on the emergence and spread of writing in the region, taking into account the interrelations between the three languages and the Christian cultures represented by them as well as the influence of external religious and linguistic factors. The project "DeLiCaTe" ("The Development of Literacy in the Caucasian Territories", running since 1 April 2022[2]) aims to assail the task of developing a thorough investigation into the common conditions and circumstances of the development of literacy in the Caucasus. For the successful execution of this project, it is important to decipher the relevant palimpsests, which has proved to be a difficult task. Several methods for the decipherment of these palimpsests have to be developed and applied such as, e.g., working with multispectral images, calculating the number of letters and lines, comparing different redactions of texts, identifying the exact text passages and analyzing and explaining the differences given via the comparison.

The Georgian Language – as the only non-Indo-European language of the Caucasus region - can look back on an uninterrupted written tradition of more than 1500 years (the oldest written records are inscriptions from the 5th century AD). A distinction is usually made between an Old Georgian (approx. 5th–11th centuries), a Middle Georgian (approx. 12th–18th centuries) and a Modern Georgian period (since the 18th century). Along with this linguistic distinction we see three different manifestations of the Georgian alphabet:

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[2] https://www.csmc.uni-hamburg.de/news/2022-04-06-delicate.html

- *asomtavruli* majuscules (also styled *mrg(v)lovani* 'rounded'; 5th–10th centuries);
- *nusxa-xucuri* (or *nusxuri*) minuscules (from the 9th century onwards, the oldest inscription being from 835 AD from the Ateni Sioni church), and
- *mxedruli* minuscules (cursive variant, from the 10th century onwards).

Asomtavruli	Ⴀ	Ⴁ	Ⴂ	Ⴃ	Ⴄ	Ⴅ	Ⴆ	Ⴡ	Ⴇ	Ⴈ	Ⴉ	Ⴊ	Ⴋ	Ⴌ	Ⴐ	Ⴍ	Ⴎ	Ⴏ	Ⴐ
Nusxuri	ⴀ	ⴁ	ⴂ	ⴃ	ⴄ	ⴅ	ⴆ	ⴡ	ⴇ	ⴈ	ⴉ	ⴊ	ⴋ	ⴌ	ⴍ	ⴎ	ⴏ	ⴐ	ⴑ
Mxedruli	ა	ბ	გ	დ	ე	ვ	ზ	ჱ	თ	ი	კ	ლ	მ	ნ	ო	პ	ჟ	რ
Transcription	a	b	g	d	e	v	z	ē	t	i	ḳ	l	m	n	j	o	ṗ	ž	r

Asomtavruli	Ⴑ	Ⴒ	Ⴓ	Ⴔ	Ⴕ	Ⴖ	Ⴗ	Ⴘ	Ⴙ	Ⴚ	Ⴛ	Ⴜ	Ⴝ	Ⴞ	Ⴟ	Ⴠ	
Nusxuri	ⴑ	ⴒ	ⴓ	ⴔ	ⴕ	ⴖ	ⴗ	ⴘ	ⴙ	ⴚ	ⴛ	ⴜ	ⴝ	ⴞ	ⴟ	ⴠ	
Mxedruli	ს	ტ	ჳ	ფ	ქ	ღ	ყ	შ	ჩ	ც	ძ	წ	ჭ	ხ	ჯ	ჰ	ჵ
Transcription	s	ṭ	wi	p	k	ġ	q̇	š	č	c	ʒ	ç	č̣	x	q	ǯ	h	ō

Table 1: The three alphabets of the Georgian Language

The oldest written documents are inscriptions from ecclesiastical buildings and (in manuscript form) translations of biblical texts. Apart from translations, an original Georgian literature developed soon after, which is attested to by legends of saints allegedly written between the 5th and 8th centuries (e.g., the Martyrdom of St. Eustathius of Mtskheta). Thus, the oldest written documents of the Georgian language comprise translations as well as original Georgian texts (Kamarauli 2022: 14). Certainly, a special focus must be made on texts written in *asomtavruli* as they are deemed the oldest: the earliest *asomtavruli* inscriptions are found outside of Georgia in Palestine (~430 AD) and within Georgia in the Sioni Church of Bolnisi (~493–94 AD).

Old Georgian written documents are classified in three groups: *khanmeti*, *haemeti* and *sannarevi*. The division in theses 3 classes is based on morphological differences: in *khanmeti* texts, 2nd person subjects and 3rd person objects are marked by a verbal prefix *x-*. The morpheme *x-* can also be found in the comparative forms of adjectives (Kamarauli 2022: 13). In a slightly later period, we find a prefix *h-* instead of *x-*; this period is called the *haemeti* period. Lastly, the term *sannarevi* denotes those texts in which a 2nd person subject and a 3rd person object is (partly) marked by an allomorph *s-*. *Khanmeti* texts are dated back to the period from the 4th–7th centuries, *haemeti* texts from the 7th–8th centuries, and *sannarevi* texts from the 9th century onwards (Kamarauli 2022: 13).

This project holds a special significance for the research of the Georgian language: As we do not have many manuscripts from 5th–8th centuries that are not palimpsests, this project is expected to fill the gap, answer previously unanswered questions/researches and add new materials for future research.

So far, most of the work concerning Georgian in our project has been concerned with the decipherment of the palimpsest manuscript Paris, BnF, géorg. 5[3]. The upper layer (in *nusxuri* script) of this manuscript is from the 11th century and contains the Lenten triodion; the lower layer (in *asomtavruli* script) is from the 9th–10th centuries and contains parts of a lectionary. Through participating in this project, I was given the opportunity to work on and analyse the palimpsest for the first time on the basis of multispectral images of the lower layer, which were provided by Jost Gippert and Bernard Outtier in 2013 with a MuSiS camera.

Paris, BnF, géorg. 5 measures 27.5 × 13 cm; the lower layer is written in two columns, which usually contain 28 or 27 lines. The titles and beginnings of the lections are written in red ink; initials are not ornamented. Most of the sheets were turned by 180° and the margins were cut off, so we suppose that the original pages must have measured 35 × 23 cm or even more.
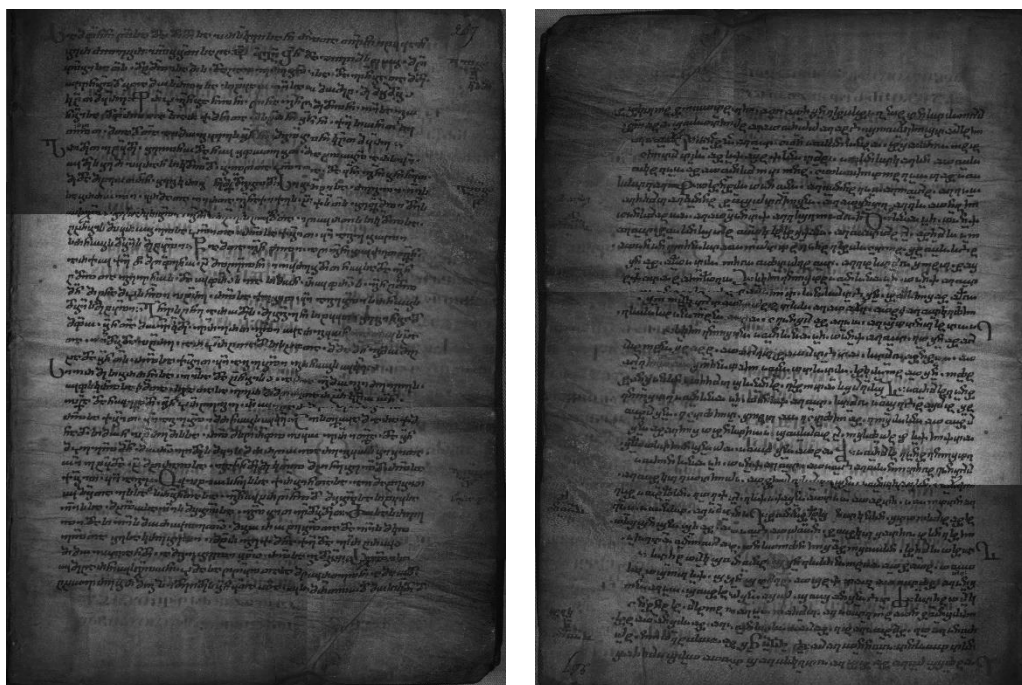

Figure 1: Folio 267, Upper layer, in one column (left); lower layer in two columns, turned by 180° (right); ultraviolet pictures, assembled

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[3] A paper about the decipherment, content and identification of the manuscript pages will be published 2023 (Kamarauli, M. & Kvirkvelia, E. (in press). A preliminary analysis of the Georgian Palimpsest Paris, BnF, géorg. 5 with Multispectral Imaging. *Mravaltavi*).
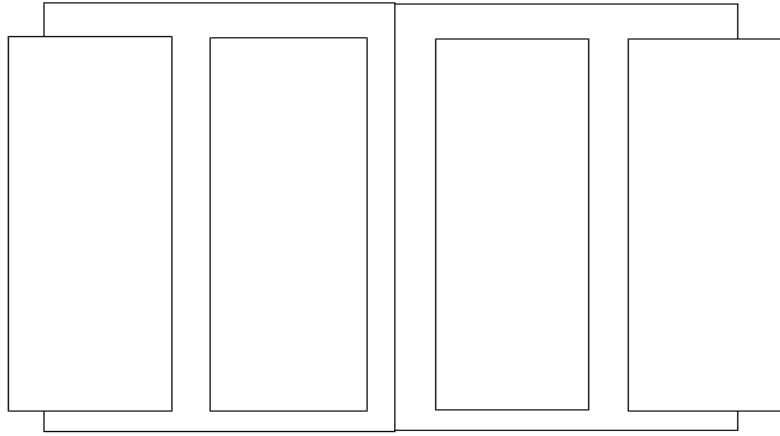
Figure 2: Visual representation of the cut-off margins

The decipherment and identification of the text goes through several steps:

- identification of a given text passage on the basis of the best readable letters (especially letters such as Ⴗ or Ⴘ are well identifiable);

- identification of the given text passage and determination of the redaction it belongs to (with the help of TITUS, GNC, bible.ge, ogg.tsu.ge, orthodox.ge, other manuscripts preserving parallel texts, etc.)

- counting the **approximate** number of lines per column/page (as said above, typically there are around 28 lines but there are also some with 30 lines)

- counting the **approximate** number of letters per line (typically between 16–24 letters)

- considering abbreviations, such as:

  - *nomina sacra*, such as traditional abbreviations of toponyms: Jerusalem, Israel
  - *nomina appellativa* (e.g. ქალაქი → ქჲქ + CASE;)
  - conjunctions
  - relative pronouns
  - quantifiers
  - preverbs
  - pre- and postpositions
  - personal & possessive pronouns

Some abbreviation examples and their decipherment are shown below.

Nomina sacra are referred to as several frequently occurring divine names or titles, such as *Lord* or *God*; the following example shows abbreviations of a preposition, a *nomen sacrum* and a possessive pronoun:

asomtavruli: Ⴤ̃Ⴠ Ⴖ̃ⴑⴖⴡ ⴌⴖ̃ⴑⴖⴡ Ⴇ·ⴤ̃ⴑ̃ⴑ, *mxedruli*: წ(ინაშ)ე ო(ჳფლ)ისა ღ(მრ)თისა

თქ(ოჳე)ნი{სა}, "before the Lord, your God (lit. before Lord God your)" (Deuteronomy, chapter 9, verse 16)

Figure 3: Extract of Folio 279, recto, column b, line 15, lower image with phrase retraced

Nomina appellativa or proper nouns can be abbreviated, too; in the following example by vowel reduction (suspension):

asomtavruli: Ⴕ̃Ⴐ̃ⴚⴈ·ⴈⴂ̃ⴈ·ⴈⴂⴖⴇ·Ⴇ·ⴞⴑ̃ⴇ·, *mxedruli*: კ(ა)ცი იგი ქ(ა)ლ(ა)ქით თჳსით

"the man from his city" (First Book of Kings, chapter 1, verse 3)

Figure 4: Extract of Folio 287, recto, column b, line 22, lower picture with retraced phrase

The following example demonstrates abbreviations of the 2nd person possessive pronoun and a quantifier:
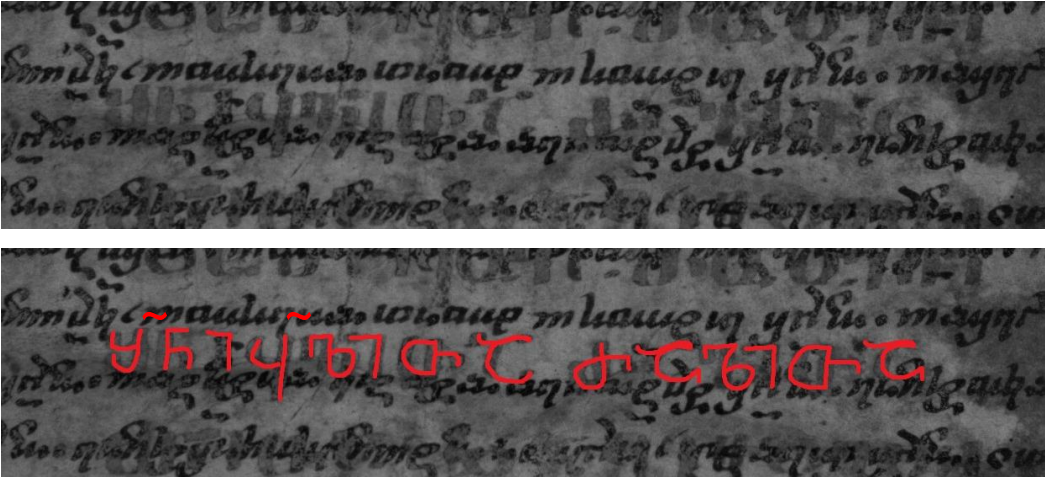
asomtavruli: �"ჩ�7Ⴣ"�ზ7Ⴣ·Ⴀ ჴႠ�ზ7Ⴣ·Ⴌ, *mxedruli*: შ(ე)ნი ყ(ოვ)ლითა ძალითა
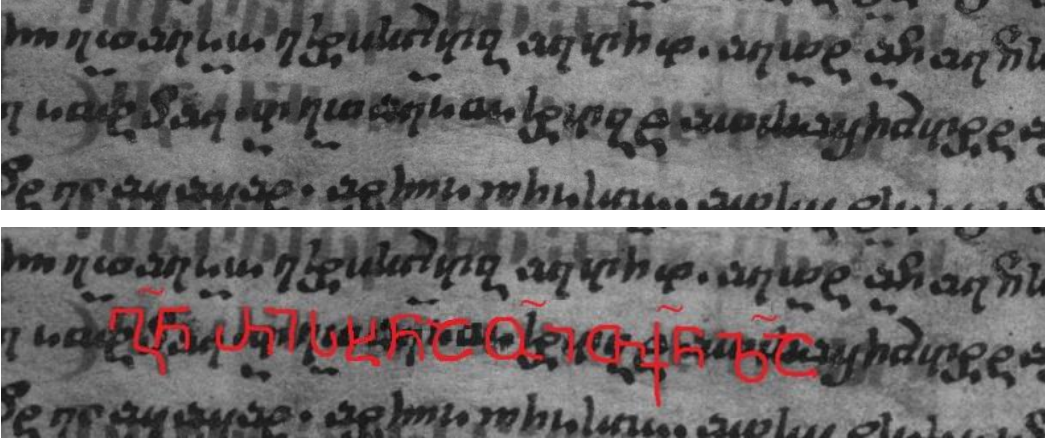
"with all your might" (Deuteronomy, chapter 6, verse 5)

Figure 5: Extract of Folio 288, recto, column b, line 11, lower picture with retraced phrase

The last example in the present paper will be one showing abbreviations of a preverb, a *nomen sacrum*, a personal pronoun and a postposition:

asomtavruli: ჃჇ ჴჍ7ႱჃႠႠ Ⴍ"ჲ Ⴍ·ჩჇ Ⴤ"Ⴀ *mxedruli*: გ(ა)ნრისხნა ო(ჳფალ)ი თქ(ოვე)ნ

ზ(ედ)ა " [He] made the Lord furious with you' (lit. … furious on you)" (Genesis, chapter 38, verse 1) (Deuteronomy, chapter 9, verse 19)

Figure 6: Extract of Folio 279, recto, column b, line 18, lower picture with retraced phrase

Even if a great amount of Paris, BnF, géorg. 5. has been deciphered by us until now, there are still some pages which are not readable and thus not identifiable. For our project, it is therefore indispensable to travel to Paris to make new images of these pages using a more elaborate

multispectral imaging system and then to continue and complete the decipherment of the lectionary.

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Project Website: https://www.csmc.uni-hamburg.de/news/2022-04-06-delicate.html

მარიამ ყამარაული

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ხელნაწერთა გაშიფვრის თანამედროვე მეთოდები საერთაშორისო პროექტის DELICATE (წიგნიერების განვითარება კავკასიის ტერიტორიებზე) მაგალითზე[4]

(აბსტრაქტი)

ბოლო 20 წლის განმავლობაში მნიშვნელოვანი განვითარება ჰპოვა კავკასიაში გავრცელებული სამი ენის - ქართული, სომხური და კავკასიური ალბანურის უძველესი წერილობითი მასალის, განსაკუთრებით პალიმფსესტური ხელნაწერების დიგიტალური მეთოდებით დამუშავებამ. თანამედროვე მეთოდების გამოყენებამ პალიმფსესტური ხელნაწერების დამუშავებაში და მიღებულმა შედეგებმა მეცნიერებას შესთავაზა არსებითად ახალი შეხედულებები ამ ენათა ისტორიულ განვითარების შესახებ. ის მოსაზრებები, რომელიც აქამდე შემოიფარგლებოდა ცალკეულ ენასთან მიმართებაში, პირველად მოექცა ურთიერთგადამკვეთ ენობრივ სინთეზში, რამაც შესაძლებელი გახადა სრულიად ახალ ასპექტში განვიხილოთ კავკასიის რეგიონში მწერლობის გაჩენისა და გავრცელების ფაქტორი, გავითვალისწინოთ სამი ენისა და მათ მიერ წარმოდგენილ ქრისტიანულ კულტურებს შორის ურთიერთდამოკიდებულება, აგრეთვე რელიგიური და ექსტრალინგვისტური ფაქტორების გავლენა დასახელებულ ენებზე. პროექტი „DeLiCaTe" მიზნად ისახავს კავკასიაში წიგნიერების განვითარების საერთო პირობებისა და გარემოების პირველი ენობრივი სინთეზის შემუშავებას. ამ პროექტის წარმატებით განხორციელებისთვის კი მნიშვნელოვანია შესაბამისი პალიმფსესტების გაშიფვრა, რაც გარკვეულ სირთულეებთან არის დაკავშირებული და მოითხოვს პალიმფსესტების გაშიფვრის კომპლექსური მეთოდების შემუშავებასა და გამოყენებას, კერძოდ, მუშაობას მრავალსპექტრულ გამოსახულებებთან, ასოებისა და სტრიქონების გადათვლას, რედაქციების

შედარებას, ზუსტი ტექსტის მონაკვეთის პოვნასა და შედარების დროს მოცემული განსხვავებების ანალიზს/ახსნას. სტატიაში წარმოდგენილია ქართული პალიმფსესტების თანამედროვე მეთოდებით გაშიფვრის მეთოდოლოგიური და ტექნოლოგიური ჩარჩო და აქამდე ჩატარებული ანალიზის შედეგები.

საკვანძო სიტყვები: ხელნაწერთა დიგიტალური დამუშავება, ქართული ენა, დიგიტალური ქართველოლოგია

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(Abstract)

Over the last 20 years, considerable progress has been made in the analysis of the oldest written materials of the three languages Georgian, Armenian and Caucasian Albanian in palimpsest form, and the results have provided substantial new insights into their historical development. These insights, which have hitherto been confined to the individual languages, are now for the first time ever to be brought into a cross-language synthesis, which will yield a completely new view on the emergence and spread of writing in the region, taking into account the interrelations between the three languages and the Christian cultures represented by them as well as the influence of external religious and linguistic factors. The project "DeLiCaTe" aims to assail the task of developing a first cross-language synthesis of the common conditions and circumstances of the development of literacy in the Caucasus. For the successful execution of this project, it is important to decipher the palimpsests relevant, which is proved to be a difficult task. Several methods for the decipherment of these palimpsests need to be developed and applied, such as working with multispectral images, counting of letters and lines, comparing the redactions, finding the exact text passage and analyzing/explaining the differences given during the comparison. The presentation will deal with these topics and provide an overview of the analyses so far.

Key words: digital processing of manuscripts, Georgian language, Digital Kartvelology

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