"New Light on Old Manuscripts: Recent Advances in Palimpsest Studies"

ABSTRACTS

WEDNESDAY, 25 APRIL 2018

Michael B. PHELPS
The Sinai Palimpsests Project: its History, Philosophy, and Contributions

The Sinai Palimpsests Project, a collaboration of St. Catherine's Monastery and the Early Manuscripts Electronic Library (EMEL), was the most extensive application to date of spectral imaging to recover obscured information from historical source materials. As such, the project served as a vehicle to advance imaging and image processing methods, the cataloging of palimpsests, and the policies and protocols for large-scale recovery projects. This talk will review the history of the project, its structure, selected contributions, and future directions. The Sinai Palimpsests Project was a ten-year effort (2009–2018), made possible by the cooperation of Sinai monks, scientists, technicians, managers, and scholars from at least 10 countries. Its workflow involved the transmission of project data to three continents. The project brought the spectral imaging methods applied to the Archimedes Palimpsest to the Sinai desert and then supplemented and enhanced these methods based on encounters with new challenges among Sinai's palimpsests. Spectral imaging methods described as experimental in the project's first grant proposal (2009)—spectral transmissive imaging and spectral fluorescence imaging—not only proved critical to the recovery of erased texts in Sinai, but are now basic components in the spectral imaging toolbox of multiple projects in Europe and North America. A philosophy of 'responsible access' made possible a project that balanced the interests of diverse stakeholders. The resulting spectral data, exceeding 50 TB, and scholarly metadata, describing 6800 palimpsest pages, open new research questions that were not previously possible.

Claudia RAPP
The Palimpsest Corpus at St. Catherine's Monastery in the Sinai. Preliminary Observations

The Holy Monastery of Saint Catherine is not only the oldest Christian monastery (including its library) in continuous operation, it also contains the world's largest known collection of palimpsested manuscripts on parchment. In the course of the Sinai Palimpsests Project—a collaboration of the Monastery and the Early Manuscripts Electronic Library that featured an international team of camera specialists, image scientists, and textual scholars—about half of this palimpsest collection was imaged using cutting-edge multispectral photography, rendered legible through innovative methods of computer-based analysis, and the erased texts identified by experts in most of the languages of the Christian Orient plus Latin.

While much work remains to be done and individual team members will present the results of their work on the processed images, this paper will focus on the study, now possible for the first time, of an entire corpus of palimpsested manuscripts that has remained in the same location. This allows for fresh insights into the relation between the content and language of overtext and undertext as well as the methods and strategies of palimpsestation.

Giulia ROSSETTO
Greek under Arabic: Behind the Lines of Sinaiticus arabicus NF 66

Sinaiticus arabicus NF 66 is made up of six fragmentary folia and three tiny parchment scraps. These were originally part of a codex of ca. 300 folia containing the *Lives of the Monks of Palestine* by Cyril of Scythopolis. It was copied at Mar Saba (near Jerusalem) in the first quarter of the 10th century and later brought, under unknown circumstances, to St. Catherine's Monastery in the Sinai. A number of folia from this manuscript are now dispersed, and have been identified in several libraries: Leipzig, Univ. gr. 2 (22 folia); Saint Petersburg, RNB, gr. 26 (6 folia); Cambridge, Add. 1879.5 (a small piece of parchment).

All preserved folia are palimpsests, with *scriptiones inferiores* in Greek and Christian Palestinian Aramaic. Among the folia with Greek *scriptio inferior* three different texts can be recognized: one biblical, one grammatical, and one poetical.

This paper focuses on the poetical text in the Sinai manuscript. Based on an analysis of codicological and palaeographical features, combined with that of linguistic and stylistic elements, I will suggest a possible date and authorship for the content of these poetical fragments.

Pasquale ORSINI
Greek Scripts, Books and Texts: New Materials from Sinai

The study of a number of the Sinai Greek palimpsests produced interesting results. As for palaeography (particularly with regard to 'canonized' majuscules and 'mixed script') important witnesses emerged for the sixth to the ninth century CE, providing new evidence for the relative chronology of scripts. Concerning book formats, it was possible to reconstruct some codicological units and, in particular, to study the reuse of liturgical scrolls, and to propose the reconstruction of their original structure. The identification of texts also brought new results. In several cases Sinaitic palimpsests appear to be the oldest witnesses for some authors, in other cases they document important textual variants, and in a couple of cases they seem to transmit texts that were unknown or unpublished until now.

Agamemnon TSELIKAS
Textual Observations on Some Sinai Majuscule Palimpsests

In the framework of my participation in the Sinai Palimpsests Project, I was assigned work on the Greek undertexts of nine manuscripts (Arabic 514, Greek NF MG 24, Arabic NF 8, Arabic NF 28, Syriac 7, Georgian NF 19, Greek NF MG 14, Greek 212, Greek 929), in order to achieve their palaeographical and textual analysis. With regard to the textual documentation, the TLG program was used initially in conjunction with other means of literary research. A similar study was also made for the palaeographical documentation based on recent results in similar research. All the manuscripts that have been examined contain religious texts except one which contains, among others, texts of classical antiquity (Arabic NF 8 Hippocrates and other medical texts). The undertexts of most manuscripts are written in majuscule letters and can be dated between the sixth and eighth centuries. The manuscripts are important from the point of view of their codicology but also as new witnesses to the texts they contain. This communication will present these thoughts and materials, supported by concrete examples.

Στο πλαίσιο της συμμετοχής μου στο Πρόγραμμα της Μελέτης των Παλιμψήστων της μονής της Αγίας Αικατερίνης Σινά που οργανώθηκε από την επιστημονική ομάδα EMEL μου ανατέθηκε αναφορικά για τα ελληνικά παλαιότερα κείμενα η παλαιογραφική και κειμενολογική τεκμηρίωση 9 χειρογράφων (Arabic 514, Greek NF MG 24, Arabic NF 8, Arabic NF 28, Syriac 7, Georgian NF 19, Greek NF MG 14, Greek 212, Greek 929). Όπως συμβαίνει σε παρόμοιες έρευνες ως προς την κειμενολογική τεκμηρίωση χρησιμοποιήθηκε αρχικὰ το πρόγραμμα TLG σε συνδυασμό με άλλα μέσα που απάιτεί η φιλολογική έρευνα. Ανάλογη μελέτη έγινε και για την παλαιογραφική τεκμηρίωση με βάση τα δεδομένα της σύγχρονης παλαιογραφικής επιστήμης. Όλα τα χειρόγραφα που εξετέστηκαν περιέχουν θρησκευτικά κείμενα εκτός από ένα, το οποίο περιέχει μεταξύ άλλων και κείμενα της κλασσικής αρχαιότητας (Arabic NF 8 Ἱπποκράτης και άλλα

ιατρικά). Το παλαιότερο κείμενο των περισσοτέρων χειρογράφων είναι γραμμένο με κεφαλαιογράμματη γραφή μεταξύ 6ου και 8ου αιώνα. Αυτονόητο είναι ότι το ενδιαφέρον του μελετητή επικεντρώνεται στη επισήμανση της κωδικολογικής και κειμενολογικής δομής των αρχικών χειρογράφων και στη συνέχεια της φιλολογικής ποιότητας των κειμένων που παρέχουν, τόσο ως προς την πληρότητά όσο και ως προς τις ορθογραφικές τους ιδιοτυπίες. Στην ανακοίνωση θα παρουσιαστούν συγκεκριμένα παραδείγματα και θα διατυπωθούν ανάλογες σκέψεις και προτάσεις.

Steve DELAMARTER – Getatchew HAILE
The Ethiopic Undertext of Sinai Greek NF 90: Discovery and Analysis

There are three Ethiopic undertexts in Greek NF 90, one of the palimpsest manuscripts from Saint Catherine's Monastery. Only six other cases of palimpsests with Ethiopic undertexts are known and all of the others are cases in which the overtext is also Ethiopic (a review of all known palimpsests involving Ethiopic text was given by Ted Erho at the annual Society of Biblical Literature Meeting in Boston, November 20, 2017). Further, since the Greek overtext is judged to be 12th or 13th century, the Ethiopic undertext will be one of only a handful of known Ethiopic texts extant from before the 13th century. These facts alone render the Ethiopic undertext of Greek NF 90 unique and important. But, after analysis, there are several other factors that make this Ethiopic text even more interesting. In the first place, there are actually remains of three Ethiopic texts from at least two different books in the manuscript. Second, though the texts have been difficult to transcribe, it is nevertheless possible to identify the genre of two of the three undertexts and, thereby, to narrow down the list of possibilities for identifying these with known texts. One of the texts is a lectionary text arranged for the observance of the hours; the other is a homily complete with sermonic elements involving exhortation and the appeal to biblical texts (from Deuteronomy and Matthew). If the Ethiopic undertexts are what we think they are, each one will dictate significant new conclusions about their respective exemplars: the relationship of Giyorgis of Sagla to the Ethiopian Book of Hours which bears his name will have to be reconceived; and if it remains impossible to identify the homily text, it may indicate that we are in possession of a previously unattested patristic homily from antiquity.

Damianos KASOTAKIS
Implementing Spectral Imaging in the Sinai Desert

This paper gives a detailed presentation of the Spectral Imaging system (built by Mega Vision and Equipoise Imaging, along with modifications suggested by EMEL) that was installed at St. Catherine's Monastery for the spectral imaging of the Sinai Palimpsests Project. An explanation of the workflow will be given, as well as the way that the technology and the system evolved and were upgraded through the years, as we

transitioned from the E6 digital back to the E7 digital back of Mega Vision. This also included the addition of auxiliary light sources, which had the effect of better quality photos with more light and more data available for the image processing scientists. Problems and creative solutions in the middle of the Sinai desert were always a challenge, but also unexpected discoveries in the dark imaging rooms were made, which gave beautiful flowery images to the scholarly community for future generations to study in depth, after their preliminary study by the author of this paper.

Kenneth BOYDSTON
Beyond Discovery: Bringing More Good Things to Light

While the core purpose of the Sinai MultiSpectral imaging System is to reveal undertext in palimpsests, the system has capabilities that enable it to do much more. Restoring faded and damaged illustrations, providing reliable spectral reflectance records, integrating with RTI, and creating highly accurate color images can increase the value of the image data and provide benefits to conservation, preservation, reproduction, and appreciation. Much added value can be realized with minimal additional effort. Given the value of the objects being imaged and the core cost of imaging, it can be argued that the additional effort is a small price to pay for many benefits that ensue.

Keith T. KNOX
Recovery of Erased Text Using Unsupervised Methods

Erased text on a palimpsest is visible to the eye to varying degrees, depending on several factors. Sometimes, the erased characters are legible and the processing methods merely clarify the reading. Other times, the erased text is not visible at all, and processing is needed to reveal them. The processing methods that are appropriate for a given manuscript depend on the visibility of the text and the nature of the ink used to write them.

Unsupervised methods work best for erased iron gall ink on parchment. The tannic acid from the ink soaks into the parchment and remains after the visible portion of the ink is removed in erasure. This residue can create colored stains, visible to the eye, but it also inhibits the fluorescence of the parchment under ultraviolet illumination, greatly enhancing the visibility of the characters. On the flesh side of the parchment, the tannic acid may eat into the parchment leaving a character-shaped hole with no ultraviolet-suppressing residue. In that case, an image of the leaf with light that travels through the parchment can reveal erased characters.

These unsupervised methods can be applied to all of the leaves of the manuscript. The methods include the use of pseudocolor to enhance the erased text, taking the ratio of different spectral bands to suppress background, illuminating at shallow angles to capture

the surface variations of the parchment, and transmitting light through a leaf to reveal characters that have been eaten away.

In many cases, these methods reveal the characters with sufficient clarity that no further work is needed. When that is not the case, statistical-based methods can be used to reveal very low contrast details. These methods require much more time and supervised attention by a skilled person to be effective, and are not the subject of this talk.

Roger L. EASTON Jr.
Customized Processing of Multispectral Imagery of Palimpsests Based on Spectral Statistics

'Multispectral imaging' is the general term used to describe methods for obtaining and combining images of objects collected under different colors of light and possibly in different modalities, including the usual mechanism of reflection, but also by transmission and by fluorescence. In the application to historical manuscripts, images collected under the different conditions of illumination are combined digitally to enhance the visibility of the feature(s) of interest, usually erased or damaged text. Over the last two decades or more, multispectral imaging has been used to recover text successfully from a wide variety of historical objects, including the Dead Sea Scrolls, the Archimedes Palimpsest, and the David Livingstone African Diaries in Scotland, among others.

In all manuscripts in these projects, it is often true that the conditions at different locations on a leaf or page may vary significantly. Such variations may be due to differences in the success of overtext removal by the scribe who prepared the parchment for overwriting. They also may arise from local damage from mold or application of chemical reagents formerly used to make the undertext more visible, at least temporarily. Since the condition of the leaf may vary over short distances, 'customized' processing based on the local spectral statistics often is necessary to recover text.

This talk describes statistical tools and the results obtained from objects that exhibit such local variations in condition. The tools used include the well-known 'principal component analysis' (PCA) and 'independent component analysis' (ICA), but also 'spectral angle mapping' (SAM) and the 'minimum noise fraction' transformation (MNF). Examples of results will be presented for a variety of objects, including palimpsests from the 'New Finds' at St. Catherine's Monastery, the 'Dexippus' palimpsest in Vienna, the world map by Henricus Martellus (c. 1491), and the Vercelli Mappa Mundi (c. 1220 CE).

Dave KELBE
Is it Magic? The Science Behind Image Processing: Perspectives and Possibilities

In this paper I will attempt to unravel the enigma of scientific image processing and its application to recovering erased, damaged, or otherwise obscured writing from historical

manuscripts. Drawing from five years of work as a scientist on the Sinai Palimpsests Project and other initiatives around the world, I will explain the core scientific principles that make our image processing techniques successful. I will survey the various computational 'recipes' that are currently being used to elucidate erased writing for these and other projects.

My goal here will be to develop guidelines for successful image processing based on an underlying intuition for the physical and scientific processes involved. I will then highlight the importance of considering each individual's unique human visual system—which is often overlooked—in the entire image processing chain. I will close with future possibilities and perspectives based on emerging trends in the broader field of image processing, computer vision and machine learning.

Michael B. TOTH
Dispersed Palimpsest Offers Digital Insight into St. Catherine's Library

The Syriac Galen Palimpsest offers a unique reconstructed digital record into the dispersal of a manuscript from St. Catherine's Monastery. The palimpsest contains a copy of a sixth-century Syriac translation of Galen's *On Simple Drugs* that was scraped off and overwritten with an eleventh-century Syriac religious text. It was the subject of multispectral imaging in 2009, 2010 and 2016 to reveal the undertext for online study – as well as x-ray fluorescence imaging in 2018 and multispectral imaging with a 100 megapixel Phase One CMOS camera. 'Missing' leaves in other institutions were imaged in 2014 and 2015. The manuscript has now been digitally reconstituted, with all images and metadata now hosted in simple flat files on digitalgalen.net.

Independent scholars working with the freely available data and processing tools found the original manuscript was stored in St. Catherine's Monastery Library in the Sinai. Only one leaf, Syriac NF Fragment 65, remains there. The rest of the manuscript is believed to have been removed from the Sinai library in the latter half of the 19th or early 20th Century. The codex was purchased by a private collector in 2002 and conserved by the Walters Art Museum in conjunction with multispectral imaging.

Following discovery of 'missing' leaves by scholar Grigory Kessel, the project team also used different multispectral systems to image five leaves that had been dispersed to other institutions—the Vatican Apostolic Library, the National Library of France, and Harvard's Houghton Library—as well as the leaf still at St. Catherine's Monastery. All kindly gave permission for imaging and free sharing of all the images—captured and processed—by the University of Pennsylvania. For the first time since the manuscript left St. Catherine's Monastery Library, the entire manuscript has now been reunited digitally and made freely available to anyone who wishes to study them – from the monks of St. Catherine's to researchers around the globe.

Doug EMERY
Reflections on the Digital Palimpsest: Data Modeling and Data Management

The author began working on palimpsest digitization and spectral imaging projects in 2005 with the Archimedes Palimpsest Project. Since that time, the technologies and approaches taken to manage palimpsest data and metadata have evolved. This short talk will survey these changes over several years and several projects, touching on the management and preservation of image files and the modeling of palimpsest structure and content, ending with a description of the Sinai Palimpsests Project's (SPP) tools and processes for managing several hundred thousand image files of 6500 imaged folio sides and coordinating that data with description and identification of complex undertext content. The SPP was new in that it introduced the imaging of multiple palimpsest manuscripts in a single project and, further, added the requirement to provide detailed description and undertext identification for the documents imaged. The work resulted in KatIkon, a bespoke web application for palimpsest cataloging and data management. The team used it throughout the project to support the complete cataloging, imaging, image processing, undertext identification, and data release lifecycle. To support palimpsest description and undertext characterization the SPP project team developed its own formal terminology to cover language- and script-based groupings of images to be delivered to scholars for undertext identification (Folio Undertext Layer, Text Layer Grouping) and the grouping and organization of identified undertexts (Undertext Object). Finally, the SPP instituted a practice, unfortunately missing from some previous projects, of releasing capture images in their full bit-depth and with integrity information to ensure their integrity and authenticity.

THURSDAY, 26 APRIL 2018

Sebastian P. BROCK
What Can Be Learnt, and What Not, from the Experience of the Syriac and Christian Palestinian Aramaic Palimpsests

The paper will consist of two sections. The first will provide an outline of the contents of the Syriac and Christian Palestinian Aramaic palimpsests in images sent to me, among which the most important are 24 folios, divided between Sinai NF Syr. 37 and 39, of a third Old Syriac Gospel manuscript. In the second part I will discuss a wide range of practical findings which I have encountered in trying to read the undertexts, focusing mainly on two extensive sets of palimpsests, in Sinai Syr. 30 and in NF Syr. 3.

Grigory KESSEL
Codex Arabicus (Sinai Arabic 514) Revisited

The manuscript Sinai Arabic 514 hardly requires any introduction as it is one of the most well-known palimpsests preserved at the library of St. Catherine's Monastery on Mount Sinai. The manuscript was dubbed as 'Codex Arabicus' by Aziz Atiya being "the unique quintuple palimpsest in three languages – Syriac, Greek and Arabic". According to the interpretation of Atiya, one and the same manuscript book was reused no less than five times until the ninth century. Despite the fact that Atiya's interpretation became widely acceptable, no systematic research has been done on the manuscript with an attempt to identify the manuscripts and texts that were reused for its production. Fortunately, thanks to the recent multi-spectral imaging of the manuscript by the Sinai Palimpsests Project, it is now possible to conduct a detailed examination. The paper will offer some preliminary results of the presenter's study of the palimpsest with particular attention to the material in Syriac language.

Christa MÜLLER-KESSLER
A Florilegium of Christian Palestinian Aramaic Palimpsests from St. Catherine's Monastery

A selection of findings made during the study of the Christian Palestinian Aramaic palimpsests within the framework of the Sinai Palimpsests Project will be presented in this paper. Apart from the previously unattested texts in CPA, some of the CPA fragments contain the texts of which the Greek *Vorlagen* are lost. This includes a martyrdom of one of the eleven followers of Pamphilos of Caesarea in Palestine about whom we knew only from a list in Arabic and in Georgian. In addition to the unpublished

version of the 'Dormition of the Holy Virgin', which surfaced among the palimpsests in the Taylor Schechter collection from the Cairo Genizah, two further versions, one even without any predecessor in Greek, came to our attention in this Western Aramaic dialect. Two of them can be even considered to be the earliest transmissions predating the early Syriac translations. Noteworthy is also the missing quire of the *Codex Climaci Rescriptus* that provides us with passages of 1-2 Corinthians so far unattested in this Aramaic dialect version and with a number of notable reading variants for the textual criticism of New Testament study. Among the unpublished palimpsests are also highlights for the textual transmission of the Septuagint and overlaps with the Byzantine Prophetologium.

Alain J. DESREUMAUX
L'apport des palimpsestes du Sinaï à la codicologie araméenne christo-palestinienne et aux versions anciennes des textes bibliques

The technique used to reveal palimpsest texts of the Library of St. Catherine's Monastery at Mount Sinai has succeeded in the discovery of Christo-Palestinian Aramaic texts from the most ancient witnesses of this literature, possibly from sixth century AD.

Ms. Sinai Syr. NF 56 (CPA) is particularly remarkable. This manuscript reveals a great deal of codicological information. The actual 90 folios reused 46 folios of an ancient Christo-Palestinian manuscript which can be reconstructed precisely. Quires are quaternions, with the flesh-side outside with 'en miroir' signatures. The layout is regular: two columns of 23 lines; system of ruling and pricking; decoration is used: big crosses inscribed in circles as drop caps mark the beginning of pericopes; the initials for many sentences are coloured and ornamented; calligraphy is beautifully realised; punctuation is regular.

Moreover, this manuscript is a precious witness for two New Testament texts translated from Greek into Christian Palestinian Aramaic. Extensive passages are legible, some of which had been previously unknown in this language.

The codex was a Gospel book containing Matthew and Mark. A critical edition is in progress; meanwhile it seems that the text is a good representative of what I have called 'the Christo-Palestinian Vulgata' that was in use among Chalcedonian Christians of Palestine and Arabia as early as the sixth century. One can note also the presence of a system of synoptical references in the margins. Moreover, the text includes subtitles with numbering of liturgical readings inside each Gospel.

La technique utilisée pour révéler les palimpsestes de la bibliothèque Sainte-Catherine du Sinaï, a permis de découvrir des manuscrits araméens christo-palestiniens qui sont parmi les plus anciens vestiges de cette littérature, peut-être du VIᵉ siècle.

Le cas du manuscrit Sinai Syr. NF 56 (CPA) est remarquable.

Il apporte d'abord nombre d'informations codicologiques. Quatre-vingt-dix folios réutilisent quarante-six folios d'un ancien manuscrit christo-palestinien que l'on peut partiellement reconstituer avec précision. Les cahiers sont des quaternions, côté « chair »

à l'extérieur, signés selon le système « en miroir ». La mise en pages est régulière en 2 colonnes de 23 lignes ; un système de réglure est perceptible ; des décors de grandes croix inscrites dans des cercles marquent certaines péricopes en jouant un rôle de lettrines ; des initiales de phrases sont décorées ; la calligraphie est soignée ; la ponctuation phrastique est régulière ; la ponctuation grammaticale est élémentaire.

D'autre part, ce manuscrit est un précieux témoin de deux textes du Nouveau Testament traduit en christo-palestinien ; en sont lisibles de larges passages dont certains sont encore inédits en christo-palestinien. Le codex contenait un évangéliaire continu de l'Évangile selon Matthieu et l'Évangile selon Marc. En attendant une édition critique en cours, on peut évaluer que le type de texte représenté semble celui que j'ai nommé « la vulgate christo-palestinienne » en usage chez les chalcédoniens de Palestine et d'Arabie dès le vi^e siècle. On distingue en outre l'existence d'un système d'indication marginale de péricopes synoptiques. Des sous-titres numérotent un système de lectures liturgiques.

Michelle P. BROWN
Arabic NF 8 and the Latin Manuscripts of St. Catherine's, Sinai

I should like to talk about one particular palimpsested manuscript and the light it throws upon my work in establishing a corpus of Latin manuscripts found, and in some cases produced, at the monastery. That manuscript, Arabic NF 8, is a fascinating confection of pieces of earlier vellum leaves from a number of manuscripts, palimpsested and sewn together around 900 to form a book containing an Arabic text. It attests to the shortage of vellum in the Sinai and to the sacrifice of earlier works to the needs of the monastic community at a time when Arabic had become the first language of the region. Some fragments had been palimpsested previously, giving two or three textual strata which are difficult—and in some cases impossible—to decipher. Some have proven identifiable, others are so fragmentary that textual recovery is elusive. However, the nature of the texts can sometimes be assessed and the hands dated by palaeographical analysis.

This analysis has been assisted and informed by my work in identifying a corpus of pre-Crusader Latin texts at the monastery, which had not previously been thought to possess Latin works amongst its rich polyglot holdings, owing to what I consider to be an historical misprision that there was no sustained or meaningful interaction between the area and western Europe between the demise of the western Roman Empire and the Crusades. The Latin manuscripts of St. Catherine's significantly challenge this view. I have published notices of them and discussed their historical contextualisation and am in the process of writing a catalogue of the Latin manuscripts of the Holy Monastery of St. Catherine's Sinai, in which the palimpsest fragments will be included along with the more substantial non-palimpsest materials.

My work has shown that there were western scribes and manuscripts present in the early medieval monastery, as well as works imported at the time of the Crusades, and that the monastic scriptorium (or a separate scriptorium serving the Latinate members of the community) was producing its own Latin books and documents, just as it did a variety of

other languages, in a hybrid style of codicology, script and decoration. Amongst the western hands are two in Arabic NF 8 which write uncial and half-uncial scripts of the sort practised in Rome in the sixth century, who penned an Apocalypse and a History of Apollonius of Tyre (this copy a rare illustrated example) and two are eighth-century Anglo-Saxon hands. The digital images generated by the Sinai Palimpsests Project have made it possible to identify more passages by these hands and the relative stratification, like an archaeological excavation, has made it possible to reconstruct a remarkable sequence of working campaigns, probably undertaken at the monastery, which has considerable bearing upon a consideration of East / West relations in the early Middle Ages.

Heinz MIKLAS
'Excavating' the Slavonic Palimpsests in the New Sinaitic Finds

Among the many results, the study of the Sinai New Finds of 1975 has shown that palimpsests belong to the most important general characteristics of manuscripts of Sinaitic provenance. This applies in particular to the Old Slavonic manuscripts and fragments, which show yet another peculiarity: their undertexts are so heavily erased that we have so far discovered little more than individual letters, let alone whole texts! Although this fact makes their assessment difficult, it does not make it completely impossible. So, at least the number of layers, the scripts and languages of the sublayers (up to three in the Medical Folia, attached to the Psalter 3N) could be determined, in a few cases also initials or drawings.

In the context of an overall sketch of the (altogether seven) Old Church Slavonic-Glagolitic manuscripts and their investigation, this presentation also traces the arduous discovery of these remains.

Die Untersuchung der Sinai-Funde des Jahres 1975 hat allmählich gezeigt, dass Palimpseste zu den wichtigsten Bestimmungstücken von Handschriften sinaitischer Provenienz gehören. Dies gilt in besonderem Maße auch für die altslawischen Handschriften und Fragmente, die noch eine weitere Besonderheit aufweisen: Ihre Untertexte sind so stark getilgt, dass wir bisher von ihnen kaum mehr als einzelne Buchstaben entdecken, geschweige denn lesen konnten! Dieser Umstand erschwert zwar deren Einschätzung, macht sie aber nicht gänzlich unmöglich. So konnten zumindest die Zahl der Schichten und die Schriften bzw. Sprachen der (bis zu drei) Unterschichten ermittelt werden, in einem Fall auch Zeichnungen. Im Rahmen einer allgemeineren Skizze zu den (heute insgesamt sieben) altkirchenslavisch-glagolitischen Handschriften und ihrer Erforschung geht die Präsentation auch der mühsamen Entdeckung dieser Reste nach.

Zaza ALEKSIDZE – Dali CHITUNASHVILI
Palimpsest N/Sin Geo 7 Kept at the St. Catherine's Monastery on Mount Sinai (Identification of the Texts)

N/Sin.geo-7 is one of the Georgian palimpsests preserved at St. Catherine's Monastery. The manuscript, which consists of 154 pages, dates back to the 13th century (according to description) and contains a collection of chants. The entire manuscript is a palimpsest.

After the manuscript examination, it became apparent that the manuscript had two lower layers, both of which are written in Nuskhuri. But they are completely different in respect of time, text organization and grapheme outline. The main part of the manuscript (1-12, 49-154) is carried out in large-scale (thick) Nuskhuri in one column. Each column contains 15 lines. The manuscript contains a Psalm, which has close similarity to pre-Athonite translations of the Psalter.

Pages 13-48 of palimpsest are completely different from the Psalm manuscript. Each page has 22-23 lines, the text is executed in thin, refined Nuskhuri, which dates back to the 10th century. As the palimpsest exploration has shown us, the manuscript contains Iadgari (Collection of Chants).

In the process of deciphering of the palimpsest, at the end of chants of Nicholas of Myra, part of the text was written in Mtavruli (uncial). After deciphering the text, the content turned out to be the following: "Saint Nicholas, guard Tornike, his brother and his son".

We think that the invocation is used for granting mercy to Tornike Eristavi a famous figure from tenth-century Tao. As for the topic of using Tornike Eristavi's common name, it may mean that the manuscript was copied before Tornike was consecrated (before 973). So, we should consider the manuscript to be of Tao-Klarjetian descent.

Because of the palimpsest nature of the manuscript, it is often hard to identify the succession of the chants; and almost impossible to read out the days of remembrance, as they were written using red ink and in time, it has faded. The names of chants are unintelligible even on digital copies taken with multi-spectral imaging. The researched material has shown us that palimpsest Iadgari of remembrance succession does not flow in accordance to any manuscripts containing the texts of the so-called New Iadgari.

Bernard OUTTIER
New Insights in Christo-Palestinian Aramaic (CPA) and Georgian Literatures

1- The most unexpected result has been the identification of the undertext in the manuscript CPA NF Fragment 16: the upper text is CPA Gospel according to Luke, from the seventh century (according to S. Brock's catalogue) or eighth century (personal communication of A. Desreumaux). However, the undertext contains the end of a Georgian liturgical manuscript with the beginning of the scribe's colophon, seems to date from the third part of the 10th century. Hence, we face here a problematic chronological issue that has to be dealt with.

2- Geo NF 84 and Geo NF 90 are two parts of the same manuscript. There are two undertexts – so, three Georgian texts one upon the other.

One undertext, asomtavruli, that is written with capital letters, is a new fragment of mravaltavi (homiliary), from the sixth century, xanmeti.

The second one is a unique Psalter, with both xanmeti and haemeti forms, so probably from the eighth-ninth century, and very peculiar textual variants.

Jost GIPPERT
New Light on the Caucasian Albanian Palimpsests of St. Catherine's Monastery

Among the many palimpsests of St. Catherine's Monastery, those with an underwriting in Caucasian Albanian (CA) are peculiar indeed, given that they represent the only manuscript remains of the East Caucasian language of the 'Albanians' that have survived from the Middle Ages. In a project running from 1999 to 2008, a first attempt at deciphering these palimpsests has been undertaken successfully, resulting in a three-volume edition published in the series *Monumenta Palaeographica Medii Aevi* at Brepols, Belgium. For one part of the palimpsests, those containing remnants of an 'Albanian' codex of St. John's Gospel, the restorability rate remained rather low, however; in a few cases, the underlying text passage could not even be identified with certainty.

With the new images provided by the Sinai Palimpsests Project, this has changed dramatically in that even for those folios that remained undetermined, their content has now been established, and the general readability rate has increased from about 25% to more than 50% for the remnants of the Gospel codex. The new images have a big potential indeed for improving our knowledge on the CA language and its textual heritage. They not only bring about corrections for many passages that could only be guessed at so far but also a small set of new fragments (counted as fols. 56 to 78 of Sin. georg. N 55) that enable us to complete our picture of the original codices. In my paper, I will summarise the results of the work on the new images in terms of both the determination of the textual contents and the reconstruction of the underlying codices.

Irmgard SCHULER
Imaging for Manuscript Inspection

The paper focuses on imaging and image processing methods for detection of illegible text, for investigation of unveiled illustrations, and for analysis of surface structure in handwritten materials of the Vatican Library. The cutting-edge technologies will be illustrated through appropriate samples.

Multispectral and transversal approaches are then shown especially in two case studies.

The first one regards a special photographic campaign addressed to the so-called Papyrus of Hanna, one of the oldest surviving witnesses of the Gospels of Luke and John. After the photo shooting process, in order to access contents that could not be detected by imaging (deciphering of the written text between glued fragments), a non-invasive survey through X-ray imaging, X-ray fluorescence elemental analysis (XRF), and molecular analysis in Raman microscopy (μ -Raman) followed. The optimal diagnostic process is yet to be identified in order to continue the investigation to detect text parts still unreadable.

The second case study concerns a palimpsest from the Abbey of Bobbio which presents, in addition to the difficulty to access the *scriptio inferior*, different problems that compromise the reading of both texts. The vicissitudes suffered by the palimpsest over time (presence of iron gall ink and leftover of restoration works of the past, i.e. coating layers of gelatin and paper fibers of absorbing paper used by the conservators), left organic and inorganic material on the parchment; these aspects, together with the effects of humidity and temperature changes during time, made the photographic recovering a special challenge.

Simon BRENNER
Photometric Stereo for Palimpsest Analysis

The digital investigation of palimpsests usually aims at the recovery of hidden layers of text. The obvious way to approach this problem is the search for traces of erased inks and pigments. Multispectral Imaging is a well-established method to this end. However, some of the secrets of palimpsests are not hidden in chemical surface properties, but in the three-dimensional structure of the base material itself, be it a carved ruling scheme that reveals the presence of a layer of text before the text itself can be detected, or tiny impressions etched into the parchment by ink that has long faded.

Raking light images are a common means to preserve the subtle plasticity of approximately flat objects, such as paintings or coins, in a two-dimensional image. Photometric Stereo drives this idea a step further and enables the digital reconstruction of the three-dimensional surface from a set of raking light images lit from different directions. The result is a high fidelity surface model, with a spatial resolution only limited by the resolution of the source images.

Photometric Stereo is therefore capable of acquiring and conserving the subtle surface structures found in palimpsests. It can be seen as a complementary method to Multispectral Imaging, not only helping to find additional clues about hidden layers of text, but also supporting the codicological analysis.

This report establishes Photometric Stereo as a meaningful method for the analysis of palimpsests and demonstrates its applications through case studies.

Leif GLASER (co-authored with Ivan SHEVCHUK, Daniel DECKERS, Christian BROCKMANN, Oliver HAHN, Ira RABIN)
X-Ray Fluorescence Investigations on Erased Text Written in Iron Gall Ink

Preparing parchment for reuse was often based on a first step of chemical erasure of the previous text, resulting mainly in a removal of the organic compounds of the iron gall ink. This way the metallic part of the ink remains in the parchment at its original place of writing. Therefore, it allows nowadays the use of non destructive X-Ray Fluorescence (XRF) investigations to access the original ink for local metallic fingerprint analysis and text recovery by mapping experiments.

Especially in order to re-access the erased iron gall ink text, non-destructive modern techniques often very successfully apply different methods of optical full field techniques such as Ultra-Violet and Multispectral imaging. The use of XRF complements these methods, allowing an element-specific probing of the writing, even if this writing is physically covered or otherwise optically inaccessible.

In this talk, a short overview will be given to highlight how XRF analysis can assist in palimpsest investigation using mobile and transportable equipment, as well as synchrotron radiation-based sources. Examples will be given to illustrate each method. In this context, the potential and limits of the methods available will be discussed together with the risks involved for the documents investigated.

Ivan SHEVCHUK
Full Field Multispectral Imaging as a Tool for Text Recovery in Palimpsests

Due to the development in the recent years towards non-destructive investigation, Multispectral Imaging (MSI) has established itself as a versatile optical tool for the recovery of erased writing in palimpsests. In this talk, the method will be briefly introduced with its possibilities and limitations, as well the data analysis which is an essential step in recovering lost writing. For many single palimpsested pages, MSI can recover large amounts of otherwise unreadable text. However, the separation of the two under layers of a double palimpsested page is much more difficult and requires creative approaches. Presented here are the post-processing results of an attempt to separate and recover two layers of a double palimpsest, Ms. C 79b Zentralbibliothek Zürich.

Processing of the multispectral data was performed using the programs ENVI, HOKU and GIMP, applying statistical methods such as Independent- and Principal Component Analysis (ICA, PCA), as well as Minimum Noise Fraction (MNF).

The separation of the text layers and the readability of the under text could be improved by a combination of various statistical analysis methods. To further improve layer separation and readability, one could complement MSI results with imaging data from X-Ray Fluorescence (XRF) Mapping.

FRIDAY, 27 APRIL 2018

Felix ALBRECHT – Chiara Francesca FARAGGIANA DI SARZANA
A Carbonized Septuagint Palimpsest of the Libri Sapientiales in Biblical Majuscule, Codex Taurinensis, Biblioteca Nazionale Universitaria, C.V. 25 (Rahlfs-Ms. 3010): Its Text and Context

Since 2010, we are working together on a very interesting, as well as hardly readable palimpsest: *Codex Taurinensis*, Biblioteca Nazionale Universitaria, C.V. 25. The manuscript was damaged during the fire in the Turin library, in the night from 25th to 26th January 1904, when about 1500 of 4500 manuscripts in total were completely destroyed. With the aid of multispectral photography, several pages of our codex could be revealed.

The script can be dated to the sixth to seventh century. The codex was re-used in the 15th century for writing a Byzantine grammar. The original Bible codex probably contained only the Wisdom books. In the remaining fragments it was possible to decipher passages of *Proverbs* (ch. 6, 18, 19, 20, 22, 25, 28, 29), *Ecclesiastes* (ch. 2, 3), Job (ch. 14, 31, 39), *Sirach* (ch. 2, 3, 16, 26, 38, 39, 43, 44), and *Wisdom of Solomon* (ch. 15, 16). The Turin palimpsest has so far not been taken into consideration by Septuagint scholars. A selection of significant variant readings will be presented.

Jana GRUSKOVÁ – Giuseppe DE GREGORIO
Neueste Einblicke in einige palimpsestierte Handschriftenunikate aus den griechischen Beständen der Österreichischen Nationalbibliothek
(Some latest insights into selected unique manuscripts in palimpsests from the Greek collection of the Austrian National Library)

The Austrian National Library (ANL) in Vienna possesses a significant number of Greek palimpsests. Many of them were identified in the twentieth century when the modern catalogue of Greek manuscripts was compiled, whereas other palimpsests could only be studied in the past two decades, taking advantage of digital recovery of erased writings. Since 2001 several projects have been conducted at the Austrian Academy of Sciences in international cooperations with leading scholars in various relevant fields, focusing on deciphering, editing and examining the important Ancient Greek and Byzantine texts as well as on an in-depth palaeographical and codicological analysis of the manuscripts. Multispectral digital imaging and special image processing by several scientific teams specialized in the recovery of palimpsests have enabled the scholars to read texts that had hitherto been invisible: Early Manuscripts Electronic Library (EMEL, California), Technische Universität Wien (lately within the Project CIMA), Fotoscientifica (Parma). In addition, X-ray fluorescence imaging has been performed on one palimpsest in cooperation

with the Deutsches Elektronen-Synchrotron DESY (Hamburg) and the Bundesanstalt für Materialforschung und -prüfung (BAM, Berlin).

This presentation will provide some latest insights into five unique Greek palimpsests of the ANL; particular attention will be paid to the palaeography of the manuscripts: (1) the *Scythica Vindobonensia* in *Cod. Hist. gr.* 73, new historical fragments on Gothic incursions into Roman provinces in the Balkans in the third century A.D., most likely parts of the lost *Scythica* by Dexippus; (2) a fragment of the lost Greek original of Eusebius' *Chronicle* (Book I) in *Cod. Iur. gr.* 18; (3) fragments of the *De prosodia catholica*, the most important, but lost ancient work on Greek accentuation by the second-century A.D. grammarian Aelius Herodianus in *Cod. Hist. gr.* 10; (4-5) two significant juridical palimpsests, *Fragm. gr.* 2 and the Basilica manuscript in *Cod. Suppl. gr.* 200 (concerning the textual evaluation see B. Stolte).

Bernard H. STOLTE
Editing the Basilica and the Role of Palimpsests. The Case of Vindob. Suppl. gr. 200

The transmission of the text of the Basilica has been precarious, resulting in our possessing only three quarters of their sixty books. In four centuries, three editions have appeared. For the *editio princeps* (1647), Fabrot had used only a handful of manuscripts, all of them in Paris. The second edition (1833–1850) of Heimbach was based on more manuscripts. For the third one (1953–1988), Scheltema *cum suis* used a different editorial method, but another striking difference is the number of palimpsests the editors had brought to bear on the constitution of their text. In the thirty years since the publication of the last volume, more palimpsests have come to light, the most important one of which is *Vindob. Suppl. gr. 200*. This paper focuses on the contribution of this manuscript to our insight into the transmission of the Basilica text.

Dieter HARLFINGER
Palimpsest-Forschung am Beispiel der Athener Handschrift EBE 192 mit juristischen Texten und Aristoteles-Kommentaren

As a follow-up to the European *Culture 2000* project 'Rinascimento virtuale – Digitale Palimpsestforschung. Rediscovering written records of a hidden European Cultural Heritage' (2001–2004), the University of Hamburg created a research unit 'Teuchos. Zentrum für Handschriften- und Textforschung' (since 2005) that also continued the work on palimpsests. In 2008, a group from this project stayed at the National Library of Greece (EBE) in Athens for imaging work on several Greek manuscripts. One main focus was the palimpsest codex EBE 192. After determining the most promising approach for this manuscript, it was digitised almost in full using UV fluorescence (multi-spectral imaging was also tested on a limited number of pages with the equipment then available).

The manuscript of approx. 200 leaves (dimensions 168×125 mm) is an Evangeliary from around the 13th century, composed of re-used parchment from two earlier manuscripts. One of them was written in late *Maiuscola biblica* and contained juridical texts, among which the Nomos Nautikos and the Ekloga edited by Burgmann 1983 could be identified. The other, which provided the larger part of the re-used leaves, was a manuscript in minuscule from around the year 900 that appears to have consisted of introductory material on philosophy, specifically on Aristotle's *Organon*, for teaching purposes.

Its content includes Ammonios, Elias, John of Damascus, Photios and Hierocles on the *Carmen aureum*. This palimpsest is thus of great value for the textual tradition of some of these authors, since it pre-dates the witnesses used in the CAG editions by three centuries. Content-wise, the most important discovery is that numerous leaves contain passages from a hitherto unknown, continuous commentary on *Categories* and *De interpretatione*, each introduced by ὅτι. The recent project 'Commentaria in Aristotelem Graeca et Byzantina' (CAGB) of the Berlin-Brandenburgische Akademie der Wissenschaften will be working on these Aristotelean texts.

André BINGGELI
The Making of a Greek Palimpsest from the Patriarchal Library in Istanbul

The Library of the Greek Patriarchate in Istanbul houses several palimpsests. Thanks to the cataloging project carried out by the IRHT team in Paris, some of these palimpsests have been subjected to a new in-depth examination. The manuscript Hagia Trias 102 is one of these: it contains an abridged Panegyrikon for the whole year, copied in 1435 in a monastery dedicated to the Pantokrator which reuses almost exclusively a monumental tenth-century Panegyrikon for the whole year. The content of the manuscript is of great interest as several of the 23 identified texts in the lower, erased layer offer hitherto unknown versions of hagiographic or homiletic texts. The aim of this paper is to reconstruct the original form of the hagiographic collection from the 159 folios that have been preserved and at the same time to shed some light on the making of the palimpsest itself. The reconstruction of the quire structure of the original manuscript gives some understanding of how the original manuscript was dismembered and how the folios were then rearranged in the new manuscript.

Carla FALLUOMINI
The Gothic Palimpsests: New Readings and Discoveries

There are nine fragmentary manuscripts, preserved in different European libraries, which transmit Gothic texts. Most of them are palimpsests, discovered in the 18th century. Another palimpsest, the Bologna fragment, was found in 2010. Reading the earlier-discovered texts with the naked eye is now very difficult because the scholars who worked with them applied chemical reagents, which degraded the ink. However, in the

last ten years, new technologies have improved our ability to examine the manuscripts and verify old and new readings. This in turn has advanced the study of the Gothic language and culture.

The last complete edition of the Gothic texts dates from 1919. A new edition, featuring the new readings and discoveries, is in progress. The aim of this paper is to present the state of the art in the reading of the Gothic manuscripts, with a focus on both progress and research problems.

Peter E. PORMANN
The Syriac Galen Palimpsest: Between Philology and Digital Humanities

The Syriac Galen Palimpsest (SGP) is a privately owned manuscript containing: an eleventh-century liturgical overtext (a so-called octṓēchos) and an older undertext, possibly written in the ninth century, namely a copy of Sergius of Rēš ʿAynā's translation of Galen's *On Simple Drugs* in 11 books. The manuscript has benefited from extensive imaging, not only through multispectral photography, but also Synchrotron X-ray imaging. This resulted in an enormous dataset which is currently enhanced and studied through computational image analysis techniques and digital text analysis tools in a large-scale project at the University of Manchester.

My talk focuses on the codicology of the undertext and the philological tools that we deploy to edit it. I shall first give an overview of what remains of the original manuscript of the undertext, and speculate what it looked like and where it was produced. Here, I will, in particular, present the result of the reconstruction of the original by using a 'skeletal' approach, which has yielded important results. I shall then turn to how to edit the undertext. Here it is important to distinguish three subsets of texts to be edited: Books 6–8, where another direct witness exists; Book 9, where we have an indirect witness, and Books 2–5, for which we only have SGP. As the Greek source text survives for all books, it can be used to reconstruct Sergius' version, and to this end, we have developed a number of digital techniques. My talk is complemented by that of Michael Toth, who explains the challenges of producing readable images of the undertext and digitally reuniting folios scattered across multiple libraries.

Ronny VOLLANDT
Palimpsests from Cairo and Damascus: A Comparative Perspective from the Cairo Genizah and the Qubbat al-Khazna

The three major finding spots of palimpsests in the Near East almost form a triangle: St. Catherine's Monastery in Sinai, the *qubbat al-khazna* in Damascus and the Genizah in Cairo. Whereas the former, representing the Christian practice of palimpsesting, has received considerable attention in the last years, a systematic study of palimpsests for the latter two lacks to date. As I will show, such a study would not only allow a comparison

of Christian with Muslim and Jewish practices, but it would also furnish additional observations as to the complex and multilayered relationships between languages and content of the upper and lower texts.

Alba FEDELI
A Few Remarks on Qur'anic Palimpsests

The paper will explore the different situations one encounters when dealing with Qur'anic palimpsests. They—as objects—cannot be understood outside the event that led to the palimpsested codices. Their event can involve multiple cultures and languages in the two layers of the palimpsest, shorter or longer distance of time elapsed between the first and the second event, provenance from different Qur'anic manuscript deposits, among other dynamics.

The 1914 edition of the Mingana-Lewis Qur'anic palimpsest from Sinai was the first study of a Qur'anic palimpsest, if we exclude citations of Qur'anic palimpsest in Islamic literature. The edition has indeed influenced the field and the reception of these interesting objects. Newspapers and other media 'trumpeted' the work with its provocative title and subtitle *Leaves from three ancient Qurâns, possibly pre-'Othmânic with a list of their Variants*. Immediately, the concept of Quranic palimpsests and pre-'Uthmanic text of the Qur'an overlapped.

This extremely influential edition has been compared with its manuscript images just recently, bringing to the surface new readings and solving old debates that had arisen from the edition itself. Hypothetical retracement of the *scriptio inferior* of the Qur'anic palimpsest and its electronic edition are online in the Cambridge Digital Library. This recent edition along with several editions of the famous Sanaa Qur'anic palimpsest in the last decade leads us to consider the role played by interpretation, human intervention, neutrality and tools in reading palimpsests.

Starting from the interesting situation of the Mingana-Lewis palimpsest and its reception, the paper will present and discuss mechanisms and circumstances of Qur'anic palimpsests, focusing in particular on their possible dating as a key element in understanding the reason behind their non-existence.

Andreas JANKE
Challenges in Working with Music Palimpsests

Most music manuscripts from the Middle Ages that have come down to us are at least partly destroyed and often erased in some manner. Many parchment manuscripts with music have been reused as flyleaves or as covers for account books and other administrative volumes, but only rarely have these been recycled and overwritten.

In the past, research on known palimpsests in the field of musicology was rather limited, and techniques to recover the lost writing (UV-Images or Digital Restoration with

Photoshop) were used rarely; indeed, very often scholars seemed to be satisfied in attaching the label 'not readable' to the musical layer of a palimpsest source. Only in recent years have more powerful techniques such as multispectral imaging been used to enhance the legibility of important music manuscripts such as the San Lorenzo Palimpsest, a Florentine music collection compiled and copied in the first decades of the 15th century, and subsequently recycled starting around 1482.

This paper will discuss different types of music palimpsests, where to find them, and how to best approach them from the scientific as well as the scholarly perspective.

András NÉMETH
Interactive Learning of Palimpsest Research: Virtual Guided Tour from the Invisible to the Abstract Reconstruction

My paper will introduce one of the thematic pathways of a three-year joint project of the Vatican Library and Stanford University, supported with a generous grant of the Andrew Mellon Foundation. When accomplished in two years, this thematic pathway will present a select group of Vatican palimpsests to a much wider audience than the small group of specialists and will do so within the framework of the Digital Vatican Library, relying on the great potential of MIRADOR and IIIF. As a tutor, responsible for this thematic pathway, I seek to share my ideas and doubts with those who have major technical, scientific, and practical expertise in palimpsests. I conceive of the presentation of palimpsests as an interactive system that will actively engage a wide circle of readers, students and experts alike, and generate interest in further study. I will show a case study (Vat. gr. 984) with a focus on the presentation method itself, highlighting technical and conceptual challenges which can be applied to other palimpsests too.

Gregory HEYWORTH
From Technology to Text: Reading and Editing the Lacunose Manuscript

Editing damaged manuscripts, especially those with limited witnesses, poses a variety of technological and philological challenges. Despite the advantages spectral imaging affords, lacunae often remain, both in the text and in issues of provenance. What then? From the promise of neural networks to the philological dilemmas technologies pose, this talk gives an overview of the choices facing a transcriber and editor, with reference to two manuscripts: the Eschèz d'Amours (Dresden Oc. 66) and the earliest translation of the Gospels into Latin (Codex Vercellensis).