Abstracts of Papers

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3D tombs modeling by simple tools

New archaeological research was carried out between 2009 and 2011 by the Ministry of State for Antiquities (MSA) at central Dra' Abu el-Naga. Joining the MSA excavation team in the field in 2009, the author has been studying the findings from this area since then. The excavation site is situated ca. 700 km south of Cairo, opposite the modern city of Luxor in Upper Egypt on the western side of the Nile. Dra' Abu el-Naga is the modern name of the northern area of the extended necropolis. Central Dra' Abu el-Naga lies to the north of the causeway of queen Hatshepsut and just south of the German and Spanish concessions, overlooking the valley where a temple of Amenhotep I was once erected. The tombs are situated just below the hilltop of the middle range of the Dra' Abu el-Naga hills Review And to reach fulfill this main objective, it was proposed in 2013 to follow these research objectives: Consequently one main objective was the recording of architecture of the new discovered tombs and the reconstruction of the original context of the objects, which formed part of their burial equipment. The overlying aim of the research is: Preparing plans of all the new tombs, and also sections and 3D views of two of the tombs as they are very complicated. To place the new tombs in their archaeological context. 2D drawings can be tricky for some people to read, but 3D model views are a universal language that anyone can understand. By using SketchUp Pro to get owners, researchers heads in the same direction.

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organizer and moderator
with Julia Jushaninowa and Franziska Naether, further collaborators Giuseppe G. A. Celano and Polina Yordanova

The Digital Rosetta Stone: textual alignment and linguistic annotation

In cooperation with projects from colleagues in Berlin and powered by the British Museum in London, we present an ongoing project whose aim is to produce a digital edition of the Rosetta Stone (the "Decree of Memphis"). The project has two main goals: 1) textual alignment of the Hieroglyphic, Demotic and Greek versions of the Rosetta Stone; 2) morphosyntactic annotation of the three versions of the inscription. As first results, we present: 1) examples of alignment of the Hieroglyphic version of the text with translations into modern languages (through the Alpheios alignment editor; 2) the complete morphosyntactic annotation of the Greek text of the Rosetta Stone (through the Arethusa treebanking editor).

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with Camilla Di Biase-Dyson and Nina Wagenknecht

Annotating figurative language: Another perspective for digital Altertumswissenschaften

Whereas past and current digital projects in ancient language studies have been concerned with the annotation of linguistic elements and metadata, there is now an increased interest in the annotation of elements above the linguistic level that are determined by context – like figurative language. Such projects bring their own set of problems (the automatisation of annotation is more difficult, for instance), but also allow us to develop new ways of examining the data. For this reason, we have attempted to take an already annotated database of Ancient Egyptian texts and develop a complementary tagging layer rather than starting from scratch with a new database. In this paper, we present our work in developing a metaphor annotation layer for the Late Egyptian text database of Projet Ramsès (Université de Liège) and in so doing address more general questions: 1) How to ‚tailor-make' annotation layers to fit other databases? (Workflow) 2) How to make annotations that are flexible enough to be altered in the course of the annotation process? (Project design) 3) What kind of potential do such layers have for integration with existing and future annotations? (Sustainability)

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Von Champollion bis Erman - Lexikographiegeschichte im Digitalen Zeitalter, Projekt "Altägyptische Wörterbücher im Verbund"

Das Projekt "Altägyptische Wörterbücher im Verbund" ist ein am Ägyptologischen Institut der Universität Leipzig angesiedeltes Teilvorhaben des Projekts „Wissensrohstoff Text", an dem sich, aus ESF-Mitteln finanziert, sieben Leipziger geisteswissenschaftliche Institute und das Institut für Informatik beteiligen. Das Ägyptische weist eine mehr als 4000jährige Sprachgeschichte auf. Nach der Entzifferung der Hieroglyphen durch J.-F. Champollion (1822) widmete man sich im 19. und frühen 20. Jh. der Erfassung des Wortschatzes und der Ermittlung von Wortbedeutungen. Das Ende dieser Pionierphase markiert das Wörterbuch der ägyptischen Sprache von Erman/Grapow (Hauptbände 1926-1931), das noch heute ein Standardwerk darstellt. Diesem gehen aber bereits eine Vielzahl von Wörterbüchern, Wortlisten und Glossaren voran, die inzwischen weitgehend vergessen, aber wissenschaftsgeschichtlich von höchster Bedeutung sind. Denn aus ihnen lassen sich einerseits das schrittweise Verständnis der ägyptischen Sprache und die angewandten Methoden zu ihrer Erschließung ablesen und andererseits das

Fundament unseres heutigen lexikographischen Wissens eruieren. Das Projekt schafft mittels eines Wörterbuchportals eine Infrastruktur, um das Vorkommen von Wörtern in altägyptischen Wörterbüchern und anderen lexikogra-phisch relevanten Publikationen mit den modernen Lemmaansetzungen der digitalen Wortliste des Thesaurus Linguae Aegyptiae (TLA) (http://aaew.bbaw.de/tla) zu ver¬knüpfen. So wird eine automatisierte Auswertung der Wörterbücher als Beitrag zur Geschichte der ägyptischen Lexikographie ermöglicht. Der TLA enthält neben einer Wortliste eine Textdatenbank, so dass über die Verknüpfung mit der Wortliste auch eine Verlinkung mit ägyptischen Volltexten und Textbelegen erfolgt.

This article presents a short overview of the project „Altägyptische Wörterbücher im Verbund" hosted at Leipzig University. Its aim is to establish a digital infrastructure for linking the lexical material of selected dictionaries of Ancient Egyptian of the 19th and early 20th century to a modern standard wordlist, the one of the Thesaurus Linguae Aegyptiae (TLA).

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Keynote and Introductions

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Anagnosis - automatisierte Buchstabenverknüpfung von Transkript und Papyrusabbildung / Text-Image Letter-to-Letter Matching and Virtual Text Reconstruction. Anagnosis – A Web Tool (not only) for Papyrologists

In recent years many institutions holding papyri have put images of their collections online, while transcriptions previously published in print are now hosted in the Digital Corpus of Literary Papyri. Anagnosis aims to provide an intuitive and easy-to-use web interface between those images and related digitized texts. The main goal lies in automatic data processing and text-recognition accuracy: Through a dedicated OCR algorithm, letters on the image are identified with single boxes and thus linked to the transcription. A coordinates system of the glyphs on the image can then be transferred and applied to each new image uploaded for the same text section. Once all character boxes are generated, Anagnosis can extract a sample alphabet that users may rearrange to virtually restore lost parts of text directly on the image.

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Cataloguing and editing Coptic Biblical texts in an online database system

The Göttingen Virtual Manuscript Room (VMR); The Göttingen Virtual Manuscript Room (VMR) offers both an online based digital repository for Coptic Biblical manuscripts (ideally, high resolution images of every manuscript page, all metadata etc.) and a digital edition of their texts, finally even a critical edition of every biblical book of the Coptic Old Testament based on all available manuscripts. All text data will also be transferred into XML and linguistically annotated. In this way the VMR offers a full physical description of each manuscript and, at the same time, a full edition of its text and language data. Of course, the VMR can be used for manuscripts and texts other than Coptic too.

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The Digital Challenges and Chances: The Case of Papyri and Papyrology in Egypt

In this paper, I would like to explore the new ways of perceiving Papyri und Papyrology i.e. papyrological studies from Egyptian-Arabic perspectives. The paper will shed light on three main and, from my point of view, intertwined ways of thinking about this discipline that has been newly of importance just because of the new media. First, one should consider the question of legal status of papyri presented online, including their provenance, and the Egyptian (legal) point of view in this regard. Most, if not all, the available, papyri databases, which presents papyri online, suffice themselves with just a note about the purchase of a certain piece from unknown Egyptian, sometime known and famous like M. Nahman, without any indication about on which government, circumstances, regulations und laws this "supposedly" legal purchase has been conducted. I would suggest putting up a Wikipedia link or any other mean to give the "Egyptian" Science citizen, a further reading lists and short justifications about the transportation of this artefact from his country to Europe or the United States, where most of the papyri, presented in the moment online, are kept. Second, The provenance of the same pieces are in many cases given either with transliterated names that doesn't exist on Arabic modern maps which one find through e.g. Google or with names that mix the archeological site with its nearby village or town. A similar database, in cooperation and with the help of with the Egyptian Universities' students of Archeology, would solve this problem. Such links would also serve as a start for more specialized research that connects Archeology and Papyri with modern as well as recent Egyptian History. Third, an Arabic translation of the Papyri presented online, again with the help of Egyptian students of History, Classics and Archeology departments, would be a basis for more further analysis of these

Texts, whither they are written in Egyptian (with all its script) Greek, Latin or Coptic. These are some chances, which may seem easier to achieve, thanks to the new digital media, especially the social ones, but the challenges that would face any implementation of the above-mentioned idea in the current Egyptian academia are tremendous. This include but not limited to financial and legal matters that control the education system in Egypt.

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Auf dem Weg zu einem TEI-Austauschformat für ägyptisch-koptische Texte

Diverse ägyptologische Großprojekte (TLA: http://aaew.bbaw.de/tla; Ramses: http://ramses.ulg.ac.be/; Rubensohn: http://elephantine.smb.museum/; Karnak: http://www.cfeetk.cnrs.fr/karnak/) erstellen annotierte Korpora. Für einen Datenaustausch ist ein standardisiertes Austauschformat, das auf TEI beruht, dringend erforderlich. Dazu haben sich diese Großprojekte zusammengeschlossen, um einen gemeinsamen Vorschlag zu erarbeiten. In unserem Vortrag möchten wir den aktuellen Stand der Diskussion präsentieren: Was ist der Basistext in der Auszeichnung: hieroglyphische Annotation oder die Umschrift des Textes? Wie geht man mit den verschiedenen Schriftformaten um? Können die Metadatenangaben im Header mithilfe gemeinsamer Thesauri standardisiert werden? Was wird inline, was wird stand-off annotiert?

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Trismegistos: identifying and aggregating metadata of Ancient World texts

Trismegistos (TM, http://www.trismegistos.org) is a metadata platform for the study of texts from the Ancient World, coordinated and maintained by the KU Leuven research group of Ancient History. Originating from the Prosopographia Ptolemaica, TM was developed in 2005 as a database containing information about people mentioned in papyrus documents from Ptolemaic Egypt. In other related databases additional information about these texts was found: when they were written (dates), where they are stored (collections) and to which archive they belong (archives). The following years also epigraphic data were added to these databases. The TM platform has two important goals: firstly it functions as an aggregator of metadata for which it also links to other projects (e.g. Papyrological Navigator, Epigraphic Database Heidelberg), secondly it can be used as an identifying tool for all of its content such as Ancient World texts, places and people. With its unique identifying numbers and stable URI's,

TM sets standards for and bridges the gap between different digital representations of Ancient World texts. In the future TM aims not only to expand its coverage, but also to provide new ways to study these ancient sources, for example via social network analysis trough its latest addition: Trismegistos networks ((http://www.trismegistos.org/network).

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„Altägyptische Kursivschriften" in a digital age

The hieratic script has never been studied systematically regarding its peculiarities in abbreviations, orthography, functions or historical development, nor in comparison with cursive and monumental hieroglyphs as well as Demotic signs. After Möller's *Hieratic Palaeography* volumes I to III, being based on merely 32 sources, Egyptologists compiled several more or less complete palaeographies on single texts, groups of texts or time spans. However, the comparability of signs is often hindered or impossible due to the heterogeneity of writing surfaces, the quality of facsimiles and photos or the choice of examples and the degree of detail. Furthermore, the word or sign context is often lacking.
Since April 2015 a long-term project for a possible maximum of 23 years is located at the universities of Mainz and Darmstadt, being financed by the Union of German Academies of Sciences and Humanities. The lecture presents the aims and methods of this project and discusses the state of affairs with regard to the development and structuring 1) of a digital palaeography of the cursive scripts, including all stages of hieratic, abnormal hieratic and cursive hieroglyphic scripts from the Early Dynastic period through to Roman times, and 2) of a database with extensive metadata that allows the study of various topics among which the emergence, development, regional use, context and economy of scripts as well as the identification of individual scribes' hands. The project shall be understood as being decisively open for any cooperation among international experts.

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Prosopographia Memphitica. Individuelle Identitäten und Kollektive Biographien einer Residenzstadt des Neuen Reiches

Das primäre Ziel meiner Arbeit ist es, das Gesellschaftsgefüge der memphitischen Region für die Zeit des Neuen Reiches erstmals auf einer Vollständigkeit anstrebenden,

breiten Basis näher zu beleuchten. Dazu soll zunächst eine aktualisierte und umfassende Sammlung an Personendaten für die memphitische Region erstellt werden. Die Materialgrundlage ist dabei bewusst sehr breit angelegt und nicht auf ausgesuchte Personenkreise beschränkt, sondern durchdringt alle im epigraphischen Befund belegten sozialen Schichten der memphitischen Bevölkerung. Obwohl die Zusammenstellung prosopographischer Daten eine gängige Methode darstellt, die gesellschaftliche Interaktion alter Kulturen abzubilden und zu analysieren, wurde sie in der Ägyptologie des 3.-2. Jahrtausends v. Chr. erstaunlicherweise schon längere Zeit nicht mehr auf breiter Basis angewandt. Für die großen Fundplätze wie etwa Theben im 2. Jahrtausend oder die Zeit der Pyramidenprojekte des 3. Jahrtausends v. Chr. existieren lediglich Separatabhandlungen. Die wenigen Versuche, wie etwa die „Materialien zur Wirtschaftsgeschichte" von Wolfgang Helck, sind mehr als 50 Jahre alt und konnten noch nicht auf die heutige Datenfülle und digitalen Rechercheoptionen zurückgreifen. Im Herbst 2013 wurde mit der Zusammenstellung des Inschriftenmaterials und dem Aufbau einer prosopographischen Datenbank begonnen. Die Datenaufnahme und -speicherung erfolgt in einer zu diesem Zweck angelegten FileMaker-Datenbank. Jede Person erhält hier einen Eintrag, der mit einer stabilen Personen ID versehen ist. Die Hauptunterscheidungskriterien einzelner Individuen sind deren Datierung, Genealogie und Titulatur (hier vor allem Titelfolgen und Kombinationen). Jedem Datenbankeintrag sind mehrere Datenblätter untergeordnet, in denen die unterschiedlichen prosopographischen Informationen zu einer Person dokumentiert werden können. Bislang konnten 1611 Personen in die Datenbank eingespeist werden, eine im Vergleich in der Ägyptologie für diesen Zeitraum bislang noch nicht prosopographisch verarbeitete Größenordnung. Da die überlieferten Privatdenkmäler memphitischer Amtsträger innerhalb eines komplexen Geflechts sozialer Interaktion als Medium zur Selbstrepräsentation und Mittel zur Partizipation und Kommunikation fungieren, ermöglicht die Sammlung und Auswertung der Texte es die Vorgänge sozio-kultureller Kommunikation und der jeweiligen personellen Teilhabe daran zu untersuchen. Dabei greift mein Vorhaben auf der einen Seite auf klassische Instrumentarien mit dem Ziel der Identifikation von Individuen, genealogischen Zusammenhänge und Karrieren zurück. Die Herangehensweise wird auf der anderen Seite mit den Chancen einer Methodik untermauert, die sich darüber hinaus der Erarbeitung von Kollektivbiographien zuwendet. Durch sie werden die einzelnen Personen nicht als isolierte Einheiten, sondern als Individuen definiert, die auf sozialer Ebene untereinander agieren, soziale Bindungen eingehen und demnach bestimmten Personengruppen und sozialen Netzwerken zugeordnet werden können.

Egypt's capital and royal residence – Memphis – and its exceptional rich inventory of textual sources forms the main focus of my dissertational project. The remaining epigraphic material dating to the New Kingdom, mainly originates from Memphite burial contexts and contains therefore high quantities of prosopographic data (e.g. names, titles, geneaological relations), which provide information about the administrative and cultic personnel belonging to different Memphite institutions.

Nevertheless, investigations of the people, who are recorded in inscriptions they left intentionally on objects and monuments in the Memphite region have occurred only sporadically. Moreover, the relevant works consist mostly of bare compilations of personal data and their arrangement to prosopographic lists. That's why it is the aim of my thesis to document all individuals attestested on inscribed monuments as well as their relationship with each other marked by social and genealogical ties. Based on that I' like to attain a regional prosopography for the whole New Kingdom, which is for the first time not limited to specific groups of people, but illuminates all identifiable social classes of the Memphite society.

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E-learning Kurs "Verarbeitung digitaler Daten in der Ägyptologie"

Seit 2013 bin ich Teil des Teams zur Bereitstellung eines online Kurses für die Ägyptologie Studenten der Universität Leipzig im Weiterbildungsmoodle. Dieser Moodlekurs wurde von Prof. Dr. Kai-Christian Bruhn (FH Mainz), Dr. Franziska Naether und Dr. Dietrich Raue konzipiert und gestaltet und ist obligatorischer Teil des Moduls "Einführung in die Ägyptologie" an der Universität Leipzig. Daher richtet sich der Kurs vorrangig an Bachelor-Studenten, aber auch Studenten höherer Semester und sonstige Interessenten nehmen an dem zusätzlichen Angebot teil. Der Online-Kurs fand in diesem Jahr bereits zum vierten Mal statt und startet zum Wintersemester (WS 2015/16) in die fünfte Runde. Die Lehrveranstaltung findet komplett im Internet statt und die Teilnehmer entscheiden selbst wann und wo sie den Unterrichtsstoff im Laufe der zwei Semester erfüllen. Mittels dieser neuen Lernform werden die Teilnehmer zum Umgang mit digitalen Daten und deren automatisierten Verarbeitung angeleitet, die für die Studenten der Ägyptologie bereits während des Studiums Verwendung finden, z.B. bei der Auswertung des archäologischen Materials. Darüber hinaus setzen sie sich mit seriösen und unverzichtbaren Internet-Ressourcen auseinander. Hierbei liefert die Übung eine Einweisung im Umgang mit unterschiedlichen frei verfügbaren Programmen zur Textverarbeitung, Betrachtung und Bearbeitung von Grafiken und Geoinformationssystemen, die eine selbstständige Vertiefung ermöglichen. Die neuartige Lehrveranstaltung richtet sich somit auf die in den vergangenen Jahren zunehmend angewachsene Nachfrage auf die langfristige Speicherung wissenschaftlicher Daten (z.B. aus Datenbanken u. Bildarchiven, kartographische Daten v. Satelliten) sowie deren interdisziplinärer Nutzung. Sie hat somit seit ihrer Anlegung weiterhin Pioniercharakter an der Uni Leipzig. So soll der fertig aufbereitete Kurs künftig im IANUS-Forschungsdatenzentrum einem breiteren Publikum zur Verfügung gestellt werden. Wie das in unserem Falle im Hochschulalltag konkret erfolgt soll mit Hilfe einer Power-Point Präsentation an einigen praktischen Beispielen veranschaulicht werden. Es gilt nun Schlüsse aus den bereits erfolgten Kurs-Durchläufen zu ziehen sowie Probleme und Anregungen zu besprechen. Gerne würde

ich mich mit den anderen Teilnehmern der Tagung über Innovative Lehr- und Lernmethoden austauschen.

see also Monica Berti and Franziska Naether

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Deciphering Demotic Digitally

In starting the Demotic Palaeographical Database Project, we intend to build up an online database which pays special attention to the actual appearance of Demotic papyri and texts down to the level of the individual sign. Our idea is to analyse a papyrus with respect to its visual nature, inasmuch as it shall be possible to compare each Demotic sign to other representations of the same sign in other texts and to study its occurrences in different words. Words shall not only be analysed in their textual context but also by their orthography and it should be possible to study even the papyrus itself by means of its material features. Therefore, the Demotic Palaeographical Database Project aims for the creation of a modern and online accessible Demotic palaeography, glossary of word spellings and corpus of manuscripts, which will not only be a convenient tool for Egyptologists and researchers interested in the Demotic writing system or artefacts inscribed with Demotic script but also will serve the conservation of cultural heritage. In our paper, we will present our conceptual ideas and the preliminary version of the database in order to demonstrate its functionalities and possibilities.

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The Project is completed! What now? The Ancient Egyptian Book of the Dead - A Digital Textzeugenarchiv

The Book of the Dead-Project Bonn started in the early 1990s. Prof Ursula Rößler-Köhler, who had previously laid the foundation for modern Book of the Dead studies by her work on BD chapter 17 applying the method of textual criticism, achieved a 10-year funding from the German Research Society (DFG). In 2004 the project was granted another 9-year funding by the Academy of Sciences and Arts of North Rhine-Westphalia. One aim of the project was to gather all available evidence of Book of the Dead manuscripts spread across collections around the world. Today, the archive comprises approximately 3000 records of BD sources. In 2012 the corresponding database, after undergoing a transfer from FileMaker to XML format in collaboration with the department of e-Humanities at the University of Cologne, was launched and made publicly available online. The data sets include various different kinds of information about the objects and the sets of BD spells and vignettes found on them.

These are now easily accessible for statistic analyses such as evaluations of neighbouring spells and sequences or occurrences in specific locations or time periods. Furthermore, the database includes several metadata such as bibliographical information, translations of spells and a motif index. It is cross connected with other Egyptological databases such as Trismegistos and the Thesaurus Linguae Aegyptiae. After the project was completed at the end of 2012, the online database has been operating for a considerable amount of time with scholars using it and trying the several opportunities it provides. Now is the time for a first evaluation to actually see which functions of the database work well, which might have been ignored by users and what information the database could provide scholars with for their actual research. Naturally, there is a need for a continuous maintenance and update on new findings and the latest research. Furthermore it is important to understand which possibly missing functions or information the users wish to be included and if this is actually realisable. On the other hand, there might be opportunities for analyses that have not been fully understood and therefore have not been made use of. This presentation aims to address some of these issues concerning the BD online database and to gather ideas and possible collaborators for future BD project plans.

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Images of Eternity in 3D. The visualization of ancient Egyptian coffins through photogrammetry

By using the technique of photogrammetry for the 3D visualization of ancient Egyptian coffins decorated with magical texts and iconography, this project aims at building up a new digital platform for an in-depth study of the ancient Egyptian funerary culture and its media. It has started in August 2015 through the support of a Mellon Fellowship for the Digital Humanities at UC Berkeley and up until now it has focused on ancient Egyptian coffins kept at the Phoebe A. Hearst Museum of Anthropology of UC Berkeley. The main outcome will be a digital platform that allows to display a coffin in 3D and where users will be able to pan, rotate, and zoom in on the coffin, clicking on areas of text to highlight them and view an annotated translation together with other metadata (transcription of the hieroglyphic text, bibliography, textual variants, museological data, provenance, etc.)

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An Intuitive Unicode Input Method for Ancient Egyptian Hieroglyphic Writing: Applying the Input Technology of the Japanese Writing System

In this study, I extended input methods for the Japanese language to Egyptian hieroglyphics. There are several systems that capable of inputting Egyptian hieroglyphic writing. However, they do not allow us to directly input hieroglyphs, for instance, into MS Word. The new Egyptian hieroglyphic input system being reported here, developed using technology used for inputting Japanese writing, is quite unique and allows the direct input of hieroglyphs, for example, into MS Word. Ancient Egyptian hieroglyphs and the Japanese writing system (with its mixture of *hiragana*, *katakana* and *kanji*) share basic graphemic characteristics. For instance, Ancient Egyptian hieroglyphic logograms are functionally similar to Japanese *kanji* logograms (Chinese characters), whereas Egyptian hieroglyphic phonograms are functionally similar to Japanese *hiragana* and *katakana* syllabic phonograms. And both often have options for writing a word like the examples below. • Examples (In the grammatological description marked by ⟨ ⟩, the upper-case letters denote the meanings of logograms and the lower-case letters signify the phonetic value of phonograms.) 1. Ancient Egyptian *sḏm* 'hear' was written as F21 = ⟨HEAR⟩, F21-G17 = ⟨HEAR⟩+⟨m⟩ etc. 2. Japanese *owari* 'end' is written as 終= ⟨END⟩, 終り = ⟨END⟩+⟨ri⟩ or 終わり = ⟨END⟩+⟨wa⟩+⟨ri⟩. Here, Ancient Egyptian *sḏm* has over two written forms and Japanese *owari* has three. Like these examples, writers often have some options of combinations of logograms and phonograms when they write words in both languages. The input technology for Japanese makes it possible to input a mixture of logograms and phonograms, and phonetic complements. This technology is a well-organized and handy tool to input Japanese writing into computers, having been used by over 100 million people. I applied this technology to Ancient Egyptian hieroglyphic inputting and created a new intuitive hieroglyphic inputting system using Google Japanese Input. Using this method, anyone can directly write Egyptian hieroglyphic writing into software like MS Word. If the transcription of an ancient Egyptian word is entered, the correct hieroglyphs are generated by this system. If there are multiple options for any phonemic combinations that use other combinations of phonetic complements or determinatives, a dropdown window with a list of several combinations of glyphs appears and the user can choose the desired combination.

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OCR of hand-written transcriptions of hieroglyphic text

Encoding hieroglyphic texts is time-consuming. If a text already exists as hand-written transcription, there is an alternative, namely OCR. Off-the-shelf OCR systems seem difficult to adapt to the peculiarities of Ancient Egyptian. Presented is a proof-of-concept tool that was designed to digitize texts of Urkunden IV in the hand-writing of Kurt Sethe. It automatically recognizes signs and produces a normalized encoding, suitable for storage in a database, or for printing on a screen or on paper, requiring little manual correction.
The encoding of hieroglyphic text is RES (Revised Encoding Scheme) rather than (common dialects of) MdC (Manuel de Codage). Earlier papers argued against MdC and in favour of RES for corpus development. Arguments in favour of RES include longevity of the encoding, as its semantics are font-independent. The present study provides evidence that RES is also much preferable to MdC in the context of OCR. With a well-understood parsing technique, relative positioning of scanned signs can be straightforwardly mapped to suitable primitives of the encoding.

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Neue Bilder, neue Möglichkeiten. Chancen für die Ägyptologie durch das 3D-Design

In der heutigen Filmindustrie bietet das 3D-Design ein anerkanntes Mittel, um virtuelle Welten oder Charaktere zu erschaffen. Doch das 3D-Design dringt mittlerweile auch in andere Bereiche vor, so etwa der Medizin und der Architektur. Dabei bietet die virtuelle Rekonstruktion auch vielfältige Möglichkeiten für die Archäologie/Ägyptologie. Beispielsweise können von kleineren Objekten oder Papyri virtuelle 3D-Modelle erstellt werden. Der große Vorteil dabei ist, dass die Originale nicht beschädigt werden und mehrere Wissenschaftler zur gleichen Zeit an ein und demselben Objekt forschen können. Selbst für die Bauforschung dürfte das 3D-Design immer bedeutender werden. Gebäude, die sich heute nur in ihren Grundrissen erhalten haben, können mithilfe des 3D-Designs nahezu vollständig rekonstruiert werden. Nicht zu unterschätzen ist dabei auch die Wirkung, die virtuelle Rekonstruktionen von ägyptischen Tempeln, Gräbern, Gebäuden auf die Gesellschaft erzielen. Durch die 3DRekonstruktionen kann nicht nur Wissenschaftlern, sondern auch Interessierten ein anschaulicher Eindruck von der Lebenswelt des Alten Ägypten

vermittelt werden. Bislang steht das 3D-Design allerdings in dem Ruf, besonders schwer erlernbar und sehr kostenintensiv zu sein. Doch gibt es neben einigen aufwendigen 3D-Design-Programmen auch nahezu kostenfreie Alternativen, die man sowohl privat wie beruflich nutzen kann. Diese Programme sind dabei sehr anwenderfreundlich gestaltet und relativ leicht zu erlernen. Ziel des Vortrages ist es, diese Programme und ihre Möglichkeiten für die Ägyptologie vorzustellen.

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The Corpus of Greek Medical Papyri and Digital Papyrology: new perspectives from an ongoing project

The ongoing project of digitising a corpus of ancient Greek texts on papyrus dealing with medical topics raises some problematic questions involving general issues of digital papyrology. The main electronic resource of papyrological texts, the Papyrological Navigator (papyri.info), has indeed been designed to host documentary items, while the special technical, even literary nature of medical papyri (which include, besides documents related to medicine, also handbooks, school books, and treatises by both known and unknown authors) requires new ways to treat the relevant data (paratextual devices such as diacriticals, punctuation, abbreviatios, layout features). Such issues are currently under discussion by the team charged of the forthcoming Digital Corpus of Literary Papyri (DCLP), but further options need to be taken into consideration in order to develop a fully functional, interactive, dynamic database of ancient technical texts: in particular, this paper will present and discuss the potentialities of a multi-layer linguistic annotation (useful to fulfil the needs of a multifaceted technical language) and of a multitextual digital edition (helpful in consideration of the fragmentary condition of the texts and of their often problematic relationship with the known manuscript tradition).

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Ein länges Leben für Deine Daten! / Let your data live longer!

Data life cycle and research data managemet plans are just two of many key-terms used in the present discussion about digital research data. But what do they mean - on the one hand for an individual scholar and on the other hand for a digital infrastructure like IANUS? The presentation will try to explain some of the terms and will show how IANUS is dealing with them in order to enhance the reusability of unique data.

The presentation starts with an overview of the different disciplines, research methods and types of data, which together characterise modern research on ancient cultures. Nearly in all scientific processes digital data is produced and has gained a dominant role as the stakeholder-analysis and the evaluation of test data collections done by IANUS in 2013 clearly demonstrate. Nevertheless, inspite of their high relevance digital files and folders are in danger with regard to their accessability and reusability in the near and far future. Not only the storage devices, software applications and file formates become slowly but steadily obsolete, but also the relevant information (i.e. the metadata) to understand all the produced bits and bytes intellectually will get lost over the years. Therefore, urging questions concern the challenges how we can prevent – or at least reduce – a forseeable loss of digital information and what we will do with all the results, which do not find their way into publications?
Being a disipline's specific national center for research data of archaeology and ancient studies, IANUS tries to answer these questions and to establish different services in this context. The slides give an overview of the centre structure, its state of development and its planned targets. The primary service (scheduled for autumn 2016) will be the long-term preservation, curation and publication of digital research data to ensure its reusability and will be open for any person and institution. One already existing offer are the "IT-Empfehlungen für den nachhaltigen Umgang mit digitalen Daten in den Altertumswissenschaften" which provide information and advice about data management, file formats and project documentation. Furthermore, it offers instructions on how to deposit data collections for archiving and disseminating. Here, external experts are cordially invited to contribute and write missing recommendations as new authors.

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What remains behind - on the virtual reconstruction of dismembered manuscripts

Coptic is the latest stage of the indigenous Egyptian language written in the Greek alphabet with some additional characters taken from the Demotic script. Due to climatic conditions many manuscripts have survived from Egypt. The bulk of Coptic manuscripts of the 1st millenium A. D. is preserved in fragmentary condition and the remains are scattered – often as single leaves or small groups of leaves – over collections on three continents. So a major aim of scholarly work is the virtual reconstruction of codices. Assigning a fragment to a specific manuscript is often not easy. It's not only necessary to compare the script for similarities but also to take into account the contents in order to identify the manuscript of origin and the position of the leave therein. In the case of known texts which have been recorded in a manuscript as full texts a mathematical approach can be used to estimate the position of a fragment. Special problems arise with manuscripts of uncertain arrangement, e.g. liturgical codices that do not have one continuous text. They combine texts from the

scriptures, hymns, prayers, or lifes of saints. In these cases reliable estimates can only be given by comparing the identified text / texts on a single leave with a representative amount of data: this means collecting and indexing as much known material as possible and arranging it according to liturgical usage. The lecture presents ways of assigning fragments by use of palaeography to known codices. An important tool is the "palaeography data base" developed in the Institut für Neutestamentliche Textforschung at Münster (INTF) as a base instrument for virtual reconstructions in the Virtual Manuscript Room (VMR) of the INTF. Furthermore, electronic tools will be shown that are a by-product of the lecturer's PhD for identifying texts, the order of manuscripts as well as for further research.

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see also Simone Gerhards

The Text Encoding Software of the Thesaurus Linguae Aegyptiae

The Thesaurus Linguae Aegyptiae (TLA; http://aaew.bbaw.de/tla) is the publication platform of the project „Structure and Transformation in the Vocabulary of the Egyptian Language: Texts and Knowledge in the Culture of Ancient Egypt" (formerly known as "Altägyptisches Wörterbuch") located in Berlin and Leipzig. It contains the largest corpus of Egyptian texts (ca. 1.4 million text words) and it is a very important tool for linguistic, philological, lexicographical, and cultural research. My paper introduces you to the software behind the TLA. I will show how easy it is to add a new text to the corpus with transcription, translation, Hieroglyphic codes, and metadata and how easy you can add any annotations of different types like rubra, citations from other texts, comments, direct speech. The software itself is freely available and platform independent. You are welcome to use our software to edit your texts and to cooperate with us!

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Release of the MySQL based implementation of the CTS protocol

In a project called "A Library of a Billion Words" we needed an implementation of the CTS protocol that is capable of handling a text collection containing at least 1 billion words. Because the existing solutions did not work for this scale or were still in development I started an implementation of the CTS protocol using methods that MySQL provides. Last year we published a paper that introduced a prototype with the core functionalities without being compliant with the specifications of CTS (Tiepmar et

al., 2013). The purpose of this paper is to describe and evaluate the MySQL based implementa-tion now that it is fulfilling the specifications version 5.0 rc.1 and mark it as finished and ready to use. Fur-ther information, online instances of CTS for all de-scribed datasets and binaries can be accessed via the projects website1. Reference Tiepmar J, Teichmann C, Heyer G, Berti M and Crane G. 2013. A new Implementation for Canonical Text Services. in Proceedings of the 8th Workshop on Language Technology for Cultural Heritage, Social Sciences, and Humanities (LaTeCH).

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In the previous years, 3D imaging has found his way into the world of Egyptology. This lecture will present two case studies where 3D technology is used for the documentation of hieratic inscriptions. The inscriptions, painted in (red) ochre or black paint, were applied on different carriers, and required a different methodology. The Egyptian collection of the Royal Museums of Art and History (RMAH Brussels) contains a large number of small decorated and/or inscribed objects. Some of these objects are currently in a bad condition - any operation carried on them can result in considerable material losses -, making it necessary to document them in such a way that it allows future scholars to study them in detail without handling them. The EES Project therefore aims to create multispectral 3D images of these fragile objects with a multispectral 'minidome' acquisition system, based on the already existing system of the multi-light Portable Light Dome (PLD). The texture/colour values on the created 2D+ and 3D models are interactive data based on a recording process with infrared, red, green, blue, and ultraviolet light spectra. Software tools and enhancement filters have been developed which can deal with the different wavelengths in real-time. This leads to an easy and cost-effective methodology which combines multispectral imaging with the actual relief characteristics and properties of the physical object. The system is transportable to any collection or excavation in the field. As a case study, the well-known Brussels "Execration Figurines" (Middle Kingdom, c. 1900 BC) were chosen. These figurines are made of unbaked clay and covered with hieratic texts, listing names of foreign countries and rulers. The study of this type of collections is mostly hampered by the poor state of conservation of the objects, but also by the only partial preservation of the ink traces in visible light. The method has also been applied to other decorated objects of the RMAH collection, such as a Fayoum portrait, ostraca and decorated objects made of stone, wood and ceramics. The final goal will be to publish the newly created multispectral 3D images on Carmentis (www.carmentis.be), the online catalogue of the RMAH collection, making them accessible to scholars all over the world. The second case study presents the quarry inscriptions of the New Kingdom limestone quarries at Dayr Abu Hinnis (Middle Egypt). These gallery quarries contain hundreds of hieratic inscriptions, written on the ceiling. The texts are mainly related to the general administration of the quarry area. In documenting the abundance of ceiling inscriptions and other graffiti, we had to decide upon a practice

that would allow not only to capture the "content", but also to document the location and orientation of each record. Every inscription can be photographed in detail, but this is insufficient to provide the reader access to vital information concerning the spatial distribution of the inscriptions, which may, for instance, relate to the progress of work. After experimenting with a variety of other methods, we adopted a photogrammetric software for 3D modelling photographs of the quarry ceilings, AGISOFT PHOTOSCAN, which uses structure from motion (SFM) algorithms to create three-dimensional images based on a series of overlapping two-dimensional images. The ultimate goal of this whole labour-intensive process in the quarries is not the creation of pure threedimensional models, but rather to generate an orthophoto of the entire ceiling of a quarry. Based on these images, each graffito could be analysed in context.

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Virtual reunification of papyrus fragments

Many Greek and Latin papyri, originally belonging to only one book (be it in roll or codex form), are currently scattered among different libraries. While it is not possible to physically rejoin these fragments as they cannot be moved from their institutions, they may be virtually reunited thanks to the techniques of digitisation, image processing and electronic publishing. This paper focuses on some issues – emerged from the work of my MA dissertation – that virtual reunification of Greek and Latin papyri presents.

Firstly, I propose a workflow for the creation of a digital edition of virtually rejoined fragments, by applying the model of virtual reunification recently suggested by R. Punzalan in *Understanding Virtual Reunification* (2014), the first systematic study on this topic. Also, as a principal reference point among the existing projects, I follow the *Sinaiticus Project* website, which, similarly, deals with an ancient Greek manuscript now dispersed in different institutions; however, while the *Sinaiticus Project* is exclusively dedicated to that artefact, the edition here proposed includes the possibility to be widened, in order to allow researchers to possibly include more reunified papyri in the future. Secondly, I propose some recommendations that can be followed by the owning institutions in order to digitise their fragments according to a common strategy. Finally, I focus on how a virtual reunification of papyrus fragments can be technically achieved – in other words, how the transcription code can present unified information about the papyrus as a whole and mark the parts of text belonging to each fragment. This project will hopefully help researchers study papyri divided among different libraries in a more systematic way, thanks to the availability of an electronic edition including the whole text and images of the virtually reunited fragments, and thanks to a consolidation of metadata.

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Demotisch, Hieratisch und SQL: Ein Beispiel für die Anwendung von DH in der Ägyptologie

Im Fokus des vorgestellten Projektes steht die Untersuchung der Verwendung von zwei ägyptischen Kursivschriften in einem homogenen Textkorpus. Hierbei handelt es sich zum einen um Hieratisch, einer Kursivschrift, die etwa zeitgleich mit den Hieroglyphen im 3. Jtd. v. Chr. entstand und für Texte auf Papyrus verwendet wurde. Mit beiden Schriftarten wurde in der Regel dieselbe Phase der ägyptischen Sprache geschrieben. Zum anderen um Demotisch, einer um 650 v. Chr. entwickelten Kursivschrift, die ebenfalls für Texte auf Papyrus verwendet wurde, und eine historisch jüngere Sprachstufe beschreibt. Beide Schriftsysteme erscheinen nebeneinander in den vier magischen Papyri der sog. „Theban Magical Library" aus dem 3. Jhd. n. Chr., die sich heute in London, Leiden und Paris befinden. Das zu untersuchende Textkorpus umfasst etwa 157 Einzeltexte, die sich auf mehr als 1700 Zeilen Text verteilen. Ein Großteil der Texte ist in demotischer Schrift und Grammatik geschrieben. Daneben finden sich einige Passagen in hieratischer, griechischer und in einer Zauberschrift. Auch sprachliche sind die Texte keineswegs homogen. Kürzere Passagen weisen häufig eine ältere Sprachstufe als das Demotische auf. Auch die Schriftart kann innerhalb eines Satzes, in einigen Fällen sogar innerhalb eines Wortes, wechseln. Die Gründe für die Verwendung von demotischer und hieratischer Schrift sind bisher nicht untersucht worden. Da die einzelnen Sprüche auf unterschiedliche Vorlagen aus verschiedenen Kulturkreisen zurückgehen, liegt der Schwerpunkt des Vorhabens auf der Untersuchung der Beziehung von Schriftart, Sprache oder Sprachstufe und Inhalt. Bisher wird in der Forschung davon ausgegangen, dass hieratische Schrift zur Schreibung von Götterbezeichnungen oder bestimmter Termini, bevorzugt also bei Passagen mit religiösem Inhalt Verwendung fand. Jüngere Überlegungen konnten jedoch zeigen, dass hieratische Schrift in einigen Fällen mit sprachlich altertümlichen Merkmalen einhergeht, wobei es sich wohl um die Reste eines Vorläufers handelt, der nicht vollständig in demotische Schrift und Sprache übertragenen wurde.
Um das Quellenmaterial adäquat zu untersuchen, ist eine genaue Analyse von Schrift, Sprache und Inhalt der Einzeltexte nötig. In einem ersten Schritt wird jeder Papyrus unabhängig von den anderen untersucht. Hierfür wird der Text in eine Excel-Tabelle aufgenommen. Jeder Eintrag wird mit verschiedenen Merkmalen versehen, die für die spätere Auswertung von Bedeutung sind. Die Texte werden in Hinblick auf die verwendete Schriftart, Sprachstufe, der zeitlichen Bezeugung eines Wortes oder grammatikalischen Konstruktion, Wortart, Herkunft (ägyptisch, griechisch, jüdisch etc.), Kontext (Vorkommen in Titeln, direkter Rede u. ä.) und, falls vorhanden,

Anmerkungen des Schreibers analysiert. In einem ersten Schritt werden die Texte in ägyptologischer Umschrift in eine Exceltabelle eingetragen. Hierbei erhält jedes Wort einen Eintrag und wird mit den für die Analyse benötigten Merkmale versehen. Im Anschluss wird die Tabelle in eine mySQL Datenbank eingelesen. Diese wurde in Zusammenarbeit mit Dr. C. Riepl von der IT-Group Geisteswissenschaften der LMU München erstellt. Anhand dieser Datenbank erfolgt die Analyse der Texte.

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"DemonBase" - Creating a Database for "The Ancient Egyptian Demonology Project Second Millennium BCE

"The Ancient Egyptian Demonology Project: Second Millennium BCE" was intended and funded as a three-year project (2013-2016) to explore the world of Ancient Egyptian demons in the 2nd millennium BC. It intends to create a classification and ontology of benevolent and malevolent demons. Whereas ancient Egyptians did not use a specific term denoting "demons", liminal beings known from various other cultures such as δαίμονες, ghosts, angels, Mischwesen, genies, etc., were nevertheless described in texts and illustrations. The project aims to collect philological, iconographical and archaeological evidence to understand the religious beliefs, practices, interactions and knowledge not only of the ancient Egyptians' daily life but also their perception of the afterlife. Till today scholars, as well as interested laymen, have had no resource to consult for specific examples of those beings, except for rather general encyclopaedias that include all kinds of divine beings or the Iconography of Deities and Demons (IDD) project that is ongoing. Neither provides, however, a searchable platform for both texts and images. The database created by the Demonology Project: 2K is designed to remedy this gap. The idea is to provide scholars and the public with a database that allows statistical analyses and innovative data visualisation, accessible and augmentable from all over the world to stimulate the dialogue and open communication not only within Egyptology but also with neighbouring disciplines. For the time-span of the three year project a pilot database was planned as a foundation for further data-collection and analysis. The data that were chosen date to the 2nd Millennium BCE and originate from objects of daily life (headrests and ivory wands), as well as from objects related to the afterlife, (coffins and 'Book of the Dead' manuscripts). This material, connected by its religious purposes, nevertheless provides a cross-section through ancient Egyptian religious practice. The project is funded by the Leverhulme Trust and includes Kasia Szpakowska (director) who supervises the work of the two participating PhD students in Egyptology. The project does not include funds for computer scientists or specialists in digital humanities. Therefore, the database is designed, developed and input by the members of the team only. The focus of my presentation will be the structure of the database that faces the challenge to include both textual and iconographical evidence. I will explain the organisation of the data, search patterns and the

opportunities of their visualisation and possible research outcome. Furthermore, I will discuss the potentials the database already possesses and might generate in the future for scholars and the public likewise. Since the evidence belongs to numerous collections from all over the world, I would like to address the problems of intellectual property and copyright with the solution we pursue for releasing the database for registered usage onto the internet.

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