AKU Altägyptische Kursivschriften

'Altägyptische Kursivschriften' in a Digital Age

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Abstract

„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 *Hieratische Palaeographie* 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 presented the aims and methods of this project and discussed 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 cooperation among international experts.

1. The Project

UNION
DER DEUTSCHEN AKADEMIEN
DER WISSENSCHAFTEN

Digital palaeography and systematic analysis of the hieratic and cursive hieroglyphic scripts

Egyptology:
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TECHNISCHE UNIVERSITÄT DARMSTADT

http://www.adwmainz.de/projekte/altaegyptische-kursivschriften/informationen.html

The project 'Altägyptische Kursivschriften' (AKU) is an interdisciplinary project in which Egyptologists from the Johannes Gutenberg Universität Mainz, and Computer philologists and an IT specialist from the Technische Universität Darmstadt cooperate to give the best digital support for our data.

2. The Aims

develop an **updated reference work for the cursive scripts**, which focuses on systematic study of the hieratic script, specifically regarding its historical and regional developments, its orthography, functionality and peculiarities in forms and abbreviations, in comparison with cursive hieroglyphic, abnormal hieratic and demotic writing.

- Systematic and digital inventory of hieratic and cursive hieroglyphic characters from the Early Dynastic period through to the Graeco-Roman period;
- Database with extensive search options and metadata incl. bibliography;
- Systematic studies on various topics concerning a.o. development, context, regional use, datability, materiality, economy and layout of scripts, and identification of individual scribal hands.

The project is specifically directed to the three aims given above. The manner in which the project is structured in order to achieve these aims will be presented further below.

A) Digital Palaeography

- Dynamic archive
- Extendable database with carefully selected sources
- Vectorised facsimiles
- Single signs, ligatures, selected word groups, numbers, measurements, correction marks, …
- Inclusion of many samples with frequency and cotext of variant forms

B) Systematic Analysis

- Formation of cursive scripts
- Combination of scripts and mutual influences
- Sign repertories
- Chronological phases and regional stages
- Hierarchy and functionality of script forms
- Calligraphy vs. script economy
- Materiality and technique
- Layout, etc.

Forms of publication:

- Online access (not before 2020)
- pdf Downloads
- Journal *Hieratic Studies Online (HSO)*
- Traditional inventories

The set-up of the project is thus two-fold: a digital palaeography with a database of cursive and hieratic sign-forms which is flexible and extendable; and systematic study and interpretation of its data.

3. The Palaeography

an archive for different repertoires of signs from different regions and time spans. Such a large and heterogeneous collection of cursive and hieratic sign forms (instead of hieroglyphic signs), in which precisely the variety of forms should be the focus, needs an adapted and enlarged classification and coding system that is moreover capable of being extended. In order to find out how to structure such an open system with free slots, we compiled a comprehensive concordance of palaeographies, which gives us a basic sign repertoire on which we can start building the system, as well as an overview of the classification and coding systems already in use, including their differences, advantages and disadvantages.

Included thus far are:

Hieroglyphic sign lists
Allen, *Middle Egyptian* (2012, 2nd ed.))
Gardiner, *Egyptian Grammar* (2005, 3rd ed.)
Grimal, Hallof & van der Plas, *Hieroglyphica Sign List* (2000)
Hannig, Gro*ß*es *Handwörterbuch Ägyptisch-Deutsch* (1995)
JSesh, Version 6.4.1
Unicode 8.0

Hieratic and cursive hieroglyphic palaeographies
Ali, *Hieratische Ritzinschriften aus Theben* (2002)
Allen, *The Heqanakhte Papyri* (2002)
Bomhard, von, *Paléographie du Papyrus Wilbour* (1998)
Dobrev, Verner & Vymazalová, *Old Hieratic Palaeography* I (2011)
Donker van Heel & Golverdingen, *Abnormal Hieratic Palaeography* (2013)
Gasse, *Données nouvelles administratives et sacerdotales* (1988)
Goedicke, *Old Hieratic Palaeography* (1988)
Gosline, *Hieratic Palaeography* I (1999)
Haring, *The Tomb of Sennedjem (TT1).* Pal.Hiér. 2 (2006)
Lenzo, *Manuscrits hiératiques du Livres des Morts* (2007)
Moje, *Untersuchungen zur Hieroglyphischen Paläeographie* (2007)
Möller, *Hieratische Paläographie* I-IV (1909-1965)
Posener-Kriéger, *I papyri di Gebelein* (2004)
Verhoeven, *Untersuchungen zur späthieratischen Buchschrift* (2001)
Verner, Posener-Kriéger & Vymazalová, *The Pyramid Complex of Raneferef: the papyrus archive* (2006)
Wimmer, *Hieratische Paläographie der nicht-literarische Ostraka* (1995)

The palaeography will be an archive for different repertoires of signs (cursive hieroglyphic and hieratic signs; single signs, word groups and ligatures; numbers and measurements) from different regions and time spans. It is impossible to incorporate all texts and all specimens of signs that we know, but we will incorporate those that fulfil necessary conditions of preservation, datability and accessibility. In order to accommodate the different sign repertoires into one palaeography which focusses precisely on cursive and hieratic instead of hieroglyphic sign forms, we need one coherent classification and coding system that is capable of being extended; that is, we need an *open system* that includes *free slots* in its sign codification in order to be able to include signs and sign forms that are only found at a later stage of the research. In order to figure out how to best structure such a system, we compiled a comprehensive concordance of palaeographies and sign lists, which gives us an overview of the sign repertoires to be included (that is, a basic corpus of signs on which we can start building the system) as well as an inventory of the differences in coding and classification systems already in use including their advantages and disadvantages.

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Gardiner	JSesh	Hieroglyphica	Unicode	Hannig	Allen MFg	Hornung & Schenkel	Möller	Goedicke	Dobrev	Allen Heqanakht	Haring	Bomhard	Moje	Wimmer	Ali	Gasse	Verhoeven	Gosline	Lenzo	Donker van Heel
A24	A24	A24	A024 U+1301C	A24	A24	A.3750	15	A24 15	A24	A24	–	A24	A24/25	A.24	A.24	5.81	A24	A24	A24	A24
–	–	–	–	–	–	–	–	–	–	–	–	cursif	–	–	–	–	–	–	–	–
A25	A25	A25	A025 U+1301D	A25	A25	A.3751	16	–	–	A25	–	A25	A24/25	–	–	–	A25	A25	A25	–
–	A25A	A25A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	447bis (vol. 3)	–	–	–	–	–	–	–	–	–	A25a	–	A25a	–
A59	A59	–	–	A59	A59	A.3900	17 (vol. 2)	–	–	–	–	–	–	–	–	–	A25b	–	A25b	–
	A59a	–	–	–	–	–	17 (vol. 3)	–	–	–	–	–	–	–	–	–		–		
A40	A40	A40	A040 U+1302D	A40	A40	–	45	A40 45	–	–	B616	–	A40	–	A.40	–	C1	A40	–	A40
A41	A41	A41	A041 U+1302F	A41	A41	–	–	–	–	–	–	–	A41/42	–	–	–	–	A41	–	–
A42	A42	A42	A042 U+13030	A42	A42	–	–	–	–	–	–	–	A41/42	–	–	–	–	–	–	–
–	A42A	A42A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	A42B	A42B	A042a U+13031	–	–	–	–	–	–	–	B617	–	–	–	–	–	–	–	–	–
–	A42C	A42C	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Detail from the concordance of hieroglyphic and hieratic sign lists and palaeographies, which shows the cursive hieroglyphic and hieratic sign repertoires thus far published. Note how the same signs can be differently coded and classified.

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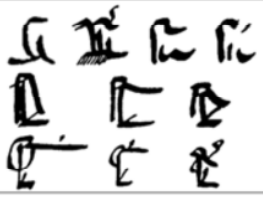
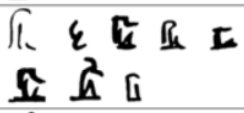
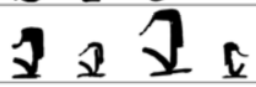
Problems and Priorities in Palaeography[1]

Ambiguous classifications

	A 'Man'	C 'Gods'	'King'		
	45				Möller
	A40				Gardiner, Jsesh, Hieroglyphica 2
	A40				Goedicke
	A40				Moje
	A40				Donker van Heel
		C.0100		[no samples]	Hornung & Schenkel
		C1			Verhoeven
		C1			Lenzo
			B§16		Haring

1. This title was inspired by Jan Assmann's *Problems and Priorities in Egyptian Archaeology* (1987)

The following problems and priorities in creating a palaeography, especially for the cursive scripts, show that we must rethink the classification and coding system on which most sign lists and palaeographies (whether digital or not) are based: the system introduced by Gardiner and elaborated in the Extended List (Gardiner, *Egyptian Grammar* (3rd edition, 2005), 438-548; Grimal, Hallof & van der Plas, *Hieroglyphica Sign List* I-II (2000)). Here, the example of the sign numbered A40 by Gardiner is given. Gardiner described the sign as a seated god, but recognized that the sign was also used as a classifier in personal pronouns indicating speech by the king (Gardiner, *ibid*., 446). Gods belong to his class C ('Anthropomorphic Deities'), but the king is a man and therefore belongs to his class A ('Man and his occupations'). In palaeographies one nowadays finds the sign either under class A or under class C.

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Problems and Priorities in Palaeography

43 king wearing crown of Upper Egypt S 1 — Ideo. or det. in … var. *nsw* (*nzw*, *ni-św*)[1] 'king of Upper Egypt', 'king'. Det. *Wsir* 'Osiris'.

[1] Reading, p. 50, n. 1.

A: Man and his occupations

B: Kings, anthropomorphic gods, and their occupations

C: Woman, queens, anthropomorphic goddesses, and their occupations

D: Deities with non-human heads

Meeks, *Les Architraves du Temple d'Esna.* Pal.Hiér. 1 (2004); Haring, *The Tomb of Sennedjem.* Pal.Hiér. 2 (2006).

	A 'Man'	C 'Gods'	'King'		
	45				Möller
	A40				Gardiner, Jsesh, Hieroglyphica 2
	A40				Goedicke
	A40				Moje
	A40				Donker van Heel
		C.0100		[no samples]	Hornung & Schenkel
		C1			Verhoeven
		C1			Lenzo
			B§16		Haring

The same is true for the sign which Gardiner numbered A43, which depicts a seated king wearing the white crown, and which is used as a classifier in the word *n(y)-sw.t* 'king of Upper Egypt' as well as in *Wsir* 'Osiris' (Gardiner, *ibid.*, 446). In the series *Paléographie Hiéroglyphique* Dimitri Meeks has redefined Gardiner's classes A to D precisely because of such ambiguities (Meeks, *Les Architraves du temple d'Esna.* Pal.Hiér. 1 (2004), XIX)). He has extracted the signs related to kings from Gardiner's class A, and has made them, together with the signs related to anthropomorphic gods, the focus of an entirely new class for 'Kings and Anthropomorphic Gods'. His redefined classes are given in the slide. Whether we include signs such as A40 and A43 in Gardiner's class A, in Gardiner's class C, or in a newly created class specifically for kings and anthropomorphic gods is a matter of how radical we want to be in adapting Gardiner.

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Problems and Priorities in Palaeography

Variants or semantically, phonetically and/or graphically related signs may be far apart

A9	A119		
E21	E216		
F13	F102		
I12	I44		
L7	L19		
N11	N13	N14	N64
O3	O70		
S27	S113	S114	S115

But we are not only dealing with Gardiner. The Extended List in Hieroglyphica 2000 contains signs that also occur in hieratic, and that we will thus include. Yet, the classification of these signs also has its problems. Variants of the same sign, or semantically, graphically and/or phonetically closely related signs are sometimes codified far apart from each other. In redefining the classification specifically for the cursive and hieratic sign repertoires such cases can be reviewed and signs that have elements in common can be grouped together.

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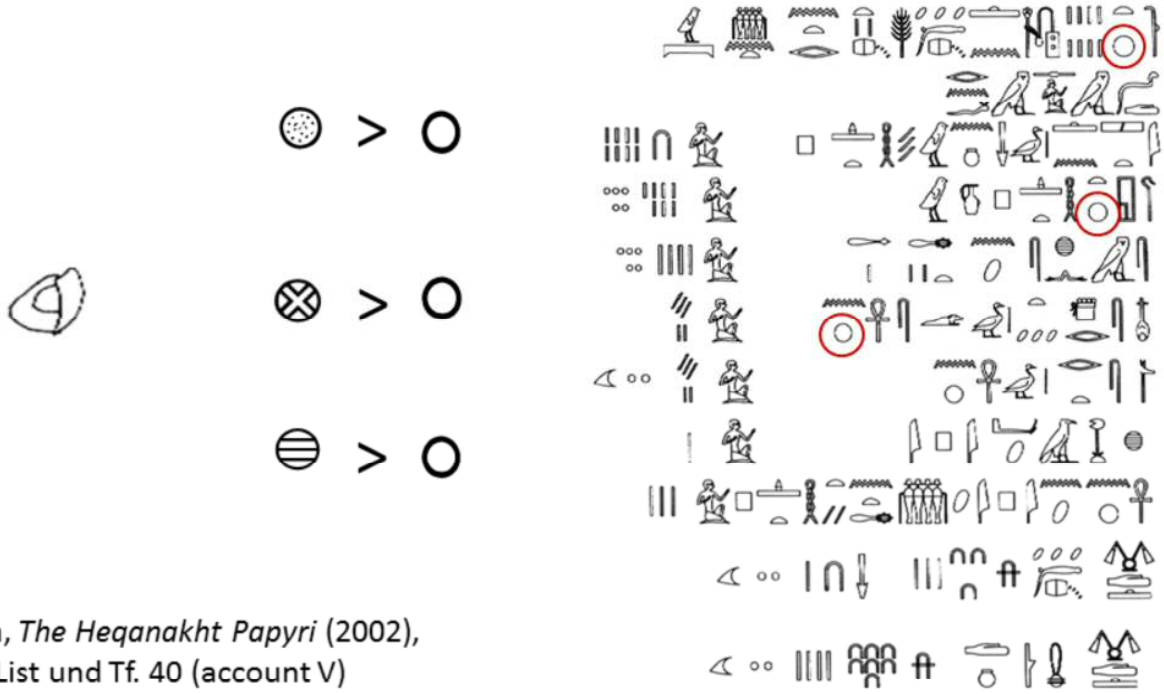
Problems and Priorities in Palaeography

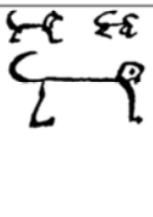
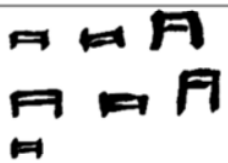
Multifunctional signs in hieratic (dyn. 11)



Allen, *The Heqanakht Papyri* (2002), sign List und Tf. 40 (account V)

Signs that have a graphic element in common are particularly interesting in a hieratic palaeography, especially when similar forms relate to completely different signs. Such cases are crucial to the project as they concern the nature of hieratic script. How are such signs to be classified and coded in a palaeography for the cursive scripts?

Problems and Priorities in Palaeography

A55	Q19	N1	Gardiner, JSesh, Hieroglyphica 2
384 (vol. II)	384 (vols. I, III)	300	Möller
Q8a	Q8	N1	Verhoeven, Lenzo
				samples

Meeks, 'Linguistique et égyptologie', in: *Chronique d'Égypte* 179 (2015), pp. 41-42

The slide gives another example, which shows how similar graphic forms in hieratic may relate to different hieroglyphic signs, but also how different graphic forms in hieratic relate to the same hieroglyphic sign. Two problems are related to this example. The first problem concerns the classification of the mummy lying on a bed: does it belong to the class of 'Man' or to the class of 'Furniture'? Gardiner included the sign in the class of 'Man' (A55). Möller included it under 'Furniture' in volume II as no. 384, but in volumes I and III he rather gave for no. 384 the sign coded Q19 in the Extended List, which is the sign of a bed without a mummy. Consistency is needed here. The second problem concerns the diacritic stroke, which is sometimes taken to indicate the mummy. Meeks, however, has argued that it serves merely to distinguish the hieratic forms of the signs A55 and Q19 from the hieratic form of sign N1, the sky, to which it is otherwise very similar (Meeks, 'Linguistique et égyptologie', in: *Chronique d'Égypte* 179 (2015), pp. 41-42). Whether the diacritic stroke is in addition to be understood as indicating the mummy, making the difference between A55 and Q19, depends upon the context in which the sign is used. Without word-context, it is in many cases not possible to say which sign the scribe had in mind.

NB: The diacritic stroke may in addition indicate the Horus bird lying on the bed, a sign that in the Extended List is coded G165 and that is classified under 'Birds'. Meeks, *ibid*., pp. 41-42.

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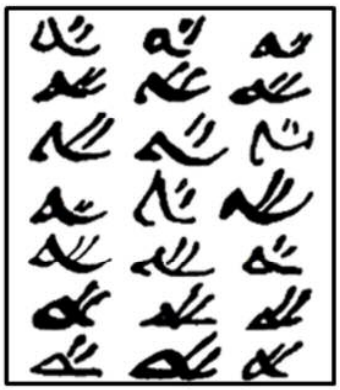
Problems and Priorities in Palaeography

Overviews of similar forms that may or may not relate to different signs

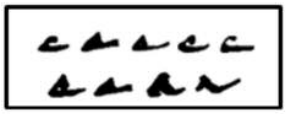


D54, F21, W3

A55, Q19

A47, A48, M18

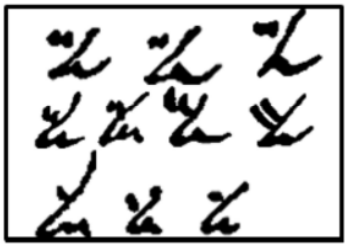
N18, X2



A1, B1A, D54

A5, A34

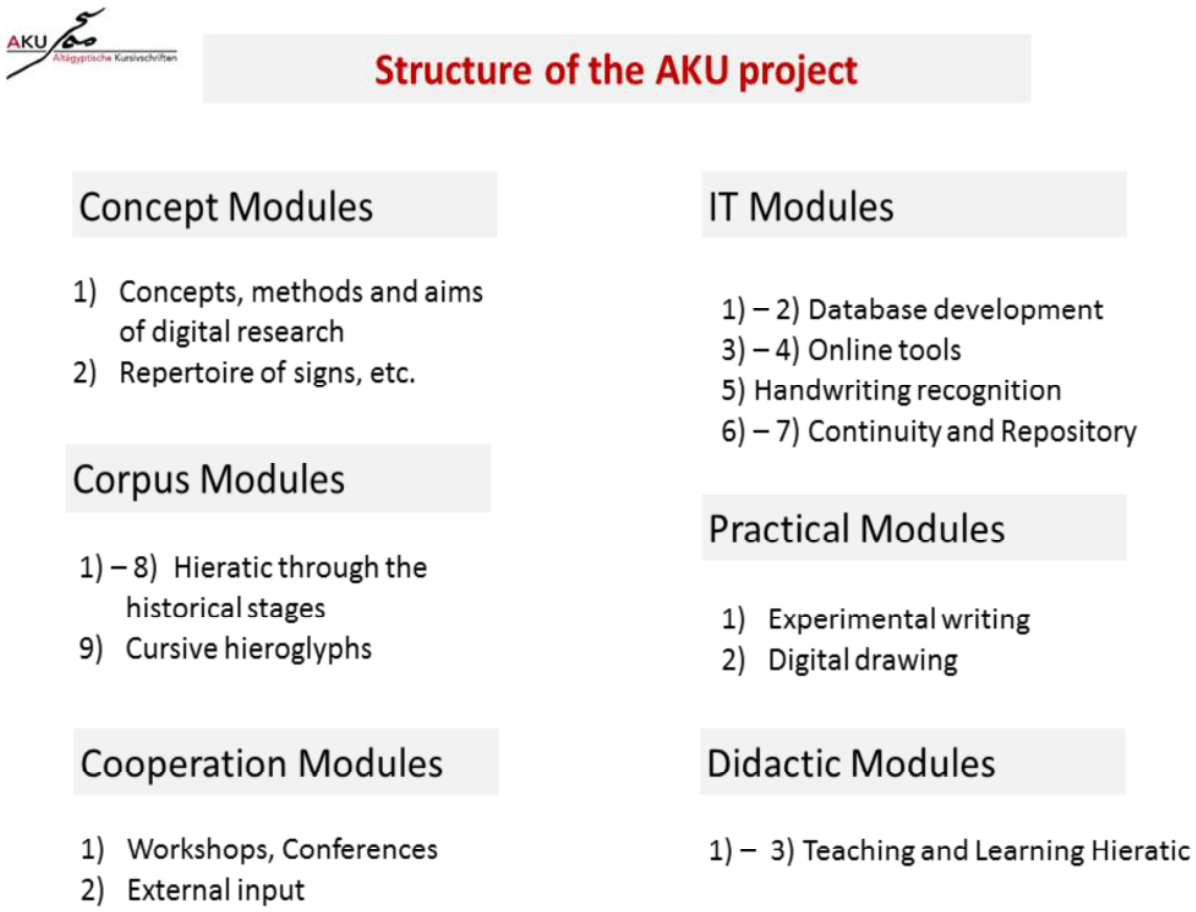
G17+D21, G17+X1



E23, U13

Overviews collected on the basis of similar form-describing parameters for similar hieratic forms that relate to different hieroglyphic signs

The graphic aspects of hieratic script demand that similar forms, which may relate to completely different signs, are reviewed together; that is, in the same, or closely related form classes. Creating a palaeography for the hieratic scripts is clearly not merely a case of adapting the classes for the accommodation of cursive and hieratic signs. In the longer run, we must create overviews that on the basis of form-describing parameters collect similar forms irrespective of which specific sign they in word-context represent. Such overviews allow more detailed study of forms and developments and make it possible to more easily inventory the possibilities for identification and the usages of a given hieratic sign form.



Structure of the AKU project

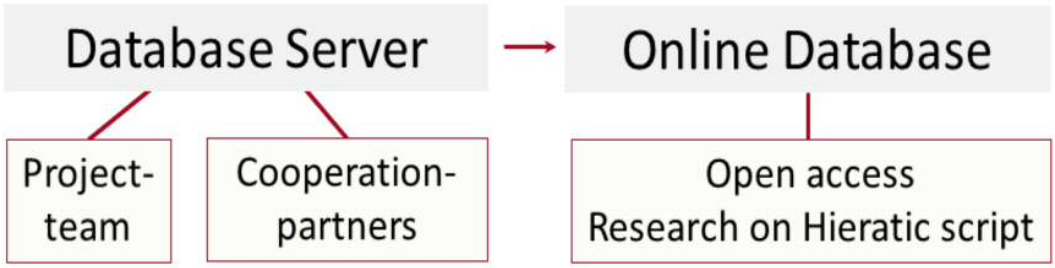
The project is organized in modules.

In the first stages of the project the focus lies – besides the Corpus Modules – on the Concept and IT Modules:

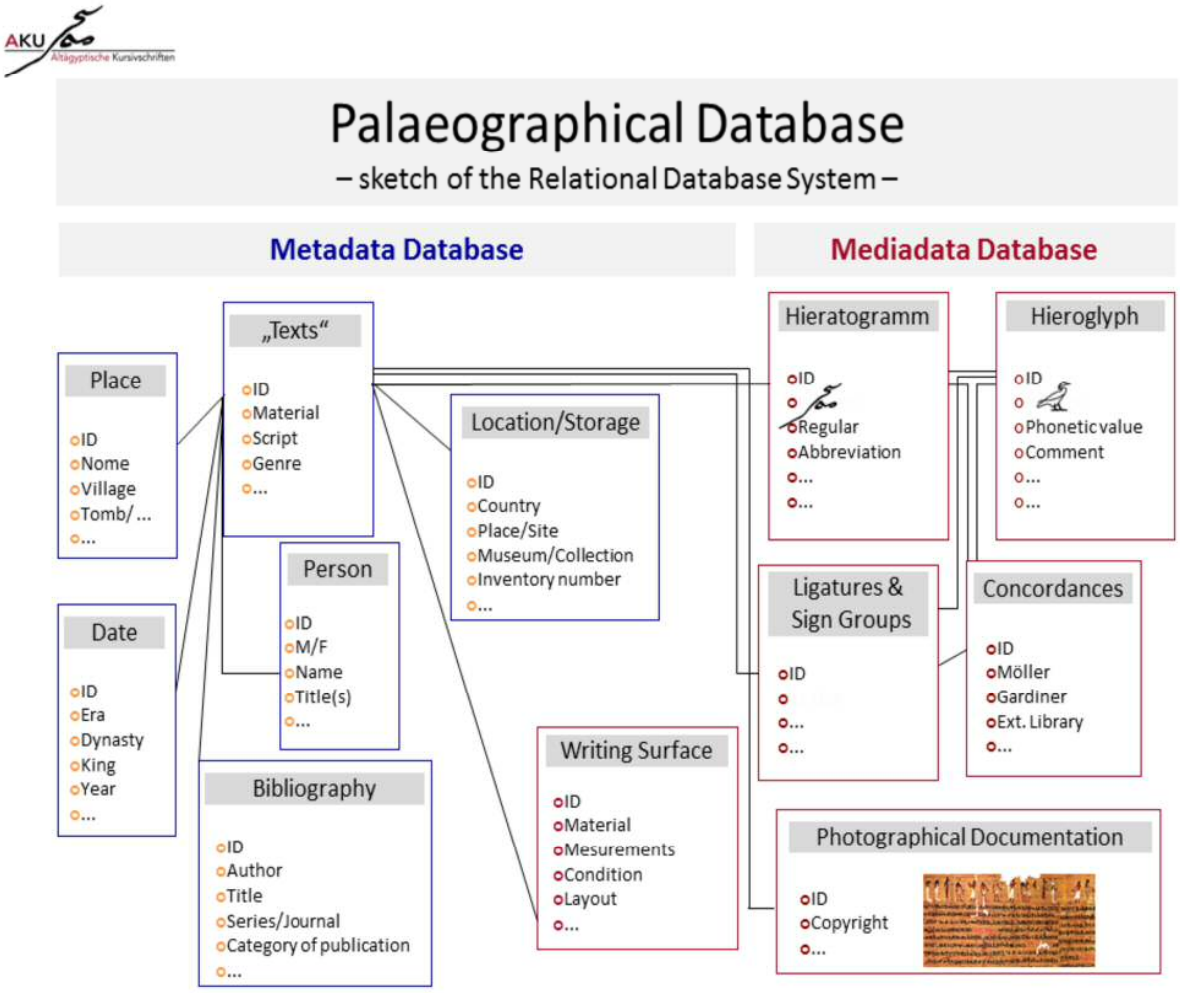
- Concept Modul 2: „Repertoire of Signs“, especially „Problems and Priorities in Palaeography“.
- Concept Modul 1: „Concepts, methods and aims of digital research“ that goes strongly together with the IT Modules 1-2: „Database development“.
- Although the IT-Modules 6-7 „Continuity and Repository“ belong the final phase of the project, they are already relevant.
- Activities belonging to Practical Modules, Didactic Modules and Cooperation Modules have already taken place as well. The next event will be the international conference: *„Ägyptologische ‚Binsen‘-Weisheiten III“ – Formen und Funktionen der Edition und Paläographie von altägyptischen Kursivschriften* in April 2016.

Relational Database System

– a dynamic tool for archiving and research



One of the project‘s initial goals is to build up a complex database as a dynamic tool for research on hieratic scripts and cursive hieroglyphs.
IT-solutions may change quickly, therefore we take care of developing a database-structure, that gives us the opportunity to move the data into a different system if eventually needed.
In a first step this database will only be available to the project members and cooperation partners.
Nevertheless it is planned to present the database as an online-tool for researchers that are interested in the field of hieratic and cursive hieroglyphs in a second step. It is planned to put this into practice in year five to ten in the term of our project.



The illustration above shows a very rough sketch of the structure of the project‘s database.
It is divided into two parts: one is the media section, the other will cover metadata of the documents that will be analyzed by the project.

Thanks to the cooperation with Mark Depauw and the Trismegistos project, the Trismegistos Metadata-Database is put to our disposal. However, there are some modifications necessary, but without changing the system‘s structure. Some tables will be added for a more detailed description of the writing surface, it‘s status of preservation, or the link to the photographical documentation for instance.

The media-database (marked in red) is the new part of the database we are developing right now.
Core of this part will be the table where we record the factual topic with which the project‘s research starts: the single hieratic sign, the „*Hieratogramm*“.

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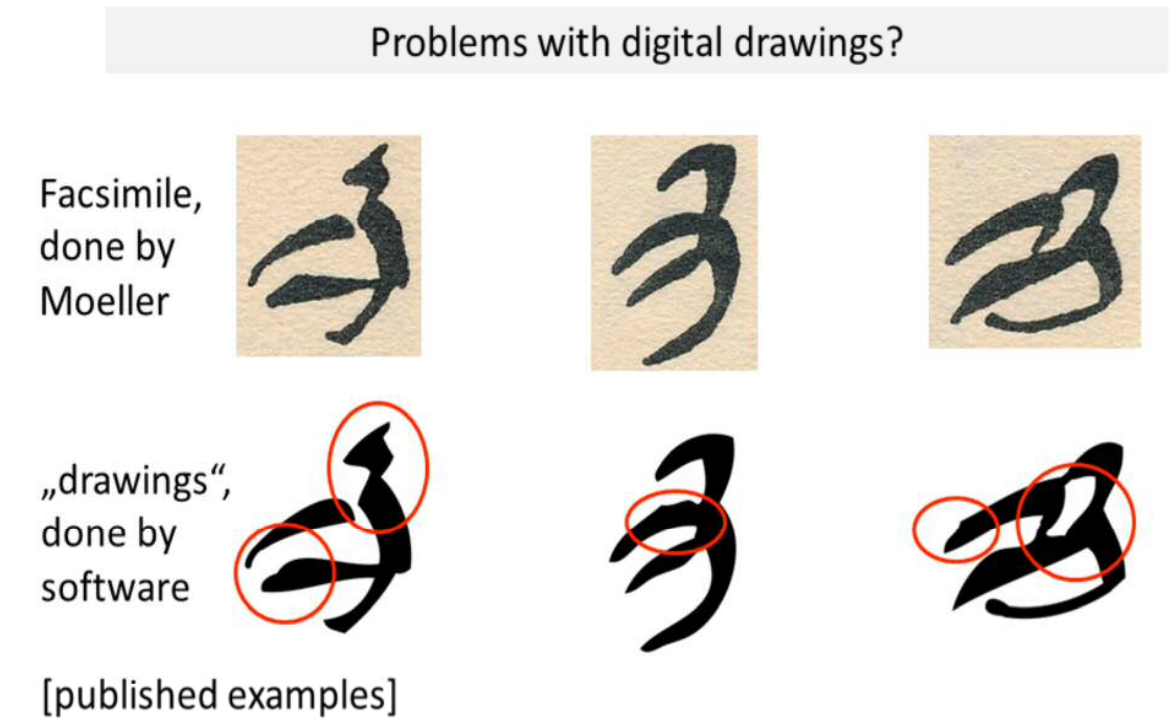
Possible Representations of Hieratic Signs in a Palaeography?

How to present hieratic signs in a (digital) palaeography?

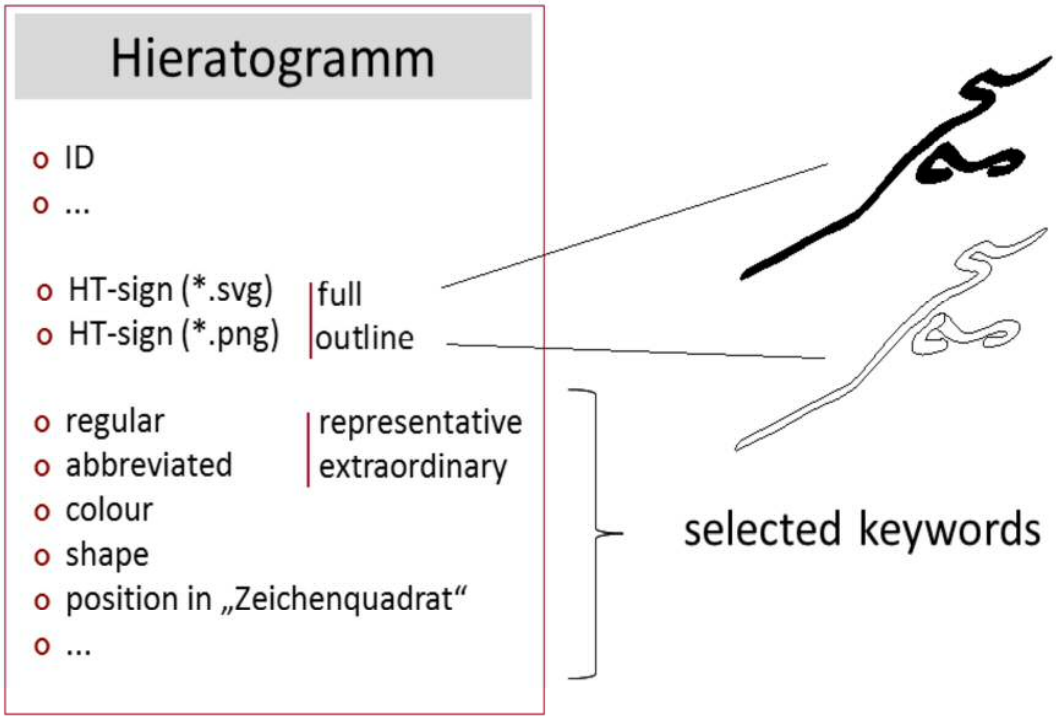
Several solutions can be found in publications, e. g. signs copied out of a digital picture with a more or less high resolution. This is a very fast, efficient solution and may work for signs that can be isolated well (comp. the signs on the left). But it is more complicated in the case with signs overlapping each other (comp. signs in the top row / right). Signs that are barely visible can be more visible by using eloborated software.



Facsimiles – a solution? „Traditional“ or digital?

Traditional facsimiles that are done properly are still very useful and in many cases better than „drawings“ done automatically by a software. The examples above show that manual corrections by the researcher would have been necessary. A third and nowadays popular way is to create digital facsimiles, which are digital drawings „manually“ using elaborated software, drawing pens and tablets.

Since our project will analyze hieratic signs with digital tools in the future, we are going to store the digitized signs using different file formats.

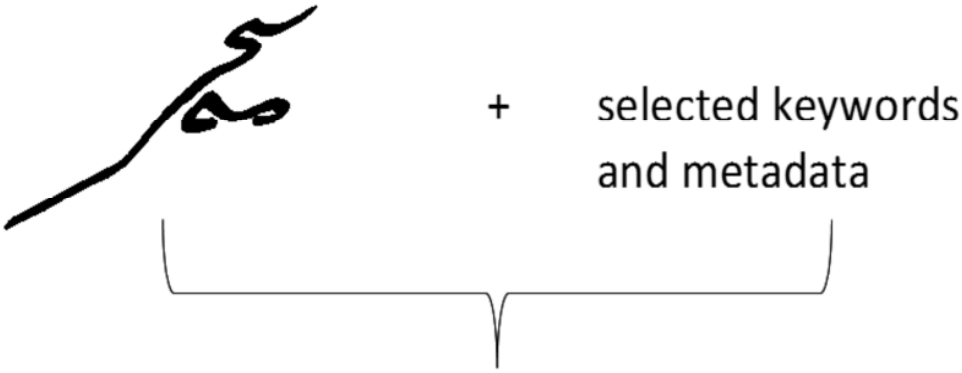


In the database itself one single *Hieratogramm* is represented in a vector graphic format (*.svg) as well as a pixel based file.
Not imported but connected to the database are the digitized signs using other file formats as well.

The description of the individual sign covers several aspects – for example:

- regular form or an abbreviated variant with the distinction of a representative form in contrast to an extraordinary one
- color
- shape classification in a wider sense – such as used by Gardiner (tall narrow, low broad, low narrow)
- shape classification in a more detailed way concerning the hieratic signs
- the position in the specific ‚block‘ of signs
- ...

With these descriptions we are going to develop selected keywords.



saved as XML files

using codes suggested by TEI-group /
creating new codes for sign-description
in cooperation with other projects ?

These keywords and other metadata are the basis for the future analysis, that will be done by using the database as well as other digital tools.

Individual Signs

A1	I (2), (vo. 1) II (1), (29), (33), (2) III (8), (vo. 3), (3), (4) IV (3), (4), (2), (vo. 2) V (29), (25), (46) — columnar text only VII (15) See also Ligatures (N35).
A1*	I (8) — as det. with B1* II (vo. 6) — as det. with B1* and in the account; inserted as 1S suffix in 29 V (13), (15), (30), (45) — in accounts VI (3), (7), (15) VII (7) P (9), (6), (19) Fr. (B); (C)
A2	I (vo. 7); (vo. 17, in restricted space) II (5) III (1, 75%) — calligraphic, for A17 IV (4) V (26)
A15	P (1)
A15*	VII (2)

James P. Allen, *The Heqanakht Papyri* (2002)

Another important aspect for every palaeography is the question of how many signs of a single source should be recorded.
Working with a database as a dynamic tool – instead of a traditional static palaeography with limitations given by, for instance, a printing format – it is very seductive to try to record every hieratic sign of a single document or at least the number of occurrences of a specific sign character. This can be important, especially if you think of a statistical analysis.
As long as sources that have an approximately „short“ text are used, this is a practicable way. But when it comes to longer manuscripts this is difficult to realize.
Without digital support for this part of the work a selection of signs with well-representative forms should be sufficient at the moment.
Currently, we note the frequency of their occurrence, with the use of temporary keywords like „common“, „rare“, „unique“ and so on. Of course this approach is not a satisfying solution and we hope that we can change this in the near to medium-term future, by using elaborated software for handwriting recognition.

AKU

Altägyptische Kursivschriften

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Since the database should cover the whole time span of ancient Egyptian history and the sources are very different and need lot of experience, it would be unrealistic to think that the small team of the AKU-project could accomplish this alone, even if the project is a longterm project of more than 20 years in total.
Therefore, we are looking for cooperation partners who are interested in joining us to build up a much-needed, updated digital inventory of hieratic and cursive signs that can be used by all to study and compare script phases and developments, temporal and geographical characteristics, scribal hands and so forth.
We are well aware of what we are asking for – the proposal we want to do is:
all of you who are working on hieratic palaeographies can import their digital data into the database we are developing.
In return, we provide our digital tools for the analysis of your material. It is important to note that your material will stay in your hands and the entries are labeled in every case so as to guarantee the authorship.

We plan to keep you regularly updated on our progress with the database from now on, but you can always contact us on **aku@uni-mainz.de**.