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Photo: Manuscript from Timbuktu, Mali; the book of prayers *Dalā' il al-khayrāt* by Muḥammad al-Jazūlī (d. 1465) devoted to the Prophet Muhammad; the image depicts the sandals of the Prophet. © CSMC

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Editorial

From Newsletter to Journal

Dear Reader

When the first issue of the newsletter *manuscript cultures* was published back in 2008, none of the editors would have dared to imagine that only three years later the Hamburg research group ‘Manuscript Cultures of Asia and Africa’ (funded by the German Research Association, DFG) would grow into a research centre with twenty-two sub-projects in eighteen disciplines, including imaging, material analysis and computer science. These sub-projects, a post-graduate programme with 35 PhD students from all over the world and a library occupy all seven floors of a building close to the campus of the University of Hamburg.

Establishing the Centre for the Study of Manuscript Cultures (CSMC) was also made possible by the generous support the DFG and the University of Hamburg provided for our ‘Sonderforschungsbereich 950: Manuskriptkulturen in Asien, Afrika und Europa’, which has attracted further manuscript projects such as ‘Safeguarding the Manuscripts from Timbuktu’ (funded by the Gerda Henkel Foundation and the German Foreign Office) and ‘Going From Hand to Hand: Networks of Intellectual Exchange in the Tamil Learned Traditions’ (NETamil, funded by the European Research Council).

Since the scope of regions and research interests has grown considerably, it was decided to expand the newsletter into an academic journal, completing the circle of publications issued by the CSMC: its website, the monograph series entitled *Studies in Manuscript Cultures* (SMC) and the *Encyclopaedia of Manuscript Cultures in Asia and Africa* (EMCAA). Just like its predecessor, the journal *manuscript cultures* will be freely available, both as a download and – upon request – as a hard copy.

The editorial policy of *manuscript cultures* is the same as the one for SMC: it strives to enhance the emerging field of manuscript studies (also known as manuscriptology), including disciplines such as philology, palaeography, codicology, art history and material analysis, thus encouraging comparative study and contributing to a historical and systematic survey of manuscript cultures. The CSMC and its international network of scholars will serve as a pool of experts, inviting, recommending and reviewing articles concerned with this academic field.

It has taken some time to produce the first volume of this journal, but we expect it to appear much more frequently in the future. We look forward to receiving your contributions and suggestions.

Michael Friedrich, Jörg B. Quenzer, and Irina Wandrey

Forum

Manuscript Terminology: a Plurilingual Perspective

Marilena Maniaci | Cassino

Manuscript terminology¹ – or codicological terminology, given that palaeographical vocabulary is still a taboo – has been a debated issue since 1953, when the idea of a multilingual glossary was conceived by Charles Samaran, the doyen of Latin palaeographers. The project did not become reality for quite some time, and then only in the family of Latin-based languages.²

The range of available dictionaries and other terminological tools is still rather unsatisfactory in English and German and in the other European languages. There are, however, exceptions in the form of a number of contributions focusing on individual aspects, mainly bookbinding and decoration,³ a mass of largely unreliable glossaries that are often no more than simple lists of terms,⁴ and one promising English project being developed by Peter Gumbert, but this is still far from complete.⁵ If we turn to the various manuscript cultures that developed round the Mediterranean basin, the outlook – with the partial exception of the Arabic sphere⁶ – is even more daunting: shortcomings in terminology are frequently joined by vague definitions of related concepts for which the need has not even been noticed.⁷

¹ This contribution is an expanded version of a paper presented at the ‘Internationale Tagung der Handschriftenbearbeiter’, held in Wolfenbüttel, Herzog August Bibliothek, on 19th–21st September, 2011.

² French: Muzerelle 1985; Italian: Maniaci 1996, 1998²; Spanish/Castilian: Ostos, Pardo, and Rodríguez 1997; Papahagi 2013. The Catalan version by Arnall i Juan 2002 is questionable under many regards (selection and ordering of terms, wording of the definitions); not by chance it has not received the patronage of the Comité International de Paléographie Latine.

³ I refer in particular to Gnirrep, Gumbert, and Szirmai 1992; Brown 1994; Jakobi-Mirwald 2008; for other references see Maniaci 2002, 2005², 191–193. The work by Beal 2008 disappoints the expectations raised by its title; it is in fact an alphabetical list of terms, adopting a very wide definition of ‘manuscript’ and principally referring to the 16th and 17th centuries. The recent repertory by Šedivý, Pátková 2008 is an interesting, but limited (and isolated) attempt to collect and define palaeographic terminology.

⁴ For a merely indicative selection of links see Maniaci 2008, 209–210 n. 84.

⁵ Gumbert 2010: thanks to the generosity of the author, I had the opportunity to preview and discuss with him the available chapters (‘Scribes and their tools’ and ‘From sheet to page’).

⁶ See Gacek 2001; 2008; 2009.

⁷ Comparative codicology has the daunting task of reducing the gap in the state of knowledge concerning the different book cultures: this is the main

Research has continued, however, and existing terminologies are therefore showing inevitable signs of age: new flaws and errors have joined earlier shortcomings affecting the choice and organization of terms and the wording of definitions.

With regard to historical terminology, the situation is even less encouraging: the surveys presented at a round table in Paris twenty years ago have not been followed up,⁸ and the only systematic initiative that has been carried on since then concerns the Byzantine book; this is still incomplete.⁹

There is a general consensus as to the usefulness of a common codicological terminology in the main European research languages, but its objectives and the means for implementing it are unclear. What are the reasons for this continuing stagnation, apart from the fact that Denis Muzerelle’s authoritative *Vocabulaire codicologique* definitely helped to inhibit the development of alternative projects (with rare exceptions)? Are the ambitious agenda and underlying assumptions of the Comité de paléographie still to be considered valid? What are the needs that a technical vocabulary should fulfil? What kind of public should it address? In practical terms, what are the challenges facing book terminologists and what are the new tools to help them accomplish their task? These are the issues I address in the following pages.

1. Why and for whom?

The first question for any aspiring terminologist concerns the purpose of the work – in other words the needs of the public to whom it is addressed. Samaran’s original project was rooted in a well-defined context in which the scientific study of the codex – as a material artefact and not just a container of texts and a vehicle of thought – was in its infancy and lacked a mature technical lexicon and reference works.¹⁰ This explains the importance attributed by Denis Muzerelle to the definition of a conceptual framework that would systematize an emerging discipline and to rigorous selection of the terms to be fit into it. The success of his *Vocabulaire* is largely

task of the ongoing project COMSt, Comparative Oriental Manuscript Studies (<http://www1.uni-hamburg.de/COMST/>).

⁸ See Weijers 1989.

⁹ Cf. Atsalos 1971 [2012]; 1971 and 1972; 1977; 2000.

¹⁰ Ruiz García 1988 and 2002; Lemaire 1989.

attributable to these basic choices. In the absence of more specific instruments it has also been used as a handbook of codicology, even though the author intended to limit his definitions to the bare minimum of terminological information and resisted the temptation to adopt a more encyclopaedic approach.¹¹

The considerable increase in the number of reference works in recent decades¹² has led to a decline in the inappropriate use of existing vocabularies for teaching purposes; in the meantime new and pressing needs for the standardization of terminology have emerged as a result of the spread of new technologies and the internet. This significant change has not yet brought about a deliberate redefinition of the original project: codicological terminology is still loaded with old and new expectations and responsibilities, and these have not yet been arranged in a clear setting. The main requirements may be summarised as follows:

Communicate with the greatest possible precision the body of technical knowledge relating to the manuscript book with a view to reducing ambiguity. Peter Gumbert recently reformulated this general objective effectively: ‘... as long as we have not embedded the facts in a structure of words, they are not yet sufficiently clear to ourselves, and it will be difficult to observe them, or to communicate our observations to others.’¹³

Represent the state of knowledge at a given time: the clarity and depth of knowledge will require precision and richness in the terminology used to express it. One example may suffice: a central concept for the study of the genesis and evolution of the codex – the ‘codicological unit’ – has been proved inadequate by recent research and, given the number and variety of structural ‘units’ that can be isolated in most Medieval codices, as a consequence a nebula of additional or alternative terms and concepts has emerged. These include ‘booklet’, ‘élément codicologique’, ‘modular unit’, ‘production unit’ and ‘circulation unit’, but their mutual relationships have not yet been defined – as shown, unsurprisingly,

by the vague and inaccurate definitions proposed for most of these terms.¹⁴

Two other requirements have emerged more recently that are less clearly defined and apparently very different from each other:

Manage the body of existing knowledge, with particular regard to the growing mass of unordered information available in digital formats. An increasingly urgent demand for glossaries of basic terms, possibly with multilingual equivalents, has recently emerged to meet the need for universal organisation and access to content on the internet. With regard to the Western and Byzantine medieval book, it is generally believed that this need is largely met by the online version of the *Vocabulaire codicologique*, also managed by Muzerelle.¹⁵ Few people seem to be aware that this is actually a one-way database founded on the original French text: it gives Italian and Spanish equivalents, occasionally adding a proposed English term, and it does not take into account developments in the versions based on the French prototype, such as the introduction of new terms, the deletion of obsolete ones, the introduction of corrected or modified definitions, or the sometimes imperfect correspondence of meanings among the different idioms.

Produce new knowledge through detailed mapping of the various aspects of the study of book materials and techniques, with a focus on poorly defined issues and concepts and, if necessary, the invention of new terms to designate them, organised into coherent systems. This less urgently perceived requirement stems from the progress made in codicological research in recent decades, particularly in fields such as the study of paper and watermarks, ‘complex’ codices, rulings and layouts. I have recently proposed an example of this new approach, which is not represented in the *Vocabulaire codicologique* and other glossaries based on its structure; I shall return to this shortly.¹⁶

It would be misleading to view electronic management of codicological knowledge and the production of new research as opposing practical and scientific needs. In fact the creation of a glossary of key terms such as those most frequently used in manuscript catalogues can only occur as the result

¹¹ Muzerelle 1985, 8: ‘La notice explicative consacrée à chaque mot ou expression devait, selon la comparaison dont il usait lui-même [i.e. Charles Samaran], demeurer aussi concise, objective et rigoureuse, qu’une définition du Petit Larousse. Et c’est à quoi nous avons tâché en nous défendant toujours expressément d’introduire tout développement ou considération de type historique, géographique ou typologique. Les explications techniques, elles-mêmes, ont été restreints à ce qui était strictement nécessaire pour l’intelligence du terme en question’.

¹² See the very close publication dates of the following recent introductions to codicology: Maniaci 2002, 2005²; Agati 2003 and 2009; Géhin 2005.

¹³ Gumbert 2010, Preface.

¹⁴ The point on this topic, with a detailed discussion of the single terms, is made by Andrist, Canart and Maniaci 2013; see also Andrist, Canart, and Maniaci 2010 (where the Medieval codex is compared to a LEGO game, each brick representing a stage of its construction or further transformation) and Gumbert 2004 (with a tentative English terminology for the ‘stratigraphy’ of the codex).

¹⁵ <http://vocabulaire.irht.cnrs.fr/>, now integrated into the application ‘Codicologia’, <http://codicologia.irht.cnrs.it>.

¹⁶ Maniaci 2008, 197–205.

of reflection on the conceptual and practical limitations of the vocabulary in use. This is also proved by the failure of a proposal made a few years ago at a London conference to address the creation of a basic English terminology in a pragmatic form using invented terms to fill the most glaring gaps.¹⁷

2. How to proceed?

Once the objectives and beneficiaries of the terminologist's activities have been defined, he or she still has to make some delicate choices such as the delimitation of the field of interest, the methods of survey and selection from the existing lexicon, the possible creation of new terms, the criteria for sorting entries, and the wording of definitions. Because most of these subjects have already been treated by all the authors of codicological terminologies, including myself, I will merely summarize the main issues, with some additional considerations:

Defining the field

Although many, if not most, collections of technical terms are inspired by the immediate needs of personal research, every systematization of technical terminology should be based on a census of the vocabulary in use. This is achieved by analysis of existing publications; in some sectors nowadays it can be done with special software. In any case, the field to be covered must first be defined. I have recently shown that the attempt to identify objective criteria for a codicological lexicon must inevitably admit the existence of a 'zone of discretion', the size of which will depend on the topics.¹⁸ Even though an excess of enthusiasm led me about 15 years ago to comprise in my vocabulary a number of marginally relevant terms – which attracted some criticism – I remain convinced that a reasonably inclusive attitude is preferable to a rigidly restrictive one. The decision to include the names of the most common pests affecting wood and paper, which are distantly related to the book, in a chapter on preservation and restoration seems to me less sinful than excluding, under some criterion of relevance, the rich vocabulary of the machinery and tools used in paper manufacturing, as if it were irrelevant to the codicological description of the paper itself.

Collecting and selecting terms

The selection of terms also involves a bit of healthy pragmatism. Only in artificial languages does each term correspond

to a single abstract definition within a fixed hierarchy. In the case of manuscript terminology, examination of the sources produces a hybrid mix of technical and non-technical terms that are lexically and conceptually inconsistent even when they are not drawn from other languages: this occurs as a result of eclectic use of foreign words – notably terms imported into Italian from French such as *lisière*, *mise en page* or *calque* (favoured by historians of book decoration), and literal translations of terms from other languages.¹⁹ To address this varied lexical ensemble, terminological theory offers a choice of opposites: a descriptive or a normative approach. The descriptive approach considers technical terminology as a systematization that derives spontaneously from actual use of a special vocabulary in a given context – a view that promotes respect for the inconsistencies of a language by registering synonyms, homonyms and obsolete terms with a view to reflecting the natural tendency of the lexicon to variation and renewal. The normative approach, on the other hand, seeks to unify the established terminology artificially, a task proposed and supported in some sectors by national and international agencies and associations. In the case of book terminology, which has remained on the margins of the debate that has developed around other scientific languages,²⁰ it seems to me that such rigid contradistinction should be mitigated by adopting a more flexible attitude than the strictly descriptive stance of the *Vocabulaire* and its Italian and Spanish homologues. In fact the artificial regularization of a living lexicon consisting of contributions from various origins does not suit a small specialist community such as codicologists, who work in various local scientific traditions and are not particularly open to experimentation, and who are inclined to employ a variety of expressive usages. Yet it seems to me that the current context, which is characterized by rapid globalization and dominated by new and increasingly urgent requirements for information retrieval, justifies a more proactive attitude, at least in relation to the basic terminology normally used in cataloguing descriptions.²¹ The aim of describing what is observed as objectively and uniformly as possible is to facilitate the retrieval of information in a given category and to aid comparisons, respect for tradition

¹⁷ *An English Codicological Vocabulary (an English Language Version of the Vocabulaire codicologique)*, London, 8–10 July, 2004 (the programme may still be consulted at <http://ies.sas.ac.uk/cmpps/events/conferences/2003-2004/Vocab/index.htm>).

¹⁸ Without necessarily sharing the extreme position of Biel 2008, VIII: 'the main principle of selection operating here was my own interests and knowledge'.

¹⁹ For the 'physiognomy' of Italian terminology (with observations which can be extended to other languages) see Maniaci 2008, 5–7. Interesting remarks on the criteria underlying the construction of the German vocabulary of book decoration have been formulated by Jakobi-Mirwald 2011, an unpublished speech delivered at the conference cited above, fn. 1.

²⁰ I refrain from giving an – even partial – account of the bibliography concerning non-codicological terminology, which is too rich and diverse, as well as very far from my specific skills.

²¹ My opinion differs under this respect from that expressed by Jakobi-Mirwald 2011.

and defence of linguistic diversity but often has the single effect of generating ambiguity and confusion instead. Consider, for instance, the Italian use of synonyms for ‘leaf’ such as *foglio* or *carta*, both of which are lexically ambiguous, or the logical sequence *binione – ternione – quaternione – quinione* and the etymologically questionable alternative *duerno – terno – quaterno – quinterno*. In these and other cases it seems to me that the achievement of lexical uniformity is worth attempting, though in some fields – the best example is decoration – the task may at first seem impossible. I remain convinced that no revision or rationalization of the lexicon can be successful unless it is associated with an equally determined effort to harmonize cataloguing protocols, abandoning the unconditional defence of their exceptional variety, in the name of the uniqueness of the manuscript book.²²

Linguistic invention

The idea that the current codicological lexicon can be modified implies correcting inconsistencies and filling gaps, both of which are delicate and risky tasks that entail different levels of intervention. The first and more conservative operation involves adapting or ‘creatively’ manipulating existing terms, as cautiously admitted by Muzerelle and more recently Gumbert,²³ with a view to constructing complete and logically consistent terminological sets: in the French sequence *bifeuillet extérieur – bifeuillet médian* or *centrale*, for example, the expression *bifeuillet intermédiaire* can logically be inserted, though it is not documented in any sources.²⁴ But genuine linguistic invention is a different and more daring matter in that it is intended to fill particular gaps or – more ambitiously – to enrich and organize existing conceptual and terminological sequences by introducing new concepts and proposing new terms to define them. I recently tried to apply this conceptual rather than terminological approach to the description of the quire: in doing so I highlighted the incompleteness and inconsistency of the available family of Italian terms, but the situation is the same in other languages. The example of vocabulary concerning the structure of the quire is particularly telling because almost all the terms needed to describe the relative position of each leaf and page in the *bifolium* and the quire are lacking. To compensate, I had to invent forms of expression such as: i) *bifoglio naturale*

(‘natural *bifolium*’) and *bifoglio artificiale* (‘artificial *bifolium*’) to designate a *bifolium* obtained by folding a single surface and one obtained by joining two separate surfaces; ii) *fogli solidali* (‘joint leaves’ of natural *bifolia*) and *fogli coniugati* (‘conjoined leaves’ of artificial *bifolia*); iii) *pagine solidali* (‘joint pages’) and *pagine coniugate* (‘conjoined pages’) belonging to the same face of a natural or artificial *bifolium*; iv) *foglio anteriore* (‘front sheet’) and *foglio posteriore* (‘back sheet’) for the first and second of the opposing surfaces of a *bifolium* in the direction of reading; and v) *fogli ante-cucitura* (‘pre-seam leaves’) and *fogli post-cucitura* (‘post-seam leaves’) to designate leaves belonging to the first or second half of a quire.²⁵ Systematic dismantling of the concepts associated with the term ‘quire’ rapidly produces a hypothetical sequence of terms and definitions that is significantly richer than those in the glossaries published to date.²⁶ In this case the terminology is clearly not meant to impose premature use of an artificial lexicon: it is intended to stimulate enrichment through logical organization. The risk of error must not be underrated. In 1996, influenced by research I was conducting with Frank Bischoff, I coined and included in my glossary the expression *in quarto longitudinale* (‘as a longitudinal *quarto*’) referring to a hypothetical mode of subdividing parchment sheets, but (after more than 15 years) its application has not yet been validated by archaeological evidence.²⁷

Organization of terms

Specialist terminologies, which are logically structured collections of concepts, tend to be presented in thematic order rather than the strictly alphabetical order typical of general vocabularies. As we know, the glossaries inspired by Muzerelle’s *Vocabulaire* all faithfully follow the structure of their prototype with a view to harmonizing different linguistic and conceptual systems. But this approach, which I have long supported, involves the risk of forcing research into a system that is too rigid and inevitably outdated. The emergence of alternative systems such as that proposed by Peter Gumbert therefore appears to be justified, though the prospect of alignment between different languages may be further complicated in the future.

Definitions

The problems of constructing definitions, which I tried to summarise earlier, are as numerous and delicate as those of

²² Another source of recurring ambiguity is the confusion between an instance of alignment and rationalization of the terminology used in different languages and the need for its strict lexical normalization, which is essential to allow automatic searches in catalogues and collections of images: in this second perspective, the choice between semantically equivalent alternatives such as, in Italian, ‘*specchio di scrittura*’ and ‘*specchio scrittorio*’ becomes unavoidable.

²³ Muzerelle 1985, 12; Gumbert 2010, Preface.

²⁴ Muzerelle 1985, 96 (313.16, 313.17, 313.18).

²⁵ The definitions are given in Maniaci 2008, 199–200.

²⁶ Other examples of this same approach have already been given: for mediaeval paper, see Ornato, Munafò, and Storace 1995, 4–12 (and also Ornato 1995, 1–3); for the layout of texts accompanied by commentaries see Sautel 1999, 17–31.

²⁷ Bischoff, and Maniaci 1996, 305 ff.; Maniaci 2008, 127.

selecting and organizing terms.²⁸ Again, I will draw attention to two points.²⁹ The first concerns the choice between a purely terminological perspective, which limits the wording to elements that are strictly essential to the definition of the item, with reference where necessary to terms defined elsewhere, and an encyclopaedic approach, which tends to incorporate inessential information in order to clarify the properties or usage of a given term or to outline the essential knowledge concerning it. An example is the (perfectible) terminological definition of *bifolium* in the *Vocabulaire codicologique*:

Bifeuillet (bf.)
 Bifolio (-lium)
 Diplôme
 *Feuillet double
 *Double feuille
 Pièce rectangulaire de parchemin, papier..., pliée en son milieu pour former deux feuillets.³⁰

This is to be compared with the encyclopaedic definition more recently proposed by Gumbert:

bifolium
 a sheet ((b) or (c)), folded in the middle so as to form two leaves.
 The two leaves are conjoint or conjugate leaves (each being the conjoint or conjugate leaf of the other); they are respectively the anterior and the posterior leaf.
 A convenient way of mentioning e.g. 'ff. 26 and 29, that are conjoint' is to print 'ff. 26^29'.³¹

Apart from the fact that both definitions ignore the existence of artificial bifolia as defined above, they seem to me equally eligible provided they are clearly distinguished and systematically applied.

The second point concerns the difficulty of conceiving perfectly accurate definitions, even – or perhaps especially – for apparently simple notions such as 'book', which has been the subject of several more or less convincing attempts. Compare, for example, the version offered by Muzerelle's *Vocabulaire*:

Livre
 Assemblage portatif d'éléments présentant une surface plane, sur lesquels un texte peut être écrit de façon durable.³²

²⁸ See Maniaci 2007, 1–15.

²⁹ Other paradigmatic examples have been proposed by Jakobi-Mirwald 2011.

³⁰ Muzerelle 1985, 91 (311.03): the Italian definition (Maniaci, 1996, 1982, 125) opens with the specification 'unità costitutiva del fascicolo', which now appears to me inappropriate.

³¹ Gumbert 2010.

³² Muzerelle 1985, 57 taken exactly in the Italian and Castilian versions.

and a more recent proposal by myself and two colleagues, arrived at after several tentative versions:

Livre
 Objet transportable destiné à accueillir, partager et transmettre des contenus immédiatement lisibles de façon ordonnée et durable.³³

The apparently minor innovations of the second definition consist of: i) explicit mention of the fundamental aim of the book – to host, share and transmit content – which does not necessarily imply a text; ii) the requirement that the content be ordered, which makes the definition inapplicable to loose leaves and drafts in which the sequence of leaves can be freely altered after writing; and iii) replacement of the adjective 'portable' with 'transportable' in order to include the possibility of moving very large and heavy books that were meant to be read or consulted *in situ*.

3. Towards a plurilingual lexicon

At this point the notion of a multilingual terminology, suggested long ago by the Comité de paléographie but soon dismissed as premature, deserves separate discussion. Christine Jakobi has recently dealt with this issue³⁴ and in general I share her observations, particularly the assumption that the translation of a whole terminology – or its harmonization with that of another language – is for various reasons of language and content an impossible and ultimately unnecessary task. I think, however, that it is feasible and desirable to build a glossary of key terms, with parallels in several languages, even if Jakobi's courageous but problematic attempt on the vocabulary of book decoration convinces me that it would be best to postpone the enterprise pending fuller reflection on each individual language.

4. A possible new horizon?

Is it better to circumscribe rigidly the boundaries of a technical language, or to trespass into more or less closely related sectors? Is it better to reflect the variety of the existing lexicon, or to run the risk of normalizing it? Is it preferable simply to record gaps and inconsistencies, or to use some creativity to correct and supplement terminology established over time? Is it preferable to limit definitions to essentials, or to enrich them with detail? Is it better to preserve the specificity of individual languages, or to force them into a common system, reducing variety in order to promote common usage? These questions highlight the limitations of the traditional

³³ Andrist, Canart, and Maniaci 2013.

³⁴ Jakobi-Mirwald 2009, 1–8.

form of the printed glossary. As I have argued elsewhere in detail, a solution to this impasse might emerge from the construction of a new digital resource that combines different perspectives, needs and uses.

I am not referring to the straightforward transposition of paper dictionaries into electronic format, following the *Vocabulaire* online, but to the construction of a knowledge management system designed to overcome the rigid conception of book terminology based on abstract and binding criteria of uniqueness, consistency and stability.

The switch from a terminological approach to an integrated knowledge database would make it possible to combine different levels of content:

- terminology, returned to its specific function of producing concise and accurate definitions purged of extraneous or redundant content;
- an encyclopaedic dictionary intended to extend, contextualize and update the basic information provided by the definitions; this aspect is crucial to encourage the development of terms not currently available in one or more languages;
- historical lexicography aiming to collect and organize ancient, medieval and recent terminology that has been superseded by modern research;
- a reference bibliography, enabling the researcher to refer to sources attesting the use of each term, which may include quotations to give the context in which it appears and references to external sources such as the digital libraries that are more and more widely available online;
- iconographic documentation, intended to integrate verbal definitions rather than replace them; and
- new research, which would lead to the creation of new and innovative terminological proposals.

The ‘encyclopaedic dictionary of manuscript terminologies’ I have in mind would be fully multilingual, with each language – and not only Western languages – treated as an autonomous system and connected to the other languages through the use of symbols graduated according to the nature and limits of the suggested parallels.

The advantages of this approach may be summarized by the word ‘flexibility’:

- Flexibility means conceiving terminological activity as a work in progress with a view to revising, correcting and updating the available vocabulary. The changes could be documented in notes to clarify the way they reflect the evolution of knowledge or the ongoing debate among scholars.

- Flexibility implies the possibility of accessing information by various means without being bound by a single system. The database allows for the coexistence of a logical classification – appropriate site maps would have to be constructed – with an alphabetical classification that would make it possible, among other things, to extract and display thematic glossaries with equivalents in different languages, and with a multidirectional and hypertextual classification that enables navigation through terminological entries containing hyperlinks, images and quotations.
- Flexibility implies the rejection of a rigid approach to the selection of terms and to the wording of definitions. Several different definitions may be included for concepts whose interpretation is still controversial or not yet fully elucidated.
- Flexibility entails a certain freedom in the demarcation of disciplines and the possibility of incorporating terms from related disciplines and of linkages to external resources.
- Lastly, flexibility means that new graphic, iconographic and textual materials can be integrated as they become available on the internet.

In concluding this paper I cannot conceal a vague sense of unease. Having attempted – with the recklessness of youth – to produce codicological terminology, I have also helped to increase the speculation that has hampered the long-standing project of a multilingual lexicon. As happens in other fields³⁵, there is a risk that theorizing works as an alibi to obscure tardiness in achieving results. Although I am convinced that international scientific cooperation is the only way to ensure the survival of manuscript research, enterprises such as the *Catalogues des Manuscrits Datés* clearly illustrate the difficulties of multinational institutional cooperation in the absence of a supranational documentation and research entity that has the authority to impose common standards and operational criteria and support them with financial and logistical inputs. For the same reasons, the electronic manuscript terminology may be in danger of being no more than a pleasant utopian dream.

³⁵ I refer for instance, as regards Italy, to the field of manuscript cataloguing, where – with rare but worthy exceptions – the theoretical debate developed in recent years has been more intense and lively than the projects sponsored by universities and other public institutions (see for instance Palma 2003, 333–351).

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Forum

Hand-Writing Styles in Early Chinese Manuscripts

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A. Preliminaries

Since the early 1970s Chinese archaeologists (and tomb robbers) have uncovered fairly large numbers of manuscripts dating from the centuries just before and just after 221 BCE, the year of the first political unification of China into an empire. The majority of these manuscripts are written on bamboo strips, less frequently on silk or wood. The earliest of the finds date from approximately the second half of the fourth century BCE; with rare exception earlier excavated or discovered texts are either epigraphic or inscriptional, that is, written on hard, durable materials. The manuscripts come from many different places, representing many different kinds of content. Generally speaking, we can identify two large categories of manuscript based on content, (i) literary and (ii) non-literary. Literary manuscripts include works that are known from the transmitted tradition, either because they are manuscript versions of transmitted texts proper or because their content, while not matching the text of any known transmitted work precisely, reflects literary or historical themes familiar from the received literary tradition.¹ Most of the discovered manuscripts that fall into the literary category are of this type. In only a very small number of cases does the main content of a literary manuscript not find a reflection somewhere in the received literary tradition.² Among literary manuscripts four corpora stand out as having so far attracted the most attention from students and scholars alike. These are, in the order in which they have become available to the scholarly public:

¹ Because Chinese texts have been transmitted largely in printed form from about 1000 A.D., manuscripts have played a comparatively minor role in traditional Chinese textual criticism and textual studies generally. The scholarly response to the discovery and availability of early Chinese manuscripts in recent decades has been to see this material not as integrally linked to the tradition of printed texts, forming a single line of textual transmission, but rather as a kind of newly recognized ancillary counterpart to traditional text history. It has become customary in the study of early and mediaeval Chinese texts to recognize ‘transmitted, received texts’ and ‘excavated, manuscript texts’ as distinct, complementary kinds of text forms.

² There are, to be sure, minor passages in many of these literary manuscripts, the content of which is not known from the transmitted corpus, but these unknown passages typically constitute parts of larger textual units that are generally familiar from the received tradition, if only because of names and events mentioned.

Silk manuscripts from Mawangdui 馬王堆, ca. 200 BCE, (Mawangdui tomb itself closed in 168 BCE) discovered in the early 1970s and first announced in July, 1974.³



Fig. 1: Mawangdui *Laozi silk jia* 甲 manuscript fragments.⁴

³ Hunan Sheng Bowuguan 1974, 39–8, 63.

⁴ Guojia Wenwuju 1980, color plate 1. This is the so-called ‘*jia* 甲 [i.e., “A”] manuscript’, chronologically the first of the two silk manuscripts found at Mawangdui, usually thought to be about thirty years earlier than the second one. See illustration two for an example of the second Mawangdui silk manuscript.



Fig. 2: Mawangdui Laozi silk yi 乙 manuscript fragment.⁵

⁵ See Guojia Wenwuju 1980, color plate 2. This is the so-called 'yi 乙 [i.e., "B"] manuscript', chronologically the second of the two silk manuscripts

found at Mawangdui. The earlier one (fig. 2) is called 'jia 甲', and is about thirty years earlier than this one.

Bamboo strip manuscripts from Guodian 郭店, Hubei province, ca. 300 BCE, discovered in the 1990s and published in 1998.⁶

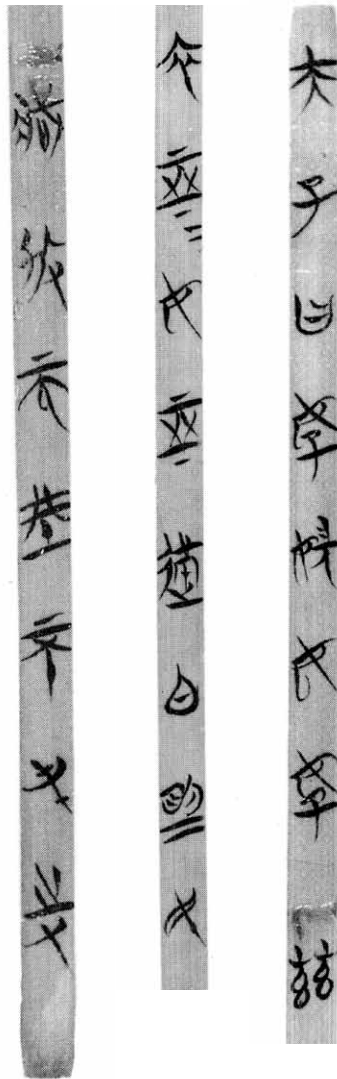


Fig. 3: Guodian, 'Zi yi' 緇衣 ('Dark Attire'), str. 01.⁷

⁶ See Jingmen Shi 1998, 1–2.

⁷ See Jingmen Shi 1998, 17. Note that the image is of a single unbroken strip that has been photographically divided into three pieces as a *mise en page* practical matter.

Bamboo strip manuscripts from the Shanghai Museum corpus ca. 300 BCE, purchased on the antiquities market in Hong Kong, provenance and discovery therefore of uncertain date and locale; published to date in nine nearly-annual installments, 2001–2012.⁸



Fig. 4: Shanghai, 'Zi yi' 緇衣 ('Dark Attire'), str. 01.⁹

⁸ See Ma Chengyuan 2001, 1–4, for the initial brief account of the purchase and scope of the collection. Apart from this, the acquisition of these strips by the Shanghai Museum was announced in the *Wen hui bao* 文匯報 newspaper on 5 January, 1999, pp. 28–29. I am grateful to Ms. Sun Yingying 孫瑩瑩 (University of Washington) for informing me of this newspaper announcement. Volumes two through nine, all edited nominally by Ma Chengyuan, appeared in 2002, 2003, 2004, 2005, 2007, 2008, 2011 and 2012.

⁹ Ma Chengyuan 2001, 45. As with figure three, the image here is of a single unbroken strip that has been photographically divided into seven pieces.

Bamboo strip manuscripts from the Tsinghua University collection, which, like their Shanghai Museum counterparts, were purchased on the antiquities market in Hong Kong and are therefore of undocumented provenance and discovery. On the basis of the physical appearance and shape of the bamboo strips themselves and the distinctive features of the orthography, the Chinese scholars charged with editing this corpus of material have determined that they are mid to late Warring States period manuscripts, that is, roughly the late fourth century BCE, about the same date as the Guodian and Shanghai manuscripts mentioned above (Li Xueqin 2010,1–4).



Left and up: Fig. 5: Tsinghua 'Jin teng' 金滕 ('The Metal-bound Coffin') str. 01-02 (right–left).¹⁰

¹⁰ Li Xueqin 2010, 75. On the reverse of the last bamboo strip of this manuscript is written a title that says *Zhou Wu wang you ji Zhou gong suo zi yi dai wang zhi zhi* 周武王又[有]疾周公所自[以]代[代]王之志 ('Zhou gong's intention to offer himself in place of the king when king Wu of Zhou was seriously ill'). This ought strictly speaking be used as the name of the manuscript, but because it is somewhat unwieldy and because the content of the manuscript matches very closely the well-known

The non-literary manuscript category includes medical and legal texts, divinatory works, hemerological records, civil and military administrative orders and records, etc. Three of the best known and most widely studied collections of such manuscripts are:

Han period (206 BCE – 220 CE) wooden slip documents from Edsen Gol (Chinese Juyan 居延, Inner Mongolia), known generally as Juyan Hanjian 居延漢簡.¹¹



Fig. 6: Wooden strip, administrative document dated to 95 BCE.¹²

'*Jin teng*' ('The Metal-bound Coffers') chapter of the *Shu jing* ('Classic of Documents'), it has become common to refer to the manuscript by the name '*Jin teng*.'

¹¹ See Lao Gan 1957, 1–2; Loewe 1967, 1; Lao Gan 1986.

¹² Cf. Lao Gan 1957, vo. 1, plate 01, transcription at Lao Gan 1986, 1.

Bamboo strip manuscripts from Baoshan 包山, Hubei province, ca. 300 BCE, excavated in late 1986 and early 1987, published in 1991.¹³



Fig. 7: Baoshan divinatory document, str. 234.¹⁴

¹³ See Hubeisheng 1991, 1–2.

¹⁴ Hubeisheng 1991, vol. 2, plate 193; transcription at Hubeisheng 1991, vol. 1, 368. As with illustration three, the image here is of a single unbroken strip that has been photographically divided into four pieces as a practical matter.

Bamboo strip manuscripts from Zhangjiashan 張家山, Hubei province, ca. 200 BCE (Zhangjiashan tomb itself closed in 186 BCE or shortly thereafter), excavated in late 1983 and early 1984, published in 2001.¹⁵



Fig. 8: Zhangjiashan, 'Yin shu' 引書 ('Breathing & Stretching Exercises') str. 01.¹⁶
(left: obverse, with text; right: reverse, with title)

¹⁵ See Zhangjiashan 2001, 1–2.

¹⁶ See Zhangjiashan 2001, 109, transcription and notes at Zhangjiashan 2001, 285.

B. Hand-writing style

In his handbook on Latin palaeography the late Bernhard Bischoff recognizes 'two fundamentally different techniques of writing... the calligraphic and the cursive'. The former, he states, is 'proper to bookhands', the latter 'to the whole spectrum of everyday scripts'.¹⁷ Bischoff offers a number of very precise details about the Latin writing techniques that characterize the differences between these two styles. These concern the diachronic development of the letters of the Latin alphabet, in particular the relation between the old cursive and the development of Latin uncial and half-uncial letters. In drawing a distinction between these two writing techniques, apart from the shape of the letters themselves, he also takes into account such things as the preparation and shape of the quill, the angle at which the writing instrument is held relative to what is being written on, the care with which the writing instrument is or is not raised from the writing surface to produce discretely executed or cursively linked letters, etc.¹⁸

In order to consider scripts other than Latin in this regard we might generalize the difference between the two techniques roughly in the following way.

Book-hand / calligraphic writing: formal, executed with care, attention to varying pressure on the writing surface and angle of the writing instrument and to general orthographic precision; neat and often elegant orthography, with attention to the appearance of the manuscript as a whole.

Cursive writing: informal, casual, executed without apparent conscious attention to the distinction between broad and fine strokes, little or no attention to varying pressure or angle of the writing instrument, minimal care given to orthographic precision, graphs are 'run on', often becoming linked one to the next; not neat and rarely elegant, apparent lack of concern with the appearance of the finished product.

In a nutshell, we can say that book-hand script is *refined*, cursive writing is *utilitarian*. Bischoff suggests that the contrast in writing technique can be correlated with a contrast in the kind of document written; the refined book-hand script was used chiefly 'in elevated higher grades of writing' and the utilitarian cursive was in 'daily use', written by 'everyone'.¹⁹

Can we identify anything in early Chinese manuscripts similar to this two-way distinction in early Latin writing technique and its possible correlation with manuscript content? If so, what are the implications of such a distinction? Illustrations one through five above are all passages from

¹⁷ See Bischoff 1986, 51.

¹⁸ See Bischoff 1986, 51–53.

¹⁹ See Bischoff 1986, 53.

well-known literary texts. The form of writing in each case, though different in some places one from the other, seems overall to fit the criteria for refined book-hand status. Illustrations six through eight by contrast are all passages from non-literary works and would seem to be written in a comparatively casual, everyday utilitarian style. The writing technique associated with literary works in these examples, which I am suggesting might be called a refined, book-hand script, shows, among other features, a more regular and more generous use of space between individual characters than do the utilitarian scripts of the non-literary pieces. In the case of the Mawangdui silk manuscript, we find also red lines separating the vertical columns of characters. These are features that enhance the appearance of the manuscripts as physical objects; they are not characteristics of the actual ‘letter-form’ orthography *per se*. This suggests that the distinction between refined and utilitarian writing techniques embraces more than simply character form, and is a feature of manuscripts in all of their physical as well as orthographic respects.²⁰

The distinction between refined script and utilitarian should not be confused with the general historical development, as it is traditionally understood, of the so-called Han *li shu* 隸書 ‘clerical’ script emerging out of the pre-Han *xiao zhuan* 小篆 ‘small seal’ script. The term ‘clerical script’ refers to that Qin-Han-period form of writing that is supposed eventually to have become the Han ‘standard,’ and should not be allowed to imply a use only for clerical, i.e., administrative documents.²¹ The script of illustration six, the wooden administrative document dated internally to 95 BCE, might be thought to reflect nothing more than the evolution of writing in general from the forms seen in the manuscripts of one or two centuries earlier, irrespective of the literary ~ non-literary distinction. But the same suspicion cannot be maintained for the scripts of the manuscripts shown in illustrations seven and eight, the first of which is essentially contemporaneous with the Guodian and Shanghai manuscripts and the second of which is contemporaneous with the Mawangdui manuscripts.

Conversely, the most frequently made observation about the script of the two Mawangdui silk manuscripts is that the second of these two silk manuscripts (illustration two), dating from the early second century BCE, uses the Han *li shu* 隸

書 ‘clerical’ script, whereas the first (illustration one), dating from the late third century BCE, about a generation earlier, is written in the pre-Han *xiao zhuan* 小篆 ‘small seal’ script, as are the bamboo strips of about a century earlier (figures three, four and five). The later of the two Mawangdui silk manuscripts, using the *li shu* 隸書 ‘clerical’ script, is all the same very much a literary text, and its overall appearance, including the fact that it is written on silk in the first place, conforms to the general criteria for a formal-hand manuscript. This example shows that the terms *xiao zhuan* 小篆 ‘small seal’ (pre-Han) and *li shu* 隸書 ‘clerical’ (Han) refer to script types, distinguished by changes in both graphic structure, stroke ductus and minor calligraphic features that can be observed in the development of the writing from the fourth to the second centuries BCE, and that this distinction is separate from the matter of formal vs. quotidian orthography.²² The general point to be considered is that manuscripts with literary content and qualities are typically written in a refined calligraphic style and manuscripts of an administrative, legal, medical, calendrical or other prosaic kind tend to be written more informally, in a utilitarian style. The distinction is not absolute, of course. Based on an informal and limited survey, it seems that while literary manuscripts are rarely found written in a casual, quotidian script, non-literary manuscripts

²² Chen Jianguo and Xu Min in the preface to their dictionary of Qin-Han manuscript characters suggest that the difference between the two Mawangdui *Laozi* silk manuscripts is not one of time, but is rather a distinction between a ‘cursive’ *li shu* ‘clerical script’ (the A manuscript) and a ‘formal’ *li shu* ‘clerical script’ (the B manuscript). (Chen and Xu 1991, 3) To be sure, it is generally recognized that there were diverse forms of the *li shu* ‘clerical script’, some comparatively early examples overlapping with the ‘late’ use of the *xiao zhuan* ‘small seal’ script in the third century BCE. To my eyes the difference between the *Laozi* A manuscript and the B is more than a cursive vs. a formal *li shu*; the structure of some of the commonest characters is substantially different in one from the other. In the end whether we call the script as it is found in these two Mawangdui silk manuscripts both *li shu* or one a ‘late’ *xiao zhuan* and the other *li shu* is of less moment than how we understand the features of the script for purposes of dating the manuscripts and assessing the status that the scribes and users attributed to them. Yan Lingfeng in an early study of the Mawangdui *Laozi* silk manuscripts, while identifying the script of the A manuscript as *xiao zhuan* ‘small seal’ script and that of the B as *li shu* ‘clerical script’, recognizes that these two forms of writing were contemporaneous with each other in the late third century BCE, and thinks, contrary to the prevailing view, that both manuscripts are pre-Han. (Yan Lingfeng 1976, 1–2) The Chen and Xu characterization of the scripts of the two manuscripts as ‘cursive’ *li shu* in one case and ‘formal’ *li shu* in the other raises the problem of how to establish objective definitions of something as inherently subjective as judging a ‘cursive’ from a ‘formal’ script. At the extremes, of course, where the differences would seem to be objectively discernible, it is easy to point to one or the other. But neither of the two Mawangdui manuscripts is in my view an extreme example of either a cursive or a formal script, though both seem closer to the ‘refined’ quality of a formal script that tends to be found in manuscripts of literary works, which both the A and B manuscripts are, than to anything that could be considered an everyday casual script.

²⁰ It is also possible, perhaps likely, that the preparation and quality of the writing medium varies directly with the distinction between a literary text in a refined script and a non-literary text in a quotidian script, but for the early Chinese manuscripts, to which very few scholars have direct physical access, this speculation is difficult to assess.

²¹ See Qiu Xigui 2000, 89–130, which presents the traditional view in detail and Galambos 2006, 31–63, where the considerable uncertainties about the traditional view are set out.

may not so infrequently be found written in a formal, refined book-hand. In other words the distinction between refined and everyday script and its correlation with manuscript type is somewhat uneven, tending in one direction more than the other; literary manuscripts and a refined script almost always go together, but the association of non-literary manuscripts with a casual, quotidian script is less predictable.

These observations may seem unsurprising, even trivial, but if the correlations can be sustained generally by examination of a large number of manuscripts, we might be able to gain some measure of understanding of the contemporaneous attitude toward written documents overall. What did the people involved with these manuscripts, – the people who compiled them, the people who ordered them produced, the scribes who wrote them, the people who read or recited them, the people who included them in tombs, etc. – think about the physical object itself, such features as its appearance, its production, its utility and its cultural status, apart from its content?²³

If the distinction between a refined and a utilitarian writing technique can in fact be recognized in a large number of early Chinese manuscripts, then we can turn the implication around, without too great a risk of circularity, and infer that a manuscript written in a careful, refined, book-hand should be understood as having some measure of high status among its creators and users, even if its content to our eyes does not at first suggest such ‘literary’ merit.²⁴ The more general, typological question with respect to manuscript cultures, is whether such a basic, two-way distinction in hand-writing technique, correlated with content, can be identified for manuscripts from other areas and periods and what such a correlation may imply about diverse cultural norms?

²³ There is a further consideration in regard to the bamboo-strip manuscripts that are found in tombs. Xing Yitian has pointed out that the very large numbers of bamboo strips constituting what would seem to be a single manuscript text suggests that such texts were written explicitly for burial with a deceased person. The sheer weight and size of such a single manuscript, when as many as a hundred bamboo strips are strung together into a single physical unit, would make it very unwieldy and its actual use very difficult. For this reason Xing Yitian speculates that such manuscripts as are found in tombs were written just for burial, and not for any actual use by a living person. (Xing Yitian 2011, 21–23).

²⁴ The *qiǎn cè* 遣冊 ‘record of tomb contents’, for example, of Mawangdui tomb three consists of over four hundred bamboo strips, each recording the quantity of one item included in the tomb. While this can in no way be considered a ‘literary’ text, much of it is written all the same in a script that would appear to be more akin to an elegant book-hand than to an everyday utilitarian style, and in that respect befitting a funerary document. See He Jiejun 2004, plates XX–LI. I am grateful to Ms. Sun Yingying for pointing out to me that, because some of the strips appear more elegant than others, the script on these four-hundred plus strips suggests that they were not all written by the same person.

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Article

Writing, Preserving, and Disseminating Scientific Knowledge: Some Remarks on Manuscripts and Other Writing Supports in Ancient Greece*

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In the study of written culture and its circulation, *specialist knowledge* rather than literary texts, due to its peculiarities, deserves a closer scrutiny. By specialist knowledge I mean the knowledge of scientists: mathematicians as well as engineers, architects as well as physicians. In the field of science, perhaps even more than in any other, the vicissitudes of the textual transmission have substantially reduced the amount of the originally existing material to a tiny fraction. For the ancient time before the age of Plato we often only have scraps of information. In some fields, such as those of ancient engineering or architecture, we know very little about how technical knowledge was handed down from one generation to another, but the consensus is that this kind of knowledge was transmitted orally. Even for such an important field like mathematics — relevant in every aspect of the life of the Greeks, from temple planning and building to music, theology and philosophy — we only begin to have substantive information starting from the age which followed Plato, i.e., around the end of the fourth cent. BCE. Almost nothing is known of the first paramount results and how they were achieved: so many efforts were devoted by scholars e.g. to the reconstruction of the fundamental and pre-platonic notion of incommensurability, but we still don't have any direct information on its initial history in the fifth cent. BCE (Theaetetus, Hippiasus of Metapontum). There is one field we have more information on than any other: medicine. In this case we are provided with a mass of material, but we still

need to look for convincing interpretations of the historical information we have access to.

Loose sheets or papyrus rolls?

How did ancient scientists and authors work when it came to writing? Did they write personal notes first, and then copy them or had them copied on a different support at a later stage? How easy was it for them to obtain papyrus rolls, sheets, tablets, parchment? How much was the result of their work influenced by the difficult working conditions they faced?¹ According to ancient sources the Greek historian Thucydides, in the fifth century BCE, wrote his work on the war between Athens and Sparta starting from personal notes, which he used in order to record the main facts and words; he himself gives information on his working method. However, since we are used to thinking of ancient Greek books as being written directly on papyrus rolls, one may wonder (as William K. Prentice put it in an article published in 1930), how was it possible to continually revise a text, to collect documents and information gradually in order to insert them into the manuscript and work them in later, if the manuscript was a papyrus roll? Should we conclude that the authors wrote on flat sheets which could be kept together in a box; loose sheets which could easily be altered, replaced, or arranged differently?²

This seems to be the case not only for Thucydides or for other authors who needed to work in archives and libraries,

* This article is a follow-up to some previous research of mine, whose results are scattered over several publications. See Perilli 2006a, 2006b, 2007, 2009. Here I wish to briefly summarize some of my former conclusions, while trying to give a few further hints on the practice of writing and its relation to the material support for script – be it a manuscript or a wax tablet, stone or metal –, the ways of preservation and circulation of written knowledge, and the intended addressee. The text was delivered as a lecture at the Centre for the Study of Manuscript Cultures in Hamburg in June 2012, it underwent only minor changes and a limited bibliographic enrichment. I would like to thank CSMC as well for having received a Petra Kappert Fellowship during the summer of 2013.

¹ Tiziano Dorandi has investigated this issue at length, see the following footnote.

² The article of Prentice ('How Thucydides wrote his history') is mentioned by Dorandi at the beginning of his first intervention on this topic: 'Den Autoren über die Schulter geschaut' (1991) and in his later works it is also quoted e.g. by Potter 1999, 114, who however sticks to the wrong (or at least, only partially right) belief of individual sheets later glued together to make a roll. It has been demonstrated that the different sheets out of which a papyrus roll was made were often already glued together before the act of writing. See Dorandi, l.c., and his later works, especially *Nell'officina dei classici: come lavoravano gli autori antichi* (2007).

transcribe testimonies, record them and write down notes themselves, but also for doctors, who needed to record the information patients gave them in a chart, log the relevant ones in a sort of clinical register with the aim of preserving everything relevant to the present case while at the same time creating an archive of clinical records to be consulted later for similar cases. This kind of writing was naturally shorthand, rich in abbreviations, deprived of any literary style; it required no ornaments and had to stick to facts instead. In the case of medicine, this situation is mirrored in the more technical works of the so called *Corpus Hippocraticum*, a collection of about 70 works attributed to Hippocrates since the fifth century BCE onwards. We can visualize the doctor writing his notes on wax tablets at the patient's bedside; he only had a limited amount of space at his disposal and later needed to transfer this material to a different surface, more apt for archival storage and preservation. Such tablets have been found among the remains of ancient medical sanctuaries.³

The text transfer from one support to another must have been fundamental when, sometime around the 2nd century CE, the complete alphabetization of lists and lexica, similar to that of modern dictionaries, was introduced. From this age onward we have four main examples of this new, revolutionary system for the retrieval of information:

1. *Pap. Oxy. 1802*, with a series of about twenty items of a lexicon written in Greek and also containing transliterated words from Near Eastern languages;⁴
2. Valerius Harpocration's *Lexeis of the ten orators*;
3. Galen's *Hippocratic Glossary*;
4. Galen's pharmaceutical treatises, where drugs and treatments are ordered according to the alphabet.

Card box and alphabetization

Alphabetical order based solely on the first or the first two letters of a word has an older origin and is found at least since the third century BCE (*Pap. Hibeh 175*, British Library, 260–240 BCE, remains of a lexicon), maybe even before with the *Glossai* of Zenodotus of Ephesus⁵. The systematic use of full alphabetic order was a paramount novelty which has remained in use for two thousand years as the most effective system for information retrieval. Before the age of

computers, ordering a mass of written material according to the alphabet was a demanding task. In modern times the main instrument was the card-box, where cards could be filed and easily moved to a different place. How was alphabetization achieved in antiquity? Papyrus rolls do not seem to be apt for such a task. One had to copy every list at least twice, probably even three times, but in the case of complex lists this might not have been enough. Adding a number in front of each item would of course help for the second stage, but inserting a new item after the first copy was done would be an impossibility without copying the whole list again. An easier solution would be to have short lists of few items, each on a different sheet, or at least all the words beginning with the same letter on a single sheet. This would work in case of a short text.

How did the author work in the case of long and detailed treatises such as Galen's pharmacological works? In *De simplicium medicamentorum temperamentis ac facultatibus* (see XI 811, 10ff. K.) Galen offers an almost perfectly ordered sequence of items; in this case, however, different from his own *Glossary* or in Harpocration's *Lexeis*, each item consists not of a few words or lines, but of one or more pages; each new paragraph assumes the role of an item, its first word being taken into account for the alphabetization. Each item — namely each paragraph, or chapter — was presumably written on a different sheet; the sheets could then be filed and at a later stage arranged according to the alphabet or to different criteria. The single 'cards' will eventually have been copied into a continuous text as known to us. This is beneficial to understanding some characteristics of Greek medical texts (for instance, the additive or catalogue-like structure of some texts in the Hippocratic collection, see below), and suggests that there must have been different kinds of archival systems, such as repositories and libraries which may have been the case with the sanctuaries of the god of medicine and other sites. On the other hand, doctors and their assistants needed to write and use individual clinical records, which could be consulted when confronted with an unusual case or a peculiar disease.

Terminology

Let us go back to the notion of books, scribes and libraries. The ancients were fully aware of the importance of writing and its instruments. An interesting testimony informs us about papyrus rolls, flat sheets, book trade and boxes in which the documents could be stored. The second century BCE grammarian and lexicographer Julius Pollux, author of the *Onomasticon*, an extremely rich thesaurus of words arranged by subject-matter, writes as follows:

³ For this interpretation of the tablets found in Greek sanctuaries of the god of medicine Asclepius, see Perilli 2009. For a detailed study of the style of Hippocrates' technical works as depending on the material conditions of writing, see Langholf 2004; also id., 1990.

⁴ Cf. Schironi 2009.

⁵ Zenodotus (second half of the fourth cent. - first half of the third cent. BCE), grammarian and superintendent of the library at Alexandria. Cf. Pfeiffer 1978; Nickau 1972.

In order to show that we are not neglecting books, one can say *bibloi*, *biblion*. In Aristophanes also booklet, *bibliदारion*. And (talking about) written sheets (*chartas gegrammenous*) Plato the comic poet said ‚making available both (writing) boards and sheets‘. On the contrary, Herodotus referred to an unwritten sheet of papyrus (*biblion*), as he said ‚writing in the *biblion*‘. And bookseller (*bibliopolen*) can be found in Aristomenes’ *Goetes*, scribe (*bibliagraphon*) in Cratinus’ *Cheirones*, bibliographos in Antiphanes’ *Sappho*. In the *Hypobolimaioi* by Cratinus the Younger (there is) library (*bibliotheke*). Antiphanes in the *Mylo* said ‚sheets glued together as a booklet‘. Herodotus says that the Ionians call the papyri (*biblous*) skins (*diphtheras*) according to an ancient usage. Such skins (*diphtheras*) they also call goatskins (*ittelas*).⁶

By mentioning some of the first comic poets this passage gives us an overview of the situation in the fifth cent. BCE, the age of Thucydides. It proves that all activities related to book production were already widespread by the time.

Oral versus written

Regarding not only poetry and literary texts, but also scientific ones, we are generally inclined to follow the traditional belief of a mere oral transmission of technical knowledge and wisdom; it has often been said and still is repeated that this kind of specialist knowledge was usually handed down privately and orally from a master to his pupil for two main reasons: firstly, acquiring technical expertise requires direct guidance by an expert and secondly, this kind of knowledge was to be only transmitted to the few who had been granted access to the limited circle of the specialists. It was secret knowledge not available to just anyone.

In my opinion the topic of the production, circulation and use of books and written texts in Greece before Alexandrian time (i.e. before the third cent. BCE) has been the object of too much scepticism. It is true that we do not have much information on this topic in the classical age, but one point is clear: if poetry was meant to be learnt by heart and orally transmitted, prose texts were *written* for a *reader* and reached their public by means of books. We have testimonies that, already in the fifth century BCE, book trade was fully developed and the birth of the specific terminology mentioned by Pollux related to books, book-writing, book-selling and book-preserving, also took place simultaneously. *Officinae* for the preparation of papyri, tablets, animal skins and all other kinds of writing support must have flourished as well as technical expertise.

The oldest support for writing: the tablet

One fundamental instrument for the practice of writing was the tablet, the wooden board. This is already mentioned in the first piece of Greek literature, namely Homer’s *Iliad*, where we find the reference to a ‘folded tablet’ (*pinax ptyktos*) carrying sad, mournful signs in the story of Bellerophon in *Iliad* VI 168–169. The name used by Homer for the tablet is *pinax*, a term not included among those listed by Pollux, presumably because there is no relation to books, as it mainly occurs at a preliminary stage of writing or with a different scope and aim — for instance, the writing of messages or letters. Wax-covered tablets had indeed a peculiar role in the practice of writing as authors could bring them along, write notes or longer texts and delete them after having copied them onto another surface, usually papyrus. We know that they remained in use for many centuries, even Charlemagne kept wax tablets, *tabulae codicellique*, under his pillow to practise writing.⁷ Papyrus rolls were the typical medium for books in their final form, ready to be archived; the tablet was the usual medium for the ad hoc writing of notes. In Hippocrates’ *Epidemics* VI 8,7 we read the rare word *pinakidion* to indicate the tablet from which the text originally came.

The kind of tablet mentioned by Homer could look like the exceptional wooden writing board found in 1984 in a Late Bronze Age shipwreck, close to Ulu Burun in south west Turkey. Wooden tablets usually vanished as they are made of organic material very difficult to preserve over the course of time. Until the Ulu Burun case there was no item known of such an old age. The shipwreck has been dated to the fourteenth century BCE; the origin of the ship is unknown, but it was presumably travelling from the eastern Mediterranean coast westward, towards Greece. As R. Payton wrote, the ship was carrying an extremely varied and rich cargo and amongst the items were fragments of a wooden writing-board set. Late Bronze Age means, in ancient Greece, Mycenaean culture — six centuries before our text of the *Iliad* and about the same time as the Trojan war.⁸

The Ulu Burun writing set consisted of two wooden boards joined together by an opening mechanism. The more common form was that of two, or more, boards opening and closing on a central hinge; the hinge of the Ulu Burun set consisted of three sections, which survived in their ivory parts. It could be easily carried and used, while the written part was protected inside. In this case, no wax was surviving on the surface of the boards and hence impossible to say whether the boards carried a text or not; the example however

⁷ *Vita Karoli*, ed. Holder-Egger 1911, c. 25, p. 30.

⁸ On the Ulu Burun wooden board see Payton 1991; Symington 1991; Mylonas Shear 1998, 187–9; also Perilli 2009, 110f.

⁶ Iulius Pollux, *Onomasticon*, ed. E. Bethe 1900, VII 210–211.

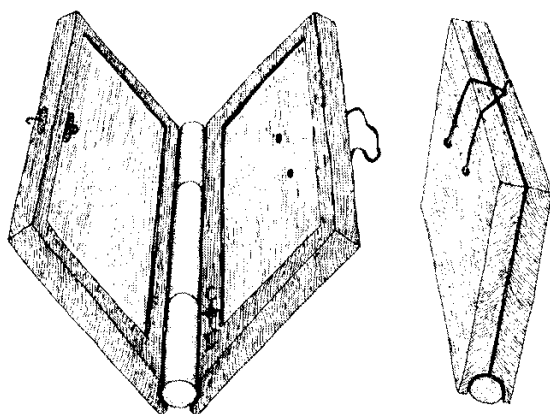


Fig. 1 The Ulu Burun writing board. Reconstruction (from: R. Payton, *The Ulu Burun writing board set*, *Anatolian Studies* 41, 1991, 105).

convincingly illustrates the most ancient mentions we have of writing in Greece and enables us to comprehend the concrete act of writing at an age when we speak of oral rather than written culture.

An extraordinary example of still surviving wooden tablets with wax-covered surface and still carrying a longer text — annotations to the text of Homer (*Scholia minora* in Homer's *Iliad*) probably written by a student in form of an exercise — are preserved at the Ägyptisches Museum in Berlin (*P.Berol. inv.* 10508, 10509, 10510, 10511+10512). This is a special case, since almost no parallel is known of wooden boards with wax and legible writing of such an extension. We are presented with several 'sheets' of what must originally have been a booklet, with text written on both sides across the short dimension and four holes arranged in two pairs on one of the longer sides, so that the tablets could be joined together. The Berlin tablets are a lot older than the Ulu Burun example and date back to the second cent. CE.⁹ Other wax tablets such as those found at Pompeii, are older than the first cent. CE, often carrying private notes or local information. They contribute to our understanding of ancient Mediterranean writing practices.

Books for learning: the private library of technical books

With regards to the classical age in Greece, we learn e.g. from Plato that books were widely circulating between the end of the fifth and the beginning of the fourth cent. BCE. One of the most important testimonies to this point is that of

⁹ Informations on the tablets can be found on the website of the Aristarchus Project at the University of Genoa, Italy (www.aristarchus.unige.it/scholia/papiriList.php), and in the online *Catalogue of Paraliterary Papyri* of the University of Leuven (cpp.arts.kuleuven.be). Images are in Criboire 1996, tables 45ff.

Xenophon who tells us about the library of Euthydemus, a contemporary of Socrates and already famous by that time. The text is extremely interesting, and reads:

[Socrates:] 'Tell me, Euthydemus, am I rightly informed that you have a large collection of books written by the wise men of the past, as they are called?'

'By Zeus, yes, Socrates,' answered he, 'and I am still adding to it, to make it as complete as possible.'

'By Hera,' retorted Socrates, 'I do admire you for valuing the treasures of wisdom above gold and silver. For you are evidently of opinion that, while gold and silver cannot make men better, the thoughts of the wise enrich their possessors with virtue.'

Now Euthydemus was glad to hear this, for he guessed that in the opinion of Socrates he was on the road to wisdom.

But Socrates, aware that he was pleased with his approbation, went on to say: 'Tell me, Euthydemus, what kind of goodness do you want to get by collecting these books?'

And as Euthydemus was silent, considering what answer to give, 'Possibly you want to be a doctor?' he guessed: 'Medical treatises alone make a large collection.'

'Oh no, not at all.'

'But perhaps you wish to be an architect? One needs a well-stored mind for that too.'

'No, indeed I don't.'

'Well, perhaps you want to be a good mathematician, like Theodorus?'

'No, not that either.'

'Well, perhaps you want to be an astronomer?' And as he again said no, 'Perhaps a rhapsodist, then? They tell me you have a complete copy of Homer.' [...]

Then Socrates exclaimed: 'Surely, Euthydemus, you don't covet the kind of excellence that makes good statesmen and managers, competent rulers and benefactors of themselves and mankind in general?'

'Yes, I do, Socrates,' answered Euthydemus, 'that kind of excellence I greatly desire.'¹⁰

What is typical in the library of Euthydemus, according to what Xenophon tells us, is that he collected not just literary books but mainly *technical* books, and when Socrates asks

¹⁰ Xenophon, *Memorabilia* IV 2, transl. Marchant.

him ‘why are you collecting these books’, the first question he asks is, ‘do you want to become a doctor, since you have collected so many medical books?’ Medicine leads, then come other technical disciplines, architecture, mathematics, astronomy, finally also epic poetry. This is what Socrates calls ‘books written by the wise men of the past’: that is, manuscripts with technical contents in form of papyrus rolls. We also have information concerning attempts of laying out real libraries — maybe the sophist Hippias had one, Plato probably too, and we know that Aristotle’s collection of books served as a model for the Alexandrian library. Of course one cannot simply dismiss the idea that knowledge circulated also by means of oral transmission, but the construct consists of three parts: oral teaching from a specialist, written materials and experience.

Making books accessible: the temple

The story of Euthydemus confronts us with the notion of ‘library’ which reminds us of a modern private library. There are, however, other vicissitudes which deserve to be mentioned here in order to get a more complete picture. The case of the philosopher Heraclitus is well known. According to several testimonies, and among them that of Diogenes Laertius (*Vit. Heraclit.* 5),

There is a book of his extant, which is about nature generally, and it is divided into three discourses; one on the universe; one on politics; and one on theology. And he deposited (*anetheke*) this book (*biblion*) in the temple of Diana, as some authors report, having written it intentionally in an obscure style, in order that <only> (*monon*, inserted by H. Diels) those who were able men might have access to it, and that it might not be exposed to ridicule at the hands of the common people.

I believe we can do without the ‘only’, inserted by Diels, who was probably led to this conjecture by the old yet presumably wrong idea that Heraclitus was willing to hide his writings. Here we are told that Heraclitus deposited his book in the great temple of Artemis, the Artemisium at Ephesus, one of the largest temples of the sixth century BCE and one of the Seven Wonders of the ancient world. Ancient temples were regularly used for storing treasures and public documents and as we see from this case they were also open to private individuals. This information has often been interpreted as an attempt from Heraclitus to protect his book by making it inaccessible (this is for instance the interpretation of the Christian authors, who despised Heraclitus); but it seems to be much more plausible that the dedication of his book to the goddess be tantamount to publishing it and to making his thoughts publicly available.

Why take up the challenging task of writing a book if it had to be kept out of the reach of any potential reader?

It is not without meaning that many later philosophers, among them Socrates, knew that book. It has been observed that back to the time of Plutarch, if not later, the little book of Heraclitus was available in its original form to anyone. Three elements are to be highlighted in Diogenes’ text as mentioned above: the book is ‘set up’ in the temple; it must be accessible; it is intended for those who are able to fathom its content, and to this aim the text is written in an obscure style, in order to exclude common people. Was the book hidden, than there would have been no need to write it in an obscure style. On the contrary, since everybody had access to it, Heraclitus used a difficult language in order to exclude those whom he considered not able to understand what he was talking about. We should bear in mind that Heraclitus came from a wealthy and powerful family. It is not a matter of *restrictions* here (‘*only* those who...’): the very act of depositing a book in the temple means to make it accessible to everybody, although not everybody will comprehend its message. Archaeological excavations may help us in getting an idea of what these kinds of libraries looked like, since rooms devoted to the storage of books have been identified among the remains of several temples and other ancient buildings.

Another, less known but more important example can be of help. With Heraclitus, we have been talking about a philosophical book. The case of Eratosthenes, the famous mathematician and scientist, brings us closer to more esoteric disciplines such as mathematics and geometry, science at the utmost of its technicality. Among the most important achievements of Eratosthenes in the third cent. BCE was his solution to one of the three great mathematical problems of antiquity: that of doubling the cube. The most famous Greek mathematicians had already attempted to solve this problem, and some of them, like the Pythagorean Archytas, had proposed very interesting but difficult solutions. A letter, supposedly written by Eratosthenes, informs us that he wrote an epigram relating to his own mechanical solution to the problem of doubling the cube and that he also invented a mechanical device to make things clearer. Eratosthenes — so we are told — raised a votive monument which consisted of a bronze exemplar of his mechanical device set atop a stele with an explanatory inscription engraved below. This text was dedicated to Ptolemy III (Euergetes).

The relevant part of the text reads as follows:

The bronze mechanical device was part of the votive (?) offering (*anathema*), and was attached by soldering to the upper end of the stele; underneath was a shorter description

of the demonstration, together with a drawing (*schema*), and followed by an epigram.¹¹

In the epigram, we read the story of the problem. At the end of the 27 verses, the ‘copyright’ is asserted:

[...] let anyone who sees this offering say ‘This is from Eratosthenes of Cyrene.’

We are not told where the stele and the mechanical device were installed and since we are apparently dealing with a votive offer, scholars have premised they were set up in a temple or sanctuary, this being often the case with *anathemata*, offerings. As the text continues, it seems like these kinds of offerings of technical knowledge and objects were common. Eratosthenes made thereby both the technical explanations and the mechanical device public, while at the same time asserting his rights to the discovery. The reference to ‘anyone who sees’ informs us that the text and the device were open to the public, and reminds us of Heraclitus ‘have access to’; the term *anathema* has its Heraclitean counterpart in the verb derived from the same root which in Heraclitus referred to the book. With Eratosthenes, we are informed about an episode taking place in the second half of the third century BCE, almost three centuries later than Heraclitus.

I am inclined to believe that, when Heraclitus went to the temple of Artemis, he met someone who was in charge of receiving his book, as any other offering. This person presumably had to record the person offering and the object in a register; in the temple there was a room, perhaps even a building, devoted to preserve these kinds of objects and to make them available to those who wanted to see or use them; one could probably also make copies of texts. And there must have been a staff, in charge of preserving and managing the materials which were given to them.

Medical books and the sanctuaries of the god of medicine

We can now move to a field on which we have more information, the field of medicine. Evidence of libraries in this case comes from two kinds of sources: archaeological evidence, and related inscriptions, together with a few remarks in literary sources concerning such inscriptions; and, in addition, the records of cures in the temples of the god of medicine Asclepius.¹² From several inscriptions, we are informed about the existence of libraries in medical

sanctuaries.¹³ But we still need to understand content, use and destination of such libraries.

A preliminary chronological partition in three periods can be of help. The first period is the one before Alexandrian time, followed by the Hellenistic or Alexandrian era, and finally by the Imperial Roman period. These are very different from one another. We have considerable knowledge about libraries in the Imperial period (first cent. BCE – third cent. CE), and libraries in Alexandrian times; we know, however, very little about pre-Alexandrian libraries. This first period, namely the beginning of book collection, is for us of the greatest interest, mostly concerning technical and medical books. Scholars have sometimes interpreted these temple libraries as containing religious literature and especially literary writings, what the French call ‘belles lettres’; that is, on the one hand, books used by the priests for rituals and for religious purposes; on the other hand, books for the general audience of patients for their entertainment and leisure. Such a surprising interpretation is clearly connected to a certain idea of medicine as a form of knowledge which was circulated orally through the relationship linking a pupil to his master, and to an idea of the possible, or impossible, relationship between medical activity and religious practice in the sanctuaries. I don’t believe in this interpretation, which has been first introduced by archaeologists when medical sanctuaries were excavated at the beginning of the twentieth century, and also quite recently by other scholars. Inferring that temple libraries contained books to be used by patients and visitors entails the notion of a widespread literacy, assuming people were able to read books by themselves, but we know that literacy was rather limited instead, especially among the lower social classes who were the main, although not the only, users of healing sanctuaries. The existence of a library devoted to these users is improbable, at least before Roman times. I am convinced that these libraries mainly contained medical writings.

It will be useful for our purpose to distinguish between books and texts, and between a library and a repository — the latter being the first embryo of what will later become an archive with its organizational features, transforming ‘boxes’ of loose sheets into a structured and indexed arrangement of related or connected items. Throughout antiquity, books and texts of various kinds coexisted. An effective definition referring to sacred books by Albert Henrichs reads as follows:

We can define a text as a verbal communication, either oral or written, and a book as an organized written text, or a collection of texts, identified by a title and originally inscribed on papyrus or parchment. Rolls and codices — the

¹¹ Eutocius, *In Archimedis de sphaera et cylindro* 88,3ff.

¹² I have dealt with this topic in the contributions mentioned in the references and will not repeat my arguments here.

¹³ Perilli 2006a.

ancient forerunners of our books — served as repositories for written texts whose survival depended on the durability of the inscribed surfaces that transmitted them. Typically, *texts* copied and recopied on perishable materials such as papyrus or parchment had a much longer lifespan than the so-called *books* that contained them. Books existed for the sake of texts, not the other way around. In principle, books were more dependent on texts for their existence than texts were on books. Shorter texts were routinely recorded on material unsuitable for books, such as stone, wood, metal, and pottery. Longer texts could most easily be accommodated on papyrus or parchment, the very materials from which books were made, and this was actually the case when a text was bound to be stored in an archive. [...] Whatever the precise relationship between ancient texts and books, it was surely one of mutual dependence in which the book helped to perpetuate the text while the text imposed its imprint on the book.¹⁴

Similar to sacred texts, medical writings depended both on the written word and on memorization and oral transmission within the circle of the initiated. Aristotle at the end of his *Nichomachean Ethics* reminds that medical books are useful only to the learned and of no use to those lacking experience and the ability to make proper use of them:

Men do not appear to become physicians on the basis of text-books. Yet they attempt to describe not only the general means of treatment, but also how one might be cured and how one should treat each patient, distinguishing their habits of body; these things appear to be useful for the experienced, but they are useless for those who are unskilled in the subject.¹⁵

Aristotle is referring here not to the more theoretical and general books on medicine — say, Hippocrates' *On ancient medicine* —, but to those technical writings which include treatments and means of cure for each individual patient. 'Books are reminders for people who have learned, but for the uneducated they are gravestones', so reads a saying attributed to the famous doctor Diocles of Carystus (fr. 6 van der Eijk), of approximately the time of Aristotle.

That medicine could only be learnt directly from a master, an experienced doctor, and that it had to be learnt in the field by accompanying a doctor during his visits — this is true, but is only a part of the picture. The so-called Hippocratic *Oath* is the most typical example of the relationship between master and pupil in a closed society, access to which was granted only to chosen applicants. But writing and script must also have played an important role in the codification and transmission of medical knowledge, and not only in later times: otherwise,

no use could be grasped from the Hippocratic technical treatises in the form in which we have them.

The act of writing and the features of the text

There are two issues we should focus on. Firstly, there existed repositories, and later archives, in sanctuaries which contained medical texts (i.e., notes, descriptions of clinical cases, perhaps short works) — rather than books, to stick to the important distinction we have drawn before. These repositories plausibly contained, or contained also, texts which were needed for medical practice: they can be regarded as the first examples of 'scientific' libraries in ancient Greece. Secondly, we can observe that some features of Greek medical writings are strongly dependent on the former autonomous existence of bits of texts which have been later put together to form a treatise as we know it. In this picture, the written medium acquires a more important role. Several treatises of what is called the Hippocratic collection feature clearly distinct textual units which are composed more or less methodically, sharing a common topic; but these textual units are usually arranged chaotically within the treatise, as Volker Langholf puts it in an illuminating article.¹⁶ They look like separate pieces, like self-contained bits of a treatise, showing what has been called an additive or catalogue-like structure; they often show no proper ending, and seem to finish abruptly as if the bottom of the writing support (the tablet) had been reached; sometimes the same bits of text happen to be repeated in various works, in the same or in a diverse position: the different tablets, or the single sheets of papyrus might have been stored in a box or otherwise archived, and could be used and reused individually, each time in a different context or sequence. This is what every good philologist would perhaps regard as an interpolation, as a text introduced into a work by a later hand; but the notion of interpolation would be inadequate in the case of medical texts, where these features of the text can reveal something of its origin and structure. A result of Langholf's analysis is that these single units of text often have the same length or a multiple of this length; corresponding to the amount of words which could be written on a tablet with an average of 2800 characters.

Sacred places and the dissemination of knowledge

In order for us to understand the role of sacred precincts and their repositories and libraries for the preservation and

¹⁴ Henrichs 2003, 210f.

¹⁵ Aristotle, *Nichomachean Ethics* 1181b2–6.

¹⁶ Langholf 2004.

the spreading of knowledge, it is important to know that they were managed by the political authorities of the city and not by the priests. This is confirmed by Aristotle, who explicitly states that the keys of the sanctuaries were held by the *prytanes*, the public authorities, and this undoubtedly means a direct control exerted on the sanctuaries by the city. The sanctuaries, as we are told in the *Athenian Constitution*, stored both the treasure of the city and the official written documents:

(The President of the Prytanes) keeps the keys of the sanctuaries in which the treasures and public records of the state are preserved, and also the public seal.¹⁷

Since this kind of control was stated in the Athenian constitutional law, it undoubtedly means that sanctuaries, including healing sanctuaries, had an overall social role, acted as a meeting point and one where public documents, decrees, laws, had to be made public and advertised.

Typical for the worship of the god Asclepius at Epidaurus, Pergamum, and at other centres was its being rich in texts focussed on the issues of health and pain relief. Such texts are a good source of material: we find inscribed tales of healing stories, which cover the whole area of ancient Greece geographically, crossing genders and economic groups.

The most famous collection of texts are the so called Epidaurian miracle inscriptions, which have been found inscribed on four huge *stelai*, with ca. 70 stories of miracle healings due to the intervention, direct or indirect, of Asclepius as a god of medicine. These Epidaurian inscriptions of miracles and cures preserve tales or traces of tales recounting a great variety of problems and solutions, of prayers and desires and of gratifications on the part of the god. Further examples come from other locations; most interesting are the inscriptions from the sanctuary of Lebena, on the island of Crete, a much shorter corpus than that of

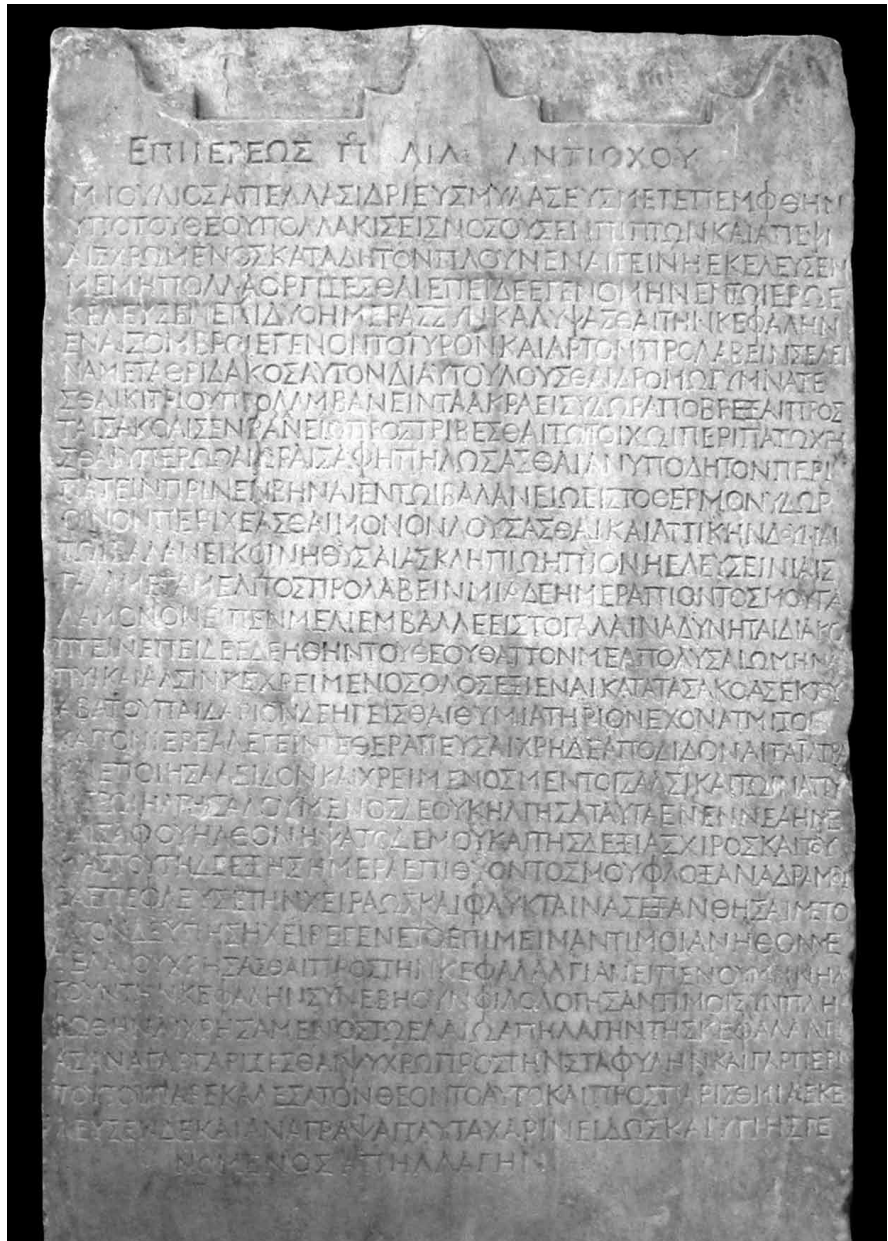


Fig. 2: *Inscriptiones Graecae* IV 2, 1, no. 126.

Epidaurus, but clearly attesting to a more rational and less 'divine' attitude.¹⁸

Sanctuaries, miracles and medical practice

The first issue which requires elucidation is that healing sanctuaries were a place for the actual practice of medicine on the part of doctors, and not only for religious rituals and prayer. One example may suffice. A very peculiar inscription, coming from the second Epidaurian stele (nr. 27), is typical because it tells us of a patient who has not enough faith and tries to run away, while the god lets his assistants catch him; the operation is described, and finally the patient is set free

¹⁷ Aristotle, *Athenian Constitution* VI, 44,1, transl. F.G. Kenyon.

¹⁸ Selected examples of the Epidaurian and other inscriptions, as well as bibliographical references, are mentioned in the Appendix to Perilli 2006b.

and can go away, but, as the text reads, ‘all the floor was covered with blood’. This is a very unusual situation, since blood, as well as childbirth, was not allowed in a sacred place:

A man with an abscess within his abdomen. When asleep in the temple he saw a dream. It seemed to him that the god ordered the servants who accompanied him to grip him and hold him tightly so that he could cut open his abdomen. The man tried to get away, but they gripped him and bound him to a door knocker. Thereupon Asclepius cut his belly open, removed the abscess, and, after having stitched him up again, released him from his bonds. Whereupon he walked out sound, but the floor of the Abaton [i.e., *the sacred precinct, accessible only to the authorized*] was covered with blood.¹⁹

This is the only testimony offering such a realistic description and it is clear evidence that medicine was practiced in sanctuaries.

There are other texts coming from sanctuaries, of which the most famous example is probably the inscription of Apella (fig. 2), a later text of the second cent. CE, accurately describing the treatment of a patient, a text first studied in detail by Ulrich von Wilamowitz-Moellendorf (1886, 116–124). It says:

I, Marcus Iulius Apellas, an Idrian from Mylasa, was sent for by the god, for I was often falling into sickness and was suffering from dyspepsia. In the course of my journey, in Aegina, the god told me not to be so irritable. When I arrived at the temple, he told me for two days to keep my head covered, and for these two days it rained; to eat cheese and bread, celery with lettuce, to wash myself without help, to practice running, to take lemon peels, to soak them in water, near the *akoai* in the bath to press against the wall, to take a walk in the upper portico, to take some passive exercise, to sprinkle myself with sand, to walk around barefoot, in the bathroom, before plunging into the hot water, to pour wine over myself, to bathe without help and to give an Attic drachma to the bath attendant, in common to offer sacrifice to Asclepius, Epione and the Eleusinian goddesses, to take milk with honey. When one day I had drunk milk alone he said, ‘Put honey in the milk so that it can get through’. When I asked of the god to relieve me quickly I thought I walked out of the abaton near the *akoai* (?) being anointed all over with mustard and salt, while a small boy was leading me holding a smoking censer, and the priest said: ‘*You are cured but you must pay up the thanks-offerings*’. And I did what I had seen, and when I anointed myself with the salts and the moistened mustard I felt pains, but when I bathed I had no pain. That happened within nine days after I had come. He touched my right hand and also my breast. The following day as I was offering sacrifice the flame leapt up and scorched my hand, so that blisters

appeared. Yet after a little the hand got well. As I stayed on he said I should use dill along with olive oil against my headaches. I usually did not suffer from headaches. But it happened that after I had studied, my head was congested. After I used the olive oil I got rid of the headache. To gargle with a cold gargle for the uvula — since about that too I had consulted the god — and the same also for the tonsils. *He bade me also inscribe this*. Full of gratitude I departed well.²⁰

The text clearly differs from those recording Asclepius’ healings at Epidaurus: no miracle, no dream, no vision, and a series of rather common prescriptions with just a nuance of religion. One may recall a passage from Plato’s *Charmides* (158b–c) concerning magic and medicine: ‘If you have this gift of temperance (*sophrosyne*) already, and are temperate enough, in that case you have no need of any charms, whether of Zalmoxis or of Abaris the Hyperborean, and I may as well let you have the medicine for the head at once; but if you have not yet acquired this quality, I must use the charm before I give you the medicine’. Marcus Apella didn’t go by himself to the sanctuary but was called by the god — a rather interesting feature —, who gives him a lot of simple dietary prescriptions, rather well known — cheese and bread, herbs, and then exercise, baths, and so on. In the middle of the text we read that the god says to the patient ‘you have been cured, now you have to pay’ — a rather concrete god. In the last line, we are informed that the god ordered the patient to write down these things, before leaving the sanctuary; this is also typical, since those who read these inscriptions, which were usually placed on the walls of the sanctuary or close to the entrance, must be led to believe that they come from the god in person. However, here we have no miracle, but only typical medical prescriptions like those found in the medical texts of the same age.

These kinds of texts must have been part of the archives of sanctuaries. They were most probably not written by the patients themselves, as has usually been claimed, but by a scribe, possibly by one of the so-called *grammateis* who were active in the sanctuaries together with the *ieromnemes*, those who among other things were in charge of keeping the records of what went on within the precinct, including the inventories of which some important examples are still extant.

Such texts also had some circulation, and this is one of their most important feature, since it attests to the spreading of this kind of knowledge. The most striking example is that of Aristagoras of Troezen, a woman who had a worm in her belly, and dreamt of the god while sleeping in the sacred precinct of Asclepius in Troezen:

¹⁹ *Inscriptiones Graecae* IV 2,1, no. 122, § 27.

²⁰ *Inscriptiones Graecae* IV 2,1, no. 126, Epidaurus, transl. Edelstein 1945, 248; italics are mine.

It seemed to her that the sons of the god, while he was not present but away in Epidaurus, cut off her head, but, being unable to put it back again, they sent a messenger to Asclepius asking him to come. Meanwhile day breaks and the priest clearly sees her head cut off from the body. When night approached, Aristagora saw a vision. It seemed to her the god had come from Epidaurus and fastened her head on to her neck. Then he cut open her belly, took the tapeworm out, and stitched her up again. And after that she became well.²¹

This text is especially important because it is also transmitted by a literary source, namely the work entitled *On the nature of animals* by Aelian, in the second cent. CE. In IX 33, Aelian has the same story with several important changes: he asserts that an historian of Rhegium, named Hippys, from the fifth or the fourth cent. BCE, had narrated the story of a woman with a worm, whom the cleverest of physicians failed to cure:

Then she came to Epidaurus and begged the god that she might become free of the ailment that lived within her. The god was not present. The attendants at the temple, however, made the woman lie down where the god was accustomed to heal the suppliants. And the woman rested quietly, as prescribed, while the servants of the god made the preparations for her cure. They removed her head from her neck. One stretched on his hand and pulled forth the worm, an animal of great size. But fit together and attach her head to its original joint, they could not do. The god then approached and was provoked at them because they set themselves to a task beyond their wisdom. But with a certain effortless divine power he himself attached her head to her body and raised up the stranger-woman.²²

In Aelian's version there is no name of the woman, who is not in Troizen but in Epidaurus, while, as in the inscription, the god is away. One could say much about these parallel texts; what we need to highlight here is only the importance of having two very different sources recording the same story, although with some changes. As far as I know, this is the only case of that kind. These inscriptions, or records of miracle cures, *probably the original tablets* rather than the inscribed stones, were accessible in some way and could be read and transcribed.

Inside and outside: circulation of texts

Another example deserving mention is the case of Hippocrates, *De natura hominis* chapter 11 (192,15–196,5 Jouanna). This text is very similar to chapter 9 of the *De ossium natura* (IX 174–8 Littré) also attributed to Hippocrates

²¹ *Inscriptiones Graecae* IV 2,1, Epidaurus, no. 23, transl. Edelstein, and Edelstein 1945, 234.

²² Translation in Edelstein, and Edelstein 1945, 221.

by the ancient tradition, and is mirrored in chapter 3 of book 3 of Aristotle's *Historia animalium* (512b-513a).²³ It is a description of blood vessels. While the first two texts are quite close to each other, Aristotle introduces some changes and uses Hippocrates' description of the bigger vessels in order to explain blood vessels in general. Did these authors copy from each other? Or did they rather — at least Aristotle and the author of *De natura hominis* — have access to a compilation of materials of various kinds, or perhaps to individual tablets or papyrus sheets, containing only that part of text, namely the description of blood vessels, which the Hippocratic author records in its entirety while Aristotle uses only the lines he deemed appropriate for his argument? The latter hypothesis seems to be more plausible.

This could perhaps also add to rescuing the historical value of another passage which is well known but usually neglected, namely a few lines from Plinius' *Natural history* (XXIX 1,4). They inform us that Hippocrates called medicine back to light by copying what had been written in the temple of the god Asclepius by those who had been freed from disease. Plinius adds that Hippocrates, 'having burnt the temple, made use of them in instituting that medicine which is called "bedside" medicine'. That 'Hippocrates' — this label meaning the historical Hippocrates or the doctor in general — had knowledge and made use of the texts preserved in sanctuaries, is possible, and is restated by a testimony by Strabo (XIV 2,19), who says that Hippocrates' dietetics were derived mostly 'from the cures recorded on the votive tablets'. Both Plinius and Strabo inform us that the ancient believed in a tight and direct connection between temple medicine and the so-called rational medicine, and deemed it likely that Hippocrates, that is, the doctors of the time, had access to the collection of written materials of temples and sanctuaries.²⁴

Document repository

There are also other sources concerning the story of Hippocrates who writes down the content of the tablets and records kept in the archives of Asclepius' sanctuaries. In the *Life of Hippocrates* by Soranus, or Pseudo-Soranus, an interesting word occurs (4 = 450 West.): *document repository* at Cnidus. The word used for the repository, i.e. *grammatophylakeion*, indicates a place for keeping *grammata*, namely written records. This is not a library; as Greek lexicography tells us, in the beginning *grammatophylakeion* simply means the

²³ Hippocrates, ed. Jouanna 2002, 118–124; Perilli 2004, 96f.

²⁴ Plinius' (as well as Pseudo-Soranus' *Life of Hippocrates*) mention of Hippocrates burning the temple of Asclepius at Cos may be interpreted as a later alteration, linking the figure of Hippocrates to the destruction possibly caused by the fires and earthquakes which devastated the island in the classical age, as happened for instance after the Spartan invasion in 411 BCE.

box, the chest where the records were stored, and only later this term was used to mean the archive. This corresponds with the idea of clinical records, of case histories written in sanctuaries because of their usefulness, since doctors faced with so many patients (in Epidaurus there were more than 160 dormitory rooms) and could not treat each patient as a new case and had to rely on previous experience instead, namely on cases recorded in written form. This is attested for ancient times in Egypt, in Mesopotamia and the Near-Eastern

of medicine Asclepius had a perfect Egyptian counterpart in the god Imouthes / Imothep; and the miracle inscriptions of Epidaurus have their Egyptian counterparts represented by Egyptian inscriptions with tales of miracles performed by the god which are similar in tone and content. In both cases we have the god who works wonders, worshippers who make offerings at the shrines, recording the works he performs; sometimes the sick were healed, sometimes they were addressed by the god. One must also notice that besides



Fig 3: Imouthes, Paris, Louvre (Ptolemaic Age, 332–30 BCE).

countries, as well as in Greece, basically every country where medicine played an important social role.

This takes us back to the beginning of the story, to the box of Thucydides and his collection of notes, and to an idea of writing which is at times rather different from the one we are used to, namely that of papyrus rolls and long, continuous texts.

Religion and writing: Greece and Egypt

Just a short reference to one among the many similarities we can recall between Greece and Egypt. The Greek god

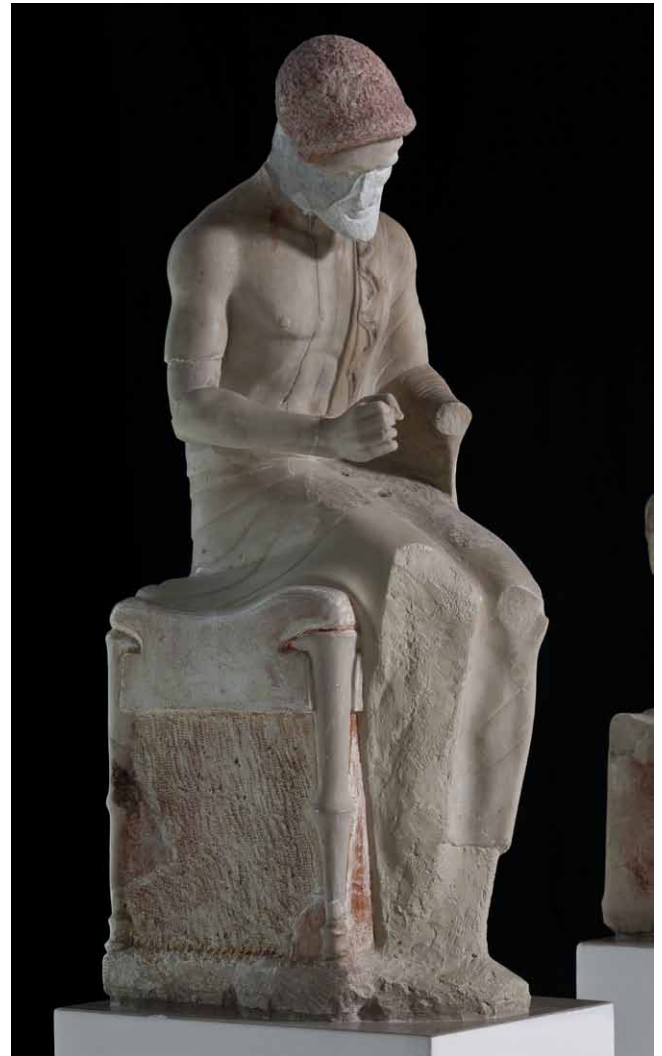


Fig 4: Scribe (6th cent. BCE), Acropolis Museum, Athens.

his role as a god of healing, Imouthes, the counterpart of Asclepius, was also a god of writing. Many statuettes of the god (the most famous being that of the Musée du Louvre in Paris) portray him as a young man seated with a papyrus scroll on his knees, a representation similar to that of professional scribes in Greece, seated and holding a tablet (fig. 4).

The scribal image of the god of medicine Imouthes (fig. 3) continued through the ages, and the papyrus that he was holding turns into a tablet. These gods were connected to medicine as well as to oracles and dreams which formed

part of the spiritual life in their cults. Medical help might also have been provided by these gods. From among the debris of the area behind the temple of Epehus at Memphis, in Egypt, in a large deposit of anatomical casts of Ptolemaic date, fragments of a Greek medical text have been found,²⁵ which may suggest that the priests, or priest-doctors just like those in Mesopotamia, did not rely on the power of dreams and oracles alone, but had other and more concrete instruments for their work. The temple of Memphis was one of the best known, and is mentioned several times by Galen, who writes about remedies ‘written on the walls’ of the temple or preserved in its inner precinct, in the *adyton* (the same as the *abaton*), which is the name given by the Greeks to the Egyptian House of Life, the place where medical records and texts were written and stored. It is interesting that the Greeks gave the House of Life, the storage place for medical and perhaps religious texts, the same name that they gave to the sacred precinct of Asclepius’ sanctuary; this points to the Greek *abaton* not only as the place for patients to lay and receive the vision of the god, but also as the place for the secret records of doctors and priests, which were a peculiar kind of text, intimately connected to both medical and religious knowledge: this was a secret lore, which had to be transmitted only to the initiated, to people who were part of the ‘family’, as we know for instance from the pseudo-Hippocratic Oath.

Like in Egypt and Mesopotamia, it was typical for Greek medicine to be based on written material, to have case histories, medical records written and consulted by doctors, and eventually transcribed. It can often be demonstrated that these texts, before being assembled together, came from different sources, were originally written on separate writing supports, namely individual tablets. They are often made up of short sentences like the records of a doctor in the course of his activity; we can think of doctors writing down some notes during their visits or dictating their observations to somebody else, to an assistant, who wrote them in a tachygraphic way, with abbreviations and sigla, and not in a literary form. As Volker Langholf has aptly demonstrated, the features of these texts probably depended on the material technique and on the act of writing.

I am convinced that such an intimate link between medicine and the medium of writing existed already since the beginning of the fifth century BCE. This must have been the case for other technical disciplines too: it is difficult to imagine how the highly technical mathematical knowledge could be shared and transmitted other than in written form; how the technicalities of architecture

and engineering, of the theory of ratios and proportion which were necessary for building a temple, could be learnt and put into practice without having the support of technical written texts to be consulted in every single case. Unfortunately, we have no information on this; the case of Heraclitus and Eratosthenes, that of Asclepius’ sanctuaries, together with others, can perhaps help to shed some light on the way in which technical and scientific knowledge was preserved and circulated in the western part of the ancient Mediterranean world.

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²⁵ Thompson 1989, 208.

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Article

Greek *Ostraca*: An Overview

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1. Some basic definitions

With the word *ostrakon*, the ancient Greeks indicated tortoise and seashells (the word ‘oyster’ has the same root, too). The term was also used for other objects of a sunken form such as pots and, more specifically, sherds of broken pottery. Nowadays, we use the word *ostrakon* in this latter sense to refer to potsherds used as a writing surface. In analogy, the word *ostrakon* also denotes limestone flakes used as a writing material; even though fragments of this kind do not come from pottery, they share the dimensions and typologies of use with *ostraca* in the strict sense of the word: being interchangeable, fragments of pottery and limestone flakes share the same name.¹

It is useful to note a number of basic points before we turn to *ostraca* in more detail:

- nowadays, a potsherd is only called an *ostrakon* if it bears a text;
- a potsherd with a written text on it is only considered an *ostrakon* if we can assume the pot was already broken when it was written on.

Writing on pottery was not uncommon, but we cannot call a fragment of a jar an *ostrakon*, for example, if the text allows us to assume that it was written when the jar was still in one piece. A typical case is that of *tituli picti* (also called *dipinti*), short texts written on a container to specify its content, its origin, its destination, etc. Texts written when the pottery was still sound are conceptually different from *ostraca* because the text is linked to the vessel, while in ‘true’ *ostraca* the potsherd is merely a writing surface. This is the reason why *tituli picti* are normally edited as a specific typology of texts in modern editions (i.e. they are not mixed with ‘true’ *ostraca*). Sometimes, however, the situation is ambiguous – usually when the text is too short or too incomplete.

2. The study of *ostraca* and the boundaries between disciplines

It is worth explaining why *ostraca* are studied by papyrologists as this might not be not immediately obvious. The

reason lies in the contents of these texts, their chronology and the culture they belong to. Texts written on *ostraca* are of the same kind and in the same languages as those written on papyrus, and they were produced in the same period, in the same places and by the same people. As we will see, the use of various writing materials in everyday life was completely normal and each text that we find on an *ostrakon* could equally have been written on papyrus.

Manuals and general overviews about the different ‘disciplines of the book’ are at times based on misunderstandings: papyrology, for example, is often thought to be exclusively linked to papyrus, a kind of ancient writing material. Even if the name is rather misleading, the main focus of papyrology today is not on the writing material itself, but rather on the kind of texts preserved and their co-existence with papyri. So if they are the product of the same culture that produced papyri, then parchment, wooden tablets (used to write directly on with ink or covered with wax and then carved) and other less frequently attested materials fall under the domain of papyrology.²

Since we have just mentioned the ‘jurisdiction’ of papyrology, some further specifications are needed now to introduce the study of *ostraca*. Papyrology is essentially conditioned by environmental factors. Egypt (or rather, certain parts of it) is almost the only country where papyri have been preserved, thanks to environmental factors that prevented the deterioration of such writing materials (viz. its climate and characteristics of the soil). The principal consequence of this geographical limitation is that our papyrological evidence is almost entirely limited to what has been found in a single country. A country which, admittedly, was very important in the Mediterranean area (politically, culturally and economically), but nevertheless just *one* country (and not the mother country of the Greeks, for instance). As is well known, papyri, *ostraca* and other inscribed materials were also found outside Egypt (see below), but the number of them found and their impact on our discipline are rather small.

¹The most relevant and extensive work on Greek *ostraca* (which is still the standard introduction on this subject) is Wilcken 1899. The general aspects have been illustrated well by Bartoletti 1963.

²An overview of the distribution of the different writing materials is provided by Bülow-Jacobsen, 2009, 4 (the figures are not up to date, but the range and distribution are still reliable). On the special category represented by *ostraca* used for ostracism, see below.

The geographical limitation of papyrology also implies a chronological limitation related to the various ancient languages: Greek papyrology is limited to the period of Greek and Roman domination of Egypt, i.e. between the conquest by Alexander the Great in 332/31 BCE and the Arab conquest completed in 642 CE (the boundaries of this period are rather fluid, of course, as contacts between Greeks and Egyptians – and written accounts of these contacts – also existed before Alexander’s time and continued to exist once Egypt became part of the Caliphate). Two aspects of the written production of this period of about a thousand years are worth mentioning for our purposes:

- the Egyptian language continued to be spoken and written in various alphabets: after the Greek conquest, Egyptian society was essentially bilingual, with the dominating language known only by a minority; bilingual documents (written both in Greek and in Egyptian) are fairly common;

- even after the Roman conquest (30 BCE), the long-established administrative machine of Egypt was basically left unaltered and Greek remained the language of documents as well as the language of the predominating culture. This is why the languages of the texts found in Egypt remain the same, even under Roman domination (comparatively few Latin texts exist).³

3. Ostraca as writing material

Coming back to the subject of *ostraca*, one might ask why – especially in Egypt, the land of papyrus – anyone would write on this kind of material. The reasons are actually fairly simple: *ostraca* were cheap (virtually free) and easy to find – a piece of broken pottery may be found in any household and in any rubbish heap. Pottery was, of course, largely used in everyday life, and one could find dumps of broken pieces in every village (especially near the pottery manufactures).

We can sum up the most important features of *ostraca* as pieces of pottery. What kind of pottery was used for them? Mostly amphorae, especially amphorae bodies (pieces of other kinds of vessels such as jars, cups and plates were used, too, but they are comparatively rare). The reason for the prevalence of amphorae bodies is easy to explain: amphorae are quite large and have a large bend radius, so (a) one can obtain a large amount of *ostraca* from a broken amphora, and (b) (probably more importantly) the writing surface offered by a sherd from this part of the vessel is ‘flatter’ than any other and thus more convenient to write on. We can therefore assume that the choice of certain kinds of potsherds was guided by several criteria, particularly their high availability and convenience of use. In Egypt, over the centuries, a variety of forms of amphorae and other vessels were used. The clay used varied, and the inclusions also differ as well



³ The database of literary texts (see fn. 9) lists 2,124 Latin texts out of a total of 16,506 records. On the documentary side, the proportion decreases significantly: the database devoted to this kind of evidence (see fn. 10) lists 2,242 Latin texts (or bilingual texts involving Latin) out of a total of nearly 70,000 records.

Fig. 1: *Ostraca* from Kerameikos excavation, Athens, bearing the name of Themistokles, son of Neokles, ostracised in 472 or 471 BCE. They come from different types of pottery: mouth of cooking vessel, foot of transport amphora, roof tile, amphora handle, foot of *krater*.

as the kind of firing. As a result, we find *ostraca* of various colours, including yellow, light grey, pink, red and brown. Ceramic material of a darker colour was mostly avoided as a writing material since the ink would not have stood out enough.

The writing was usually traced on the outside of the potsherd, i.e. on the convex part. Writing on both sides is less common. The inner side, by the way, was sometimes useless because if the sherd came from a vessel used for storage or transport of wine or other liquids, it was pitched (i.e. coated with resin inside). Conventionally, we call the outer, convex part of an *ostrakon* ‘recto’ and the inner side ‘verso’.

The surface of the potsherds was not treated before writing; the only preliminary operation, if there ever was one, was probably to choose a fragment flat enough for writing and whose size was convenient for the length of the text that one intended to write. The writing was traced with the same ink and with the same ‘pen’ – the *kalamos*, a sharpened reed – used to write on papyri. Some *ostraca* are graffiti, but they are comparatively rare. Amphorae were wheel-thrown and therefore had throwing lines on their body and neck. In *ostraca* with deep throwing lines, the writing is usually parallel to these grooves, but throwing marks were often ignored if the surface was smoother, even if they were visible, which meant they were not regularly used as a kind of ruling for the writing. The layout of the text depended on the shape of the sherd and on the typology of the text itself, of course: we usually find the same layout conventions as in papyri (indentation/indentation of some parts of the text, paratextual signs, etc.). We should note that even though *ostraca* were cheap and fairly easy to find, there are some extant cases of palimpsest: an existing *ostrakon* was ‘erased’ (ink could be washed away with a sponge and water) and then reused for a new text.

4. Typology of contents

Ostraca were used extensively in the ancient world. The first papyrologists’ belief that *ostraca* were strictly linked to the Greek culture and that their use was imported into Egypt by the Greeks has been abandoned: Egyptians began

using *ostraca* for writing and drawing from at least the New Kingdom (half of the sixteenth century BCE, more than 1,300 years before the Greek conquest).⁴ But it is still true that a huge amount of *ostraca* is written in Greek or in the other languages used in Egypt after the Greek conquest, and we know for sure that Greeks used *ostraca* in their mother country.

We should, of course, say a few words about a practice in Athenian democracy that derives its name from *ostraca*: ostracism. Ostracism was a procedure used in Athens (and in some other Greek towns) during the fifth century BCE and originally intended to expel citizens thought to be a threat to democracy – such as potential tyrants – for a period of ten years (in practice, it was often used by political factions as an instrument to eliminate opponents). During an assembly, the citizens scratched the name of the man they wished to expel on potsherds (fig. 1 and 2) and deposited them in urns.



Fig. 2: *Ostraca* from Kerameikos excavation, Athens, with diverse name forms (name, father’s name, demotic name): Kallias, Kallias son of Kratio, Kallias Alopekethen (of the Athenian deme Alopeke), Kallias Kratiou Alopeke. Kallias was ostracised in 485 BCE.

Provided that a quorum was met, the person whose name was written on the most *ostraca* would be banished; he had ten days to leave the city and if he attempted to return without permission, the penalty was death. Around twelve thousand ‘political’ *ostraca* have been excavated in the Athenian agora and in the Kerameikos area; they bear the name of a host of important Athenian political personalities of the fifth century

⁴ For a quick overview (and bibliography) on Egyptian *ostraca*, see Helck 1982. For a survey on *ostraca* written in languages other than Greek, see Bagnall 2011, 123–130.

BCE.⁵ These *ostraca* form a special category in many ways: they were used for a specific procedure, they each contain only one name and they are incised. As a result, they are mostly studied by epigraphists and archaeologists.

Being a common writing material, Greek *ostraca* were found in many parts of the Hellenized world, provided that environmental conditions allowed their preservation.⁶ But as we have already said, Egypt is by far the most important source of our evidence. A huge number of *ostraca* were found during the excavation campaigns that began at the end of the nineteenth century and are still going on in some cases. In certain areas and specific sites, *ostraca* findings were particularly conspicuous, and it is likely that in more isolated parts of Egypt or areas far from the manufactures of papyri, *ostraca* were used more than elsewhere. Take, for example, the village of Kellis (in the Dakhleh Oasis, Western Desert) or the Mons Claudianus (a quarry in the Eastern Desert), or the region of Thebes and more generally Upper Egypt. Surveys and excavations in these places have gathered a great deal of *ostraca* and only a few papyri, revealing a range of texts written on potsherds wider than elsewhere. One can also observe a certain pattern of distribution relating the text typology to the materials used as writing supports: papyrus had to be imported from the Fayum or from Lower Egypt and was therefore reserved for longer and more important documents, while shorter, less important or ephemeral texts were written on *ostraca*. Roger Bagnall recently published some important remarks on reasons that might explain the very different finds of *ostraca* in the various excavation campaigns:⁷ the aims and methods of the excavations played an important role here since the earliest campaigns mostly looked for papyri and were conducted without much attention being paid to what can easily be mistaken for useless fragments of broken pottery. The environment is important as well: *ostraca* have withstood humidity much better than papyrus. Another factor to be taken into account is the habit (perhaps more common in some regions) of burning discarded papyri as fuel (while *ostraca*, of course, cannot be used in the same way and thus survived).⁸

Some figures may be useful to understand the importance of *ostraca* in our evidence and to start outlining the kind of

texts they have preserved. First of all, we need to make a preliminary distinction: papyrological texts are divided into literary, paraliterary (or subliterary) and documentary groups. Literary papyri contain those texts that may be labelled as literature. Paraliterary papyri represent a sort of ‘intermediate’ category including texts such as commentaries, glossaries, school exercises, texts pertaining to medicine, magic and astrology. Documentary texts (such as contracts, private and official letters, wills, accounts, lists, registers, notes and any other text one might have produced) represent – as it is easy to imagine – the bigger category: those written texts are not the remains of a library, a scriptorium or the like; ‘books’ (that is, literary texts) are found, of course (as some people read, copied and created literature), but they are mixed with any written product of everyday life. This distinction between literary, paraliterary and documentary texts is pointed out in any edition of papyri and it is also reproduced in the electronic databases listing the published papyrological texts: we have a database for literary and paraliterary texts⁹ and another database for documentary texts.¹⁰ Unfortunately, the specific database for paraliterary texts is neither complete nor up to date.¹¹

If we look for *ostraca* in the database of published documentary texts, we find that more than 19,000 texts out of approx. 60,000 in Greek (or in Greek and another language) are *ostraca*; in the database of literary and paraliterary texts, we find about 460 *ostraca* out of about 9,000 texts written in Greek (or in Greek and another language). A considerable proportion of these texts (about 380 of them) are paraliterary; the total number of paraliterary texts listed in the database is around 1,400.

These figures show us that:

- *ostraca* make up a large part of the papyrological evidence as a whole and of the documentary texts we have in particular (almost a third of the published documentary texts are written on *ostraca*). We must, of course, bear in mind that these texts are short and that 19,000 *ostraca* are therefore not comparable to 19,000 published papyrus fragments (precedence in publication was usually given to the longer – and thus usually more rewarding – pieces of writing), but still, they remain an imposing number,

- the great majority of texts written on *ostraca* are documentary,

⁵ On ostracism, see Siewert, Brenne, Eder et al. 2002.

⁶ For more on Greek papyri and *ostraca* found outside Egypt, see (among others) Cotton, Cockle, and Millar 1995, Bowman 1998, 143–144, and most recently the survey by Bagnall 2011. For a palaeographical approach, see Crisci 1996. A group of *ostraca* recently found in Rhodes is presently under study.

⁷ See Bagnall 2011, 117–122.

⁸ On this aspect and on the general matter of scarce survival of papyri in some areas, see the remarks by Cuvigny 2003, 265–67.

⁹ LDAB: *Leuven Database of Ancient Books*, <http://www.trismegistos.org/ldab/index.php>.

¹⁰ HGV: *Heidelberger Gesamtverzeichnis der griechischen Papyrusurkunden Ägyptens*, <http://www.rzuser.uni-heidelberg.de/~gv0/>, now also hosted at <http://www.papyri.info>.

¹¹ CPP: *Corpus of Paraliterary Papyri*, <http://cpp.arts.kuleuven.be/>.

– as for the literary and paraliterary categories, *ostraca* are a common writing support for paraliterary texts, while literary texts are comparatively scarce.

5. A closer look at the evidence

a. Documentary texts

The majority of these texts are tax receipts. As a matter of fact, our knowledge of how revenue, tax offices and tax payments worked in Egypt has largely been obtained from *ostraca*. This is doubtless the field of knowledge where evidence provided by *ostraca* is absolutely crucial. How did taxation work in ancient times? The taxpayer went to the office of the tax collector and paid the sum due for a certain tax. The tax collector registered the payment on a papyrus roll – a veritable register intended to include all the payments of a certain tax in a certain place (village, part of a town, etc.) over a certain period of time – and gave a receipt to the taxpayer (written, in most cases, on an *ostrakon*; we also possess some receipts written on papyrus, however). The receipt says that the taxpayer has paid the amount due for one or more taxes.

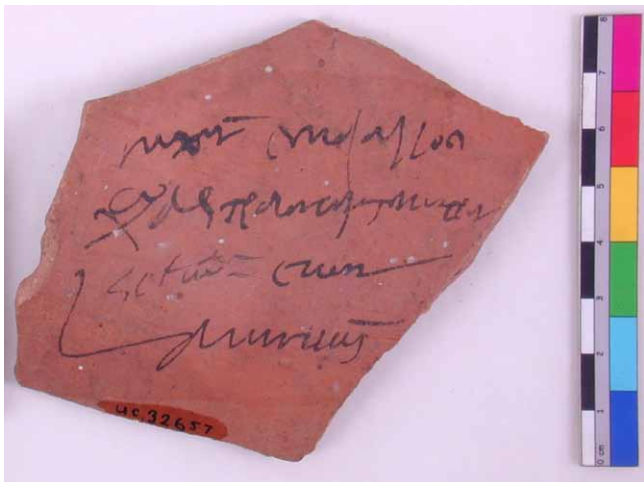


Fig. 3: O. Petr. Mus. 311: a receipt for the payment of three taxes (in *Heidelberger Gesamtverzeichnis der griechischen Papyrusurkunden Ägyptens*).

The receipt always bears the date and sometimes the name of the tax collector. The hands in which these receipts were written are professional, fluent and no doubt quick, some words were actually written in a sort of continuous line (the individual letters are indistinguishable) and abbreviations and symbols were used extensively (fig. 3).

Besides being employed as receipts (for taxes, but also for goods of any kind), *ostraca* were commonly used to write down accounts, lists (of people or objects), labels and warehouse notes – indeed, memoranda of every kind. We also have evidence of *ostraca* being used for longer documents such as private letters (sent to their addresses exactly as if they were sheets of papyrus; see fig. 4) and drafts of petitions



Fig. 4: O. Claud. II 270: a private letter (in *Heidelberger Gesamtverzeichnis der griechischen Papyrusurkunden Ägyptens*).

or contracts (being official, these kinds of documents could not be presented on an *ostrakon*, but an *ostrakon* could prove very useful for preliminary drafts). And we also have evidence of long texts written on various *ostraca* meant to be read continuously.¹²

Ostraca were very frequently kept together by their owners (individuals, families and businesses) and they were therefore found in groups during excavations. We can actually reconstruct a good number of archives due to such finds:¹³ sets of *ostraca* of this kind have had a great impact on our knowledge of various aspects of economics, demography, prosopography and sociology.¹⁴

¹² A famous and ‘extreme’ example is that of *ODN* 100–188, a huge set of 89 bilingual *ostraca* (they are written in Demotic with some passages in Greek) bearing the account of a long legal dispute. Each *ostrakon* has a number on it so they could be kept in order (this set was found stored in a room near the temple of Narmuthis – modern Medinet Madi, in the Fayyum); see Menchetti 2005.

¹³ As Roger Bagnall (2011, 137) has rightly observed: ‘In isolation, they [i.e. *ostraca*] tell us very little, and that not of much broader interest. It is normally as groups that they can give us information.’ Some archives are now scattered between various collections as a result of different excavations on the same sites or of purchases on the antiques market. Studies that aimed to gather *ostraca* pertaining to the same archive and analyse them as a whole are useful: for some recent examples, see Habermann, Armoni, Cowey, and Hagedorn 2005 (where several family archives were reconstructed) and Funghi, Messeri, and Römer 2012, vol. 2, 143–282 (where G. Messeri studied the archive of the freight firm of Nicanor and Sons, operating between Coptos and the harbours on the Red Sea using the roads in the Eastern Desert).

¹⁴ For a recent survey on the contribution of documentary *ostraca*, see Reiter 2009.

b. Paraliterary and literary texts

I would like to focus first on the kind of paraliterary texts that are mostly found on *ostraca*, viz. school exercises and, more generally, texts related to education: *ostraca* provide more than a third of all the evidence we currently possess in this field, being a favourite writing material for pupils and students.¹⁵ The reasons for this preference are the same as those we have already mentioned: potsherds were inexpensive, easy to obtain and ideal for writing down short-lived texts. *Ostraca* provide us with a complete overview of the path that a student of the Greek language should follow: starting with basic writing exercises (such as alphabets, letters written again and again in non-alphabetical order, exercises in syllabification, exercises in writing longer words and so on), the pupils moved to more elaborate texts, learning to write (and learning by heart) short sentences of moral content (such as the *Sayings of the Seven Wise Men*, or the *Menandri Sententiae*), and, later on, longer passages of classical and Hellenistic authors: Homer, theatre authors (above all, Euripides) and passages from lyrical and epigrammatic poetry. Mathematical exercises and arithmetical tools (tables of fractions and the like) are also found on *ostraca*.

The use of *ostraca* in schools was not limited to exercises for pupils, however: we have a number of examples that, in all probability, were models used by schoolmasters. These models were placed in the classroom and the children copied

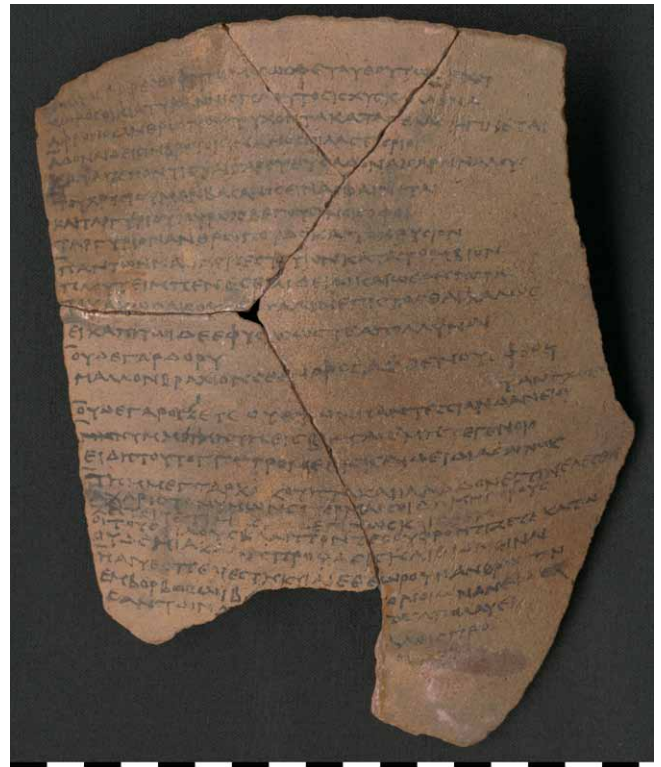


Fig. 6: P. Berol. inv. 12319 (LABD no. 3864): an anthology of passages from various authors, including Euripides, Homer and Hesiod.

from them or used them as a reference. The form of some of these *ostraca* suggests that they were positioned vertically, on public display (see fig. 5).

The boundary between advanced school exercises, reference books and literary texts used in other contexts is not always easy to identify: some *ostraca*, for example, display fine examples of short anthologies of passages by various authors written in a fluent hand (fig. 6). Ascribing some of these *ostraca* to an advanced educational context is possible, but we cannot rule out the possibility that they represent private anthologies written by someone interested for whatever reason in the passages copied here.

A famous (possibly the most famous) literary *ostrakon* is kept in Florence, Italy (at the Biblioteca Medicea Laurenziana) and contains part of an ode by Sappho (fig. 7).¹⁶ Before the discovery of this *ostrakon*, only a few words of this poem



Fig. 5: O. Claud. II 415 (LABD no. 4632): neck and shoulders of an amphora used to write disyllabic words starting with the letter π, and for a drawing. The fragment was put upside-down to stand up (perhaps for public display).

¹⁵ In her book *Writing, Teachers, and Students in Graeco-Roman Egypt*, 1996, Raffaella Cribiore provided a chart of the different materials used for school texts (p. 76); *ostraca* represent 34% of the total number.

¹⁶ The *ostrakon* has the number 3904 in the *Leuven Database of Ancient Books*. The record provides references to a bibliography and available images, among other things.

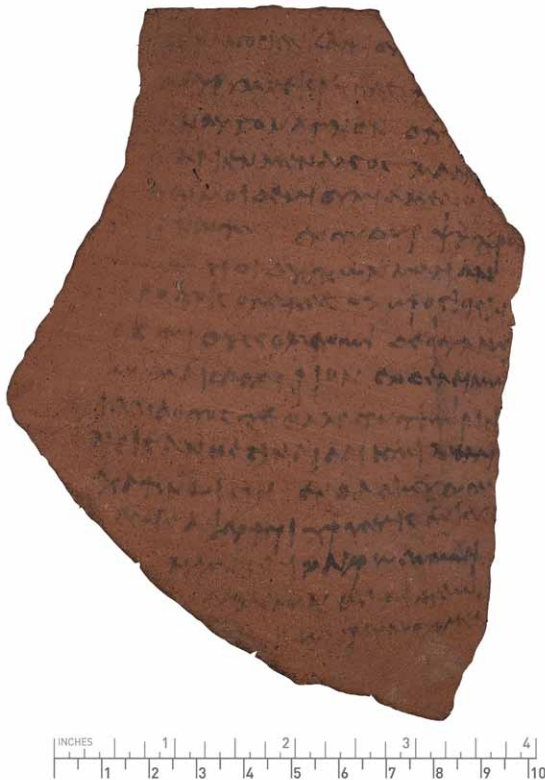


Fig. 7: PSI XIII 1300: 'the Sappho ostrakon'.

were already known in quotations of other surviving authors, and these were thought to belong to two different odes. Ancient lyric poetry, so much loved and celebrated by the Greeks, has largely disappeared; its fragmentary survival is mostly in quotations and on papyri. *Ostraca* have made a small but valuable contribution to our knowledge of Sappho and other authors.

One interesting contribution of *ostraca* worth mentioning – a mixture of documentary, paraliterary and literary texts – concerns monastic life. The huge amount of *ostraca* found in various monastic sites (and bearing passages of the Holy Scriptures, homilies, prayers, letters between priests, documents pertaining to the administration of monasteries, etc.) is of great importance in reconstructing this particular milieu in Egypt from the fifth century onwards.

These few examples make it clear that literary *ostraca* are always single passages of writing that are quite short: the writing surface imposes narrow restrictions on the texts. It would not be easy to imagine a whole 'book' written on *ostraca*, but we can briefly discuss an interesting case: a set of *ostraca* found in Denderah (Upper Egypt) and written by the same hand at the end of the fifth century CE (fig. 8). The extant evidence allows the reconstruction of six potsherds (some of which were lost after their publication) containing the first 127 verses of the *Iliad*. The majority

of them are written on both sides, the potsherds were not very big and the verses on them were copied continuously – with two dots to separate them – to save space. Two of these potsherds were numbered (they have now been lost, unfortunately), and it is possible that all the *ostraca* in the set originally bore consecutive numbers, useful for reading (and keeping) them in the right order.¹⁷ We do not know how much of the *Iliadic* text was copied in this set; no potsherd with any other verses of the first book (or other parts of the *Iliad*) was found together with it. Considering the fact that the first book of the *Iliad* consists of 611 verses, writing it in full would have required 29 *ostraca* of about the same size as those of the extant group. It should be noted here that the whole *Iliad* consists of nearly 15,700 verses and would therefore have required almost 750 *ostraca* to be copied in full. It is difficult to say what the purpose of these *ostraca* was: the hand is fairly fluent, but not calligraphic, and the text contains mistakes and corrections. An educational context seems probable. Another continuous literary text copied on numbered *ostraca* is provided by a set of ten pieces found in Upper Egypt and written in the fifth or sixth century CE: they bear part of St. Luke's Gospel (22:40-71) in an abridged form (some passages are omitted) and they were found together with ten other pieces containing passages from other gospels,

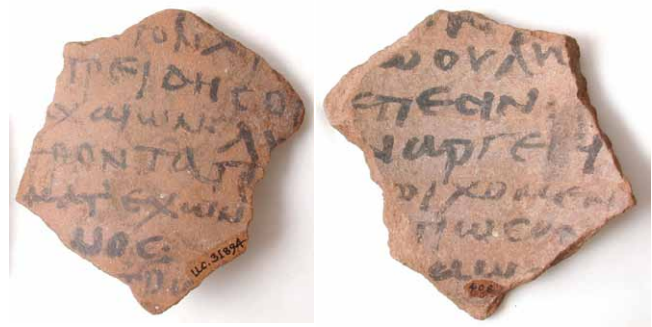


Fig. 8: O. Petr. Mus 23 (LABD no. 113383): one fragment of a set containing at least vv. 1–127 of the first book of the *Iliad*; the potsherd was written on both sides and the verses were copied continuously.

all written by the same three hands. These possibly represent (part of) a collection of passages from the New Testament used by a small group of Christians (although it is impossible to say exactly what purpose they were used for).¹⁸

An interesting question arises at this point: did *ostraca* play a role in the transmission of literary texts? We can say

¹⁷ On this set of *ostraca*, see Funghi, and Martinelli 2008.

¹⁸ These *ostraca* (number 2991 in the *Leuven Database of Ancient Books*) were published by Gustave Lefebvre in 1905.

that they theoretically did – and that they certainly did in a way. In the case of school texts, one or more passages of a literary work might have been copied over and over again by several pupils from a model represented by an *ostrakon*. In the case of a composition of a literary text, notes or passages written on an *ostrakon* possibly became part of a larger ‘book’. In either cases, *ostraca* may have functioned as a sub-archetype (even if of a specific passage) and their textual peculiarities may have passed in their descendants. It is clear, however, that such a transmission would be very limited and it is highly improbable that it could have affected the transmission of a text over the centuries.¹⁹

6. Conclusions

Ostraca were used extensively and were a common writing material for short and/or ephemeral texts. Receipts, notes of any kind, drafts and exercises are the most frequent texts found on *ostraca*. Their high availability and economical nature played a very important role in the choice of *ostraca* as a writing material (in a way, *ostraca* may be considered the ‘papyrus of the poor’). The use of *ostraca* increased in places where papyrus was difficult to find, but it was nonetheless limited and it never replaced papyrus completely. We have found examples of all the kinds of texts we find on *ostraca* on papyrus as well, but we have not been able to find any long texts written on *ostraca* to date.

¹⁹ One famous ancient witness of the writing of longer texts on ‘poor’ material such as *ostraca* is Diogenes Laertius, *Lives of Eminent Philosophers*, VII, 174, where we are told that the philosopher Cleanthes ‘wrote down Zeno’s lectures on ostraca and the blade-bones of oxen because he lacked money to buy paper’. In view of the nature of *ostraca*, these texts were likely to have been notes rather than a full transcription of Zeno’s lectures.

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Article

Manuscript Culture of West Africa*

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1. Preliminary remarks

In 1997, the well-known Harvard professor Henry Louis Gates Jr. visited the Mamma Haïdara library, one of the most important private collections of manuscripts of the ‘fabled’ city of Timbuktu. Seeing the manuscripts held there, immediately ‘[h]e wept like a child, and when I [the curator of the library, Abdel Kader Haïdara] asked him why, he said he had been taught at school that Africa had only oral culture and that he had been teaching the same thing at Harvard for years and now he knew all that was wrong’.¹

For a long time, it had been assumed that a civilisation existed in the sub-Saharan region which was exclusively characterised by an oral tradition.² However, the number of manuscripts that have come to light over the past decades calls this assumption into question. At present, the only comprehensive estimate that one may make regarding the number of manuscripts (i.e. books, letters, documents, etc.) existing in West Africa is based on the *World Survey of Islamic Manuscripts* realised by the Al-Furqan Islamic Heritage Foundation.³ Based on an analysis of this source, it is possible to roughly assess the number of manuscripts listed in West African collections. This estimate ignores the manuscripts hosted in Western – i.e. European and North American – and North African collections.

Benin, 2 collections, 30 manuscripts (vol. 1, 83–86).

Burkina Faso, 14 collections, 2,342 manuscripts (One collection has no indication of the number of manuscripts included) (vol. 4, 43–54).

Cameroon, 2 collections, 104 manuscripts (vol. 1, 145–146).

Gambia, 18 libraries, 1494 mss (v. 4, 135–146).

Ghana, 8 collections, 375 manuscripts (vol. 1, 367–373).

Guinea, 17 collections, 2797 manuscripts (vol. 4, 153–164).

Guinea Bissau, 11 collections, 703 manuscripts (vol. 4, 167–173).

Ivory Coast, 19 collections, 5,171 manuscripts (vol. 2, 117–132).

Liberia, no collection surveyed.

Mali, 17 collections, more than 5,500 mss (the number of manuscripts in one collection is missing) (vol. 2, 273–288).

Mauritania, 42 collections, more than 27,000 mss (many collections give only approximate numbers) (vol. 4, 282–307).

Niger, 70 collections, 3,537 manuscripts (vol. 2, 389–405).

Nigeria, 127 collections, more than 24,000 manuscripts (lower estimate: not including some collections described as having ‘hundreds’ or ‘thousands’ of manuscripts and other collections that show no indication of the number of manuscripts) (vol. 3, 237–245 and vol. 4, 311–349).

Senegal, 14 collections, 1,333 manuscripts (the estimate does not include five of these collections that are described as having from ‘hundreds’ to ‘thousands’ of manuscripts) (vol. 3, 51–63).

Sierra Leone, 13 collections, 754 manuscripts (in 12 collections; the number of manuscripts in one collection is missing) (vol. 3, 65–75).

Togo, 9 collections, 1,114 manuscripts (vol. 3, 237–245).

Unfortunately, the *World Survey of Islamic Manuscripts* dates to the early 1990s. Indeed, it was in the middle of that decade that most West African manuscripts came to light after a long period where they had literally ‘disappeared’.⁴ An example from Mali may help us understand how that number is to be revised. The Centre des Hautes Études et de Recherches Islamiques Ahmed Baba – IHERI-AB (formerly Centre de

* This paper is an outcome of my stay at the University of Hamburg. I would like to thank the network of Comparative Oriental Manuscript Studies (COMSt) for having been allowed to revise an earlier version of this article which was published in the *COMSt Newsletter*; no. 2 (2011) and no. 3 (2012). I am grateful for having received the Petra Kappert Fellowship from Oktober 2011 until March 2012 at SFB 950 ‘Manuscript Cultures in Asia, Africa and Europe’ / Centre for the Study of Manuscript Cultures (CSMC).

¹ Baxter 2005.

² This assumption is epitomised by Jan Vansina’s statement that Africa is a civilization of the ‘spoken word’, see Vansina 1987, 165.

³ *World Survey of Islamic Manuscripts* 1992–94.

⁴ On the phenomenon of the ‘disappearance’ of West African manuscripts, mainly due to the fear of manuscript expropriations on the eve of the colonial period, see Haïdara 2008, 266–267.

Documentation et de Recherches Ahmed Baba – CEDRAB) is described in the *World Survey of Islamic Manuscripts* as hosting 2,174 manuscripts (vol 2, 287), while in 2008 the registered number totalled 20,000.⁵

More recent estimates are quite speculative. At the beginning of the twenty-first century, UNESCO suggested that the number of manuscripts originating from the mere region of Timbuktu could amount to 60,000⁶. Even more recently, the aforesaid Haïdara increased this estimate to 101,820 manuscripts, stored in at least 408 private and public collections, and suggested that similar estimates would probably also apply to other regions of the ancient Islamic tradition, such as Ségou, Gao, Kayes, Mopti and Kidal.⁷

Notwithstanding the above numbers, scholars have neglected this cultural heritage and only a few local works have been studied, published and translated. Such is the case with the two well-known chronicles of Timbuktu, the *Ta'rikh al-sūdān* by al-Sa'dī⁸ and the *Ta'rikh al-fattāsh* of contested authorship⁹, with some of the works of the triumvirate of the Sokoto jihad, 'Uthmān bin Fūdī, 'Abd Allāh bin Fūdī and Muḥammad Bello,¹⁰ and, more recently, with the *Faṭḥ al-shakūr* by Muḥammad al-Bartilī¹¹ and with the *Faṭḥ al-ṣamad* by Muḥammad b. 'Alī Perejo¹². But why did these manuscripts not attract scholarly interest as one can observe in other cultural contexts?

2. The disqualification of a heritage

The neglect of such a heritage originates from what John O. Hunwick and Alida Boye describe as the 'unfortunate divide between Middle Eastern Studies and African Studies' that is 'a legacy of orientalism and colonialism'.¹³ In Islamic studies, one of the focuses of Middle Eastern Studies, an ideological framework advocating a hierarchised vision of the Muslim world still dominates. According to the Italian scholar Alessandro Bausani who criticises this approach,

in Western scholarly production there has been a tendency to organize hierarchically the Muslim world, dividing it in a supposed 'heartland' and some 'peripheral areas' such as Central and Southeast Asia as well as Maghreb and sub-Saharan Africa. In such 'marginal areas', Islam would bear so-called 'pagan traces', i.e. local beliefs that survived Islamisation and entered Islam, changing it into something quite different to its supposed 'authentic' nature.¹⁴ This is the theoretical paradigm invoked by Jean Schmitz based on the 'separation of the African Muslims from the wider Islamic world and on the ethnicisation of Islam'.¹⁵ During the colonial period, Western – especially French – specialists of West African colonies devised a theory that excluded Africa from the wider Islamic world. Paul Marty epitomised the theory suggesting the existence of 'a religion which was distinguished by its wholesale adoption of pre-Islamic customs'.¹⁶ As a result, scholars of Islam treated Africa as an 'insignificant backwater isolated from the so-called Islamic heartland'.¹⁷

In turn, African historiography was born as an independent discipline along with the fight of the African nations against the colonial rule.¹⁸ African historiography opposes itself to colonial historiography, written to support colonial powers and deny African people a past prior to the arrival of the colonists. African historians of the post-colonial period based their methodology on the oral tradition, perceived as the unique autochthonous method for transmitting knowledge, the only source that can be invoked to discover the 'real' history of Africa. The oral tradition was opposed to written sources, which were believed to be alien to West African culture. Within this romantic search for 'African authenticity', Africanists found in the supposed resistance of the 'Africans' to Islamisation,¹⁹ in the words of Scott S. Reese, 'a testament to the strength and vitality of African social and cultural systems that resisted the imposition of [presumed] foreign belief structures [like Islam]'.²⁰

As a consequence, both 'scholars of Islam' and 'Africanists', who could have been attracted by the manuscript tradition of West Africa, perceived this cultural heritage as 'alien'. The former did so because it pertained to a region

⁵ Ould Youbba 2008, 289. Today's estimate amounts to more than 40,000 manuscripts.

⁶ Gaudio 2002, 280.

⁷ Haïdara 2008, 265-266.

⁸ Edition and French translation Houdas 1898–1900; English translation Hunwick 1999.

⁹ Edition and French translation Houdas and Delafosse 1913.

¹⁰ See, e.g., 'Uthmān b. Fūdī, *Kitāb al-farq*, edition and English translation Hiskett 1960; 'Abd Allāh b. Fūdī, *Tazyīn al-waraqāt*, edition and English translation Hiskett 1963; Muḥammad Bello, *Ḥashiya 'alā muqaddimat 'Idā' al-nusūkh*, partial French translation Delafosse 1912.

¹¹ French translation El Hamel 2002.

¹² Edition and French translation Bohas et al. 2011.

¹³ Hunwick, and Boye 2008, 11.

¹⁴ Bausani 1984.

¹⁵ Quoted in Hamès 2002, 170. (transl. from French).

¹⁶ Quoted in Harrison 1988, 203.

¹⁷ Reese 2004, 2.

¹⁸ Triulzi 1979, 5.

¹⁹ Maurice Delafosse stated that the 'Negros' were 'inherently' hostile to Islam (quoted in Harrison 1988, 146).

²⁰ Reese 2004, 2.

perceived as being situated outside the ‘real’ Islamic world. The latter, because ‘Islam and its manuscripts cannot be considered other than a foreign element, an intruder’.²¹

3. A survey of catalogues and handlists of local manuscript collections²²

Two essential research tools to explore West African manuscript and literary production have been developed: the West African Arabic Manuscript Database (WAAMD) by Charles C. Stewart and the Arabic Literature of Africa project (ALA), which was edited by the above-mentioned Hunwick.

The WAAMD was launched in the 1980s.²³ It is a bilingual (Arabic and English) database including a search engine. In its 3.0 version (<http://www.westafricanmanuscripts.org>), the database contains descriptions of more than 20,000 manuscripts included in eleven different collections. New manuscript descriptions are being added thanks to the collaboration with the London-based Al-Furqan Islamic Heritage Foundation. Given the fact that the manuscripts are not described *ex novo*, but the entries are compiled using some of the available catalogues of the collections, the degree of detail of the WAAMD entries depends on the information found in the original catalogue. As a result, there is a certain degree of heterogeneity, and of the thirty-one data fields less than ten are fully filled out. As for the texts, only the main topical indications are reported (Sufism, Theology, Jurisprudence, etc.).

Hunwick’s ALA²⁴ was largely inspired by the work of the well-known Arabist Carl Brockelmann, i.e. *Geschichte der Arabischen Litteratur*.²⁵ The second and fourth volumes of the ALA are dedicated to West Africa and include detailed information about the writings of the authors from this region, as well as notes on works that are known only through quotations or fragments. To this end, the authors analysed all available sources such as indices, monographic studies and catalogues, including catalogues of collections that are available only *in situ* at the local libraries. The aim of this project is to produce a general outline of the literature from West Africa rather than a catalogue of catalogues. Therefore, it stands to reason that the ALA provides no codicological details or information about the manuscripts’ preservation conditions, numbers of folia/pages, etc.

²¹ Hamès 2002, 170 (transl. from French).

²² The Centre for the Study of Manuscript Cultures (CSMC) at the University of Hamburg hosts a complete collection of these materials, either in hard or digital copy.

²³ For an analysis of the WAAMD, see Stewart 2008.

²⁴ Hunwick et al. 1995 and Hunwick et al. 2003. For a presentation of the project see Hunwick 2008.

²⁵ Brockelmann 1898–1902 and 1937–42.

Starting with the manuscript collections referred to in ALA and WAAMD, I provide a survey of published handlists, inventories and catalogues of these materials. The overview omits any reference to unpublished materials, such as accession lists or indices of manuscripts that are available *in situ*, or to collections that are not specifically devoted to West Africa and only include a few occasional manuscripts from the region.

3.1 Chronological overview: 1950s–1970s

The first pioneering works on West African collections date back to the early 20th century when Louis Massignon presented an index of selected manuscripts from the inventory compiled by the French colonial administrator Henry Gaden of Sīdiyya Bābā (1862–1924) family library, one of the most important in Mauritania.²⁶ In the 1950s, Georges Vajda and H. F. C. (Abdullahi) Smith briefly described some manuscripts included in the two main West African collections kept in France, the Bibliothèque ‘Umarienne (also called Fonds Archinard) at the Bibliothèque nationale de France in Paris (BnF)²⁷ and the Fonds de Gironcourt at the Institut de France.²⁸ The latter collection was re-analysed in the following decade by Hunwick and Hassan I. Gwarzo.²⁹

In the late 1950s and early 1960s, the first analyses of manuscript collections housed in West African countries came to light in the former British colonies. W. E. N. Kensdale published a handlist of the Arabic Manuscripts of the University Library of Ibadan, Nigeria.³⁰ Since then, the collection has expanded to up to more than 600 items.³¹ In the same Nigerian city, the Centre of Arabic Documentation of Ibadan started a project of collecting manuscripts in 1964. The policy of the project was to borrow manuscripts, copy them and return them to their owners, thus the collection exclusively contains microfilms. A list of its items regularly appeared on the centre’s *Research Bulletin* until the 1980–1982 issue, describing 438 manuscripts,³² but the number of manuscripts that Hunwick recorded at the end of the 1980s is

²⁶ Massignon 1909.

²⁷ Vajda 1950; Smith 1959. The publications have been implemented by Ghali et al. and the online catalogue of the Bibliothèque nationale de France.

²⁸ Smith 1958.

²⁹ Hunwick, and Gwarzo 1967. This contribution, as well as Smith 1958, are superseded by my catalogue of the de Gironcourt collection, see Nobili 2013.

³⁰ Kensdale 1955–58; superseded by Hunwick and Muhammad 2001.

³¹ Hunwick 1988, 377–78. Hunwick and Muhammad 2001, however, only list 422 manuscripts.

³² Arabic Manuscripts at the Center of Arabic Documentation, University of Ibadan (Nigeria). Accession list.

522.³³ Hunwick also noted that the microfilms were in a very bad condition.³⁴ In the same *Research Bulletin*, in 1966–67, Murray Last published a short list of the manuscripts included in the National Archives of Kaduna.³⁵ In Zaria, the Northern History Research Scheme of the Ahmadu Bello University established a manuscript collection whose belongings were listed and briefly described in successive reports of the project³⁶ and in a handlist prepared in 1979, which was only published in 1984.³⁷ However, the collection has grown ever since.³⁸ To complete the picture of the research initiatives dedicated to Nigerian collections in the 1960s, I would like to mention Aida S. Arif and Ahmed M. Abu Hakima's inventory of manuscripts kept in the Jos Museum and in the Lugard Hall Library, Kaduna.³⁹

As for Ghana, Osman Eshaka Boyo, Thomas Hodgkin and Ivor Wilks published a list of the manuscripts kept at the University of Ghana.⁴⁰ In 1965, thanks mainly to the efforts of K. O. Odoom and J. J. Holden, short descriptions of selected parts from the collection started appearing in a series of instalments in the consecutive issues of the *Research Review* published by the Institute of African Studies, University of Ghana.⁴¹ As with the Centre of Arabic Documentation of Ibadan, the University of Ghana also pursued a strategy of leaving the originals with the owners; the collection is composed of copies or photographs of actual manuscripts, totalling approximately 500.

The first attempts to describe collections of manuscripts housed in what was formerly known as French West Africa date back to the mid-1960s. The first to be described was a collection housed by the most important centre of research in the region, the Institut Fondamental d'Afrique Noire, formerly Institut Français d'Afrique Noire (IFAN). The *Catalogue des manuscrits de l'IFAN* (actually an inventory) was prepared

by Thierno Diallo, Mame Bara M'Backé, Mirjana Trifkovic, and Boubacar Barry⁴² and was supplemented in the following decade by Ravane El-Hadji Mbaye and Babacar Mbaye.⁴³ More recently, Khadim Mbacké and Thierno Ka published a new inventory including the manuscripts which had been acquired by the institute since 1975.⁴⁴ During the same period Mokhtar Ould Hamidoun and Adam Heymoski produced a provisional handlist of Mauritanian manuscripts including approximately 500 authors and more than 2,000 titles.⁴⁵

The latter two contributions are the only ones that appeared in former French colonies until the 1980s, revealing an astonishing difference as to what happened in Ghana and Nigeria. The explanation of the backwardness in French West African manuscript studies is related, as convincingly suggested by Zakari D. Issifou, to the different policy of colonisation pursued by France and Britain. The French policy of 'assimilation' excluded any medium of acquisition and transmission of knowledge other than the French language, while the British indirect rule, which exploited the cooperation of native authorities, preserved and even stimulated traditional forms of learning and power.⁴⁶ Therefore, it comes as no surprise that at the end of the British colonial rule and during the first years of independence, scholars like Hunwick, Last, Smith or Wilks, as already mentioned above, – who have been among the most prolific authors of West African historiography – were active at universities in Ghana and Nigeria.

3.2 Chronological overview: 1970s–2000s

While the 1970s did not offer any further contribution in terms of description of West African manuscript collections, the 1980s were characterised by interesting research projects. In 1980, Elias N. Saad briefly presented some of the approximately 200 manuscripts of the Paden collection of the Northwestern University,⁴⁷ while in 1984 the collection of Arabic manuscripts of the Institut de recherches en sciences humaines, Université Abdou Moumouni in Niamey,

³³ Hunwick 1988, 378.

³⁴ Ibidem.

³⁵ Last 1966 and Last 1967; superseded by Hunwick, and Muhammad 1995–1997.

³⁶ I have been unable to consult these reports and insofar rely on Hunwick 1988, 380 for the information provided.

³⁷ Al-Bīlī 1984.

³⁸ Hunwick 1988, 380.

³⁹ Arif, and Abu Hakima 1965.

⁴⁰ Boyo et al. 1962. Unfortunately, I have not yet been able to consult this publication.

⁴¹ *Arabic Manuscripts at the Institute of African Studies*, University of Ghana. Accession list. In 1993, the late Wilks donated to the Herskovits Library copies of manuscripts from the collection of the University of Ghana. The inventory has thus been superseded by the online catalogue of West African collections at the Northwestern University.

⁴² Diallo et al. 1966.

⁴³ Mbaye, and Mbaye 1975.

⁴⁴ Mbacké, and Ka 1994.

⁴⁵ Ould Hamidoun, and Hymowski 1965–1966.

⁴⁶ Issifou 2002, 34.

⁴⁷ Saad 1980. The publication has now been superseded by the online catalogue of West African collections at the Northwestern University. Since the 1960s, Northwestern University has been the institution of affiliation of several scholars engaged in the study of West African manuscripts, the likes of the above-mentioned Hunwick and Wilks, as well as John Paden. As a result of their work, the Northwestern library houses today an important number of manuscripts.

was introduced by Ahmed M. Kani.⁴⁸ In the following year, Nourredine Ghali, Mohammed Mahibou and Louis Brenner published the inventory of the West African manuscripts of the BnF.⁴⁹ After the completion of this catalogue, the BnF acquired more manuscripts from West Africa, which Marie-Geneviève Guesdon analysed in her short description of new acquisitions in the early 2000s.⁵⁰ More recently, this supplementary information has been incorporated in the online catalogue of the BnF (section 'Manuscrits d'Afrique sub-saharienne' at <http://archivesetmanuscrits.bnf.fr/cdc.html>).

The 1980s to early 1990s saw a surge of interest in the study of Mauritanian manuscripts. First, the German scholar Ulrich Rebstock accomplished the amazing task of microfilming 2,239 manuscripts from Mauritanian libraries and completed, in 1985, an inventory of these materials that was published in 1989.⁵¹ From this fieldwork, the Universities of Freiburg and Tübingen developed the Oriental Manuscript Resource (OMAR), a database available at <http://omar.uni-freiburg.de> which includes full reproductions of the manuscripts described.⁵² At the same time, Stewart published two inventories of Mauritanian collections. The first concerns the manuscripts of the Institut Mauritanien de Recherche Scientifique (IMRS),⁵³ a collection started in the middle of the preceding decade by the first director of the Institut, Abdellah Ould Babacar.⁵⁴ Stewart also produced the catalogue of the library of Sīdiyya Bābā, a library that had grown substantially in the twentieth century thanks to the activities of Sīdiyya's son Harūn (1919–1977).⁵⁵

The mid-1990s were marked by the increasing public attention to manuscripts preserved in West Africa, probably due to the democratisation of Mali that 'restored citizens their democratic rights, among which was the right to establish foundations, companies and private societies'⁵⁶ in order to promote families' manuscript heritage. In this climate, Timbuktu and its manuscript collections acquired a new appeal. The fascination with the city and its 'hidden

treasures' culminated in a series of BBC documentaries.⁵⁷ Subsequently, many private libraries opened in Mali as well as in other West African countries, such as Mauritania.

While quite a number of contributions promoting these libraries have been published in recent years,⁵⁸ the main progress in the field of cataloguing and manuscript studies was achieved by the Al-Furqan Islamic Heritage Foundation's launching of an important project of handlists and catalogues of West African collections that has covered many West African regions to date: Ghana, Mali, Mauritania, Niger, Nigeria and Senegal. This project has so far analysed the collections of the National Archives of Kaduna (see above),⁵⁹ IHERI-AB (formerly Centre de Documentation et de Recherches Ahmed Baba – CEDRAB),⁶⁰ the towns of Šinqīt and Wadān in Mauritania,⁶¹ the libraries of Šaykh S. M. Cisse al-Ḥājj Malick Sy and Ibrāhīm Niasse in Senegal,⁶² the Ghana Libraries,⁶³ the Mamma Haidara library of Timbuktu,⁶⁴ the University of Ibadan (see above),⁶⁵ the manuscripts of the Mauritanian towns of Ni'mah and Wallatah,⁶⁶ the manuscripts of the Institut de Recherche en Sciences Humaines (IRSH) of Niamey,⁶⁷ and the al-Zeiniyyah Library in Boujbeïha, Mali.⁶⁸ The Al-Furqan Islamic Heritage Foundation descriptions have rendered some of the inventories and handlists discussed on the preceding pages obsolete and represent the most up-to-date knowledge on West-African manuscripts.⁶⁹

Another relevant contribution of recent years includes the online catalogue of the West African collections of manuscripts of the Herskovits Library of African Studies at the Northwestern University (<http://digital.library.northwestern.edu/arbms/index.html>). Initiated in the early 1990s by John Hunwick, Hamid Bobboyi and Muhammad S. Umar, the catalogue follows the criteria of WAAMD. It includes the descriptions of manuscripts from West Africa

⁵⁷ Krätli 2011, 331.

⁵⁸ See, for example, the presentations included in Gaudio 2002, Jeppie, and Diagne 2008.

⁵⁹ Hunwick, and Muhammad, 1995–1997.

⁶⁰ Ould Ely et al. 1995–1998.

⁶¹ Ould M. Yahya, and Rebstock 1997.

⁶² Kane 1997.

⁶³ Muhammad, and Zaki 2000.

⁶⁴ Haïdara, and Sayyid 2000–2003.

⁶⁵ Hunwick and Muhammad 2001.

⁶⁶ Ould M. Yahya et al. 2003.

⁶⁷ Mouleye, and Sayyid 2004–2008.

⁶⁸ Haïdara, and Sayyid 2006.

⁶⁹ See fn. 31, 36 and 49.

⁴⁸ Kani 1984. Important historical information has been added by Fadel 1996. The publications have been superseded by Mouleye, and Sayyid 2004–2008.

⁴⁹ Ghali et al. 1985.

⁵⁰ Guesdon 2002.

⁵¹ Rebstock 1989.

⁵² The OMAR hosts today reproductions of 2600 manuscripts.

⁵³ Stewart et al. 1992.

⁵⁴ Stewart 1991, 180.

⁵⁵ Stewart 1994. See also Stewart 1991.

⁵⁶ Haïdara 2008, 268.

forming the ‘Umar Falke Collection, the John Paden Collection, the John Hunwick Collection, the University of Ghana Collection, and other documents from different sources. The descriptions have recently been updated for the online catalogue by Muhammad S. Umar, Andrea Brigaglia, and Zachary Wright.

More recently, Carmela Baffioni has edited a scanty handlist of the Ahel Habott library of Chinguetti including more than 1,000 items.⁷⁰ A similar item is the repertoire of the Fondo Kati library in Timbuktu, published by the Iranian Grand Library of the Ayatullah al-Uzma Marashi al-Najafi, who also published the catalogue of the Imam al-Suyuti Library and another volume of the catalogues of the Mamma Haidara Library.⁷¹ Finally, two other collections kept in France have been described. The first collection is the so-called Petit fonds Archinard (which should not be confused with the Fonds Archinard kept at the BnF, see above), housed by the Musée national des Arts d’Afrique et d’Océanie [formerly Musée de la France d’outre-mer].⁷² A handlist of this collection of Arabic West African manuscripts was produced in 2000/2001 by Jillali El Adnani.⁷³ The second collection has been described in the catalogue of the Fonds de Gironcourt of the Institut de France, which was published in 2013.⁷⁴

4. Conclusion

In spite of the seemingly high number of contributions under review, the West African manuscript heritage, a huge legacy of the Islamic civilisation that has flourished in the region for centuries, remains largely unexplored. All the initiatives described in this overview show, in Graziano Krätli’s words, a substantial ‘imbalance between the ‘intellectual’ and ‘physical’ dimension in the study of West African manuscripts’.⁷⁵ Some work has been done in order to explore the Arabic literacy developed in the region, ranging from rough translations of texts to critical editions in order to satisfy the African scholars’ thirst for new sources that can cast light on the history and culture of West Africa.⁷⁶ But none of these

studies has addressed the material aspects of a manuscript. Among the few exceptions are the rare analyses of specific Qur’ān handwritten copies,⁷⁷ or non Qur’ānic manuscripts,⁷⁸ the general essays by Hamès and Seyni Moumouni on the West African manuscript tradition,⁷⁹ or the presentations of the Timbuktu manuscripts by John Hunwick and Alida J. Boye (addressed, however, to a non-specialist audience)⁸⁰ or those of the Nigerian city of Ilorin.⁸¹ Some contributions focused on the analysis of the paper used in West African manuscripts,⁸² as well as of the inks⁸³ or covers⁸⁴ used, and more recent publications address the problem of the Arabic scripts employed in West Africa.⁸⁵ Krätli’s and Lydon’s collection of essays *The Trans-Saharan Book Trade*⁸⁶ is the first attempt to study the West African manuscript as both a container of one or more texts and a physical object that reflects the cultural context in which it was created, including the materials, the techniques, skills, circulation, collecting, etc. No further research has been carried out in this field, and a lot of issues relating to the peculiarities of West African manuscripts remain unexplored.

I conclude by quoting once again Krätli’s words: ‘any full understanding and appreciation of this unique cultural heritage, let alone any serious attempt at studying or preserving it, should roughly consider all the material, technological, economic, cultural and intellectual aspects of book production, circulation, consumption and preservation in the area’.⁸⁷

⁷⁰ Baffioni 2006.

⁷¹ Haidara et al. 2010; Haidara et al. 2011; Haidara et al. 2012.

⁷² Today kept at the Quai Branly Museum.

⁷³ Adnani 2000–2001.

⁷⁴ Nobili 2013. For a preliminary presentation of the de Gironcourt collection see Nobili 2008–2009.

⁷⁵ Krätli 2011, 329.

⁷⁶ This scholarly production spans from the late 19th century (see, for example, Houdas 1898–1900) to the recent project Valorisation et Edition Critique des Manuscrits Arabes Sub-Sahariens (VECMAS) promoted by George Bohas (see <http://vecmas-tombouctou.ens-lyon.fr>).

⁷⁷ Abbott 1938; Brockett 1987; Stanley 1999; Jimoh 2007; Hamès 2009; Brigaglia 2011; Bondarev 2014.

⁷⁸ Johnson 2010.

⁷⁹ Hamès 2002; Moumouni 2007a and 2007b.

⁸⁰ Hunwick, and Boye 2008.

⁸¹ Reichmuth 2011.

⁸² Bloom 2008; Waltz 1980–1982 and Waltz 2011.

⁸³ Biddle 2011.

⁸⁴ Viola 2009.

⁸⁵ Bondarev 2014; Nobili 2011; Nobili 2012; Brigaglia 2011; Brigaglia & Nobili 2014.

⁸⁶ Krätli, and Lydon 2011.

⁸⁷ Krätli 2011, 340.

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Article

Standards and Specifics – the Layout of Arabic

Didactic Poems in Manuscripts*

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1. Introduction

Arabic manuscripts are enormously diverse in terms of their layout. Although a number of layout features have already been explored, the research conducted up to now can generally be characterised by its incompleteness and imbalance since high-quality manuscripts – especially early copies of the Qurʾān – have been the object of palaeographical, codicological and art-history research more frequently than plain manuscripts have.

A systematic investigation and description of the layout of a relatively large number of plain manuscripts of a particular type has not been carried out yet. Thus, there is still a need for further research. One minor area of research will be explored here involving copies of didactic poems written in Arabic.

From the ninth to at least the nineteenth century, didactic poetry in the Islamic world was written on a wide range of topics:¹ dogmatics, Qurʾānic sciences, jurisprudence, history and logic were expounded as well as algebra, medicine, agriculture and even the interpretation of dreams, just to name a few.² Despite varying so much in terms of their subjects, didactic poems have at least two things in common, namely that they are rhymed and composed in metric language. But even if the form of writing they contain equates to poetry, didactic poems are not usually considered to be poetry in a proper sense.³ The primary purpose of these poems was the preservation and didactic transmission of knowledge. The former was primarily achieved by metre and rhyme, by which the text of a single verse was protected. Even if the number of lines differed because of additional or omitted lines, the content of the verse was fixed. Regarding the process of knowledge

transmission, written and oral transmission complement each other.⁴ In fact, it was not unusual for didactic poems to be memorised entirely since rhyming facilitates memorisation. In addition to the factors already mentioned, the process of knowledge transmission is also promoted by the length of text since didactic poems generally do not contain any more than 150 lines (with a few exceptions).⁵ This also applies to the didactic poem which is to be examined here: the *Badʾ al-amālī* (‘Beginning of Dictations’) written by ‘Alī ibn ‘Uṣmān al-Ūshī (d. after 1173).

Al-Ūshī was a scholar who stood in the Ḥanafī tradition, one of the four Sunnī schools of law named after the scholar Abū Ḥanīfa (d. 767). He lived in al-Ūsh (Osh, now in the Kyrgyz Republic), a city located in the eastern part of the Ferghana Valley. Al-Ūshī is famous for his didactic poem *Badʾ al-amālī*, whose title corresponds to the last words of the first hemistich⁶ and which is also known by the abbreviated form *al-Amālī*.⁷ It is a popular creed in verse form, which presents complex matters concerning the tenets of faith briefly and concisely from a Māturīdī point of view, one of the two principal schools of Sunnī theology.⁸ It comprises the usual topics dealt with in statements of belief, such as the attributes of God, the eternity of these attributes and the eternity of God, the diversity of God and his creation, the uncreatedness of the Qurʾān, the Prophet Muḥammad, the meaning and status of the Rightly Guided Caliphs, and Paradise and Hell.⁹

⁴ Cf. Schoeler 2006, 65.

⁵ Cf. Seidensticker 2009, 1.

⁶ Cf. *ibid.*

⁷ Other names by which the poem is known are *al-Qaṣīda al-lāmīya fī t-tauḥīd* and *Qaṣīdat Yaḡūlu l-ʿabd*. Cf. Quiring-Zoche 1994, 111.

⁸ It seems that the *Badʾ al-amālī* has been influenced by the creeds (‘*aqāʾid*’) of Naḡm ad-Dīn Abū Ḥafṣ an-Nasafī (d. 1142). Since the latter’s works have often been copied, commented on and adopted, they have played a significant role in the spread of the Māturīdī doctrine. The same applies to the didactic poem by al-Ūshī, which has often been copied and analysed in commentaries as well. Cf. Madelung 1991, 848.

⁹ Cf. von Bohlen 1825, 9–12.

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¹ Cf. Seidensticker 2009, 1.

² Cf. van Gelder 1995, 106.

³ Cf. Seidensticker 2009, 1.

The *Bad' al-amālī* was often copied and interpreted in commentaries. Hence, there are copies¹⁰ of it in almost every major library containing Arabic manuscripts. Meanwhile, both the original number of lines and the sequence of the verses are known. These findings are due to studies that were part of the sub-project in Arabic and Islamic Studies conducted by the research group called ‘Manuscript Cultures in Asia and Africa’ at the University of Hamburg.¹¹ A detailed examination of a large amount of manuscripts revealed that the *Bad' al-amālī* originally comprised 64 verses.¹² In some exemplars, however, the number of verses differs because of additional or omitted lines¹³ and the sequence of verses is subject to considerable variation (hardly any copies display the same order of verses).

In this essay, another aspect will be investigated, namely the layout of copies of this didactic poem. To this end, thirty manuscripts have been analysed that are in the possession of libraries in Berlin, Munich, Göttingen, Princeton and Istanbul, plus one Nigerian manuscript containing the poem. Further manuscripts containing other didactic poems were used to determine whether a specific type of layout is typical of this genre or at least a certain didactic poem, or whether specific layout elements are peculiarities of individual copies. A final comparison with copies of poems of other sub-genres, namely copies of Abū Nuwās’ *Dīwān* (a collection of poetry), serves to provide information as to whether the exposed types of layout are specific to didactic poems or whether the layout was generally used for copies of any kind of poetry.

2. Composition of lines

2.a. Pseudo-columns

The page layout, or *mise-en-page*, is the arrangement of various graphic elements on a page. This includes the actual text on it, of course. Even though most Arabic manuscripts were written in blocks of text occupying the central part of the page,¹⁴ there were also many other ways to place a text on a page. Certain arrangements seem to have been

preferred for texts of a specific genre, however. A first rough inspection prior to a detailed examination of individual copies has already confirmed one assumption, namely that didactic poems were largely written in two columns, a layout familiar from other types of poetry. As a matter of fact, 22 of the 31 analysed copies of the *Bad' al-amālī* feature this arrangement, six of them with rule-borders, nine of them with dividers and two of them with both characteristics.¹⁵ However, all of these are pseudo-columns, which means that the column on the right contains the first hemistich and the column on the left the second one. Consequently, in order to read the poem, one always has to read the entire line and not column by column. Usually the two columns are of equal width; only a manuscript from Ilorin (Nigeria) – an unframed copy of the *Bad' al-amālī* – differs in this respect (fig. 1).

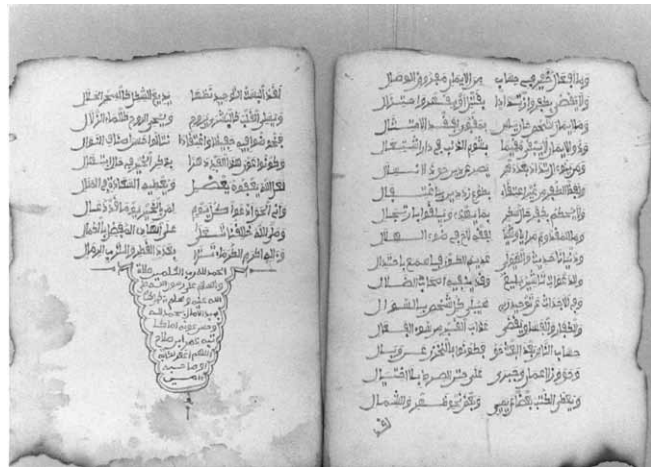


Fig. 1: Manuscript from a private collection owned by the Ile Tapa Gbodofu Qur’ān school in Ilorin, Nigeria.

This manuscript on the scale of 21×16 cm was possibly copied in the nineteenth century since the paper corresponds to that of other manuscripts produced at that time. The scribe, ‘Umar ibn Ṣalāh, is named in the colophon. The work is part of a collection belonging to the Ile Tapa Gbodofu Qur’ān school in Ilorin, Nigeria – a Nupe family of weavers and teachers of the Qur’ān who possess a large number of manuscripts, most of which are of an early date. The existence of a manuscript with Māturīdī content in sub-Saharan Africa is highly unusual.¹⁶ Unlike most other investigated manuscripts containing the poem, this copy features a narrow right-hand column on the verso of each folio. This phenomenon which is quite unusual for copies of poetry in general, is difficult to explain. It is possibly due to the fact that ruling was carried out for only one of the two columns. But this is not the only

¹⁰ The author is aware of the scholarly discourse about the term ‘copy’. It is usually understood as an imitation or reproduction of an original, i.e. a duplicate. However, the versions in the manuscripts can be considerably different from each other on a textual and visual level. To simplify matters and for lack of an appropriate term, the word ‘copy’ is used in the following, comprising the various variants and ways of representing a certain text.

¹¹ The research group ‘Manuscript Cultures in Asia and Africa’ at the University of Hamburg was financed by the German Research Foundation (DFG) in the years 2008 till 2011.

¹² Madelung claims that the poem has a length of 66 or 68 verses. Cf. Madelung 2000, 916.

¹³ Cf. Ahlwardt 1889, 557.

¹⁴ Cf. Gacek 2009, 177, s.v. ‘Page layout’.

¹⁵ See list of Manuscripts at the end of the article.

¹⁶ This information was kindly provided by Prof. Dr. Stefan Reichmuth.

manuscript that differs with regard to the visual appearance of the columns. In another one (fig. 2), a copy of the *Bad' al-amālī* and an Ottoman Turkish translation of this poem were juxtaposed in the form of a synopsis. The poem in Arabic is on the right-hand side and thus precedes the translation.

Both the Arabic and the Ottoman Turkish version were written in two columns. The verses in Arabic are emphasised and at the same time separated by horizontal lines. Moreover,



Fig. 2: Princeton University Library, Garrett no. 5729Y; fol. 193^v (detail).

the whole written area is enclosed in a border and even the columns are separated by a vertical line. This copy is of interest not only in terms of columns, but also in terms of its rule-borders, which will be discussed in more detail in section 3b. It is one of the rare cases in which the poem itself was dated, namely to the year 1103 H (1672 CE). This is a specific feature which is worth mentioning as copies of didactic poems which are in general quite short, are usually parts of multiple-text manuscripts and a dated colophon is only included at the end of the manuscript, if at all.

2.b. Indentation, centring and line spacing

In general, of course, there are many more ways of arranging the verses of such a poem. The layout of poetry varies a great deal in this respect. The following example (fig. 3), dated to 1207 H (1793 CE), reveals that the hemistichs are not always arranged in two columns.

In this particular manuscript, the hemistichs were alternately right-justified and left-justified with an overlap of one or two words. Due to the odd number of lines on every page but the first, one page begins with a first hemistich, whereas on the next page a second hemistich is at the top. The first line is always right-justified, regardless of whether the page begins with a first or a second hemistich. This practice leads to a most unusual effect, namely that, apart from the first page of the copy, the rhyming words are on the left-hand margin on the recto.

In another manuscript (fig. 4), the distiches are alternately right-justified and left-justified. The hemistichs are divided

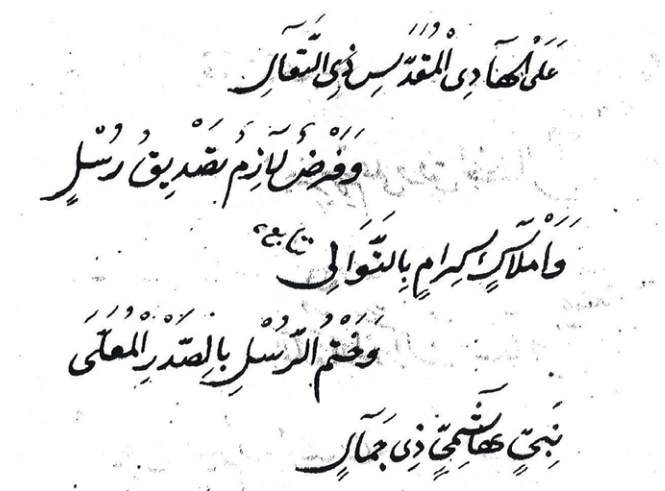


Fig. 3: Staatsbibliothek zu Berlin, Hs. or. 4496; fol. 9^v (detail).

by three small circles arranged in the form of a triangle which is upside down. These elements can also be found to the right of the left-justified verses, and vice versa.

Regarding the verse's layout, one of the inspected manuscripts is particularly striking, namely a manuscript kept by the Süleymaniye Library in Istanbul (fig. 5). An annotation on the cover page documents that this manuscript was a donation

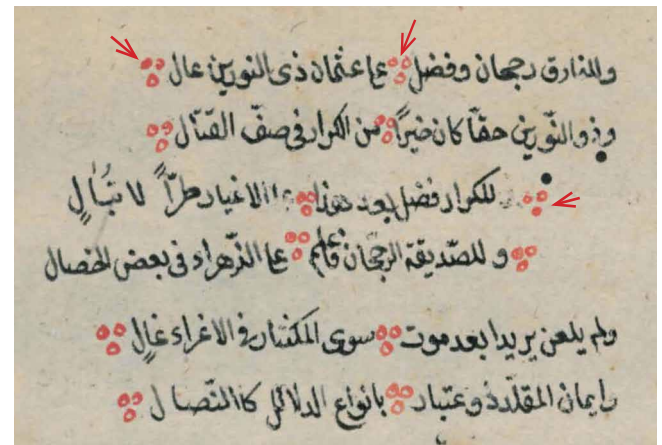


Fig. 4: Staatsbibliothek zu Berlin, Hs. or. 4950; fol. 51^v (detail).

(*waqf*) made by the second-to-last Mamlūk sultan, al-Ašraf Qānšawh al-Ġawrī (often incorrectly vocalised as Qānšūh al-Ġūrī¹⁷), who reigned from 1501 to 1516.¹⁸ This manuscript is a more lavish one, written in black and decorated in blue, red and gold ink. Another noteworthy characteristic it has is the framing, which is caused by an uncommon composition of lines.

As a rule, the first hemistich and the first half of the second one are written in one line and the last part of the second hemistich, which carries the rhyme, is centre-justified

¹⁷ Cf. Holt 1978, 552.

¹⁸ Cf. al-Sayyad 2011, 138.



Fig. 5: Süleymaniye Library, Istanbul, Aya Sofya 1446; fols. 50^v and 51^r.

underneath it. To the right and left of this centred part, separated by a vertical double-line, are six-leaved flowers. The double-lines of which the frame is composed border the lines of the text and the written area. This arrangement is maintained throughout the text. Apart from exceptions such as this, in copies of poetry the line usually ends with the second hemistich and consequently with the rhymed syllable(s). As a result, the verses are separated from each other by the line break. Another manuscript could be identified that shows some particularities in this respect (fig. 6).

Here, the poem was written like a piece of prose, i.e. without any regard for the end of the verses. Instead, the scribe used circular dividers between the hemistichs, the verses and occasionally at the end of the line as well. As a result of this non-uniform arrangement, neither the rhymed parts of the verses nor the dividers are arranged one below the other.

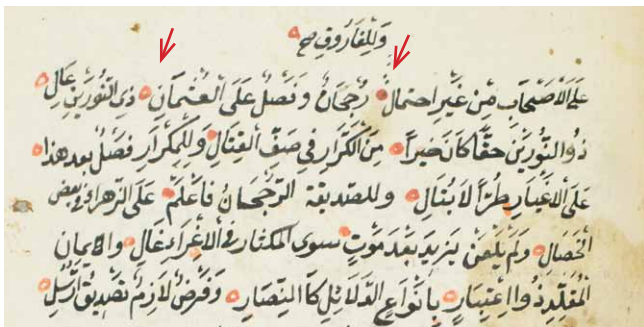


Fig. 6: Niedersächsische Staats und Universitätsbibliothek Göttingen, Cod. Ms. arab. 176; fol. 115^v (detail).

Another copy (fig. 7) is noteworthy insofar as the hemistichs are neither separated by spacing nor by dividers or rule-borders; only the written area is bordered. However, the copyist obviously strove to end each of the first hemistichs at half the height of the line.



Fig. 7: Princeton University Library, Garrett no. 3563Y; fol. 49^r (detail).

A very common practice employed in Arabic manuscripts for copies of all kinds of texts can be seen in this manuscript: scribes altered the shape of letters in order to achieve a uniform line length, no matter whether they appeared in columns or continuous lines. The elongation of the horizontal part of single characters which was known as *kashīda* justification – in this case the rhyme letter *lām* – is a particularly frequent practice used to adjust the length of a line. To avoid excessive length, scribes often contracted words or superscribed the last word or merely a few characters of it. In this manuscript, the scribe avails himself of all three methods. What is noticeable, too, is the broad line spacing, presumably intended for interlinear glosses. All of the copies that were on hand were written in a vertical format, but the relation between the size of the page and the written area varies as well as the number of lines and the interlinear spacing. Considering the cost of material, one reason for a small number of lines might have been an increase in symbolic value. The intention to provide space for glosses may be another reason for wide line spacing and wide margins as well. Numerous manuscripts were destined for textual criticism and consequently prepared for marginal annotations to be made. The example shown here proves that the space between the lines was not always used for this purpose, though.

With regard to interlinear spacing, there is a further interesting manuscript (fig. 8) that has a broad gap of approximately three blank lines between the distichs (framed in red). On some pages, the broad line spacing has been used for interlinear glosses and was probably intended for this.

The line spacing in the other examined manuscripts is considerably smaller; usually they are single-spaced. Nonetheless, even some of the copies with little space between

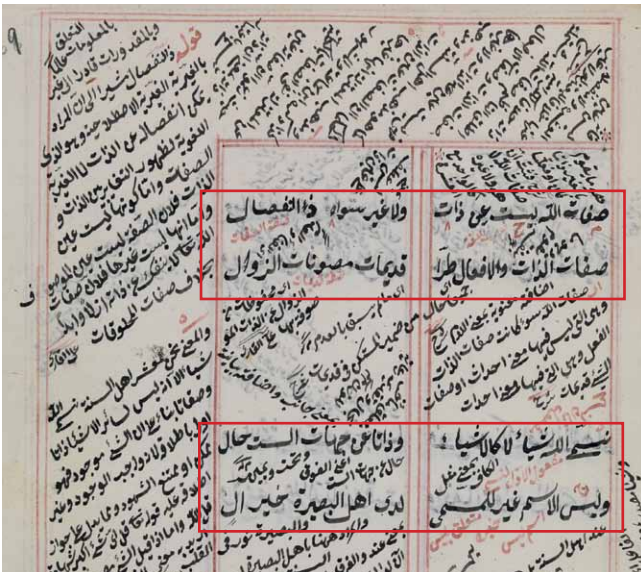


Fig. 8: Princeton University Library, Garrett no. 5310Y; fol. 69^r (detail).

the lines contain glosses between them. One of these is particularly noteworthy in this respect (fig. 9).

The text here was written in two columns with only a small amount of space between the lines. In spite of that, there are glosses all over the page, marginal as well as between the lines and the columns. These were written in a horizontal, perpendicular or angular direction and even upside down. The various writing directions have not only been used to distinguish the glosses from the text itself, which is particularly necessary in manuscripts without a bordered text area,¹⁹ but also in order to distinguish the glosses from each other. In addition, markings allocate the glosses to the word or section that has been commented upon, for instance connecting lines or graphic symbols and numbers in pairs.

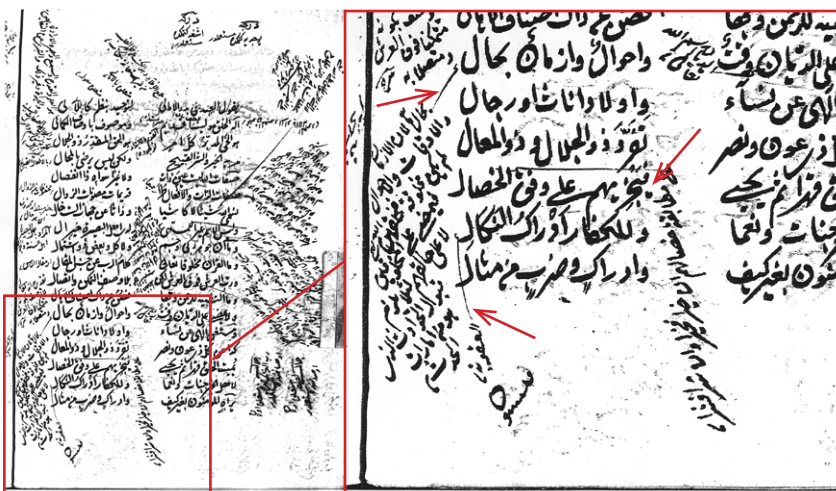


Fig. 9: Staatsbibliothek zu Berlin, Diez oct. 50; fol. 52^r.

¹⁹ Cf. Gacek 2009, 230, s.v. ‘Rule-borders and frames’.

Besides manuscripts containing only the didactic poem, there are others in which parts of the *Bad’ al-amālī* are embedded in a commentary (e.g. Princeton University Library, Garrett nos. 5807, 5130 and 5310). In this case, the sections commented upon appear within the running text, which is usually justified. Verses that have been commented upon are generally either marked by overlines or written in another colour (red in most cases). The respective verse numbers are frequently stated in the margins, possibly added by a later hand. Sometimes the text of the poem was added separately and in addition in full length at the end of the commentary.

Decorative and organising elements

3.a. Dividers

As was said already above, the most common way to arrange the hemistichs of the didactic poem *Bad’ al-amālī* was to write the text in two columns. However, the space between the columns was not always left blank, but often filled with dividing elements designed in a variety of shapes and colours. In addition, similar elements were sometimes added at the beginning or the end of the verse (the latter is less frequent than the former). The elements used consist, for example, of two or three components arranged in a row or in the form of a triangle. The individual parts may also be connected to each other:

Besides the little drop-shaped or comma-shaped elements shown here, scribes used circular elements to divide the hemistichs, as can be seen in the Göttingen manuscript that has already been mentioned (cf. fig. 6). Similar figures were often used in early codices of the Qur’ān to separate the verses (*āyāt*). The Göttingen manuscript and several other examples indicate that this kind of dividing element was adopted in other types of manuscripts as well, especially those containing



Fig. 10: Staatsbibliothek zu Berlin, Wetzstein 1754; fol. 149^r (detail).



Fig. 11: Staatsbibliothek zu Berlin, Sprenger 1956; fol. 12^r (detail).



Fig. 12: Staatsbibliothek zu Berlin, Wetzstein 1718; fol. 77^r (detail).

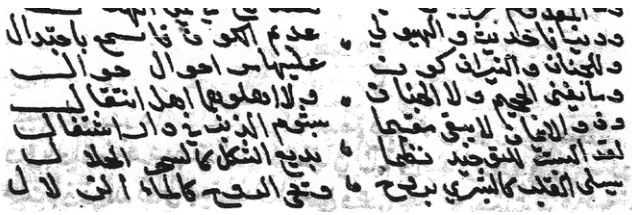


Fig. 13: Staatsbibliothek zu Berlin, Wetzstein 1804; fol. 4' (detail).

poetry.²⁰ Normally the number of elements corresponds to the number of lines, and the form, colour and arrangement of these elements stay the same throughout the text. However, some exceptions can be found among the manuscripts studied.

In the example shown here (fig. 13), the number of lines and elements to separate the hemistichs deviate from each other, which is why these elements do not separate the single half-lines but as a vertical dotted line the two columns from each other. It is notable that these elements are completely missing on fol. 4', which indicates that it was produced in two steps. Another indicator is the use of a different colour of ink, namely red, while the text itself is written in black.

In another copy (fig. 14) dated to 1291 H (1874 CE), the form and colour of the dividers vary from page to page, which gives the manuscript a colourful, decorative appearance.

However, all of the dividers consist of drop-shaped elements, sometimes arranged in the form of a triangle or in a row, and one of them sometimes forms the blossom of a stylised flower (fig. 15).

Adolf Grohmann mentions these in connection with figures that ensure the correct reading of the Qur'ān. He introduced the German term 'Differenten' and the Arabic term *muhmalā* for these elements. On the basis of the research conducted by J. v. Karabacek, he states that the lower part of this 'flower'



Fig. 14: Staatsbibliothek zu Berlin, Sprenger 1956; fol. 11v (detail).

²⁰ Cf. Bloom, and Blair 2009, 185.



Fig. 15: Staatsbibliothek zu Berlin, Sprenger 1956; fol. 11v (detail).

originally developed from the Qur'ānic abbreviation *lā* as a short form of *lā waqf* (= 'without a break'). As in this manuscript, the angle has often been stylised to form paired leaves or a 'V'.²¹ Scribes or illuminators often placed a dot, rhombus, crescent or – as in this case – a drop or inverted comma in the space between the leaves.²²

In the present manuscript, these flowers do not only serve as dividers; similar elements were also placed above the parallel line of the elongated horizontal stroke of the letter *lām* in order to fill the free space, as shown in fig. 16.

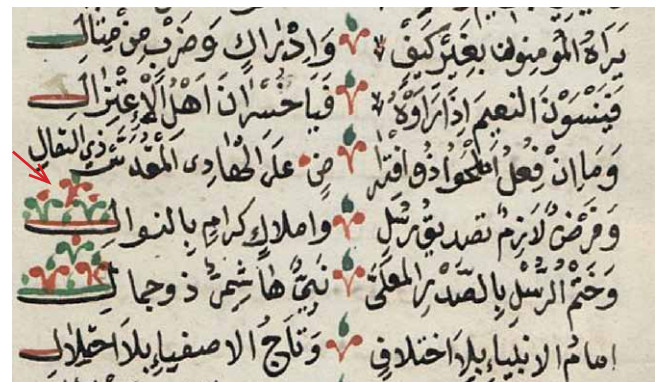


Fig. 16: Staatsbibliothek zu Berlin, Sprenger 1956; fol. 12v (detail).

On the whole, the scribe tried to create columns with a uniform line length. To this end, he occasionally used *kashīda* justification, in this case the *lām* at the end of the line. By lengthening this letter, the line ends with a long horizontal stroke. The last ascender, namely the shaft of the *lām*, is relatively far to the right (cf. fig. 7 and fig. 16). Although the letter was stretched to the edge of the line, this gives the impression that the line is considerably shorter than the others. In order to achieve optical margin alignment, the space above the horizontal stroke was filled with decorations. Additions such as the above-mentioned flowers or zigzag lines (cf. fig. 17) only occur above the longest elongations. Shorter ones were merely filled with a parallel horizontal line, which serves the same purpose, however.²³

²¹ Cf. Grohmann 1971, 43.

²² Cf. *ibid.*, 44ff.

²³ This phenomenon is also known in European typography, where optical margin alignment belongs to the segment of microtypography. It comprises a range of methods which were used to improve the appearance of a justified text. It is required particularly with regard to the long slopes of majuscules. In this context, a concise line arrangement is achieved by manipulation of the characters' width. Majuscules like A, V, W and Y are outdented into the margins in order to align the text border visually. The same is true of the

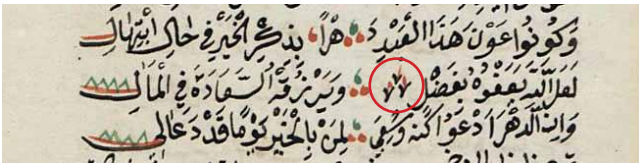


Fig. 17: Staatsbibliothek zu Berlin, Sprenger 1956; fol. 13^r (detail).

In general, it is striking that in copies of texts divided into columns, the elongation of single characters mainly appears in the second hemistich, whereas in the first one scribes more often used little graphical elements to fill the gaps and, in doing so, to justify the columns (on the differing length of the first and second hemistich, see below).

In addition to the elongations, the scribe used contractions and superscriptions. In this respect, this copy is another good example of the use of distinct methods to justify the lines.

3.b. Rule-borders and margins

Margins played an important role in page-layout. A margin is the area between the text – sometimes enclosed in rule-borders or a frame – and the edge of the page. While rule-borders (or bounding lines²⁴) are present in some of the examined manuscripts, more complex and elaborate frames are not to be found. As is typical for rule-borders, these merely consist of a single thin line or several parallel lines (rules), most often in red ink.²⁵ A single or two parallel lines can also run vertically between the columns. In both cases, the use of different-coloured ink and interruptions shows that the lines were often only drawn once the copy was finished.

In some copies, different layout elements such as rule-borders and dividers are combined, as can be seen in a manuscript located in Munich (fig. 18).

Here, the text is enclosed in rule-borders and the intermediate space between the columns is filled with dividers, consisting of three red drops arranged in the form of a triangle. In addition, a single red drop marks the end of the verse. Generally the use of dividers in addition to rule-borders or frames seems to be rather unusual. This is especially true of dividers placed at the end of a line. Since the end of the verse is already indicated by the rule-border, the rhyme letter and the line break, such dividers can be dispensed with in this case.

Besides enclosing the body of the text, rule-borders were used to separate the text and the marginalia from each other. A further line can be added in order to limit the outward margin and thus avoid marginalia being written too close to the edge

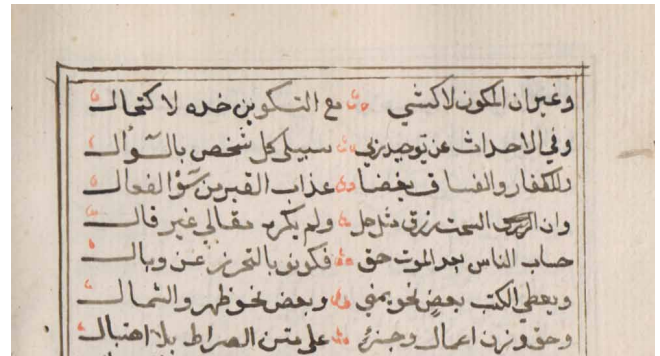


Fig. 18: Bayerische Staatsbibliothek, Munich, Cod. arab. 1735; fol. 94^v (detail).

and then cut off during the process of (re-)binding.²⁶ Curiously enough, the manuscript with the Ottoman Turkish translation that was mentioned at the beginning (cf. fig. 2) features an annotation written beyond this outer border (fig. 19).

In this manuscript, marginal notes were apparently intended from the outset. However, in this case, the predefined area has only been used for the introductory invocation ‘In the name of God the All-Compassionate, the Most-Merciful’ (*basmala*), the catchwords and the foliation.

With most of the examined manuscripts, however, the space was used as intended, which means that the glosses were written in the designated areas. They were usually written in a smaller script and often obliquely, sometimes upside down, in order not to be confused with the body of the text.²⁷ Quite interestingly, this is often the case, even if the glosses are clearly separated by rule-borders. The skewing of the glosses has other advantages, too. By writing the gloss at an angle, the scribe was able to refer to the annotated word



Fig. 19: Princeton University Library, Garrett no. 5729Y; fol. 193^r (detail).

arrangement of special characters and punctuation marks, such as hyphens, which project over the right edge for this purpose. Cf. Neumann 2003, 169a.

²⁴ Cf. Déroche 2005, 161.

²⁵ Cf. Gacek 2009, 229, s.v. ‘Rule-borders and frames’.

²⁶ Cf. *ibid.*, 230, s.v. ‘Rule-borders and frames’.

²⁷ Cf. *ibid.*, 115, s.v. ‘Glosses and scholia’.

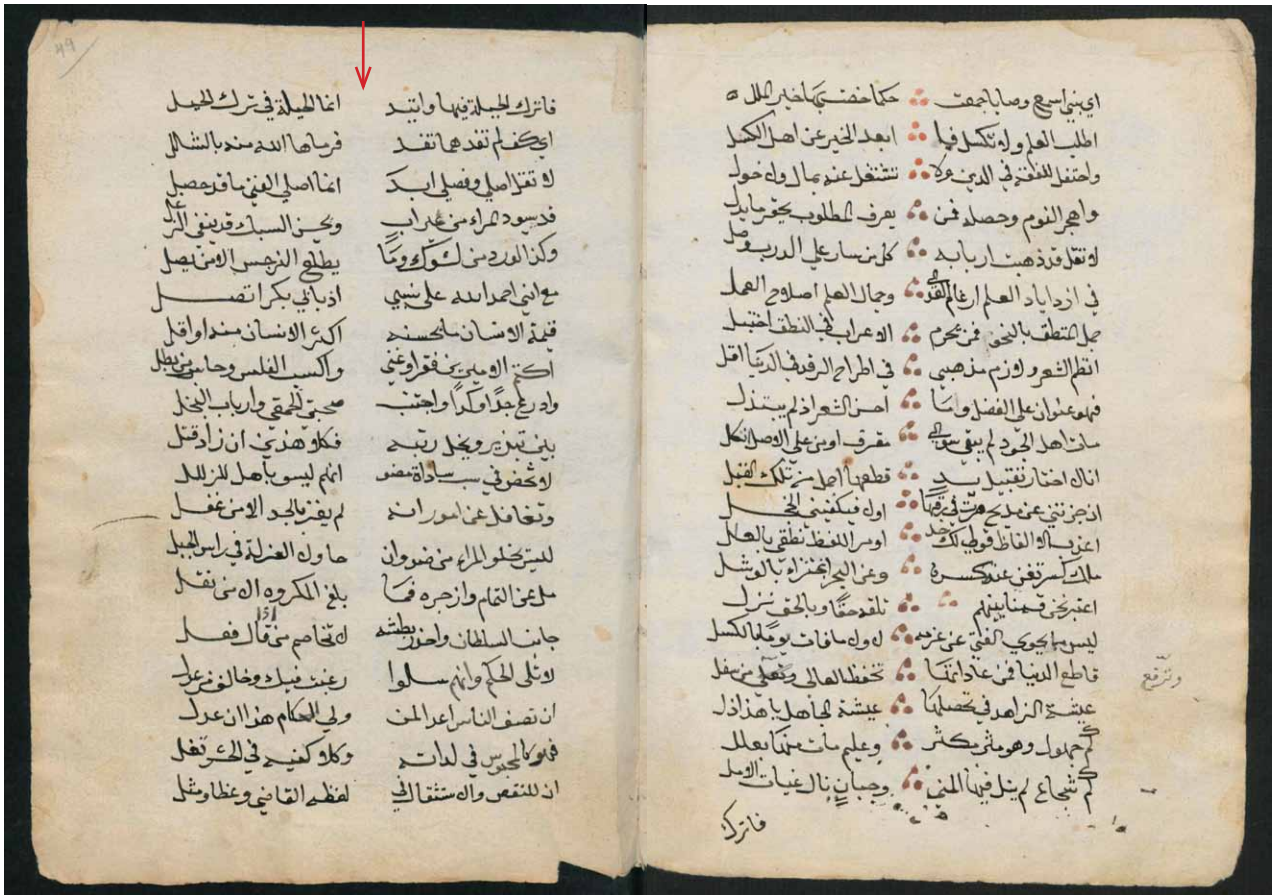


Fig. 20: Staatsbibliothek zu Berlin, Wetzstein 1748; fols. 48^v and 49^r.

directly by letting one line run directly towards the word he was commenting on. In addition, by making it skewiff, a longer line was available to the writer and thus the small amount of space available could be used more effectively. However, other examples without any space between the lines and in the margins indicate that the corresponding copy was not intended for annotations – neither interlinear nor marginal. But even if the layout clearly indicates that the copy was not meant to be glossed, annotations can often be found.

4. Comparison with the layout of copies of other didactic poems

Different forms of layout used for copies of the *Bad' al-amālī* have been examined and described in the first section of this article. Common layout types as well as specifics of individual copies have been outlined. In general, copies of the *Bad' al-amālī* are characterised by having a highly variable layout, even though there are elements which are obviously standard features. In order to find out if the above-mentioned components and peculiarities of the layout are specific to copies of the *Bad' al-amālī*, a comparison with copies of other didactic poems will be carried out.

4.a. Ibn al-Wardī's *Qaṣīda al-lāmīya*

First of all, fifteen copies of the *Qaṣīda al-lāmīya*, a poem by

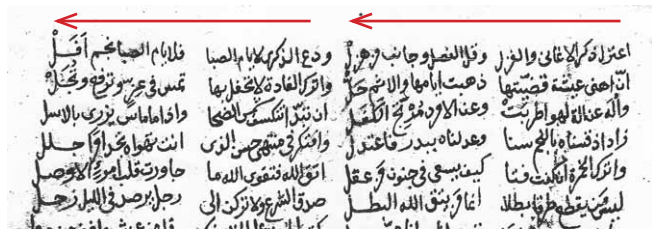


Fig. 21: Staatsbibliothek zu Berlin, Petermann 8; fol. 14 (detail).

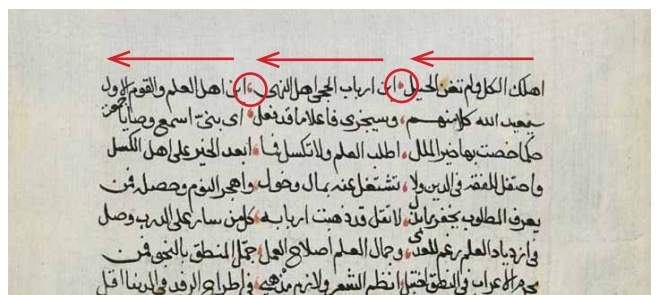


Fig. 22: Staatsbibliothek zu Berlin, Wetzstein 409; fol. 76^v (detail).

Zainaddīn 'Umar ibn Muẓaffar ibn al-Wardī (d. 1349), were analysed. This poem is also known by the title of *Waṣīya li-waladihī*. As this title indicates, it is addressed to the writer's

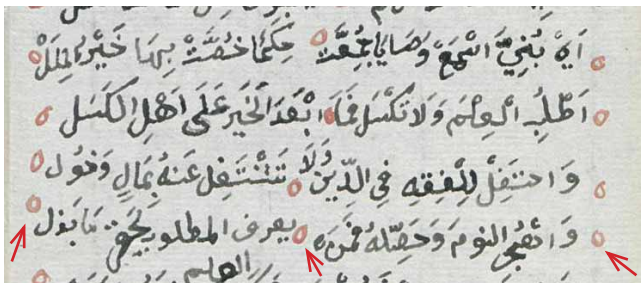


Fig. 23: Staatsbibliothek zu Berlin, Wetzstein 1793; fol. 39^r (detail).

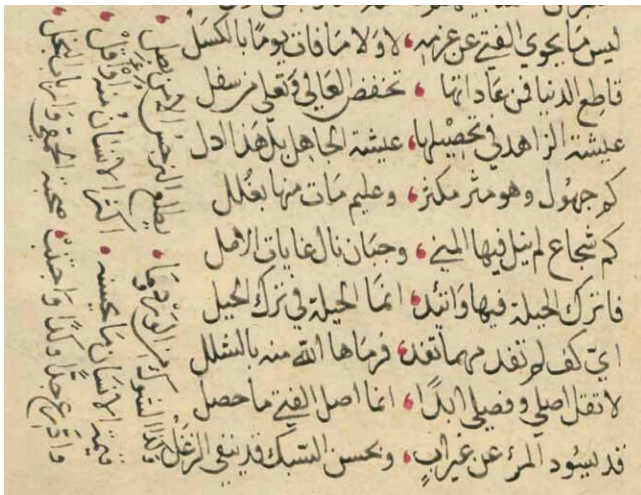


Fig. 24: Staatsbibliothek zu Berlin, Sprenger 1930; fol. 28^r (detail).

son, who is exhorted to live a life that will please God.²⁸ The number of verses in the manuscripts ranges from 68 to 80. Except for five copies, the hemistichs were arranged in two columns separated by dividers in the majority of cases. However, in one manuscript (fig. 20), the dividers are missing on one of the four pages.

In the other five manuscripts, the arrangement is entirely different in each case. The first one features four pseudo-columns per page (fig. 21). That means two verses or four hemistichs respectively are allocated to four columns. In another manuscript (fig. 22), the copyist arranged the hemistichs in three columns. This type of composition is very unusual, since only every second line ends with the hemistich with a rhyme. In addition, since the space between the columns is very small, it looks as if the text was written in a block, despite its droplet-shaped dividers.

The same applies to another copy (fig. 23). There are only two columns with a consistent line length on the first page; on the other pages, the hemistichs are of a different length. Due to the circular dividers between the hemistichs, however, which were also placed at the beginning and end of the lines, the hemistichs can still be distinguished from each other quite easily.



Fig. 25: Staatsbibliothek zu Berlin, Sprenger 1966; fol. 27^r.

Another copy shows two columns divided by little drops in magenta (fig. 24). To the left of these columns and written at a right angle are three (on the last page four) further rows, each with four hemistichs, separated by dividers of the

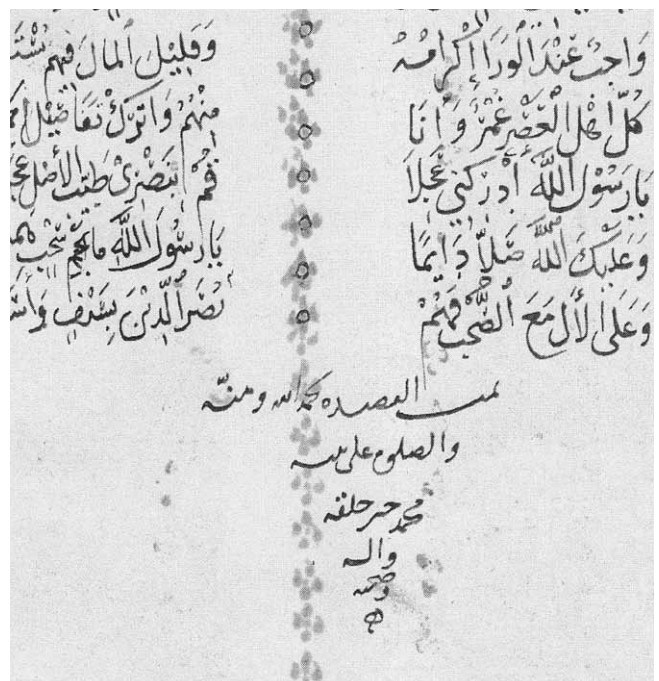


Fig. 26: Bayerische Staatsbibliothek, Munich, Cod. arab. 1235; fol. 109^r (detail).

²⁸ Cf. Quiring-Zoche 1994, 180ff.



Fig. 27: Staatsbibliothek zu Berlin, Petermann 241; fol. 69r.

same type. By knowing the number of lines, the scribe was presumably able to calculate in advance how to finish the poem at the foot of a page.

The peculiarity of the fifth manuscript is that the poem was written in the margin (fig. 25). The lines, each containing one hemistich, were written obliquely to the bordered poem placed in the middle.

Besides the commonly used dividers already introduced in connection with copies of the *Bad' al-amālī*, yet another type can be detected within this group of manuscripts. It is a kind of expansion of the familiar circular divider to form a flower-like element.

On the last page of this copy (fig. 26), the number of circles corresponds to the number of lines, but the row of petals continues and even runs through the colophon. This leads to the assumption that the petals were drawn first and the circles were added during the process of writing or shortly thereafter. Flowers are already known from the manuscript made for the Mamlūk sultan al-Ašraf Qānšawh al-Ġawrī



Fig. 28: Staatsbibliothek zu Berlin, Wetzstein 183; fol. 58r.

(cf. fig. 5), in which they merely have an ornamental function, not a separating one.

In all the examined manuscripts containing this poem, the text was written in black ink. Dividers, elements to adjust the length of a line and headlines were written in red²⁹ – or magenta in the case of one manuscript (Sprenger 1930; fig. 24). When analysing these copies, it becomes apparent that the text is not surrounded by rule-borders in any of them. This is an unusual and therefore striking fact. The reason for this might be that it was not customary to annotate such a paraenetic poem focusing on moral advice. As a matter of fact, only four of the examined manuscripts show a small number of annotations.

Two copies of the *Qaṣīda al-lāmīya* feature a peculiarity which has already been mentioned in connection with the Ilorin copy of the *Bad' al-amālī*. In both cases, the text was written in two columns, which often occurs, but one of the

²⁹ It cannot be said with any certainty for the manuscript Cod. arab. 1235 (see fig. 27), but the petals were probably red originally.

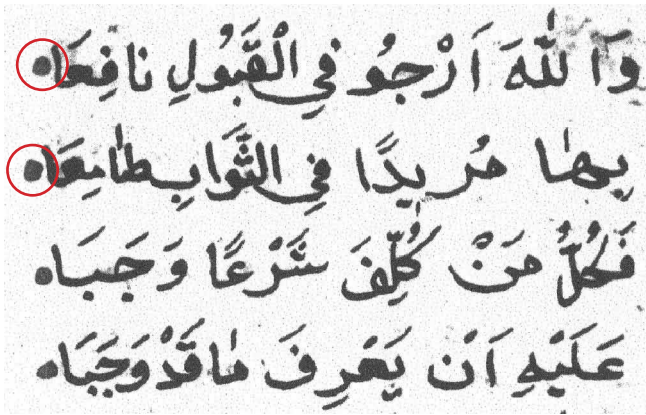


Fig. 29: Staatsbibliothek zu Berlin, Sprenger 1953; fol. 2' (detail).

two columns is always narrower than the other. In contrast to the Ilorin manuscript, which has a narrow right-hand column on the verso of each folio, these manuscripts display this characteristic on both sides of the page.

In one manuscript (Petermann 241; fig. 27), the narrow column is always on the right. In the other one (Wetzstein 183; fig. 28), however, it is always the left column that is narrower than the adjacent one.

With regard to the width of the single columns of these copies, it is striking that single letters of the wider columns were stretched to a certain length. Obviously the scribes did not aim at giving the columns a uniform width from the outset. On the basis of this discovery, it can be said that two columns of unequal width are not a specific feature of West African manuscripts. Moreover, this phenomenon is evidently not limited to copies of the *Bad' al-amālī*.

4.b. *Al-Laḳānī's Ġawharat at-tauḥīd*

In addition, six copies of the *Ġawharat at-tauḥīd*, a rhymed creed written by Burhān ad-Dīn Abū l-Imdād Ibrāhīm ibn

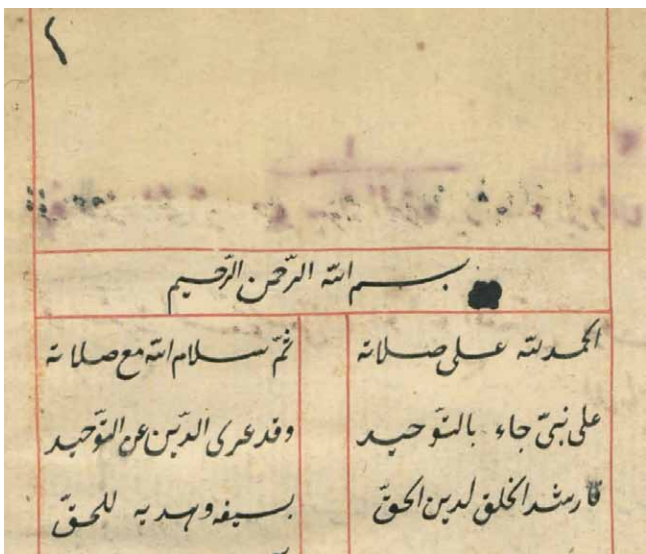


Fig. 30: Staatsbibliothek zu Berlin, Hs. or. 4831; fol. 1' (detail).

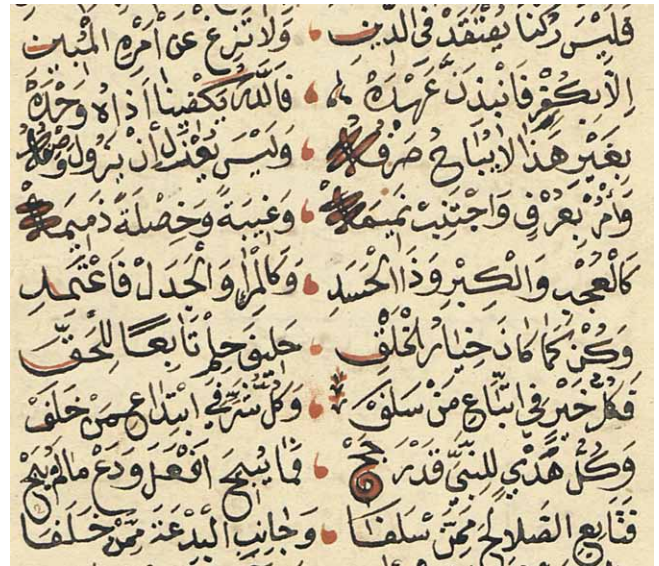


Fig. 31: Staatsbibliothek zu Berlin, Sprenger 1956; fol. 8' (detail).

Ibrāhīm al-Laḳānī al-Mālikī (d. 1631), have been chosen for comparison. The number of verses varies in different manuscripts, amounting in most cases to about 114.³⁰ The layout as a whole – especially the arrangement of verses in two columns – is comparable to the aforementioned groups. An exception to this rule is Sprenger 1953, which shows one hemistich and a circular divider per line apart from the first four lines (fig. 29).

There is only one copy among the examined material that features rule-borders, which are drawn in red with two central lines running parallel to the columns (fig. 30). In addition, two horizontal lines border the preceding *basmala*. Although this is the only exemplar with rule-borders, it is not the only one showing colours other than black. One copy, in particular, stands out with respect to its colouring and decoration (fig. 31).

Several letters are designed very eccentrically. The notation of the letters *hā'* and *tā' marbūṭa* are noteworthy in this regard as they were written in the form of a lattice. In addition to these grid-shaped letters, the spiral-shaped descenders of the letters *ḡīm*, *ḥā'* and *ḥā'*, which are usually arc-shaped, are particularly striking. In order to adjust the length of the line, the scribe filled the gaps using congeries of drops or nested V's or he used the *kashīda* justification mentioned above. All of these decorative elements were filled in with red ink or were at least adorned by a parallel red line. This copy of the *Ġawharat at-tauḥīd* bears an exceeding resemblance to the above-mentioned copy of the *Bad' al-amālī* (cf. fig. 15) regarding the colouring and embellishment of individual letters.

³⁰ Cf. Quiring-Zoche 2000, 96ff.

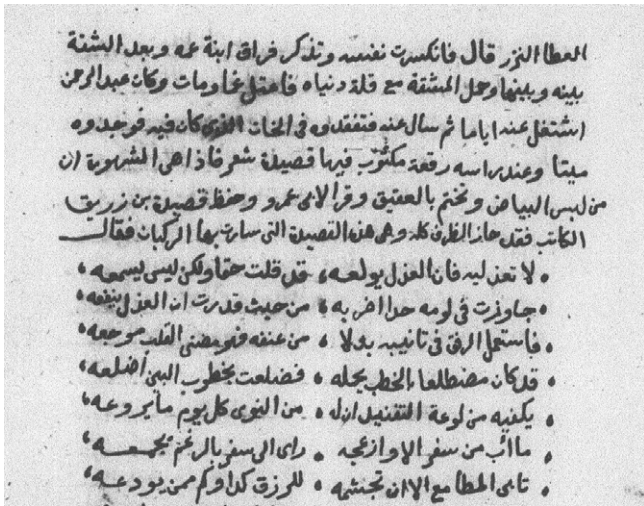


Fig. 32: Staatsbibliothek zu Berlin, Landberg 243; fol. 120' (detail).

To conclude, one can say that copies of the *Gawharat at-tauhiid* have several similarities to those of the previous groups and that none stands out by having a characteristic that could not be found among the aforementioned manuscripts containing copies of didactic poems.

4.c. Ibn Zurayq's *Andalusīya*

Of all the copies examined, there is one group whose layout differs in many respects, namely copies of the didactic poem *al-Andalusīya* by Abū l-Ḥasan 'Alī ibn Zurayq (d. 1029), a secretary from Baghdad.³¹ The number of verses usually amounts to forty, but there are manuscripts with 38 or 39 verses as well. Compared with the didactic poems treated above, it is thus comparatively short.

At first glance, the layout does not seem to differ greatly since copies of the *Andalusīya* were also often written in two columns with a rule-border and dividers placed between the hemistichs. However, the way in which the poem is embedded in the text surrounding it is very different. Unlike the other poems examined, the *Andalusīya* is obviously seldom treated as a separate, independent text; this poem is often passed on together with a prose text, basically a combination of commentary and theological statements, written in a text block. These sections are therefore directly related to the poem, which is probably the reason for the small space between the single text units. In addition, this connection explains the direct change from text block to columns (or another arrangement of the hemistichs), and vice versa.

As can be seen in another example (fig. 32), in some manuscripts the single text units adjoin directly and they are not separated by space or another method used to separate texts such as headings, frames or a different colour.

³¹ Cf. Ahlwardt 1894, 585.



Fig. 33: Staatsbibliothek zu Berlin, Petermann 193,2; fol. 53' (detail).

As a piece of poetry, the *Andalusīya* stands out from the preceding and subsequent sections as it has a different composition of lines – in this case two columns with dividers. The text block is usually wider than the two columns. However, there is one copy of the *Andalusīya* (Petermann 193,2; fig. 33) in which the poem is continued to the left of the two columns at a right angle, as it was already practised in one copy of the *Bad' al-amālī* (cf. fig. 25).

Because of this, the poem and the preceding text are nearly of equal width, which possibly was the writer's intention from the outset in order to achieve a harmonious overall appearance.

It is also conceivable that he intended to finish the poem with the end of the page. In the arrangement chosen here, the text takes up the entire recto and ends with the verses that were written at a right angle. If the scribe had only used two columns, he would have ended the poem in the upper part of the following page (verso).

Even though the poem is part of a multiple-text manuscript which only contains poetry (fig. 34; cf. Sprenger 1239 or Ms. or. Quart. 674), the space between the *Andalusīya* and the preceding and subsequent poem is usually very small.

To sum up, regardless of whether the *Andalusīya* is surrounded by prose or poetry, it is apparent that this didactic poem is not usually treated as a separate, independent text. Copies of the *Andalusīya* differ greatly from those of the *Bad' al-amālī* in this respect. With the exception of two manuscripts (Wetzstein 1754 and Cod. arab. 1735), copies of the *Bad' al-amālī* start at the beginning of a new page and end on a separate one as well. Even if the last verses only take up a third of the page, the remaining space is not usually used for another text. There are only two exceptions among the examined copies of the *Andalusīya*. In one manuscript (Petermann 542; fig. 35), the poem takes up three full pages. This manuscript is bound at the upper edge – a type of binding often used for notebooks

– and the script runs parallel to the binding. The verses of the poem are arranged in two columns with dividers at the beginning and end of each verse and between the hemistichs. These are shaped like a loop with overlapping ends and were drawn in red.

In the other manuscript (Ms. or. Quart. 117; fig. 36), the poem takes up one page written in a block. In this copy, neither dividers nor an extended interspace clearly separate the hemistichs; they are written one after another instead. Nevertheless, the copy shows a certain regularity since every line displays exactly two verses, even though they can hardly be discerned from each other as such.

The phenomenon of four hemistichs per line also appeared in a copy of Ibn al-Wardī's *Qaṣīda al-lāmīya* (cf. fig. 22), but this features four clearly separated pseudo-columns per page. Another one (Petermann 193,1) stands out in terms of the way the hemistichs are arranged.

As in the case of the copy of the *Bad' al-amālī* in Aya Sofya 1446 (cf. fig. 5), the first and the first half of the second hemistich are written in one line and the last part of the second hemistich, which carries the rhyme, is centre-justified below (fig. 37).

To sum up, the layout of copies of the *Andalusīya* results primarily from the textual context in which it frequently appears and the length of the poem, which is too long for only one page, while two pages are generally too much.

Comparison with copies of Abū Nuwās' *Dīwān*

A final comparison with copies of poems of other sub-genres serves to provide information as to whether the exposed types of layout are specific to copies of didactic poetry or whether they can generally be found in copies of any kind of poetry. Black-and-white photographs of thirteen copies of Abū Nuwās' *Dīwān*, a bequest from Arthur Schaade (d. 1952) kept by the Hamburg State and University Library, were examined for this purpose.



Fig. 35: Staatsbibliothek zu Berlin, Petermann 542; fol. 172r.



Fig. 34: Staatsbibliothek zu Berlin, Sprenger 1228; fol. 9r (detail).

In the literature of the Near and Middle East, *dīwān* is the Arabic term for a collection of poems by one author that often covers a certain range of topics. These collections are usually quite comprehensive, extending to several volumes. Due to the amount and variety of different poems, not every detail can be described here, but some striking characteristics of the handwriting used for these poems will be pointed out.

Abū Nuwās (d. 815 CE), a famous poet of the early 'Abbāsīd period, is well known for two genres, namely the wine poem and the hunting poem, but he is mainly remembered in connection with the former.³² His *Dīwān*, which is completely extant, is the earliest to contain a section especially devoted to the chase.³³ His hunting poetry (*ṭardīya*) consists of pieces in both *rağaz* and other metres, but beyond the hunting poems *rağaz* is not to be found.³⁴ In most copies of his *Dīwān*, these *arāğīz*, i.e. poems written in *rağaz*,³⁵ stand out because of their different layout. While poems in other metres in this collection are written in a text block without any intermediate space, the short hemistichs of the

arāğīz are split up. With respect to the overall layout of these manuscripts, this means that text blocks of uniform width, merely interrupted by centred or outdented subheadings, form the basic layout used on every page. Only the hunting poems in *rağaz* contrast with this layout as they are written in two columns. It is striking that only one of these eight manuscripts (Köprülü 1250) additionally features dividers between the hemistichs.

In one manuscript (Fātiḥ 3775), only excerpts of his poems were compiled. Only the hemistichs of the verses composed in *rağaz* are split up in this manuscript. Since sections

³² Kennedy 2005, viii.

³³ Smith 1990, 168.

³⁴ Cf. *ibid.*, 168 and 174.

³⁵ Kennedy 2005, 110.



Fig. 36: Staatsbibliothek zu Berlin, Ms. or. Quart. 117; fol. 96^r (detail).

composed in *rağaz* alternate with those of other metres, however, a permanent change between small text blocks and short columns results. This seems to be an exception, though, as this phenomenon only occurs in one manuscript. In four of the examined manuscripts, the poems in both *rağaz* and other metres are all written in two columns. This corresponds to the assertion which was put forward at the beginning, namely that poetry, no matter which kind, is most frequently written in two columns. In these manuscripts, the hemistichs are additionally always separated by dividers, usually dots or congeries of drops. Framing of the written area or the columns seems to be atypical for copies of the Abū Nuwās' *Dīwān* as this feature could not be found in any of the manuscripts examined.

Conclusion

Even the earliest dated copies in Arabic script – both Qur'āns datable to the seventh or early eighth century and non-Qur'ānic texts in manuscripts from the ninth century – show a tendency to use long, continuous lines. This tradition was maintained by scribes when copying texts in Arabic script. Poetry, however, is an exception to this rule. The peculiarities of Arabic poetry determine the layout to a large extent. Copyists frequently used a layout that emphasised the typical characteristics of poetry, namely its bipartite structure and rhyme.³⁶ Although exceptions do exist, writing the hemistichs in two columns separated either by a gap, dividers or vertical lines seems to have been the most typical way of arranging poetry. Consequently, in most cases, even an untrained eye can recognise whether a text is poetry or prose simply by looking at its layout. In addition, in the case of monorhyme, the identical last grapheme(s) give the reader an important hint. The latter particularly matters in copies of Abū Nuwās' *Dīwān*, in which most of the poems (with the exception of the *'arāğīz*) are written in text blocks without any intermediate spacing.

Although standardised ways of writing down poetry have developed, some copies stand out because of their peculiar layout features, which – as this investigation has attempted to

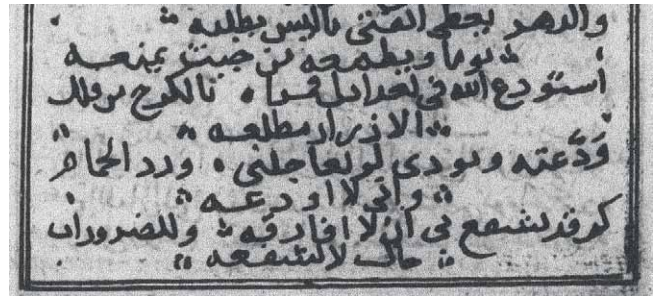


Fig. 37: Staatsbibliothek zu Berlin, Petermann 193,1; fol. 29^r (detail).

show – are not necessarily singular. Even the specifics of the fancy copy of the *Bad' al-amālī* mentioned above (Sprenger 1956; cf. figs. 14–16), which one might take to be an exception at first glance, appear in other manuscripts containing for example copies of the *Ġawharat at-tauhīd* (cf. fig. 31). These copies, which stand out on account of their complex design, are in the minority in relation to the rest of the group of copies of Arabic didactic poems. Apart from rare exceptions like these, they are usually designed in a relatively simple way with regard to the script, frames, dividers and colours used and the composition of the lines they contain. The reason for this is most likely to be their intended purpose, namely teaching and learning. These manuscripts preserve knowledge and also serve as an educational resource in a process in which oral and written traditions complement each other. Within this context, the copies of the didactic poems served as manuals for moral education and as implements for the memorisation of the text, which is why teachers were owners of manuscripts just as their pupils were, who frequently wrote the texts down in the course of their instruction and occasionally left important hints such as ownership statements, certificates of audition (*samā'*) or similar notes.

A simple but well-structured and functional form of visual organisation proved to be of value in this context of teaching and learning. In contrast, questions of prestige or comparable motives had little influence on the layout in most cases and were probably mostly restricted to commissioned works, which were not intended for intensive study. The primary purpose of these plain manuscripts made for practical use was the preservation and transmission of knowledge and this is ensured by a structured and organised – but not necessarily aesthetically appealing – copy of the poem. In conclusion, however, it has to be stressed that even if different layout features proved to be practical for this purpose and were used as a standard, every single copy is characterised by singularities and its own uniqueness.

³⁶ Cf. Déroche 2005, 171 and 173.

LIST OF MANUSCRIPTS

Al-Ūshī, *Bad' al-amālī**Berlin, Staatsbibliothek zu Berlin Preußischer Kulturbesitz:*

Diez oct. 50
 Hs. or. 4496
 Hs. or. 4505
 Hs. or. 4950
 Landberg 28
 Sprenger 1956
 Wetzstein 1718
 Wetzstein 1721
 Wetzstein 1754
 Wetzstein 1804

Göttingen, Niedersächsische Staats- und Universitätsbibliothek:

Cod. Ms. arab. 176

München, Bayerische Staatsbibliothek München:

Cod. arab. 1610
 Cod. arab. 1735
 Cod. arab. 2005
 Cod. arab. 2615

Princeton, Princeton University Library:

Garrett no. 3174Y
 Garrett no. 3563Y
 Garrett no. 4392Y
 Garrett no. 5014Y
 Garrett no. 5043Y
 Garrett no. 5130Y
 Garrett no. 5310Y
 Garrett no. 5729Y
 Garrett no. 5807Y

Istanbul, Süleymaniye Library:

Aya Sofya 1446
 Karaçelebizade 347
 Kılıç Ali Paşa 1027

Ilorin, Nigeria:

Manuscript in a private collection owned by the Ile Tapa Gbodofu Qur'an school in Ilorin, Nigeria (Reichmuth)

Ibn al-Wardī, *Qaṣīda al-lāmīya**Berlin, Staatsbibliothek zu Berlin Preußischer Kulturbesitz:*

Hs. or. 4438
 Petermann 8
 Petermann 241
 Petermann 654
 Petermann 696
 Sprenger 1930
 Sprenger 1966
 Wetzstein 183
 Wetzstein 409
 Wetzstein 702
 Wetzstein 705

Wetzstein 1748

Wetzstein 1793

Munich, Bayerische Staatsbibliothek München:

Cod. arab. 587
 Cod. arab. 1235

Al-Laḡānī, *Ġawharat at-tauḥīd**Berlin, Staatsbibliothek zu Berlin Preußischer Kulturbesitz:*

Hs. or. 4831
 Ms. or. Quart 618
 Petermann 703
 Sprenger 1953
 Sprenger 1956
 Wetzstein 1732

Ibn Zurayq, *Andalusīya**Berlin, Staatsbibliothek zu Berlin Preußischer Kulturbesitz:*

Glaser 37
 Glaser 168
 Landberg 243
 Ms. or. Quart 117
 Ms. or. Quart 674
 Petermann 193,1 and 2
 Petermann 542
 Sprenger 1228
 Sprenger 1239
 Wetzstein 1547

Abū Nuwās, *Dīwān**Hamburg, Staats- und Universitätsbibliothek Hamburg Carl von Ossietzky:*

Bequest from Arthur Schaade (NL Schaade), 28 Archive boxes with photographs of manuscripts:
 Aḥmed Paša 267
 Add. 19404
 Brit. Mus. Add. 24948
 Fātiḥ 3773
 Fātiḥ 3774
 Fātiḥ 3775
 Hs. Ambrosiana
 Köprülü 1250
 Köprülü 1251
 Ms. No. 3867
 Rāḡib Paša 1099
 'Umūmī 5767
 Zāhirīya 7877

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Fig. 2, fig. 7, fig. 8, fig. 19: © Princeton University Library. Department of Rare Books and Special Collections. Manuscripts Division. Islamic Manuscripts.

Fig. 3, fig. 4, fig. 9, fig. 10, fig. 11, fig. 12, fig. 13, fig. 14, fig. 15, fig. 16, fig. 17, fig. 20, fig. 21, fig. 22, fig. 23, fig. 24, fig. 25, fig. 27, fig. 28, fig. 29, fig. 30, fig. 31, fig. 32, fig. 33, fig. 34, fig. 35, fig. 36, fig. 37: © Staatsbibliothek zu Berlin Preußischer Kulturbesitz.

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Fig. 18, fig. 26: © Bayerische Staatsbibliothek München

Article

On the Eight Uses of Palm Leaf: *ōlai* and *ēṭu* in the Tamil Literature of the First Millennium*

Eva Wilden | Hamburg

We are reading and editing Classical Tamil texts that may roughly date back to the beginning of the first millennium of the Common Era. However, the manuscripts that still exist are at the best two to three hundred years old. Still, if we want to find out what manuscripts may have meant in their own cultural context, one possible approach is to trace references to manuscripts and related practices in the literary texts of an earlier period. A cursory survey of sources from the first millennium (in so far as they are available in searchable, digital form) reveals, apart from a number of manuscript-related terms such as *ōlai* and *ēṭu* (for the palm leaf itself), *kāppu* for the string it is tied with and *ūci* for the stylus employed for writing, a whole range of various ways in which manuscripts were used. The verb *eḷututal*, ‘to draw’, is commonly used in the sense of writing since the *Akanāṇṇūru* (*AN*), which is one of the earliest poetic anthologies of Classical Tamil included in the so-called *Caṅkam* (‘academy’) corpus datable to approximately the first centuries of the Common Era¹ (where it is used in connection with the stone inscriptions on what is called, in Tamil, a *naṭukal*, ‘hero stone’, inscribed memorial stones erected in honour of fallen warriors of exceptional prowess)². Also its nominal derivation *eḷuttu*, ‘letter’, may be found in the same context.

The time frame contemplated in this article can be roughly described as the second half of the first millennium with the exception of part of the *Akanāṇṇūru* material which may

even date back several centuries further.³ The texts belong to five different genres. Apart from the *AN* and the *Kalittokai*, a later addition to the same corpus, we find recurring references in the poetic epic *Cilappatikāram*. Two of the didactic anthologies collected under the title *Kīḷkkaṇakku*, ‘minor classics’, which follow in the wake of the *Caṅkam*, have to be taken into account as well, namely the *Nāḷaiyār* and the *Paḷamoḷi* (as a continuation of the tradition of court poetry, the *Muttollāyiram* can be mentioned which followed slightly later). Finally, the *Śaiva* devotional tradition does not remain silent on our topic, even if the event alluded to is to be considered as mythical.

Table: the semantic field⁴

Term	Source
<i>eḷututal</i> ‘to write, inscribe, draw’ <i>eḷuttu</i> ‘letter’	hero stones in the <i>Akanāṇṇūru</i> ~ 3/4 th c. CE
<i>ōlai/ēṭu</i> ‘palm leaf’ ⁴	<i>Akanāṇṇūru</i> , <i>Kalittokai</i> , <i>Cilappatikāram</i> , <i>Peruṅkatai</i> , <i>Tēvāram</i> , <i>Nāḷaiyār</i> , <i>Paḷamoḷi</i> ~ 5 th –8 th c. CE
<i>kāppu</i> ‘string’	<i>Kalittokai</i> ~ 6 th c. CE
<i>ūci</i> ‘stylus’	<i>Muttollāyiram</i> ~ 8/9 th c. CE

* The material on which this article is based was first presented at a meeting of the then Research Group Manuscript Cultures in Asia and Africa financed by the German Research Foundation (DFG), as well as to the participants of the 9th Classical Tamil Summer Seminar in Pondicherry. Among the colleagues to whom I would like to thank for discussing this topic I just want to mention Jean-Luc Chevillard who brought to my attention the strange verse from the *Intirakāḷiyam* quoted at the end.

¹ The *Caṅkam* corpus comprises the ‘Eight Anthologies’ *Eṇṇittokai* – i.e. the six earlier anthologies *Kuṟuntokai*, *Narriṇai*, *Akanāṇṇūru*, *Puṟaṇāṇṇūru*, *Aiṅkuṟunūru* and *Paṭiṟruppattu* as well as the two later anthologies *Kalittokai* and *Paripāṭal* – and the ‘Ten Songs’ *Pattuppāṭṭu*. For a model of their anthologization and interrelation, see Wilden 2014.

² For a discussion of the literary and archaeological evidence concerning the hero stones, see Rajan 2014; for the Tamil Brahmi material see also Mahadevan 2003.

³ The *Akanāṇṇūru* is generally considered as counting among the oldest *Caṅkam* anthologies (with core material dating back to the first three centuries CE), however its poems are often difficult to place because, arguably, the collection was compiled late and thus contains not only very early but also fairly late material (as late as the sixth century). In the case of the hero stone poems the considerably high number of formulaic elements as well as conservative morphology and syntax rather seem to point to an earlier date; moreover, one poem has a long formulaic parallel in the *Aiṅkuṟunūru*, one of the intermediate anthologies.

⁴ As for the semantics of *ōlai* and *ēṭu*, both seem to be special forms of more general terms referring to the leaf or part of the leaf of the Palmyra

Going roughly through the relevant passages in the order of temporal precedence, the *AN* has to be put first. Here, palm leaf as writing material is not yet mentioned, but the so-called hero stones (*nāṭukal*) form a small topos in only two of the *Caṅkam* anthologies, the *AN* and the *Puṛaṇānūru*. Since the latter is the core anthology of heroic poetry (*puram*), the presence of such a topic is not surprising. In the love poetry (*akam*) of the *AN*, the exclusive context is a subtheme of *pālai* poems (the setting where the male protagonist travels through the desert region), namely of the dangers of travelling due to highway robbery. Being killed in the fight against such bandits was one of the reasons for a man to receive a hero stone.

Akanānūru 53.10f. [10–11b ~ *Aiṅkurunūru* 352.1–2b]
(letters on a hero stone)

விழுதொடை மறவர் வில்லிட வீழ்ந்தோ
ரெழுத்துடை நடுகல் லின்னிழல் வதியும்

viḷu toṭai maṟavar vil iṭa vīḷntōr
eḷuttu uṭai naṭukal iṇ niḷal vatiyum

Abiding in the shade of the hero stone [inscribed]
with letters
for those fallen when the bold [highway] men with
excellent arrows had aimed [their] bows.

In the above quotation, letters were engraved on a stone, which was erected to commemorate defenders killed in a fight against robbers (the traditional occupation of the desert folks being to waylay travellers, since their barren country cannot feed them) and was apparently quite big as a person could stay in its shade. What is supposed to be written there follows from the subsequent passage which belongs to the same topical subset in two closely related formulaic versions.

Akanānūru 67.8–10 [9f. = *AN* 131.10f.]
(writing on hero stones)

palm (*borassus flabelifer*). The *Marapu-iyal* of the *Tolkāppiyam* (one of the first parts of a literary *thesaurus* in the grammatical tradition) enumerates both among the parts of the species referred to as (soft-cored) *pul*, 'grass', in contrast to (hard-cored) *maram*, 'tree', from which we must conclude that palm trees were not perceived as trees but rather as a variety of grass. *Sūtra* TPi 635 runs: *tōṭu maṭalē ḍlai enṛā | ēṭē italē pālai enṛā | ṛkkē kulai eṇa nērntaṇa pīravum | pulloṭu varum eṇac collīṇar pulavar*. Learned men say that the following terms are used to denote the different parts of the *pul* genus: *tōṭu* (sheath), *maṭal* (tagged stem), *ḍlai* (leaf), *ēṭu* (strip of leaf), *ital* (petal), *pālai* (spathe), *ṛkku* (rib of a leaf), *kulai* (bunch), etc. (translation Subrahmanya Sastri 1956, 224f.). Furthermore, the leaf of a tree (*maram*) is called *ilai* (TPi 633), a term once used in the most important of the early Śaiva devotional anthologies, the *Tēvāram*, in the sense of inscribed palm leaf (see note 11). For the early period contemplated herein, the predominant word is clearly *ḍlai*; only three examples of the use of *ēṭu* could be established so far.



Fig. 1: Hero stone from Pakkam, (6th cent. CE).

நல்லமர் கடந்த நாணுடை மறவர்ப்
பெயரும் பீடு மெழுதி யதர்தொறும்
பீலி சூட்டிய பிறங்குநிலை நடுகல்

nal amar kaṭanta nāṇ uṭai maṟavar
peyarum pīṭum eḷuti atar torum
pīli cūṭṭiya piraṅku nilai naṭukal

Hero stones in glittering condition adorned with peacock
feathers

on every way, inscribed with the name and fame
of honourable⁵ warriors overcome in good battle.

Inscribed, or, more precisely, incised in the stone are the 'name and fame', which are presumably the name of the hero and his deed through which he dies. Judging by the actual hero stones of which a considerable number was found even before the beginning of the Common Era and the *Caṅkam* period – i.e. predominantly between the fourth century BCE

⁵ *nāṇ* is one of the key words referring to the ethical codex of the heroic domain. Its basic meaning is 'shame', which means, in the case of men going to war, their sense of honour which prohibits them to show any weakness such as fear or even cowardice.

and the fifth century CE⁶ – the inscriptions were incised either in Tamil *brahmī* or in early *vaṭṭeluttu* script.⁷ Still in the AN, but perhaps in a slightly later layer we find the first reference to a palm leaf as an item used, although the passage is too elusive to determine whether it was used as a writing support or whether it had a symbolic value as such.

1. Ensign of Peace

Akanāṅṅūru 337.7

(message/ensign of peace?)

தூதொய் பார்ப்பான் மடிவெள் ளோலை
tūtu oy pārppāṅ maṭi veḷ ṭlai

The folded white palm leaf of a brahmin sent as a messenger.

In the above quotation, a Brahmin acting as a messenger, holding a palm leaf (*ṭlai*) in his hand, is attacked by desert robbers who believed he was carrying gold. The description of the palm leaf as being ‘white’ (*veḷ*) is quite unclear, since it can either mean that it is bright and plainly visible or that it was intentionally left blank (cf. the *Peruṅkatai* example on p. 57). Further, it may have been folded if we take *maṭi* as a verbal root, which with respect to a palm leaf may rather mean that it was rolled up lengthwise into a sort of ring, which was presumably easier to carry than an easily damaged loose leaf.⁸ Or it may have been covered in cloth (*maṭi* as a noun), which might explain the robbers’ interest who apparently hoped for a more valuable content of the bundle. Either way no mention is made of script being used on the palm leaf; it could indeed contain a message or be a sign of messenger’s legitimation.⁹

The next passage, which is one of the two passages using *ēṭu* instead of *ṭlai*, is unambiguous with respect to writing, although the function is far from being obvious. It seems to be of a ritual nature rather than of an informative one.

⁶ For details on such findings see Rajan, ib., who affirms that the practice continued until the seventeenth century; from the fifth century CE onwards inscriptions can be accompanied by carved images.

⁷ Both scripts are generally counted among the derivatives of Aśokan *brahmī*, with Tamil *brahmī* being the earlier of the two, and both predate the actual Tamil script found in the surviving manuscripts which, apart from some modifications, is still used today.

⁸ Rolled palm leaves are today found in manuscript collections (one is kept in the Staats- und Universitätsbibliothek Hamburg Carl von Ossietzky). They seem to be amulets, with a charm or protective verse written on them which, however, cannot be deciphered anymore, since a leaf kept in such a position for so long cannot be unrolled without being destroyed.

⁹ Palm leaves handed over by ambassadors is a practice referred to in a famous commentary of approximately the thirteenth century on the most important among the early didactic anthologies, namely *Parimēlaḷakar* on *Tirukkuḷaḷ* 687. However, in this case it is not specified either whether or not something is written on the palm leaf.

2. Expiation

Cilappatikāram 15.58

(expiation)

வடமொழி வாசகஞ் செய்த நல்லேடு
vaṭamoḷi vācakam ceyta nal ēṭu

A good palm leaf made with a verse in Northern language.

The above quotation includes one of the elusive sub-episodes in the narrative of the oldest poetic epic in Tamil, the *Cilappatikāram*. Among the good deeds of the hero Kōvalaṅ the following is mentioned: the wife of a *brahmin* inadvertently killed a mongoose. In order to make her expiate her sin, her husband inscribes a Sanskrit verse on a palm leaf and sends her abroad to go from house to house in order to find someone who will take the leaf from her including the sin, an act of kindness duly performed by Kōvalaṅ. The cultural background remains obscure; it is neither clear what the function of writing is in this case, nor what the reason of using Sanskrit rather than Tamil language is.¹⁰ However, the same text testifies to the practice of writing as a somewhat more wide-spread activity, because we also find an episode where the courtesan Mātavi writes a private letter to her absent lover Kōvalaṅ.

3. Letters

Cilappatikāram 13.74c-78

(letter)

மலர்க்கையி னெழுதிக்
கண்மணி யனையாற்குக் காட்டுக வென்றே
மண்ணுடை முடங்கல் மாதவி யீத்ததும்
ஈத்த வோலைகொண் டிடைநெறித் திரிந்து

malar kaiyiṅ eḷuti
kaṅ maṇi aṅaiyārku kāṭṭuka eṅṅē
maṅ uṭai muṭaṅkal mātavi tītatum
tīta ṭlai koṅṅ iṭai-neṅṅit tirintu

As soon as Mātavi gave the sealed scroll,
having written [it] with her blossom hand,
[with the words] ‘show [it] to him who is like the pupil
of [my] eye’,
he took the palm leaf given [by her] and set out on [his] way.

¹⁰ A somewhat later parallel for the use of the term *ēṭu* derives from the Vaiṣṇava devotional corpus, i.e. the *Periyatirumōḷi* of Tirumaṅkaiyālvār (ninth c.). *Periyatirumōḷi* 4.1.7 includes a description of *brahmīns* who are knowledgeable in the *Vedas*: *ēṭ ēṭu perum celvatt eḷil maṅaiyōr*, ‘graceful *Veda* experts with great wealth that is spread by palm leaves’. I suggest interpreting this as an elaboration of the Tamil designation of the devotional corpus as *Veda*; in contrast to the notoriously unwritten *Veda* of the Northern tradition, the Tamil *Veda* was transmitted and is accessible in manuscript form.

Besides *ōlai* we find a second term in the above quotation which may go back to an idiosyncratic use in the *Cilappatikāram*, namely *muṭaṅkal*, morphologically a verbal noun of the root *muṭaṅkutaḷ*, ‘to bend’. Not unlike the attribute *maṭi* included in *AN 337.7* above, it seems to refer to what is done with the leaf once it has been written on, namely to fold or, as already suggested, rather to roll it, which suggests ‘scroll’ as a plausible translation for the verbal noun. The further attribute here conveys important information; *maṇ-ūṭai* literally means ‘possessing clay’, which is explained by the commentator as a seal (*illaciṇai*). Thus the palm leaf is written on, rolled and sealed and then sent out as letter. Regarding the delivery of the letter, the text varies between *ōlai* and *muṭaṅkal* without any apparent differentiation; the commentary uses the term *ōlai*.¹¹

A differentiation seems to be made between *ōlai* and *ēṭu* in another, perhaps roughly contemporaneous text of the epic tradition, the *Peruṅkatai*, which is a Tamil version of the *Bṛhatkathā*.¹² In this context, an order is given to servants by king Piraccōṭaṇṇ concerning the accommodation of prince Uṭayaṇṇ as honoured guest according to his rank.

4. Cheque

Peruṅkatai 1.32.69f.

(cheque)

வெள்ளேட்டங்கண் வித்தக மெழுதிய
கடையெழுத் தோலைக் கணக்கு வரிகாட்டி
veḷ ēṭṭ' ankaṇ vittakam eḷutiya
kaṭaiyeḷutt' ōlaik kaṇakku vari kāṭṭi

Showing the lines of an account on a palm leaf with
signature
written with skill there on a blank leaf.

So the king’s servants are supposed to show the document produced to the treasurer in order to be able to draw on the amount required for entertaining the guest in proper style. The document in question is a palm leaf (*ōlai*) representing an account (*kaṇakku*) – presumably a calculation of the amounts to be spent for different purposes (e.g. housing, food etc.) – authenticated by the king’s signature (*kaṭaiyeḷuttu*)¹³, with the whole text having been written on a piece of white or

¹¹ The phrase referring to a sealed scroll (*maṇṇūṭai muṭaṅkal*) is used once more in the *Cilappatikāram*, in 26.171, referring to an official letter written by the royal scribes and sent off by the king. The commentary gloss mentioned above is found in connection with said passage.

¹² For a comparative study of the various versions and possible sources for the Tamil *Peruṅkatai* and a synopsis of the events referred to see Vijalalakshmy 1981.

¹³ *kaṭaiyeḷuttu* is literally the ‘end-writing’, glossed by the commentary as ‘hand likeness’ (*kaiyoppam*).

blank¹⁴ palm leaf (*ēṭu*), which obviously refers to the material support. The modern designation that comes closest to such item would be a cheque, with the extended function being to record the exact use of the king’s gold.

If we now examine *AN 337.7* once again in the light of the last two passages, we are rather confused. On the one hand, the use of *muṭaṅkal* (‘scroll’) in the *Cilappatikāram* may serve to interpret the ‘rolled’ (*maṭi*) leaf mentioned there rather as a written message. On the other hand, the *Peruṅkatai* mentions a second ‘white palm leaf’ (*veḷ ōlai*), interpreted by the commentator as a blank leaf. How are we to understand a blank palm leaf in letter format carried by a messenger or ambassador? It is impossible to answer this question without examining further parallels.

5. Accounts

A different use of palm leaves, which however belongs to a similar sphere of human activity, is shown in the *Nālaṭiyār*, one of the didactic *Kīlkkkaṇakku* anthologies dating back to approximately the seventh century. One of the distinct characteristics of almost all the poetry of this period is a consciousness of the heavy load of tradition. Classical Tamil poetry is subjected to a very strict and complex set of conventions, and poetic originality often consists in the attempt to find new, surprising similes and metaphors to express the inherited range of situations and emotions. The following verse reflects the sadness of the evening, a time when separated lovers, after the day’s work has been done, take their time to think of their absent dear ones, which seems to be a playful variant on the topos of human activities coming to an end.

Nālaṭiyār 40.7.1

(account)

ஓலைக் கணக்க ரொலியடங்கு
ōlaik kaṇakkar oli aṭaṅku

(In the evening,)

when the noise of those making accounts on palm leaves
subsides.

The idea is that in the evening work stops, including the hustle and bustle of talking and, presumably, dictating on the part of the accountants who keep their accounts on palm leaves – a practice to which tons of badly assorted decaying material in various temples and libraries still bear testimony.

¹⁴ *veḷ ēṭu* is explained by Cāmināṭiyār as a palm leaf that has not been written on (*eḷutāta ōlai*) for which he finds a quotation from the inventory of anonymous poetry (*tāṇippāṭar riraṭṭu*) that is quite impossible to date.

A parallel for *kaṇakku* meaning ‘account’,¹⁵ although in a metaphorical sense, can be found in the *Tēvāram*, the core text of the Śaivite bhakti corpus, dating back to approximately the seventh cent.

Tēvāram 5.21.8

(account)

பொழுது போக்கிப் புறக்கணிப் பாரையும் |
இன்னம்ப ரீசன் கீழ்க்கணக் கெழுதும்,

poḷutu pōkkip purakkaṇippārayum |
iṇṇampar īcaṇ kīlḷkaṇakku eḷutum,

Those who waste [their] time, neglecting [religious service]
Śiva in *Iṇṇampar* (the temple) will write down in [his]
account [book].

6. Literary/Learned Texts

The first reference to palm-leaf as a material support for literary texts appears late, i.e. in one of the late additions to the classical corpus, the *Kalittokai*. This is interesting in two ways, because the passage in question might be considered as an indication of the transition from oral to written transmission. None of the six anthologies in today’s *Eṭṭuttokai* that probably formed the original collection (and are still transmitted as a series in some of the surviving manuscripts) contain any reference to a written tradition, although they certainly derive from a literary tradition with a set of highly sophisticated conventions (described in a roughly contemporaneous poetological treatise, the *Tolkāppiyam*). Thus they are representing a tradition which is quite conscious of itself, as is attested by a variety of meta-poetic games such as playing with homophones, ironical intertextual references, and the like.¹⁶

Kalittokai 94.42f.

(poetic/learned text?)

துகடபு காட்சி யவையத்தா ரோலை
முகடு காப்பு யாத்துவிட் டாங்கு

tukaḷ tapu kāṭci avaiyattār ōlai
mukaṭu kāppu yāttuviṭṭāṅku

as if the strings were tied on top
of the palm leaf by those of the assembly whose sight fails
with dust.

In fact the *Kalittokai* does not contain a direct statement but provides a variant on another famous topos in the form of a simile for the closeness of lovers in an embrace, thereby recalling the famous *Kuṇṭokai* 370 where the encounter between lover and beloved is compared to fingers gripping a bow in aiming, an image that has given the poet his pen name, Villakaviraṇiṇār (‘He [who sung] the fingers on the bow’). In this example the lovers are as tightly linked as a palm leaf is tied with strings, which here undoubtedly means a manuscript. As a poetic aside we are getting a glimpse of the poet-scholars who handle the object in question, who are (ironically?) very far from being lovers and whose vision is clouded by the proverbial dust from the palm leaves, thus suggesting an ancient tradition.

A written tradition, though a devotional one in the present case, is also a prerequisite for the next passage from the Śaivite *Tēvāram*. It has to be read as an allusion to a well-known episode from the life of Tiruṇānacampantar, one of the three poet-sages who composed the *Tēvāram*, which is told *in extenso* in the twelfth-century hagiographic *Periyapurāṇam*.

Tēvāram 3.54.11.2c–3c

கரைக்கு ஓலை தெண்ணீர்
பற்று இன்றிப் பாங்கு எதிர்வின் ஊரவும்

karaikku ōlai teḷ nīr
parru iṇri pāṅku etirviṇ ūravum

when the palm leaves moved against nature (= upstream),
without being seized by the clear water, to the shore.

The episode alluded to is part of the poet’s conflict with the Jains. As part of a discussion with the exponents of the (from the Śaivite perspective) heterodox sect, both parties threw bundles of palm leaves containing their respective holy scriptures into the water of a river. While those of the Jains were carried away by the flood, then submerged and were destroyed, those of the *Tēvāram*, thrown by Tiruṇānacampantar, moved upstream back to the shore.¹⁷

Returning to the learned tradition, we will analyse another verse from the already quoted *Nālaṭiyār*, although here we can raise the question whether we are still dealing with an exclusively poetic tradition or whether by now the theoretical domain – presumably in the form of grammar – has to be included, for it already seems to be a major effort to deal with the existing tasks.

¹⁵ The prefix *kīl* (‘under’), in a compound *kīlḷkaṇakku* that is better known as the designation of the minor classics (‘lower order’) is quite surprising, but in this context is to be understood in its literal meaning.

¹⁶ For a brief foray into the *Cankam* meta-poetic realm see Wilden 2011.

¹⁷ The same episode is probably alluded to in *Tēvāram* 3.113.12.1 where palm leaves are described, with a more general term for ‘leaf’ (*ilai*), as *patikam atu eḷutu ilai avai*: ‘those leaves on which that decade [of poems] was written’.

Nālaṭiyār 26.3

(symbol of a learned tradition)

கல்லென்று தந்தை கழற யதனையோர்
சொல்லென்று கொள்ளா திகழந்தவன் மெல்ல
வெழுத்தோலை பல்லார் முன்னீட்ட விளியா
வழுக்கோலைக் கொண்டு விடும்.

'*kal*' *enru tantai kaḷara*, '*ataṇai* *ōr*
col' *enru koḷḷātu ikaḷntavaṇ*, *mella*
eḷuttu ōlai pallār muṇ niṭṭa, *viḷiyā*
vaḷuk kōlaik koṇṭu-viṭum.

He who, when [his] father nagged 'learn',
was negligent, not taking that to be a word, when gently
he is offered a lettered palm leaf in front of many,
disgracefully
he will receive the stick for [his] fault.

As is often the case, syntax is undermarked and semantics are elusive, but the message appears to be unequivocal. The young man who does not heed his father's advice to pursue his studies fervently and refuses to accept that assignment (*ataṇai*, anaphoric pronoun) as an appropriate rule of behaviour (*col*, literally 'word'), will receive his just punishment (*kōl*, 'stick') at a later time when he exposes his ignorance in front of the assembly by not being able to understand the text written on the palm leaf presented to him. This little verse reveals a number of things: we have to conclude that it was customary to read and discuss literary and/or theoretical texts in convivial gatherings and that being unable to participate in such a discourse was regarded as disgraceful in case of a man belonging to a corresponding social class (whatever that may have been). The scenario that comes to mind, as described in Ebeling 2010 for the nineteenth century, is that of public recitation of newly composed poetry, read from the freshly accomplished palm leaf by the author or one of his students, followed by an oral commentary to elucidate the details and discuss questions from the appreciative audience. Learning as recommended by the father in that particular case must have comprised the practice of reading and writing as well as learning literary texts, *thesauri* and grammatical treatises by heart, as was the premodern standard for higher education. In other words, this verse substantiates and confirms the playful simile from the *Kalittokai* concerning manuscripts tied with string. Palm leaf was the material support of the learned tradition.

7. Book of Fate

A further didactic anthology from the *Kīlkkanaṅku*, the *Paḷamoḷi* (seventh/eighth century) contains a stanza which in a metaphorical way refers to what may be named a book of fate.

Paḷamoḷi 29

(the 'book' of fate?)

முழுதுடன் முன்னே வருத்தவ னென்று
தொழுதிருந் தக்கண்ணே யொழியுமோ வல்ல
லிழுகினா னாகாப்ப தில்லையே முன்ன
மெழுதினா னோலை பழுது.

'*mulut*' *uṭaṇ munṇē vakuttavaṇ* '*enru*
tolut' *iruntak-kaṇṇē oḷiyumō allal*.
iḷukiṇāṇ ā kāppatu illaiyē. *munṇam*
eḷutiṇāṇ ōlai paḷutu.

'He who of old allotted the whole',
when thus worshipping, will misery cease?
When [someone] procrastinates, there is no protecting
[him].
Of old he has written [his] faults on a palm leaf.

Again, the syntax is slightly dubious but I suggest reading the masculine *vakuttavaṇ* in the first line as referring to God in his position as overseer of the world he has created and maintains. Then the question of the first two lines pertains to the possibility of attaining salvation by devotion, as is the attitude of the Tamil devotional movement (*bhakti*). The answer is partly definite and partly inconclusive. Taking the two masculine verbs in lines 3 and 4 as referring to a human subject, line 3 affirms that for someone who is remiss in worshipping (*iḷikiṇāṇ*) God's protection is definitely out of reach. The fourth line then seems to cast doubt on the capacity of human beings to change their ways: what evil deeds they may do is already noted down. Since in this case the object of writing is the human being itself, the implication may be that what is going to happen is predestined by the influence of old *karma*. Again, the object to be written on is simply called palm leaf. The context, however, also reminds us of the *Tēvāram* stanza quoted above on page 72 where Śiva records human misbehaviour in his account book (*kīlkkanaṅku*).

8. Inscription

The very last stanza can be found in the *Muttollāyiram*, a partially transmitted collection of royal panegyrics for the three great houses Cōḷa, Cēra and Pāṇṭiya which also dates back to the later first millennium. Here the urge to find fresh images within the old framework is in its prime, which is why we find there a fully-fledged image of the production of royal panegyrics, incidentally including the first attestation of the term *ūci* as a stylus used for incising the leaf.

Muttollāyiram 3.47

(royal panegyric = inscription)

மருப்பூசி யாக மறங்கனல் வேன்மன்ன

ருருத்தகு மார்போலை யாக திருத்தக்க
வையக மெல்லா மெமதென் றெழுதுமே
மொய்யிலை வேன்மாறன் களிற்று.

*maruppu ūci āka maṛam kaṇal vēl maṇṇar
urut taku māṛpu ōlai āka ‘tiru takka
vaiyakam ellām ematu eṇru’ eḷutumē
moy ilai vēl māraṇ kaḷiru.*

With [his] tusk as the stylus [and] with the beautiful chest
of kings
[carrying] brave angry spears as palm leaves he writes:
‘the whole world fitted with wealth is ours’,
the elephant bull of the Pāṇṇiya with a battle-bladed spear.

So the wounds which the king’s war elephant caused to the chests of the enemy kings they killed in the battle can be interpreted as an announcement of victory in the form of writing, a practice familiar from the eulogy part (*meykkīrtti*) of inscriptions, even if the material metaphorically alluded to in this case is again palm leaf. Whether simple war poetry in manuscript form or epigraphy, such imagery presupposes a well-established tradition of writing. As a mere curiosity we may add here one further passage from a lost treatise on poetic genres, the *Intirakāḷiyam*, which may or may not pertain to the period under consideration, with the text being dated between the ninth and thirteenth centuries. In one of its verses surviving as quotation it states the measurements to be used for palm leaf manuscripts depending on the social class for whose use they are destined.

Intirakāḷiyam

(quoted in *Tamiḷ Ilakkaṇa Nūlkaḷ*, p. 186)

ஓலைய திலக்கணம் உரைக்குங் காலை
நாலாறு விரற்றானம் நான்மறை யோர்க்குப்
பார்த்திபர் தமக்குப் பதிற்றிரட்டி விரலே
வணிகர்க் கெண்ணிரு விரலே
சூத்திரர்க் கீராறு விரலே
இப்பரி சேபாட் டெழுதவும் படுமே

*ōlaiyat’ ilakkaṇam uraikkum kālai
nāl āru viral-tāṇam nāṇ maraiyōrkku
pārttipar tamakku patir’ iratti viralē
vaṇikarkk’ eṇṇ’ iru viralē
cūttirarkk’ ir-āru viralē
ipparicē pāṭṭ’ eḷutavum paṭumē.*

At the time one states the characteristics of palm leaves,
four [times] six finger-breadth for those of the four Vedas,
for earth rulers doubling ten fingers,

for merchants eight [times] two fingers,
for Śudras two times six fingers,
composed in this manner they are written [down].

There is no indication whatsoever that such rules have ever been implemented, but still one may conclude that palm leaf was used for writing by the whole range of people representing the Tamil society, which seems to be proven by the material compiled here.

No less than eight uses of palm leaves testify to the practice of writing in four different domains of human activity, which can be roughly described as communication, religion, administration, and literature. Allusions to letters of both official and private nature are quite frequent. There is evidence of an ensign of peace, whether with or without written message. Administration, whether royal or mercantile, appears to use palm leaves as cheques or accounts. The idea of keeping records is, however, not limited to business but can also be found in the field of religion where God can be said to keep book of human deeds or where we discover the more abstract idea of a book of fate. The use of manuscripts as an implement in an expiation rite is even more metaphorical. Finally, there is evidence of manuscripts as a medium for a poetic and/or learned tradition in the hand of scholars. Its scope includes royal panegyrics. Also, the use of manuscripts in the instruction of the younger generation is attested where the ability to understand a text written on a manuscript becomes the standard for a young man’s education. This fact in turn suggests the existence of both academic and lay literary expertise, reminding us of the possible double-provenance of manuscripts as we perceive it today still, both professional and non-professional.

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PICTURE CREDIT

Fig. 1: © Photograph: N. Ramaswamy, EFEO.

Article

Character Variation in Early Chinese Manuscripts

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In reading any Chinese manuscript, irrespective of whatever may or may not be its relation to texts known from the received tradition, the first step is to determine what words the characters of the manuscript stand for.¹ For transmitted texts, particularly those that have been written or edited in the mediaeval or modern periods, by which time the writing system had become in large measure standardized in the form familiar to us as the received orthography, the process of identifying what words the characters stand for is so automatic and so unconsciously done that we generally lose sight of the fact that what we are really doing is matching characters to words.² Formally, this is what ‘reading a text’ means. It is entirely natural in such cases to refer to the characters themselves as the ‘words’ of the text. They are not, of course, *sensu stricto* the words of the text; they are the written representations of those words.³ But we can safely ignore this technical distinction and read transmitted texts

‘automatically’ precisely because these texts use characters in the standard, conventionally established way. That is to say, the texts are written in the standard writing system of the time, and we have learned to read that writing system. Having learned to read, we are free to remain unconscious of that part of the process involving the matching of character to word and consequent understanding of meaning. In most of what we read we do not expect, nor do we encounter, many deviations from the conventionally accepted standard, and so we do not have to think about the actual process of reading. This happy innocence does not extend to the matter of reading pre-Han or early Han manuscripts. To be sure, this does *not* mean that the orthography of those manuscripts is not systematic or conventional, that is, ‘standard’ within its own framework; it means instead that the framework itself, i.e., the set of rule-governed conventions of the orthography that makes it a workable writing system, is different to some degree from the standard framework with which we are familiar on the basis of the transmitted, received writing system.⁴ The differences may be numerous and substantial or few and inconsequential, or something in between, varying from manuscript to manuscript. But whatever their extent, determining what those differences are lies at the heart of reading the manuscripts. Whatever idiosyncrasies, irregularities and apparent aberrations we may think we see in the orthography of early manuscripts, we must suppose that these actually are consistent with the rules and conventions to which the writing adheres overall.

¹ I am grateful to Matthias Richter and Michael Friedrich for very helpful comments, suggestions and corrections on earlier drafts of this paper. Remaining mistakes and infelicities are of course my own responsibility.

² Note that nothing in the process described as ‘matching characters to words’ restricts it to a ‘one character to one word’ isomorphism. While most Classical Chinese words are in fact monosyllabic and written with one character, not all are, and as the language evolves the proportion of two-character ‘compounds’ used to write what would linguistically be considered a single bisyllabic word increases. Conversely, in early manuscripts it is not uncommon to find instances of one character used to write a two-word phrase. These are the so-called *hé wén* 合文 ‘ligature graphs’. In the Baoshan manuscripts, for example, we find a single multi-component graph that can be transcribed as 𠄎, standing as a *hé wén* for the two characters 之歲 and presumably read as the two morphemes *zhī suì* (in whatever the Chu Old Chinese pronunciation would have been.) See Zhang Shouzhong 1996, 234. Similarly, in the Guodian *Tai yi sheng shui* manuscript (among others) we find the two-word grammatical phrase 之所 regularly written with the *hé wén* graph 𠄎.

³ There is an important sense in which the distinction between ‘words, and ‘written representation of words’ is complex and multifaceted when we are concerned with the multiple functions of writing and the linguistic psychology and neurology of reading. From those linked perspectives ‘written words’ may well have a significance in their own right as durable, visual representations of language (not limited simply to speech) that distinguishes them from mere representations of spoken words. See, for example, the now classic work by David Olson, *The World on Paper* (Olson 1994), and the more recent work by Stanislas Dehaene, *Reading in the Brain* (Dehaene 2009). Important as this consideration is, for the analytical purpose of the present discussion we can set it aside.

⁴ The term ‘standard’ can by definition be used only relative to something that is ‘non-standard’. It is important to recognize that the orthography of early Chinese manuscripts is not imbued with a great measure of graphic arbitrariness or capriciousness, but adheres to a set of graphic conventions and rules just as any other writing system does, even if we cannot immediately discern all of those conventions and rules. Those conventions and rules in fact define a ‘standard’ for that writing system. Nevertheless, for convenience in our discussions here we will reserve the term ‘standard’ to refer exclusively to the transmitted, received Chinese writing system that we are familiar with from the Han on. Relative to this standard so defined, the writing system of the early manuscripts is ‘non-standard,’ i.e., not the same standard that we automatically assume when reading everyday texts. The differences between the received script and the variant forms found in pre-Han manuscripts may be slight enough to be called ‘sub-standard’ variations relative to the standard. See Haeree Park, who first draws explicit attention to this fact about Warring States manuscripts and their writing (Park 2009, *passim* and especially 318-24).

The extent to which we can take the standard, received writing system as a basis for identifying what words are intended by what characters in a given pre-modern manuscript will vary from manuscript to manuscript, but in most cases the orthography of pre-Han and early Han manuscripts will likely be somewhat unfamiliar in comparison with the received standard. Many characters will have the same graphic structure and same internal arrangement of components as characters known from the transmitted writing system and may be unfamiliar only to the extent that the manuscript shapes of the graphic components differ in the outward appearance of their formal execution from how the same components appear in the standard *kaishu* 楷書 script known from the Han on.

Examples:

- 是 :  (GD LZ.A, str 08, pos 19) *shì* ‘this’⁵
- 祭 :  (*Baoshan*, str 237, pos 47) *jì* ‘sacrifice’
- 君 :  (SH 3.4 *Peng zu*, str 04, pos 19) *jūn* ‘lord’
- 命 :  (*Baoshan*, str 12, pos 25) *mìng* ‘fate’
- 登 :  (*Baoshan*, str 27, pos 14) *dēng* ‘ascend’
- 樂 :  (SH 5.7 *San de*, str 16, pos 30) *lè* ‘pleasure’ ~ *yuè* ‘music’.

In these cases the task is simply to recognize the pre-*kaishu* form of the script. All other things being equal, such characters can be presumed to stand in their manuscript usage for the same words that they stand for in the received writing system, including so-called ‘loan character’ usages. Other manuscript characters will have structural forms that differ from anything known in the transmitted writing system and will therefore not be immediately graphically identifiable with standard characters. Identifying what word such characters stand for generally calls for ad hoc analysis and sometimes extended investigation, and is often speculative.



⁵ The following set of abbreviations will be used in referring to published collections of early manuscripts: GD: Guodian 郭店 (Jingmen Shi 1998), SH: Shanghai Bowuguan 上海博物館 (Ma Chengyuan 2001-2010), LZ: Laozi 老子.

Examples:

-  : 達 (GD LZ.A, str 08, pos 14) for *dá* ‘penetrate, pervade’ 〈達〉?
-  : 免 (SH 5.2, *Bao Shuya yu Xie Peng zhi jian*, str 02, pos 43) for *miǎn* ‘evade’ 〈免〉?
-  : 安 (SH 5.8a, *Gui shen zhi ming*, str 04, pos 16) for *ān* ‘thereto, thereon’ 〈安〉?
-  : 沒 (SH 5.8a, *Gui shen zhi ming*, str 02 recto, pos 40) for *mò* ‘sink, drown’ 〈沒〉?
-  : 殊 (GD *Yucong* 4, str 03, pos 09) for *shì* ‘era’ 〈世〉?
-  : 繆 (SH 4.3, *Zhao wang hui shi*, str 02, pos 20) for *biǎn* ‘ritual burial’ 〈窆〉?⁶

And there will be numerous characters that fall somewhere between these two extremes; characters where, relative to their transmitted equivalents, the components are familiar but re-arranged, or where one or more components are missing, or where the manuscript character has one or more additional components in comparison with its presumed transmitted counterpart, etc.

Examples:

-  (豐, GD *Yucong* 1, str 27, pos 02) *lǐ* ‘ritual’, for transmitted 禮.
-  (𠄎, SH 4.3 *Zhao wang hui shi*, str 09, pos 26) *bāng* ‘state’, for transmitted 邦.

⁶ See Yang Zesheng (2005). I am grateful to Yang Li for pointing this out to me.



(胃, SH 2.1 *Min zhi fumu*, str 05, pos 05)
wèi ‘refer to’, for transmitted 謂.



(祟, SH 5.8 *Gui shen zhi ming*, str 01, pos 03)
guǐ ‘revenant’, for transmitted 鬼.



(犛, SH 5.2, *Bao Shuya yu Xie Peng zhi jian*, str 3,
pos 09) xī ‘sacrificial ox’, for transmitted 犧.

For all of these categories we must find ways to analyze the characters such that we can identify with some degree of confidence what word the character is intended to write. To do this we are in effect determining for ourselves what the users of the script knew implicitly, that is, what the rules and conventions of their orthographic system were. The ‘rules and conventions’ that govern any writing system apply basically at two levels: (i) those rules that pertain to the structure of individual graphs themselves (*wén zì* 文字), or to the combination of individual graphs into a single orthographic unit (*hé wén* 合文, often called a ‘ligature graph’), and (ii) those that govern what word is linguistically allowable in a given context.⁷ The ‘system’ part of any writing system is a ‘given’ simply by virtue of the fact that the writing is intended to be effectively shared by a community of users. What those users know in common that allows them to use writing to communicate with one another is nothing other than the set of rules and conventions that govern the structure and usage of the elements in their orthography, in other words, the features of the system that prescribe how characters may or may not be structured and the rules, based on the language being written, that determine what characters may or may not occur in a given written context. Depending on what the context is, the number of allowable characters may be relatively high, but it is limited all the same. This means fundamentally that a part of the way that any character X conveys its meaning is the fact that it fits with the characters of its immediately surrounding context to write a meaningful word, phrase or sentence. If a particular character X in isolation happens to be graphically difficult to distinguish from Y, that has only

⁷ In English, for example, the frame ‘What she _____ is good’ allows (when restricted to a single word) only verbs in the blank space, and the frame (similarly restricted) ‘_____ person did not come’ allows only articles, demonstrative pronouns, relative pronouns, the number ‘one’, the negative ‘no’, or the somewhat legalistic and formal ‘said’ in the blank. There are many more possible words that can fill the blank in the former frame than in the latter, but the number is all the same limited in both cases, and a writing system can take advantage of these kinds of contextual constraints just as usefully as the language does.

a minor impact, if any at all, on the effective functioning of the writing system. Isolated occurrences are comparatively infrequent and atypical generally; writing systems evolve, it seems safe to assume, chiefly to write connected texts, not isolated words or letters. Most ambiguities or uncertainties about the identification of a given character will likely be resolved in context by virtue of the fact that only X and not Y is allowable, i.e., only X and not Y ‘makes sense’.⁸ We might call this the *context constraint* on the use of a graph X or Y within a given writing system.

Writing systems, no matter how seemingly complex, are finite in the number of their constituent graphic units. Any graph operates within the system in contrast to all other graphs. This means that a given graph does not have to be absolutely identifiable, but identifiable only relative to the other graphs in the system. In principle this means that ‘X means X because it isn’t Y’ where Y is any other graph in the system. A character X in other words conveys its meaning, apart from whatever implications or indications its own graphic structure may carry, chiefly by not being Y. All Xs need not be precisely identical in their graphic shape or execution; they have only to be more like other Xs than like any Y in the system. Phrased somewhat more formally, we would say that a writing system includes a finite number of graphic *types*, any one of which we will call X. Any instance of a written example of X is a *token*, called for illustrative purposes x. The tokens are the visible, physical instances of a given character type; we can see them, count them, analyze them and copy them. Any x need not be precisely identical to any other x; it must only be identifiable as a token of X rather than of some other type Y. We can call the extent of variation among tokens of a single type the *token / type allowable latitude*. The notion of *allowable latitude* is a kind of functionally allowable free variation from two distinct, but complementary perspectives, that of the scribe’s execution and that of the reader’s perception of a character. Viewed in the light of what we called the *context constraint* above, recognizing this *allowable latitude* among variant tokens of a single type releases us from the burden of trying to identify minute graphic details as making a significant difference in what word is intended. We can in principle narrow the choices down, so to speak, in any given case by relying on the combined effect of the context constraint and the allowable latitude of the token / type relation together as setting out the limiting conditions for identifying graph with word. In practice,

⁸ I am tempted to claim that there is a law of ‘orthographic natural selection’ at work in the evolution of any writing system that would prevent the survival of an identical graphic form for two characters intended to stand for two different, unrelated words, when those two words could easily occur in the same context.

determining the allowable latitude of a token / type relation is an empirical matter, which unfortunately makes the process potentially circular.

For the practical matter of reading a manuscript, the problem amounts to this basic question:

How different can the ways of writing a given character be before they are no longer recognizable as writing the same word?

Phrased slightly differently, the question becomes:

How do we know when two differently written graphs are variant ways of writing the same word or instead write two different words?

The question has, for Chinese manuscripts at least, different implications depending on the kind of variation we confront and the context in which the variants occur. Matthias Richter has dealt at considerable length with the first of these two points. He has set out a clear distinction between two kinds of Chinese character variation that might be found within a single manuscript or among a group of relatively homogeneous manuscripts: (A) variation in the stroke shape or individual stroke configuration of the characters; this he calls ‘non-structural variation’, and (B) variation based on differing graphic components or different arrangements of the same graphic components, which he calls ‘structural variation’.⁹

For example: (A) non-structural variation:

versus for 冬 〈終〉 *zhōng* ‘end’,

versus for 長 *cháng* ‘long’,

versus for 才 〈在〉 *zài* ‘to be located’,

versus for 為 〈為〉 *wéi* ‘to act’.¹⁰

⁹ See Richter 2005.

¹⁰ These manuscript forms and the ones in part (B), structural variation, below are taken from Matthias Richter’s Guodian manuscript character tables (<http://www.aai.uni-hamburg.de/MPC/datab.html>).

A considerable amount of effort has gone into trying to analyze and characterize this kind of variation, including such things as comparing the angles and lengths of certain strokes, noticing when matching strokes are straight or curved, hooked or not hooked, etc. in variant scriptions of the ‘same’ character. The goal is to determine what the orthographic rules or conventions might be and how much latitude we can expect in the writing of such characters before they no longer are recognized as writing the same word. Richter’s suggestion that we try to identify what he calls a ‘profile’ of graphic variation for a single manuscript, while discussed initially largely in regard to instances of structural variation, can equally usefully be applied to non-structural variation as well. In this approach we might think of any graphic ‘profile’ that we may be able to discern in a given manuscript as a ‘manuscript context’, on a par with lexical context of the kind mentioned above, as an additional strategy for determining the words written. It may turn out that the hand-writing profile of a given manuscript, that is the ‘manuscript context’, is sufficiently distinctive to determine a particular reading in the same formal way that a lexical context often is; and further, a recognizable profile of non-structural variation may allow the identification of a single scribe as responsible for a number of different manuscripts, thus providing a basis for a historical grouping of the manuscripts in question together as coming from a common source.¹¹

(B) structural variation:

i.

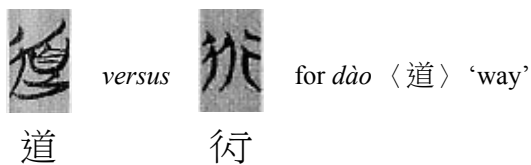
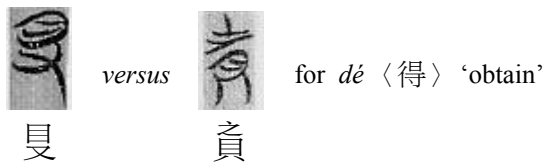
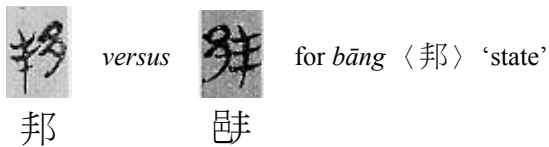
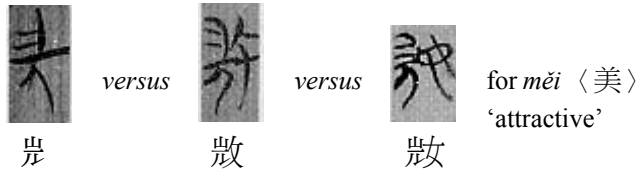
versus for 天 *tiān* ‘sky’

versus for 上 *shàng* ‘above’

versus for 下 *xià* ‘below’

¹¹ The possibility of such groupings is up to a point analogous to identifying diviner groups of the Shang divinatory inscriptions. The big difference is that Shang inscriptions typically include the diviner’s name, which can be correlated fairly directly with calligraphic style, whereas Warring States and Han period manuscripts only rarely mention scribes by name. See Richter 2005, 175-82.

ii.



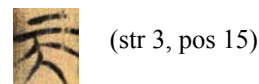
There would seem to be little doubt that the pairs of variants in the (B.i) set are different ways of writing the same word. In the (B.ii) set it is much less obvious that the variation is between two ways of writing the same word. This has to be determined generally on a case by case basis, until the orthographic conventions of the manuscript(s) in question have been identified. Structural variation also includes, in its absolute form, entirely different characters used to write the same word. This we might call absolute structural variation, exemplified here by 𠂇 / 𠂈 / 𠂉 vs. 美 for *měi* ‘attractive’ and 𠂊 versus 道 for *dào* ‘way’ in the (B.ii) set above, where the various manuscript characters seem not to have any component in common at all with the character used in the received orthography for the same word.¹² Such cases

¹² The two different ways shown here to write the word *dào* ‘way’ do *sensu stricto* have one component in common, viz., the left side component, 彳, of 行, which is historically the same as the three-stroke upper part of 道 (Kangxi classifier 162, combining form 彳). This is clear from the manuscript forms of the two characters, but becomes completely obscured in the received writing system. To be sure, we find unambiguous manuscript testimony to apparently unconditioned graphic variation between the component 彳 and the component 彳. This would suggest that the 彳 in 行 is tantamount to 彳 (彳) in 道. Beyond this, the variation of the second component, 人 [rén] ‘person’ in 行 and 首 [shǒu] ‘head’ in 道 is categorically consistent

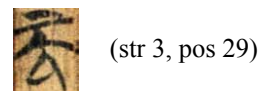
inevitably raise the question of whether the variation might be lexical instead of graphic. In fact there remains always the possibility, at least in principle, that any pair of variants, no matter how similar or different each is to the other, write different words and represent therefore lexical variation, not graphic. Intuitively, we are likelier to be drawn to the possibility of lexical variation in cases of absolute structural variation than in those of merely partial structural variation, an intuition that would probably be borne out statistically. For our purposes here, in these examples and in the ones to follow, we are assuming that the fact of graphic variation as opposed to lexical has been established independently of the features we discuss.

Consider next these two groups of character tokens from the Shanghai Museum manuscript called *Gui shen zhi ming* 鬼神之名 (SH 5.8):

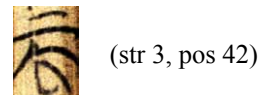
1. *ér* 而 ‘then’:



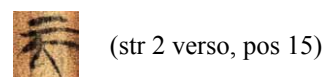
a



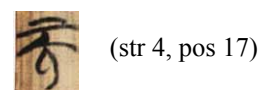
b



c

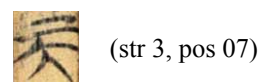


d



e

2. *tiān* 天 ‘sky, heaven’:



a

semantically insofar as both components are ‘body part’ terms (understand 人 as ‘body’ proper). These two facts about the variation between 道 and 行 as ways to write the word *dào* ‘way’ together suggest that we might not want to call this an example of ‘absolute’ structural variation. I am grateful to Matthias Richter for drawing my attention to the need to analyze this example fully. For further discussion of this example, including comments on what seems to be still another variant, written 行, see Richter 2003, 5-8.



(str 3, pos 21)

b



(str 1, pos 30)

c



(str 1, pos 38)

d

and these, both from strip 4 of the Shanghai Museum manuscript called *Heng xian* 互先 (SH 3.3):



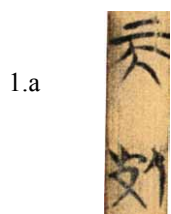
3.a (str 4, pos 26) ér 而 and



3.b (str 4, pos 12) tiān 天.

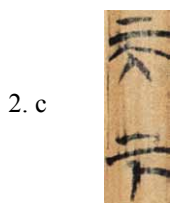
One might be excused for thinking on a first look that all nine characters of the *Gui shen zhi ming* strips and both of those from the *Heng xian* strip were tokens of the same type, but in fact the group 1 and 3.a examples are, as indicated, tokens of the character type 〈而〉 and the group 2 and 3.b examples are all tokens of 〈天〉. Once these are seen in their respective contexts, all ambiguity disappears.

For example, 1.a occurs in the phrase



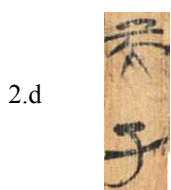
1.a 而死 'then died'

a context in which the word *ér* 'then' is natural, but where *tiān* 'sky, heaven' makes little sense, while 2.c occurs in the phrase



2.c 天下 'sub-celestial realm'

and



2.d 天子 'Son of Heaven'

in lexical contexts where clearly the word in question is *tiān*. In the *Heng xian* strip example 3.a occurs in the phrase



3.a 同出而異生 [for standard 性] 'having a common origin, but different nature',

and 3.b occurs in:

3.b 清燮 [for standard 氣] 生天 'pure pneumas give rise to heaven'.



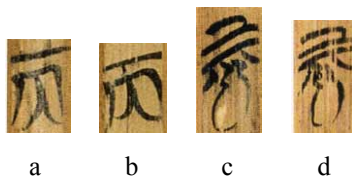
Phrase 3.a is straightforward with *ér* 'then, but', but odd to the point of incomprehensibility if read with *tiān* 'sky, heaven'; phrase 3.b is just the reverse. In particular there can be little doubt about the understanding of 3.b because it is parallel to the immediately preceding line 濁氣生地 'murky pneumas give rise to the earth'.¹³ Context is the crucial determining factor in distinguishing graphically similar, if not nearly identical, characters such as these. Once that is recognized, the token / type allowable latitude constraint becomes largely inconsequential. That is, it no longer matters in these cases that the tokens of *ér* 〈而〉 and the tokens of *tiān* 〈天〉 are nearly indistinguishable in isolation.

One fairly obvious feature easily seen in the above examples is that primary horizontal strokes often show up with a secondary, slightly shorter parallel horizontal twin stroke added to the 'outside' of the primary stroke. The examples given above to illustrate the simplest kind of structural variation, those in set B (i) as well as some of the the

¹³ All of these manuscript scans have been made from the Shanghai Museum publications of the manuscripts in question. The *Gui shen zhi ming* manuscript is the eighth manuscript in volume five, and the *Heng xian* manuscript is the third in volume three. For an exhaustive listing of tokens of *ér* 而 in the Shanghai Museum manuscripts published in volumes one through five, see Li Shoukuei 李守奎 et al. (2007), 447–56, and for *tiān* 天, op. cit., 2–5.

ér (而) tokens, are examples of this secondary horizontal stroke. This turns out to be a very common feature in third-century BCE. manuscripts, and characters written with this secondary horizontal stroke have long been recognized as in free variation with the same characters written without it. The received orthography from Han times on does not include characters with this ‘extra’ secondary horizontal stroke. Consider now these additional examples of the character for *ér*:¹⁴

4. *ér* 而 ‘then’:

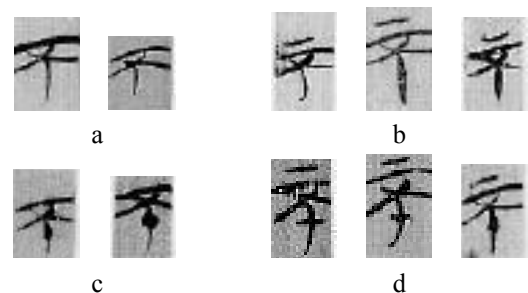


Clearly there is more than just the secondary horizontal stroke that distinguishes 4 c and d from 4 a and b. And these four examples are as a group markedly different in appearance from those given in line 1. Apart from the inconsequential secondary horizontal stroke in 4 c and d, none of these variants is structural in Richter’s sense, but all of them are noteworthy as hand-writing features of these manuscripts. We could debate what type these characters are tokens of, and the question then would become a textual criticism matter. Which of the characters given in the preceding lines one through four are tokens of the graph (天) and which of (而)? This kind of decision, as we said, has to be made on a case-by-case basis, generally on the basis of context. Once the context constraint has pointed us in the right direction for determining what word is intended in each case, we end up with a total of ten tokens for the character type *ér* (而) and five for *tiān* (天).

The next question is how do we choose a graph to represent the type? How do we determine what graphic shape suggested by the available tokens we should designate as representative of the type? Our first inclination might be to identify the standard form of the character that we know from the received writing system as representative of the type, and then every instance in a particular manuscript, or in a group of manuscripts, of that character is a token of that type, irrespective (up to a point, see below) of how it may diverge from the shape or structure of the type. This recourse is often the default solution to the problem by modern editors who print transcriptions of these manuscripts in modern books. As a practical matter, this is not an unreasonable approach to the problem and is easy to defend. (It is what I have done above for (天) and (而) here.) But if our concern is with a more historically accurate

and theoretically well-informed analysis of the writing system, then this solution falls short in at least three respects: first, it is anachronistic as far as an analysis of the early writing system is concerned, because it resorts to what we know about the later, standardized script to identify the type; second, it fails to recognize that some tokens look more like others than other tokens do, – in other words, the tokens can be grouped according to their own internal graphic appearance; and third, it still doesn’t tell us anything about how different two tokens can appear and still be instances of the same type.

The first of these three shortcomings, apart from the theoretical concern, usually will not present any real problem in the majority of cases. And it is hard to imagine how *any* choice for a type could actually overcome the third shortcoming. The second is really the only substantive issue, and is the easiest to accommodate. We need only to recognize an intermediate level between type and token, which we can call *sub-type*. Consider the different ways of writing the verbal negative adjunct *bù* (不) in the Guodian manuscripts, for example, which we can array in four distinct groups as follows:¹⁵



As suggested by the groupings, I would identify four sub-types: a (不), b (丕), c (丕) and d (丕). A sub-type is defined by a distinctive graphic form shared by some, but not all, tokens of a given type. The relation between a sub-type and its tokens will be graphically closer than that between all tokens generally and a type, and its form is as a consequence less difficult to define or establish than the form of the type. The *ér* ‘then’ ‘sub-type – token’ relation has less indefiniteness than the ‘type – token’ relation. But a sub-type is, all the same, an abstraction, a mental construct, in the same way that a type is. And any visible, tangible representation or characterization of either a type or a sub-type is an artificial, in some sense even a superficial, instantiation of an abstraction. From this perspective, how we choose to represent the sub-type or type graphically is entirely arbitrary. The only caution that must be observed is

¹⁴ Examples 4a and b both are from the Shanghai ‘Zi yi’ ms., 4c and d are both from the Shanghai ‘Wu wang’ ms.

¹⁵ These examples are all taken from the data assembled by Matthias Richter in his Guodian Characters data base, which includes many more examples that can be classified structurally into the same four categories. See <http://www.aai.uni-hamburg.de/MPC/datab.html>.

not to allow our choice inadvertently to suggest a misleading historical link or developmental process.

The question remains, what does it mean to say that the ‘same’ character appears in another form, forms that can be written as differently from one another as seen in the examples of *ér* 而 and *bù* 不 given above? What does it mean to be the ‘same’ character when in visible, discernible fact the characters look different, sometimes quite different, from one another? Efforts to account for these kinds of variation by measuring stroke angles, line lengths, degree of curvature, presence or absence of hooks, etc., as useful as they may be in some respects, will not in the end alone be sufficient to answer the question of how different the characters can appear before they no longer are recognized as writing the same word.

Characters are written to be read. Apart from a reader, that is to say, in the absence of someone who recognizes what a character is supposed to write, no graph of any kind writes anything. Any graph that functions as glottographic writing functions *ipso facto* as an element in a writing system. And as we have already pointed out above, the rules of the system play a part in conveying the meaning of any given graph that is used as a part of that system. In order for a reader to recognize a character as writing a word X, he must have a knowledge of the writing system to which that character belongs and the rules that govern how it operates. This is the ‘background knowledge’ against which the recognition of a character as writing word X takes place. Most readers, of course, will not be conscious of this background knowledge, until someone points it out, but it is there all the same as a necessary condition for reading. Imre Galambos makes the same point in a slightly different way when he says that:

[W]ith the absence of a standard form that could serve as an abstract form of a particular character, the solution to the problem of identification lies in determining the relationship of a character form with the word it stands for. Because written characters are graphical representations of words of a language, they are meaningful only in reference to the word they have been chosen to represent.¹⁶

To be sure, not all problems of graphic variation will be easily resolved. The foregoing examples have been deliberately chosen to illustrate the discussion in the clearest and least ambiguous way. Many such questions will entail more uncertainty than these examples have shown, sometimes a lot more. But that does not change the fact that writing systems work in principled ways.

We are in a better position to deal with problems of graphic variation if we recognize how the writing system operates and

how graphs within it function than if we allow ourselves to overlook this aspect of what we mean by writing.

Abbreviations

GD : Guodian, i.e., Guodian Chumu zhujian, see Jingmen Shi 1998.

LZ : Laozi.

pos : position (in a strip).

SH : Shanghai, i.e., Shanghai Bowuguan cang Zhanguo Chu zhushu, see Ma Chengyuan 2001-2012.

str : strip (of a bamboo manuscript).

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¹⁶ See Galambos 2006, 77.

Article

Innocence Lost – Sutra Writing and Calligraphic Style*

Uta Lauer | Stockholm

[...] I sigh that this sutra the Buddhists treasure is also treasured by Confucianists as calligraphy by a sage worthy. Certainly it should be treasured. Jizhi was famous in the Song Dynasty for his calligraphy, and we Confucianists treasure his ink traces. [...]¹

Zhang Jizhi 張即之 (1186–1266) transcribed the *Diamond Sutra*² in 1248 for his deceased wife. These lines were appended in a colophon by a Confucianist layman. Zhang Jizhi was a devout Buddhist with close ties to disciples of the influential Chan master Wuzhun Shifan 無準師範 (1177–1249). A scholar-official, Zhang was well versed in calligraphy and hailed as the last great calligrapher of the Southern Song (1127–1279). This *Diamond Sutra* was written for religious reasons and the manuscript treated accordingly. It was stored in the sutra repository at Huideng Monastery 慧燈寺 in Suzhou and was only retrieved on important religious occasions. Now it is part of a collection kept by the Palace Museum in Beijing and has been catalogued as a work of calligraphy.

Transcribing a sutra is a religious exercise; the content of the text that is chosen matters because of its ritual efficacy. On the other hand, presenting a sutra as a gift adds a new dimension to it that goes beyond this purely religious aspect. The text is fix, for eternity; not a single character may be altered. No personal message or hidden meaning seems to lie below the surface of the words. An ‘innocent’ text – unlike a poem, for example, – always connected to its author and their fate. Yet the calligrapher could and did invest a

sutra transcription with a personal, social, historical and even political subtext by consciously selecting a specific, meaningful calligraphic style. The recipient of such a work and later owners demonstrated their ‘reading’ by acknowledging this in colophons appended to the sutra. The majority of colophons discuss such sutra transcriptions in calligraphic terms, ignoring the religious contents of the text.

A painting by Qiu Ying 仇英 (c. 1494–c. 1552), *Zhao Mengfu Writing the Heart Sutra in Exchange for Tea*³ (fig.1), illustrates how a sutra transcription gained new life as a work of art when it entered the literati sphere where it was appreciated according to a different set of values. The picture shows the famous painter, calligrapher and statesman Zhao Mengfu 趙孟頫 (1254–1322) in a garden setting. Across from him, seated at a stone table, is a Buddhist monk. A piece of paper is spread out on the table and Zhao is holding a brush in his hand, ready to write. An attendant approaches with a container of tea, a second servant boy is boiling some water and a third comes onto the scene with a bundle of scrolls in his arms. Beyond the fence, two birds are pecking grain from a lotus pedestal, a hint at a Buddhist ritual for hungry ghosts. The painting was commissioned by one of Qiu Ying’s patrons, the art collector and lay Buddhist Zhou Fenglai 周鳳來 (1523–1555). Zhou himself practised calligraphy in the style of Zhao Mengfu. The painting was meant as a companion piece for a poem in Zhou’s collection. The poem was a piece of calligraphy by Zhao Mengfu in which he writes about copying the *Heart Sutra*⁴ for a certain priest (Gong) in exchange for tea.⁵ The sutra copy mentioned in the poem was no longer extant in the sixteenth century. Thus, Zhou Fenglai asked the famous calligrapher, painter and fellow art connoisseur Wen Zhengming 文徵明 (1470–1559) to create a replacement for it. Zhou resided in Kunshan

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¹ From a colophon by Xie Ju 謝矩 dated 1402, following a transcription of the *Diamond Sutra* by the Song dynasty calligrapher Zhang Jizhi made in 1248; album, now in Beijing’s Palace Museum, nine colophons. Translation quoted from McNair 2001, 84; Chinese text in Xu Bangda, 1987, 555.

² Chin. *Jingang bore luomiduo jing* 金剛般若波羅蜜多經; Sanskrit *Vajracchedikā Prajñāpāramitā Sūtra*. It was first translated into Chinese by Kumārajīva around the year 400 and was re-translated later by Xuanzang 玄奘 (in 648). The *Diamond Sutra* is one of the most important Buddhist texts that are known to us. Its name was given by Buddha, who explained it as ‘The Diamond of Transcendent Wisdom’ in the text itself. The diamond metaphor refers to the *Sutra’s* wisdom, which is thought to cut away worldly illusions with the ease of a sharp diamond. Its popularity also results from its comparative brevity.

³ Hand scroll, ink and light colour on paper, 21.1 × 77.2 cm, The Cleveland Museum of Art; John L. Severance Fund.

⁴ Chin. *Xin jing* 心經; Sanskrit *Prajñāpāramitā Hṛdaya Sūtra*. It was first translated into Chinese by Xuanzang in the year 649. The *Heart Sutra* is the shortest sutra text we know of, consisting of only 260 Chinese characters. It belongs to the *Perfection of Wisdom* canon of Mahāyāna Buddhism and is one of the most popular Buddhist texts in East and Southeast Asia.

⁵ The Chinese version of the poem is cited in an article by Huang Qijiang 黃啓江 (2005) on Zhao Mengfu’s practice of copying sutras.

near Suzhou, where Wen Zhengming was the most highly esteemed artist. Their collaboration on this project is a clear indication that they were both part of a closely woven local network, participants in literati cultural activities. Once Wen Zhengming had completed the transcription of the sutra in 1542, it was mounted together with Qiu Ying's painting and Zhao Mengfu's poem from Zhou Fenglai's collection. In 1543, two of Wen Zhengming's sons, Wen Peng 文彭 (1498–1573) and Wen Jia 文嘉 (1501–1583), both artists in their own right, supplied a colophon each.⁶ The texts these contained discuss the sutra copy and the poem exclusively in calligraphic terms. They place Zhao Mengfu's achievements in the art of calligraphy firmly in line with Wang Xizhi 王羲之 (303–361) and Su Shi (Dongpo style:) 蘇軾 (1037–1101). Wen Peng equates sutra writing in return for tea with two other well-known transactions, involving calligraphy:

[...] I-shao [Wang Xizhi] wrote in exchange for a flock of geese. Su Tung-po (Su Shi) wrote in exchange for meat [...]⁷

In 1584, a later owner of this scroll – the art connoisseur Wang Shimao 王世懋 (1536–158), who had obtained possession of the scroll from Zhou Fenglai's family – cut off Zhao Mengfu's poem. Wang re-mounted the poem along with a transcription of the *Heart Sutra* – also by Zhao Mengfu – taken from his own collection. As he explained in a colophon relating to Qiu Ying's painting:

[...] I was able to get two complete works of art in one clever stroke [...]⁸

From the same colophon we learn that this *Heart Sutra* had been transcribed in *xingshu* (semi-cursive script), a type of script for which Zhao Mengfu was particularly well known, and not in *kaishu* (regular or standard script), which was commonly employed to copy sutras. It had been a regular routine for Zhao Mengfu to transcribe sutras,⁹ to which he often added paintings of Buddhist deities like the Bodhisattva Guanyin – usually one before and one after the text. This was more than a purely religious exercise; it was definitely also an exercise in calligraphy (perhaps even more so). Unlike poems, colophons or letters, such sutra copies were free of loaded connotations and accumulated history. The copier's



Fig. 1: Qiu Ying (c. 1494–c. 1552), *Zhao Mengfu Writing the Heart Sutra in Exchange for Tea*, hand scroll, ink and light colour on paper, 21.1 × 77.2 cm, detail.

personal and individual expression was concealed in the style and form of the handwriting he used. Such works of art lent themselves particularly well to meeting one's social obligations, i.e. as gifts, the possession of which would not endanger the recipient if the political wind happened to shift. Zhao Mengfu had been a scion of the Song Imperial family. His decision to follow the call to serve at the Court of the foreign Mongol rulers as a high-ranking official did not pass uncriticised. When he was asked for a piece of calligraphy by the Emperor, Zhao, his wife Guan Daosheng 管道昇 (1262–1319) and their son Zhao Yong 趙雍 (1289–c. 1360) chose to present him with a sutra transcription on several occasions, thus avoiding any implications or taking an overt stance on the morally difficult issue of loyalty. As a calligrapher, Zhao Mengfu strictly adhered to the orthodox Wang Xizhi school. It was the Tang dynasty (618–907) emperor Taizong 太宗 (reigned 629–649) who had made Wang Xizhi's calligraphy an authoritative standard.¹⁰ This was a political act only partly motivated by aesthetic considerations. Officials employed the calligraphic style of Wang Xizhi and his son Wang Xianzhi 王獻之 (344–386) throughout the Empire. This fostered a strong sense of belonging to the ruling elite, of shared value, and of allegiance to the central power

In the Ming dynasty (1368–1644), when factional struggles within the political elite were rampant, this close connection between orthodox calligraphic style and Confucian values was well understood.¹¹ Thus, when Wang Shimao created

⁶ English translation of both colophons in Goodfellow 1980, 205.

⁷ Translation quoted from Goodfellow 1980, 205.

⁸ Translation quoted from Goodfellow 1980, 204.

⁹ At least sixty sutra transcriptions are recorded in secondary texts. Eleven of these are copies of the *Heart Sutra*. The second most frequently copied sutra was the *Diamond Sutra*.

¹⁰ Lauer 2012.

¹¹ The two main factions who fought for political power at the Ming Court were the Donglin movement and the supporters of the Eunuchs. The Donglin movement consisted mainly of highly educated officials from the literati class, men deeply concerned about Confucian ethics and morals, which they believed were being violated by corrupt, poorly educated or even illiterate Eunuchs. The choice of an imperially sanctioned and favoured style of calligraphy expressed loyalty and an adherence to Confucian values. For



Fig. 2: Dong Qichang, *Heart Sutra*, dated 1627, album of six leaves, each 21.5 × 25 cm, ink on paper, detail.

a second scroll with a sutra from his collection transcribed by Zhao Mengfu and appended a colophon to Qiu Ying's painting, discussing the artwork in aesthetic and calligraphic terms, he positioned himself in an ongoing discourse, not on art but on politics! Zhao Mengfu's calligraphy was in line with the orthodox Wang Xizhi tradition and hence acceptable at Court. His political position, on the other hand, was a controversial matter during the Ming period. In the eyes of many critics, Zhao had violated Confucian ethics by serving as an official under a foreign regime despite his descent from the fallen Song Imperial family. He was therefore considered a traitor. When Wang commented on Zhao's calligraphy in his colophon, he at the same time conveyed a subtle political message which left a back door open allowing him to either side with Zhao Mengfu's critics or admirers, depending on how the political wind shifted at Court. Such clever, manoeuvring, ambiguous writing was necessary to avoid any fatal consequences should the opposing faction win the upper hand. Wang Shimao had passed the imperial examinations in 1559 and subsequently served as an official in Nanjing. He entertained excellent ties with the literati from the urban centres of South-east China (Jiangnan), a fact attested to by his obtaining the Qiu Ying scroll from Zhou Fenglai's family and, together with his brother Wang Shizhen 王世貞 (1526–1590), building one of the best collections of painting and calligraphy in the entire Empire.

more on these factional struggles, see Dardess 2002.

Dong Qichang 董其昌 (1555–1636), a slightly younger contemporary of Wang Shimao, was a most influential calligrapher, painter, art collector and art historian. He copied sutras for religious reasons, but was also keenly aware, that his writing would be appreciated as a work of calligraphy. In a colophon Dong wrote for his own transcription of the *Heart Sutra* dated 1627, he very specifically records the sources of the calligraphic style (fig. 2) he had employed to transcribe this sutra, namely Ouyang Xun 歐陽詢 (557–641) and Yan Zhenqing 顏真卿 (709–785):

[...] In writing this sutra I used regular script, employing the style of Ou [yang Xun] and Yan [Zhenqing] [...]¹²

What Dong Qichang used as models of calligraphy by those two eminent Tang calligraphers were not sutra copies but other works written in *kaishu* that he had in his art collection. Which specific works of calligraphy by Ouyang and Yan he had actually seen, handled, copied and commented on is documented quite well.¹³ Apart from calligraphies in his own art collection, Dong Qichang also had access to first-rate works in the collections of such eminent connoisseurs as Xiang Yuanbian 項元汴 (1525–1590).¹⁴ Whether or not Ouyang Xun or Yan Zhenqing ever transcribed any sutras is a controversial matter. Yet it had been common practice to describe the calligraphic style of a sutra as *Outi* 歐體 (in the style of Ouyang Xun) or *Yanti* 顏體 (in the style of Yan Zhenqins) since at least the Ming dynasty. The *Suti* 蘇體 (in the style of Su Shi) was less prominent. There are rubbings of a *Heart Sutra* by Ouyang Xun (fig. 3) containing his signature and a date from the year 635. The text is a translation by the pilgrim monk Xuanzang 玄奘 (602–664), who translated this sutra in 649. This post-dates Ouyang's *Heart Sutra* by fourteen years. In other words, it is impossible

¹² *Heart Sutra*, dated 1627, album of six leaves, each 21.5 × 25 cm, ink on paper, National Palace Museum, Taipei; published by The National Palace Museum, 1993, 188–189, no. 28.

¹³ For a good survey, see Wang Qingzheng 汪慶正 1992, Vol. II, 337–348 and the introductory essay by Zhu Huiliang 朱惠良 1993 in The National Palace Museum 1993.

¹⁴ One of the few excellent scholarly books on Xiang Yuanbian's art collection is by Zheng Yinshu 鄭銀淑 1984.

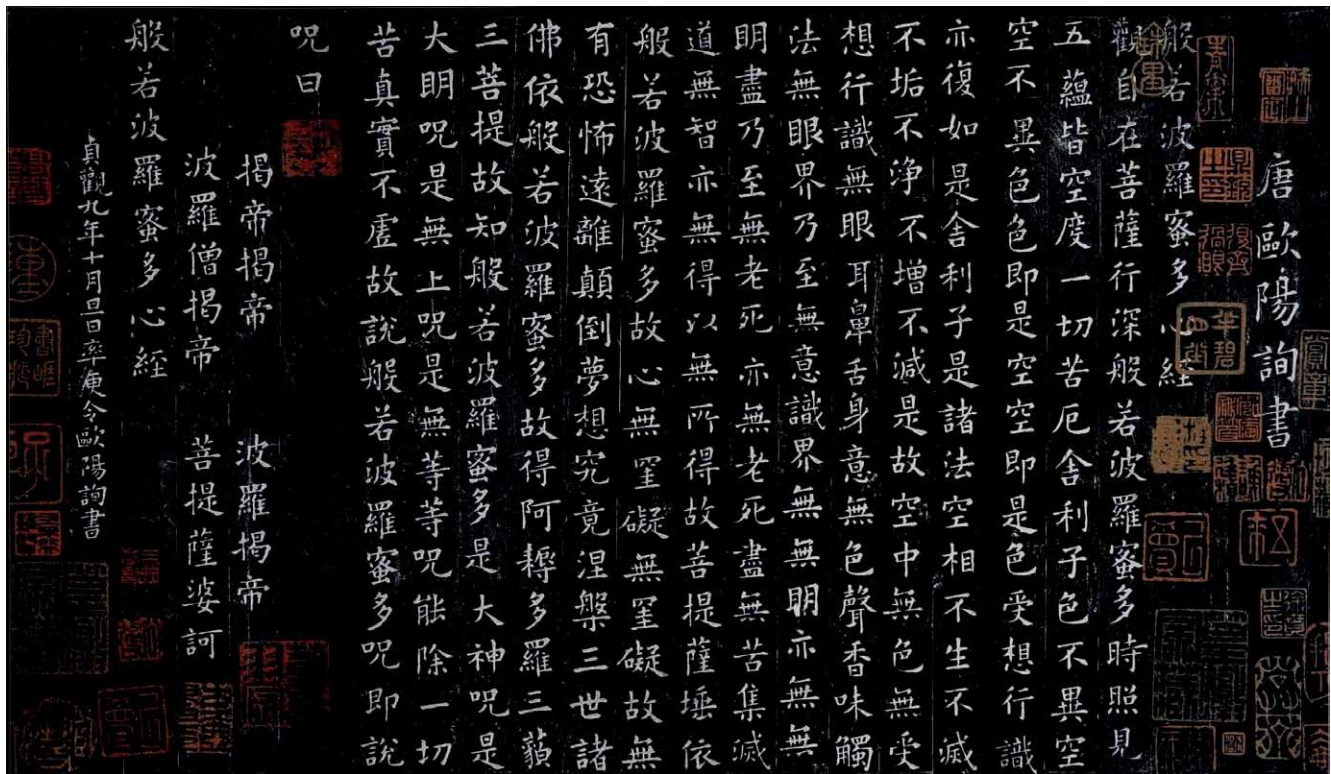


Fig. 3: Rubbing of a Heart Sutra by Ouyang Xun.

that Ouyang Xun used Xuanzang's Chinese translation of this sutra. These facts point to an interesting phenomenon in calligraphy, to a practice still commonly resorted to in China nowadays, namely that of selecting individual characters from various works of calligraphy and re-assembling them to form a new piece of writing. One well-known example is the *Thousand-Character Essay* (*Qianzi wen* 千字文), which consists of a thousand words or characters that only occur once in the entire text. Legend has it that Emperor Wu of the Liang dynasty (502–549) selected a thousand characters from various works of calligraphy by Wang Xizhi and asked the scholar Zhou Xingsi 周興嗣 (470–521) to make a meaningful text out of them. The *Thousand-Character Essay*, which was written in Wang Xizhi's distinct style, was intended to serve the crown prince as a model for practising calligraphy.

There are handwritten and printed sutras penned in the calligraphic style of Ouyang Xun and Yan Zhenqing from at least the Song dynasty (960–1279) onwards, although no evidence actually exists that either of these men ever copied a sutra.¹⁵ Sutras created in retrospect in the style of famous calligraphers lent these copies enormous prestige, not because of the contents of the text, but because of the weight and importance of the calligraphic style. Printed editions of these sutras were a political tool. The Imperial Court had complete editions of the Buddhist Canon printed and distributed

among the major monasteries. The strategy behind this act was to assure the loyalty and allegiance of these monasteries and the Buddhist community to the Imperial Court. Equally anonymous but important and prominent sutra writing, like the monumental *Diamond Sutra* engraved into the rock at 'Sutra Valley' on Mount Tai around the year 570 were associated with the names of famous calligraphers by later epigraphers. On the grounds of stylistic similarities, it is said that Yan Zhenqing's calligraphy was influenced by the style of this *Diamond Sutra*. As Amy McNair has convincingly argued, there is no proof of such influence, though

[...] we have absolutely no evidence that Yan ever visited Sutra Valley or saw ink rubbings taken from inscriptions. The connection cannot be substantiated through documentary evidence, nor is the visual evidence compelling. The critical practice of locating stylistic sources for the writing of well-known calligraphers in certain exceptional anonymous engraved stele inscriptions of the Northern Dynasties period (386–581) arose during the resurgence of epigraphic study that began during the reign of the Qianlong emperor (1735–1796). Chinese scholars are still wedded to this questionable practice today, as are some Western historians of calligraphy.¹⁶

This 'questionable practice' certainly reached its peak during the Qianlong reign, but had actually been in place since at

¹⁵ See Xu Yuanting 許媛婷 2006.

¹⁶ McNair 1998, 31.

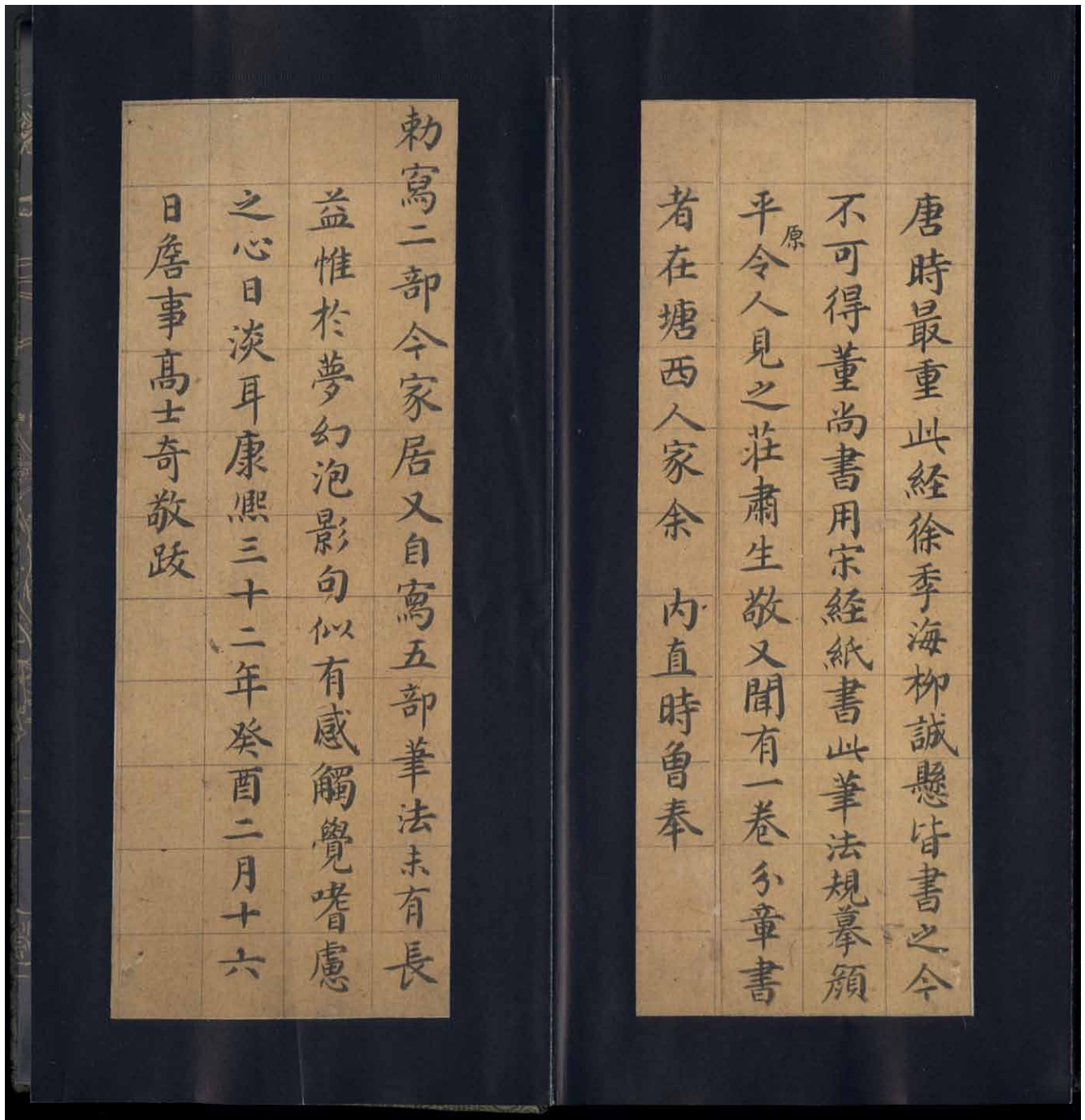


Fig. 4: Dong Qichang, *Diamond Sutra*, dated 1625, detail: colophon Gao Shiqi (1645–1704).

least the Song dynasty. A prominent example of this practice in the case of the early Qing dynasty was the courtier and art collector Gao Shiqi 高士奇 (1645–1704). He did not manage to pass the imperial examination and consequently had to struggle hard to win the respect of the Emperor and his fellow officials. Gao Shiqi used his art collection and colophon writing as a means of positioning himself in elite society. He was very knowledgeable about painting and calligraphy and perfectly conversant with literati conventions. In 1693, Gao appended a colophon (fig. 4) to a *Diamond Sutra* written

by Dong Qichang in small, regular script in 1625.¹⁷ In his colophon, Gao boldly states that during the Tang dynasty the most important calligraphic style employed when copying sutras was that of Xu Hao 徐浩 (703–782). Specimens of this calligraphy were unobtainable in his time, the early Qing. He continues to prove his connoisseurship by showing his expertise and familiarity with practical aspects of material

¹⁷ Now in the National Palace Museum, Taipei. A facsimile print of this sutra has been issued by the Museum: *Ming Dong Qichang shu Jingang bore boluomi jing* 明 董其昌書金剛般若波羅蜜經, Taipei, 1991.

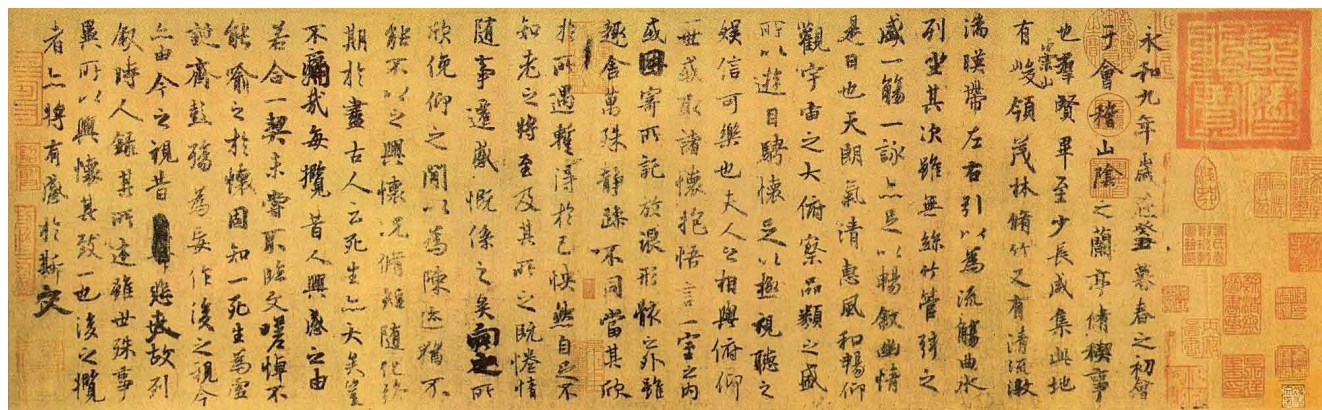


Fig. 5: Chu Suiliang's 褚遂良 (597–658) copy of Wang Xizhi's *Orchid Pavilion Preface* with a colophon by Mi Fu.

culture by saying that Dong Qichang had used Song sutra paper in his copy of the *Diamond Sutra*. Unused Song sutra paper was extremely precious and hard to come by at the time. When a more or less auto didactic, self-made man like Gao Shiqi showed his expertise in matters like identifying a specific type of paper such as Song dynasty sutra paper, it certainly added a feather to his cap. Gao goes on to say in his colophon that in his view, Dong Qichang had based his calligraphic style on that of the Tang master Yan Zhenqing in this particular sutra copy. So by the early Qing, Yan Zhenqing had been elevated – uncritically – as a great copyist of sutras, something for which there is actually no evidence at all. Gao continues to praise Dong's sutra copy and adds how much he is personally touched and moved by merely looking at the calligraphy. This individual response, formalised as the wording may be, still reveals something of Gao Shiqi's eager attempt to show to his surrounding fellow courtiers that he took an active part in the transmission and history of this work of calligraphy, very much in the established literati manner. Later, Emperor Qianlong inherited Dong Qichang's sutra copy with Gao Shiqi's colophon. Qianlong added several of his seals and had the whole work mounted in an album format, with two Buddhist paintings in gold on indigo paper added after the sutra transcription. The Qianlong Emperor favoured Dong Qichang's calligraphy so much that he modelled his own handwriting on the master's calligraphy and had imperially commissioned books printed in Dong Qichang-style regular script.

The earliest known work of calligraphy by Dong Qichang is a copy of the *Diamond Sutra* dated 1592.¹⁸ He copied the sutra for the souls of his deceased parents, as indicated in his own dedication. Dong then presented the album to Yunqi Temple 雲棲寺 near Hangzhou. The abbot of the monastery at that time was the reformist monk Yunqi Zhuhong 雲棲

祿宏 (1535–1615).¹⁹ The sutra copy also bears a dedication by Dong Qichang to Yunqi Zhuhong. The former maintained close contact with the abbot and the temple throughout his life. In 1604, he was asked to write the temple record in his calligraphy to be engraved onto a stele.²⁰ For Zhuhong's eightieth birthday in 1614, Dong Qichang gave him a copy of a *Pure Land Sutra*.²¹ In a comment on this sutra transcript, Dong Qichang does not remark on any religious matters or on his friendship with the highly respected older monk, but considers this transcription a work of calligraphy. He compares his *Pure Land Sutra* to a copy by Zhao Mengfu,²² which the latter had dedicated to his friend, the Chan abbot Zhongfeng Mingben 中峰明本 (1262–1323). With unusual modesty, Dong says that the calligraphy used in his transcription is not as good as Zhao Mengfu's. For Dong Qichang, Zhao Mengfu was an arch rival – a calligrapher whom he strove to surpass. By 1614, Dong's calligraphy had certainly reached a level of maturity and excellency that was on a par with that of the Yuan dynasty giant of calligraphy. With his pretence at modesty, Dong was, in fact, seeking confirmation to the contrary, namely that his calligraphy was actually better than Zhao Mengfu's. In 1615, Dong Qichang transcribed the *Amida Sutra*,²³ which he also presented to Yunqi Temple.

¹⁹ Yü Chün-fang 1981.

²⁰ *Zhongjian Yunqi chanyuan beiji* 重建雲棲禪院碑記. The stele is no longer extant.

²¹ Chin. *Jingtu jing* 淨土經, Sanskrit: *Sukhāvāṭīyūha*, abbreviated title of several sutras including *The Larger Sutra on Amida* (transl. into Chinese by Samghavarman), *The Sutra on Contemplation of Amida* (transl. into Chinese by Kālayāśas) and *The Smaller Sutra on Amida* (transl. into Chinese by Kumārajīva). Cf. Fujita 1990, 151ff.

²² Hand scroll, ink on paper, 35.6 × 322.6 cm, dated 1316, National Palace Museum, Taipei.

²³ Chin. *Amituo jing* 阿彌陀經; translated into Chinese by Kumārajīva in the year 402, one of the three main *Pure Land Sutra* texts.

¹⁸ This is now stored in the sutra repository of Lingyin Temple in Hangzhou.

When Dong Qichang copied the *Diamond Sutra*, his calligraphy was still at an early formative stage. Unlike the *Heart Sutra*, which is short and easy to memorise, the text of the *Diamond Sutra* is rather long and lends itself well as a calligraphic exercise. This is precisely what Dong Qichang did. He wrote the sections of the sutra in various styles used by famous calligraphers of the past; the change in style is discernable. Sections one to five are written in the style of Zhong You 鍾繇 (151–230), sections six to nine in the manner of the Two Wangs (Wang Xizhi and his son Wang Xianzhi), sections ten to thirteen in Ouyang Xun's hand, sections fourteen to twenty are based on Mi Fu 米芾 (1051–1107) with some elements from Yan Zhenqing, and the final sections (up to thirty-two) again follow Wang Xizhi's stylistic approach. It is noteworthy that these names read like a Who's Who of orthodox calligraphic tradition. By copying different sections of this sutra in different styles, Dong Qichang demonstrated his familiarity with works of calligraphy by these earlier masters and at the same time strove to be included in this illustrious lineage as a worthy successor of a centuries-old tradition. From his own comments and other sources, it is known that Dong had had the opportunity to see and occasionally copy or borrow famous works of calligraphy from two of the foremost private art collectors of the time, Xiang Yuanbian and Han Shineng 韓世能 (1528–1598). The list of works Dong was able to study and copy prior to making his transcription of the *Diamond Sutra* is truly impressive, including Chu Suiliang's 褚遂良 (597–658) copy of Wang Xizhi's *Orchid Pavilion Preface*²⁴ with a colophon

by Mi Fu (fig. 5). At this point, what mattered most was calligraphic style, stylistic quotations and the models that were selected. The sutra's religious function – it was stored in the sutra repository and only taken out and recited in temple rituals on important days – was secondary. When Emperor Qianlong visited the South on his inspection tours, he always stopped at Yunqi Temple and asked to see Dong Qichang's *Diamond Sutra*. The Emperor's preference for Dong's calligraphy was well known. He liked the calligraphy of this sutra transcription so much that he personally wrote the title slip, the frontispiece, appended six lengthy poetic colophons dated 1751, 1757, 1762, 1765, 1780 and 1784 and imprinted a total of nineteen of his seals on it.

Sutra transcriptions produced by anonymous monks in the scriptorium of a monastery tended to – quite literally – lead a cloistered existence in the temple or be sent from one temple to another. Once a sutra copy was associated with the name of a famous calligrapher, it left the religious Buddhist environment and entered the Confucian-dominated literati sphere, the 'world of the red dust',²⁵ where the written characters of sacred words lost their innocence and became part of very worldly matters such as issues of loyalty, status, rivalry or political allegiance. This discourse was not carried out openly in words, but concealed in the style and form of the calligraphy.

²⁴ Hand scroll, ink on paper, 24 × 88.5 cm, Palace Museum, Beijing.

²⁵ *hong chen* 紅塵, a Buddhist term denoting the secular, material world.

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Fig. 5: © Palace Museum, Beijing

Article

The Tibetan *Kanjur*: Regional Patterns and Preliminary Paper Typology of Manuscripts and Xylographs

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The consecutive editions¹ of the Tibetan *Kanjur*, i.e. the Buddhist canon in Tibetan script and language, were written or printed on paper. The paper preserved in these editions represents a variety of types and is a treasure of knowledge about the past. It may serve as an identification key and helps to obtain information about a book's origin, purpose, and significance in the further perspective. Complementary sets of data collected for each manuscript highly increase the possibilities of dating and determining the place of origin of unknown manuscript collections in the future.

For this study I examined paper in all available editions of the Tibetan *Kanjur* with respect to the dating and place of origin of a particular manuscript. These editions comprise:

- Printed in 1410 in Beijing: one folio of the *Yongle Kanjur* kept in the Special Collections Library, University of Michigan in Ann Arbor, USA;²
- Printed in 1606 in Beijing: the twenty-eight volumes of the *Wanli Kanjur* kept in the Jagiellonian University Library (Biblioteka Jagiellońska)³ in Cracow, Poland;
- Printed in 1606 or slightly later in Beijing: the twenty-

two volumes of the Supplement to the *Wanli Kanjur* kept in the Jagiellonian University Library (Biblioteka Jagiellońska) in Cracow, Poland;

- Printed in 1606 or slightly later in Beijing: two volumes of the *Supplement* to the *Wanli Kanjur* kept in the Harvard-Yenching Library in Cambridge MA, USA;
- Handwritten in 1680 in Beijing: the *Berlin Kanjur* (manuscript Beck), which was copied from the *Wanli Kanjur* and is kept in the Berlin State Library – Prussian Cultural Heritage (Staatsbibliothek zu Berlin – Preußischer Kulturbesitz), Germany;
- Printed between 1684 and 1692 in Beijing: one volume from one of the later editions of the *Kangxi Kanjur* kept in the Jagiellonian University Library (Biblioteka Jagiellońska) in Cracow, Poland;
- Printed in 1730-1732 in Narthang: the *Narthang Kanjur* kept in the Berlin State Library – Prussian Cultural Heritage (Staatsbibliothek zu Berlin – Preußischer Kulturbesitz), Germany;
- Printed in 1733 in Derge: the *Derge Kanjur* kept in the Library of Congress, Washington D.C., USA;
- Printed in 1926 in Cone (blocks carved in 1721-1731): the *Cone Kanjur* kept in the Library of Congress, Washington D.C., USA;
- Printed in 1934 in Lhasa: the *Lhasa Kanjur* kept in the Berlin State Library – Prussian Cultural Heritage (Staatsbibliothek zu Berlin – Preußischer Kulturbesitz), Germany.

¹ The term 'edition' is not only used in the most common sense of a printed work, but also for the result of consciously produced handwritten or xylograph copies of the canon on the highest level of scholarship. The editorial work in Hellenistic Alexandria or of Byzantine scholarly circles is comparable in this context. In this sense I am using 'edition' for a set of volumes (number of prints) struck from one particular set of wooden blocks. I am additionally using the term 'set' where a particular collection of volumes was printed at the same time and represents the same physical features, such as page outline, type of paper and ink and the same style of decorations.

² According to the unpublished hand-list prepared in 1986 by Bruce Cameron Hall, 'Tibetan Manuscripts and Xylographs in Michigan Collections,' several items were received in 1924 from Edward Barrett, a New York fur trader who travelled in China in the 1920s, and as a side line sold 'Oriental curiosities,' mostly books and printing blocks. Among these is the single sheet identified by Hall as belonging to the *Yongle Kanjur*, catalogued as 'Central Asian Collection 1'. See Hall 1979, and Silk 1996, 171.

³ All volumes mentioned that are kept in the Jagiellonian University Library belong to the Pander collection, which has recently been rediscovered in Cracow by the author of this article after having been considered lost in World War II. For more information see Eimer 2000, 27–51, and Helman-Ważny 2009.

These specimen of the Tibetan *Kanjur* are of different quantity, ranging from a small single folio to complete multi-volume sets. However, they provide a good representation of consecutive editions of the Tibetan *Kanjur* produced between the 15th and 20th centuries.⁴ Particular sets were produced in different places, from Beijing in the East to the Lhasa region in the West. Varieties in paper type, the style of

⁴ For more information on the history and development of the consecutive editions of the Tibetan *Kanjur*, see Eimer 1992.

particular volumes, and their format are closely connected to the different places where these books were produced. Documentation of paper features in known and datable sets of volumes allows for creating a solid chronological and regional reference for future work.

The earliest xylographic editions of the Tibetan *Kanjur* were printed in China. The first one was the edition identified by the reign name of its commissioner Emperor Yongle (r. 1402–1424), printed in red ink in 1410. In Beijing, new impressions continued to be taken from the *Yongle* blocks and in this way, the *Wanli* set printed in black ink in 1606 was produced.⁵ When the blocks wore out, new blocks were prepared and carved, using prints of earlier blocks as a master. At present we cannot be sure about the total number of wooden blocks prepared for the so-called Beijing editions. Japanese scholars, who visited China during World War II, after their return provided the information that for printing the *Kanjur* in Beijing mainly two different sets of blocks were used. Here this second set of blocks is represented by one volume printed during the reign of emperor Kangxi (r. 1661–1722). However, the wooden blocks served for printing both the *Yongle* and *Wanli* sets of the Tibetan *Kanjur*, produced not only the first printed edition of the Tibetan *Kanjur*, but also one of the first printed Tibetan book collections known so far.⁶ Since the 17th century, *Kanjur* sets have also been edited and produced in Tibet.

Methodology⁷

This study of paper is based on the optical characteristics of the material, focusing on:

1) *Fibre composition*

The components of raw materials provide the most useful information for typology. The distinct character of any paper derives, much more than is generally known, from the raw materials used in its creation.⁸ Fibres constitute the basic components of any paper sheet, and therefore the determination of the fibre composition is essential for characterizing the paper. Optical microscopy, which uses visible light and a system of lenses to magnify images of small

samples, allows for fibre composition identification. The key features of the fibres of the papers examined are the general shape and dimensions of the fibres, cross and longitudinal markings on the fibre surface, the shape of the ends of the fibres, irregularities in the fibre walls, and the type and size of the associated cells of the sample. The results are compared to a fibre atlas.⁹ In some cases the observations made with regard to fibres were also compared with the parameters of particular species recorded in the samples of raw materials that were taken directly from plants by the author. Thus the comparative study of historical and new specimens allowed for collecting fingerprint information¹⁰ about paper.¹¹

2) *The papermaking sieve prints and other technological information sealed in the paper structure*

The papermaking sieve prints and fibre distribution patterns produced during sheet formation can be read in historic papers independently from changes due to aging. For example, handmade wove paper is characterized by the textile print on the surface, whereas handmade laid paper is characterized by the particular number of laid lines measured at a distance of three centimetres that are visible in the paper structure against the light. They can be distinguished depending on what type of papermaking sieve was used.

3) *The preparation of the leaves before writing or printing*

This includes the structure of the leaf and the visual properties of its surface, such as dyeing the paper or applying insect-repelling substances - which may also change the colour of raw paper - sizing the paper, gluing it in layers, and polishing its surface. This type of criteria in particular shows the difference between paper prepared for manuscripts and paper used for prints.

Knowledge of the technology of paper production – as determined from the papermaking sieve pattern sealed in the paper structure and from the kind of plant used for its production and identified during microscopic examination – is essential, since such information allows for creating an objective typology. Through this approach to examine the paper structure the manuscripts cannot be dated directly; however, by comparing the results of fibre analyses in particular manuscripts we can learn more about the geographical origin of the paper and the region where the plant used for making this specific paper occurred. The prospective typology regarding the differences in papermaking technology can thereby also provide clues as to the region of a book's origin,

⁵ These volumes are located in the Pander Pantheon section (vols. 23–28, 38–57, 59–60) of the Pander collection kept in the Jagiellonian University Library in Poland; *Wanli* again is the reign name of an emperor (r. 1572–1620). For more details on this collection, see: Pander 1890, Mejor et al 2010.

⁶ For the history of Tibetan printed works see: Harrison 1996, 81 and Shaeffer 2009, 9.

⁷ I based this methodology on standard procedures used for conservation. However, I selected and modified it for the purpose of typology and history of books and paper. See: Helman-Ważny 2009b, 67–75.

⁸ Helman-Ważny 2006.

⁹ Ilvessalo-Pfäffli 1995.

¹⁰ Fingerprint information is a complex of features sealed in paper, which can be used for identification of a particular type of paper.

¹¹ Fibre examinations were performed by the author of this article at the Department of Plant Biology, Cornell University.

since we generally know the geographical range in which a particular type of papermaking mould was used. Differences in sheet formation should be classified in a similar way and should also become part of this typological approach.¹² Once a paper typology for Tibetan *Kanjur* editions is established, it will be much easier to classify all other newly found *Kanjur* fragments.

Results: Patterns in *Kanjur* volume sets

All *Kanjur* volumes examined are distinguished by their large size. However, a variety of sizes and visual appearances of paper were documented.¹³ Particular volumes differ in the number of paper layers glued together and the character of the paper surface. Paper was prepared differently for handwritten manuscripts and for xylograph prints.

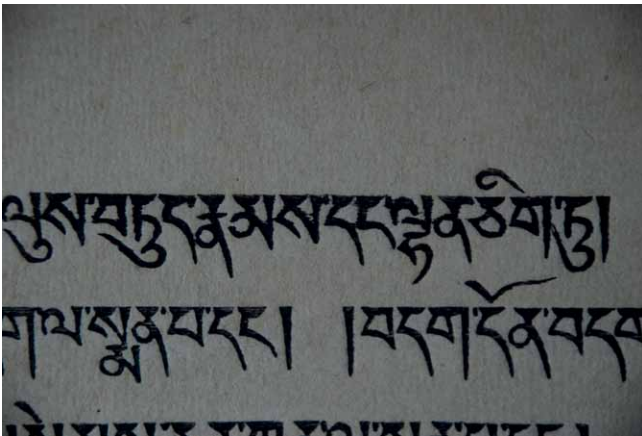


Fig. 1: Fragments of the first sub-type of paper from vol. 23 of the *Wanli Kanjur* set. Collection of the Jagiellonian University Library, Cracow.

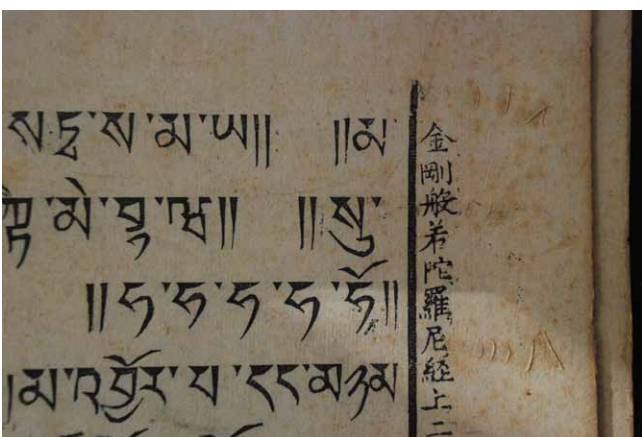


Fig. 2: Fragment of the second sub-type of paper from vol. 11 of the *Wanli Kanjur Supplement* set. Collection of the Jagiellonian University Library, Cracow.

¹² Methods of paper examination and record of paper features are discussed in van Staalduinen, Lubbe, Backer, and Paclik 2006, 346–353.

¹³ Cp. table 1 at the end of article.

I was able to identify three different groups as to the regional origin of particular sets of Tibetan *Kanjur*. The first such group comprised the earlier *Kanjur* editions produced in China. These are the *Yongle* and *Wanli* sets plus the Berlin manuscript copy of the *Yongle/Wanli* edition as well as the *Wanli Supplement* and the fragment from the *Kangxi* editions. All of these sets of volumes were executed on paper produced in China, which is characterized by the same or at least a very similar measurement of leaves but is made of a variety of different fibres.

Leaves in all sets examined from this group were glued in multiple layers. Increasing the thickness of the paper by gluing it together to create layers was necessary, because thinner paper would not ensure the stability needed for a large format. The leaves of the *Kangxi* volume in Cracow, which was not directly modelled on either the *Yongle* or the *Wanli* edition, are slightly larger than those in the *Wanli Kanjur* and *Wanli Kanjur Supplement* but smaller than in the handwritten copy of the *Wanli Kanjur* kept in Berlin.

Furthermore, even within a group of sets written on the same general type of paper I discovered differences in the components, quality and outward appearance of the paper. For example, the paper of the *Yongle* and *Wanli Kanjur* volumes is much whiter and of better quality than the one used in the later sets of the *Kanjur* produced in China, although both types are characterized by very similar laid lines printed in the paper structure. Therefore I could distinguish two sub-types. The *Yongle* and *Wanli* editions belong to the first sub-type, whereas later sets starting from the *Wanli Kanjur Supplement* volumes represent the second sub-type of paper, clearly differentiated by hue, fibre components and, generally speaking, its minor quality (figs. 1 and 2).

Another difference between these two sub-types can be detected by examining the paper composition. The leaves of the *Yongle* and *Wanli* volumes are composed of more layers of paper than those of the *Wanli Supplement* volumes, the Berlin manuscript copy of *Wanli* volumes, and the *Kangxi Kanjur* volume. The underlying pattern here is that the thinner paper of better quality in the *Yongle* and *Wanli* editions was made of paper mulberry and required the addition of more layers of paper in order to prepare a leaf suitable for a large format in regard to stability (first sub-type). A leaf consisting of slightly thicker and more absorbent (softer) paper made of mixed components, as identified in the second sub-type, does not require so many layers of paper in order to be adequate and strong enough for printing.

By analysing the paper structure, information could be obtained about the type of sieve attached to the papermaking mould used. This laid lines fingerprint pattern suggests that the paper of the *Kanjur* sets from Beijing was produced by

dipping technique and by using a mould with a moveable type of sieve. This type of mould with fine laid lines (24–33 in 3 centimetres), which is used in all sets of *Kanjur* examined in this group, was not used in Tibet. Tibetans used a woven type of mould made of textile attached to a wooden frame. Those materials were easier to obtain in Tibet, where bamboo or reed does not grow. Thus the aforesaid laid sieve print confirms the Chinese origin of these papers. Chain lines were usually not visible due to the many layers of paper glued together.

I noticed differences between these two sub-types of paper at all levels of my examination. However, all these differences in the quality and outward appearance of the paper result from the different raw materials used for making particular types of paper. The *Yongle* and *Wanli Kanjur* were printed on paper made of plain paper mulberry. Given its extremely long fibres, this plant can produce very strong and thin paper (fig. 3).



Fig. 3: Paper mulberry fibres in polarized light visible on image at 150 x magnification composing the paper of the *Wanli Kanjur* (vol. 60 of the Pander Pantheon collection) from the Jagiellonian University Library, Cracow.

The volumes of the *Wanli Kanjur Supplement*, which was printed at the same time as the *Wanli* edition or shortly thereafter, already represent a poorer paper quality. Regarding the quality, technology, and raw material, the paper of the *Wanli Supplement* is very similar to the paper found in the volume examined of the *Kangxi* edition of the Tibetan *Kanjur*. I detected three types of cells in those papers: paper mulberry fibres (cut short), pitted wood/bamboo tracheids or vessels, and narrow straw fibres with pointed ends (fig. 4).

Plain paper mulberry fibres produce much stronger, more elegant and better quality paper than those mixed with bamboo and straw. The addition of straw mixed with bamboo, however, makes paper softer but at the same time

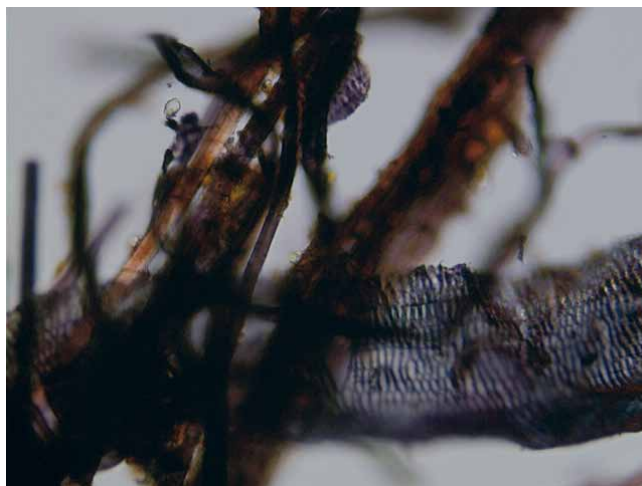


Fig. 4: Paper mulberry fibres and bamboo vessel in polarized light visible on image at 600x magnification composing the paper of the *Wanli Kanjur Supplement* (vol. 5 of the Pander Pantheon collection) from the Jagiellonian University Library, Cracow.

less durable. Such a type of paper is especially suitable for printing. The same type of paper, when used for writing, needs more processing. Commonly used sizing substances, such as starch or plant extracts, had to be applied on the paper surface before writing, sometimes together with additional fillers such as rice starch, white powder or chalk. Then the sized sheet of paper was finished by polishing the surface with shell or semi-precious stone. The handwritten copy of the *Wanli Kanjur* kept in Berlin is a good example of such elaborate processing.

The only sets examined of *Kanjur* produced in Eastern Tibet are the *Cone* and *Derge* editions. These places are located quite distantly, about 1,000 km from each other. Additionally, the copy examined from *Cone* cannot be directly compared to the *Derge Kanjur* set, since its volumes were printed much later (in 1926) from original wooden blocks carved in 1721–31.¹⁴ At that time it was probably common in the region to order paper from other parts of China.

The paper used for the *Cone* editions is not the same as the one used for the *Derge* editions. *Cone* paper has typically ‘Chinese’ characteristics and is made from specific fibre components (paper mulberry and straw), (fig. 5).¹⁵

¹⁴ The woodblocks for this set were produced in the area of the Cone Monastery at the beginning of the 18th century. This set, composed of 108 volumes, was purchased for the Library of Congress in 1926 at the Cone Monastery in the Gansu Province, China, by the botanist Joseph F. Rock. For more information about the provenance of this set see Meinheit 2009.

¹⁵ I use ‘Tibetan’ and ‘Chinese’ in this context only as terms for certain types of paper without implying a particular place of origin or the ethnicity of the producers. However, from the evidence assembled here it is quite clear that we observe indeed a regional distribution with East Tibet being the zone of interaction.



Fig. 5: Paper of the *Cone Kanjur* in volume 1 *mdo* shows the presence of paper mulberry and straw fibres in 60x magnification.

However, the size of the leaves is visibly smaller when compared to those of the editions produced in the Beijing area and described above. Due to their smaller format, the leaves of the *Cone* set are composed of 23 layers – much fewer than the leaves of volumes from the earlier editions. However, the laid lines pattern in the *Cone* paper is characterized by about 27 laid lines spanning 3 centimetres, which is exactly the same pattern as in the earliest editions of Tibetan *Kanjur* sets produced on Chinese paper.

Derge paper belongs to a typically Tibetan type made of the *Thymelaeaceae* family plants (fig. 6).¹⁶ This paper is

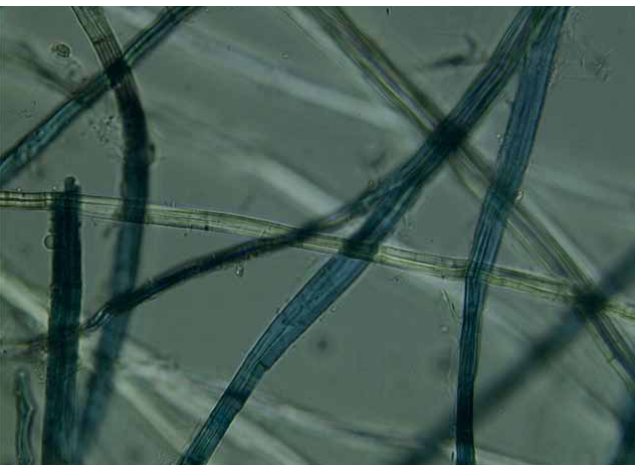


Fig. 6: *Daphne* or *Edgeworthia* sp. fibers in polarized light visible on image at 600x magnification composing the paper of the vol. 45 of *Derge Kanjur* acquired by William Rockhill in 1908. Tibetan Rare Book Collection, Asian Division, The Library of Congress, Washington DC.

¹⁶ *Thymelaeaceae* family plants are reported by many scholars in the context of paper production in the Himalayan region and India only. I cannot exclude that these plants were also used in China from time to time for very specific purposes, since they occur in some regions of China. However, there is no reason to believe that Chinese communities used *Thymelaeaceae* plants for making paper used for books, since authors such as Tsien, Hunter or Pan Jixing never mentioned such use (cp. fn. 17).

of a much darker (brownish) colour than that of *Cone*, and the paper structure is characterized by many external bark particles and fibre bundles. When creating the paper for the *Derge Kanjur* set, both the woven and the laid papermaking mould were used. The examined *rgyud* volume 77 of the *Derge Kanjur* was printed on paper made by a woven type of mould. For the other two volumes examined from other parts of this *Kanjur*, paper was made on a bamboo sieve characterized by 15 laid lines spanning 3 centimetres. This type of mould was used in Tibetan borderland provinces and in Bhutan.¹⁷ Some of the old Dunhuang papers show very similar laid line characteristics.¹⁸ Typically, Tibetan papermaking moulds are woven. However, there are much more similarities between both editions produced in Eastern Tibet when taking into consideration the style of particular volumes. For example, the leaves of the *Cone* and *Derge Kanjur* sets are visibly smaller than leaves in the sets of the Beijing editions of the Tibetan *Kanjur*. Their proportions are more similar to the format of a palm leaf.

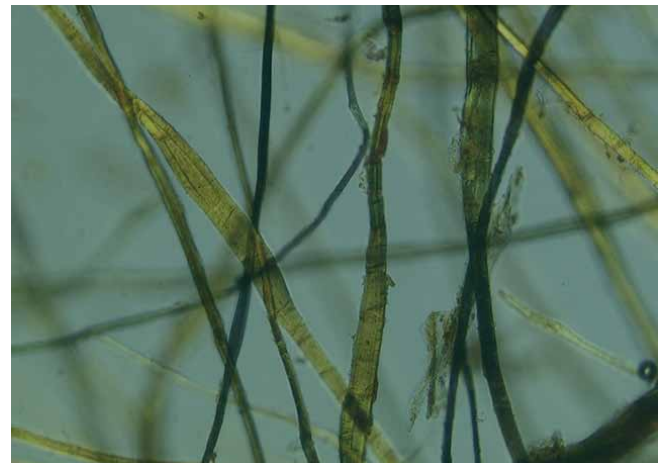


Fig. 7: *Daphne* or *Edgeworthia* sp. fibers in polarized light on image at 300x magnification composing the paper of the *Narthing Kanjur* from the Berlin State Library.

The third group includes sets of *Kanjur* produced in the central part of Tibet, the Lhasa area. The *Narthing* and *Lhasa Kanjur* sets belong to this group. All volumes examined were printed on the same typical Tibetan paper made of *Daphne* or *Edgeworthia* sp. of the *Thymelaeaceae* family plants (fig. 7). All volumes from this group were printed on one-layer paper of uneven thickness presenting a structure characterized by many outer bark particles and fibre bundles. The quality of the *Narthing Kanjur* paper is not as good as the paper quality of the *Lhasa Kanjur*. However, in both editions the quality

¹⁷ Imaeda 1989.

¹⁸ For example, see: Or.8210/S.1524, Or.8210/S.4528, Or.8210/S.2105, Or.8210/S.6492 dated to 6th century CE.

of printing is worse than in all previously described editions produced in China. This is due to the features of the Tibetan paper, which is very durable and has a slightly glossy surface that is not as absorbent as that of Chinese papers. All sets of *Kanjur* in this group were made of one layer of paper. If the paper layers were glued together, this would lead to perfect material for writing, which, however, would be more difficult to print on. In fact, the usage of Tibetan paper may also be one of the reasons why in Tibet manuscripts were widely produced simultaneously with printed books until the 20th century.

Resumee

Finally, I could distinguish two main types of paper used in the sets of Tibetan *Kanjur* examined as well as further sub-types. The main differences between the two types can be found in the fibre composition and traces of the type of papermaking sieve sealed in the paper structure. In Tibet, primarily *Thymelaeaceae* family plants were used for producing paper. This clearly distinguishes Tibetan paper from Chinese paper, which is composed of a variety of plants such as paper mulberry, bamboo, and straw among many others.¹⁹ Tibetan papers in the different *Kanjur* volumes do not represent a large variety, whereas the Chinese papers allow for distinguishing more sub-types, which is very promising in the context of creating a precise typology in the future. Early *Kanjur* sets produced in China used paper made of pure paper mulberry fibres, whereas later volumes were printed on mixed fibre components. Regarding regional origin, all *Kanjur* sets produced in the Beijing area were printed on typically Chinese paper, and all sets produced in the Lhasa area were printed on the Tibetan type of paper made of *Daphne* or *Edgeworthia* sp. of the *Thymelaeaceae* family plants. In Eastern Tibet, both types of paper were used.

I discovered the same difference in paper features when examining fingerprint patterns of papermaking sieves used. The majority of Tibetan papers were made by means of a woven type, and all Chinese papers were characterized by about 24–30 laid lines spanning 3 centimetres. In the *Kanjur* sets examined, Tibetan types of paper were produced by means of both mould types – woven and moveable bamboo sieve, whereas Chinese types of paper were made by using a mould with a bamboo or grass sieve.

The comparative examination of different *Kanjur* sets shows the technical similarities between different editions, and their re-prints and re-editions, when supported by a research on paper including the examination of other physical

features of particular volumes. The relation between a master copy and the subsequent edition of the *Kanjur* (which was modelled on this master copy) is also characterized by paper features, as was clearly evident in the case of the *Yongle* edition, its *Wanli* reprint and consecutive re-editions. I found out that raw materials changed in time and techniques of papermaking evolved that allow for dating other volumes to a particular period or identifying their place of origin.

This research allowed for drafting a preliminary paper typology, which should be supported by more *Kanjur* volumes to be examined. In the future I am planning to create a data base of paper features derived from Chinese and Tibetan books dated to different periods and originating from different places. This will be linked to my collection of papermaking plants including keys for identification and mapping of their distribution. I believe this will lead to a clearly more precise identification of book paper. Finally, this research appears to be very promising for identifying newly found fragments of the Tibetan *Kanjur*, which are still widely discovered.

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¹⁹ For further information on Tibetan and Chinese papermaking, see Hunter 1932 and 1978; Meisezahl 1958, 17–28; Trier 1972; Tsien 1973, 510–519; Tsien 1985; McClure 1986; Koretsky 1986; Pan 1998; Helman-Ważny 2005 and 2006, 27–37 and 3–9.

Table 1: Characteristic features of paper in particular sets of Tibetan Kanjur

No.	Set Examined fragment	Present Location	Dating	Place of production	Size of leaves height × length cm
1.	<i>Yongle Kanjur</i> : folio 12 of the <i>Samādhirāja-sūtra</i>	Special Collections Library at the University of Michigan, Ann Arbor, USA	1410	Beijing	24.2–24.5 × 68.7–69
2.	<i>Wanli Kanjur</i> : the twenty-eight volumes: Nos. 23–28 (<i>rgyud</i>), 38–57 (nos. 38–55 = <i>rgyud</i> ; 56 = <i>mdo</i> ; 57 = <i>rgyud</i>), 59 (<i>rgyud</i>), 60 (index – <i>dkar chag</i>)	Jagiellonian University Library in Cracow, Poland (Biblioteka Jagiellońska w Krakowie)	1606	Beijing	23.8–24.5 × 68.5
3.	<i>Wanli Kanjur</i> Supplement: Pander Pantheon: volumes 1–22	Jagiellonian University Library in Cracow, Poland (Biblioteka Jagiellońska w Krakowie)	1606–1607	Beijing	approximately 23.8–24.5 × 68.5
4.	<i>Wanli Kanjur</i> Supplement: volumes <i>tsa</i> and <i>ku</i> of the <i>Wanli Supplement</i>	Harvard-Yenching Library in Cambridge MA, USA	1606–1607	Beijing	approximately 23.8–24.5 × 68.5
5.	‘ <i>Handwritten Kanjur of Berlin</i> ’: vol. 1, <i>ka</i> ; vol. 24 Part 1 and Part 2, <i>nya</i> ; vol. 17 Part 1 and Part 2, <i>ka</i> ; vol. 18 Part 1 and Part 2, <i>kha</i> ; vol. 108 Part 1 and Part 2, <i>ja</i> ; vol. 85 Part 1 and Part 2, <i>ka</i> plus 64 folios of <i>dkar chag</i> attached to this volume)	Berlin State Library, Germany (Staatsbibliothek zu Berlin Preußischer Kulturbesitz)	1680	Beijing	approximately 26.8–29 × 68.9–73.3

Fibre composition	Papermaking sieve print (number of laid lines in 3cm and chain line intervals if visible)	Structure of the leaf and visual properties of its surface
paper mulberry (<i>Broussonetia</i> sp.)	27–30	six or more layers glued together; good quality and well preserved paper
paper mulberry (<i>Broussonetia</i> sp.); within the <i>Wanli</i> set the best quality (longest) fibres were used for volume 60 (<i>dkar chag</i>); the volumes of the <i>rgyud</i> (Tantra) section were produced on medium quality raw material	24 some of the papers show pattern 15–18; chain lines visible in volume 28: distances between them as follows: 3cm-2cm-3cm-2cm-2,5cm-2,5cm-2,5cm-2,5cm. paper.	six or more layers glued together; the paper on which laudation text is written has about four layers, which makes leaves thinner; good quality and well preserved paper
paper mulberry, straw, and bamboo	laid paper	six or more layers glued together
paper mulberry, straw, and bamboo	laid paper	six or more layers glued together
bamboo, straw, jute and paper mulberry	laid paper characterized by 9–11 laid lines in 1cm	three or more layers glued together; highly sized and polished; possibly also covered by other substances increasing its whiteness

No.	Set Examined fragment	Present Location	Dating	Place of production	Size of leaves height × length cm
6.	one of several corrected reprints of the <i>Kangxi Kanjur</i> edition: <i>sher phyin, Tha</i> (volume 58 from the Pander collection)	Jagiellonian University Library in Cracow, Poland (Biblioteka Jagiellońska w Krakowie)	1684–92	Beijing	approximately 24.5–25.5 × 71.5
7.	<i>Cone Kanjur</i> : Vol. 1 <i>mDo</i> (sutra), <i>ka</i> ; vol. 35 <i>'Dul-ba (Vinaya), ga</i> ; vol. 92 <i>Yum, ka</i> ; vol. 108 <i>dKar chags</i> (Index); vol. 72 <i>rgyud</i> (tantra); Original Paper Strings from <i>Cone Kanjur</i>	Library of Congress, Washington, D.C., USA	1721–31 (the copy examined was printed in 1926)	Cone	approximately 18–18.5 × 56.5–57
8.	<i>Narthatang Kanjur</i> : vol. 1 <i>'Duk-ba, ka</i> , and vol. 2 <i>'Dul-ba, kha</i>	Berlin State Library, Germany (Staatsbibliothek zu Berlin Preußischer Kulturbesitz)	1730–32	Narthatang	approximately 17–18 × 61.5–63.5 (certain folios are not evenly cut)
9.	<i>Derge Kanjur</i> : <i>tnaya, ka</i> ; vol. 45 <i>mDo-sde</i> (sutra) part volume, <i>ka</i> ; vol. 77 <i>rGyud-hbum</i> (tantra), <i>ka</i> .	Library of Congress, Washington, D.C., USA	1733	Derge	approximately 10–11.5 × 60.5–62
10.	<i>Lhasa Kanjur</i> : vol. 1 <i>'Duk-ba, ka</i> , vol. 1 <i>'Dul-ba, ka</i> , and vol. 2 <i>'Dul-ba, kha</i>	Berlin State Library, Germany (Staatsbibliothek zu Berlin Preußischer Kulturbesitz)	1934	Lhasa	15.5–17.5 × 62.8–64 (certain leaves are not evenly cut)

Fibre composition	Papermaking sieve print (number of laid lines in 3cm and chain line intervals if visible)	Structure of the leaf and visual properties of its surface
paper mulberry, bamboo, and straw	laid paper with hardly visible structure	three or more layers glued together
paper mulberry and straw	laid paper characterized by about 9 laid lines in 1cm; chain lines not visible; a paper fragment with a title (label) printed on a lotus flower in the first volume [ka] of mDo shows the same chain and laid lines pattern as paper leaves; here one may detect chain lines within a distance of 3.5 to 4 cm from each other	slightly yellowish (cream), stuck together to form two or possibly three layers; absorbent and soft; glued using diluted starch paste rather than any kind of animal glue; two leaves (ms folio 244 in vol. 35 and ms folio 289 in vol. 92) handwritten on much thicker paper in which more layers were glued together to allow for writing with a bamboo or wooden stick; surface of the leaf polished with stone before writing
<i>Thymelaeaceae</i> family plants (<i>Daphne</i> or <i>Edgeworthia</i> sp.)	both a woven type of paper made with thick textile as woven sieve and possibly a finely woven cotton sieve, and a laid paper characterized by about 5 laid lines in 1cm were used when producing this paper	very thin one-layered paper with glossy surface of uneven thickness; the middle part of the volume was printed on visibly worse paper quality; fibre bundles and outer bark particles in the paper structure
<i>Thymelaeaceae</i> family plants (<i>Daphne</i> or <i>Edgeworthia</i> sp.)	laid paper characterized by 5 laid lines in 1cm; chain lines within a distance of 3-4cm in volumes 1 and 45; paper in <i>rgyud</i> volume 77 produced by means of a mould with a woven type of sieve	one-layered, soft and absorbent paper characterized by a brownish color and slightly glossy surface (possibly polished); the thickness of the paper differs in different leaves; many fibre bundles and fragments of outer bark in its structure caused by an inadequate amount of well-separated fibres
<i>Thymelaeaceae</i> family plants (<i>Daphne</i> or <i>Edgeworthia</i> sp.)	both a woven type of mould and a laid mould characterized by about 7 laid lines in 1cm; the woven mould had a sieve made of loosely woven textile, which is clearly visible in the paper structure	one-layered, very thin paper with visible fibre bundles in its structure and a slightly glossy surface; the thickness of the paper and its quality differs in different leaves: some leaves are almost brown showing more particles of outer bark in their structure

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Fig. 1 – 7: © Photographs Agnieszka Helman-Ważny

Article

The Study of Manuscripts: a Natural Scientist's Approach*

Oliver Hahn, Emanuel Kindzorra, Ira Rabin | Hamburg & Berlin

Abstract:

The analysis of physical and chemical properties of artefacts provides important data for answering questions that cannot be solved by historical and philological methods alone. In its individual materiality, each manuscript is the result of various influences (e.g. production, storage, restoration, preservation). Given the recent technological developments (e.g. miniaturization of structural units, enlargement of memory capacity), technical diagnostics of art and cultural objects are becoming increasingly sought after in trans-disciplinary research. In this review we present a multi-instrumental approach to the investigation of manuscripts. Several case studies will illuminate our methodology.*

1. Introduction

The investigation of manuscripts is often associated with the question of origin, dating, or attribution of these cultural objects. In some cases, the differentiation between different scribes is of special interest. Other questions concern the history of a particular manuscript and examine the relation between the original text and its amendments, corrections, or additions. In this context Mantler and Schreiner indicated that 'styles were sometimes copied at locations and periods completely different from those of their origin', so that physical and chemical investigations 'are helpful and increasingly applied to allocate an object to a particular historic or prehistoric context, to determine the correctness of the claimed provenance or to explore the technology used for manufacturing'.¹ This very general statement also applies

to manuscripts. In addition, the development of reversible restoration or conservation concepts requires the knowledge of the material composition and ageing phenomena of the artefacts.

From a scientific point of view, we have to consider a manuscript as a physical object consisting of two types of material. The first one comprises various substrates (e.g. papyrus, paper, parchment, palm leaves), while the second includes writing materials (e.g. carbon ink, iron gall ink, or chalk). In addition, we have to take into account that the examination of writing utensils (e.g. rush, reed, quill, pen, ink wells) may provide useful information about the writing process.

In general, we may perceive information acquired during the lifetime of a manuscript as a stack of layers (fig. 1). The first one is the production layer followed by the use, storage, and finally post-discovery treatments. In the ideal case the structure of the layers is preserved; in any real case the phases intermix with one another at the borders, which can even result in the loss of identity of the individual contributions.

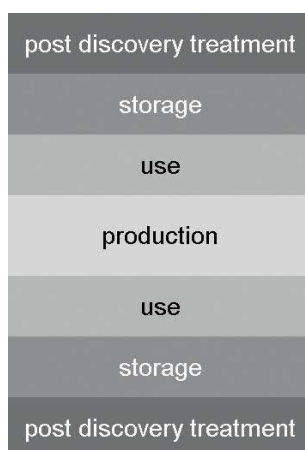


Fig. 1: Cross-sectional scheme of an object with traces from different periods in its history

2. Analytical techniques

The options of methods and techniques available for the analysis of art objects are diverse. To give an example, the relevance of technical investigations in arts and culture was summarized in the 'European Cooperation in Science and Technology (COST) Action G8 report: Non-destructive testing and analysis of museum objects'². The following compilation contains only a limited choice of investigation techniques that are appropriate for manuscript analyses:

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¹ Mantler, and Schreiner 2000.

² Denker et al. 2006

- Image-processing techniques are used to digitalize the objects, map the surfaces, and reveal hidden layers (Multi-Spectral or Hyper-Spectral Imaging, Infrared-Reflectography, various types of radiography), or investigate cross sections (e.g. Scanning Electron Microscopy, SEM).
- X-ray and neutron technologies help to determine elemental compositions (e.g. X-ray Fluorescence (XRF), Particle Induced X-ray Emission (PIXE), Neutron Activation Analysis (NAA), oxidation states of certain elements and their adjacent atoms (X-ray Absorption Near Edge Structure (XANES), Extended X-ray Absorption Fine Structure (EXAFS)), or the crystal phase of pigments (X-Ray Diffraction (XRD)).
- Vibration spectroscopic techniques such as IR and Raman spectroscopy are necessary to determine the chemical composition.

The most important requirement for the investigation of manuscripts is the use of analytical techniques that are non-destructive or require minimal sampling. After the analysis, the unchanged sample should preferably be available for further investigation. According to Lahanier et al.³, the ideal procedure for analyzing art, historical, or archaeological objects should be ‘nondestructive, respecting the physical integrity of valuable and irreplaceable objects; fast, so that large numbers of objects from archaeological excavations and from museum collections, the latter often with little known archaeological context, can be analyzed comparatively; universal, i.e. applicable to many materials

and objects of any dimension; versatile i.e. suitable to provide both highly localized analyses of microscopic areas, and average bulk analyses of heterogeneous materials; sensitive and multielemental to furnish a maximum amount of information’ However, in some cases sampling may be a basic requirement for a successful analysis. Therefore, the choice of a technique depends strongly on the specific question addressed to the investigator. Ideally, one would apply a number of methods that complement each other to obtain a maximum amount of information belonging to the object.

Band-pass-filter infrared reflectography (IRR) is a useful method for distinguishing between different writing materials. It was invented in the 1960s for investigating paintings. The fact that some pigments and dyes show a low infrared absorption makes it possible to investigate underdrawings.⁴ Since infrared light interacts differently with different materials, it is also possible to distinguish between carbon inks and iron gall inks by means of IRR.⁵ During analysis the manuscripts are illuminated with infrared light. An infrared-sensitive camera visualizes the radiation, which is invisible to the human eye. Wavelengths ranging from 800 to 1500 nm are most advisable for investigation. Band-pass filters split the whole infrared spectrum into appropriate partitions. Depending on the wavelength, plant inks become transparent at about 800 nm, iron gall inks at between 1000 nm and 1200 nm. Writing materials that contain elemental carbon will absorb the infrared light within the whole mid-infrared range and appear as black lines.

An interesting task is the ‘virtual deletion’ of iron gall inks. A variety of fragments of Goethe’s Faust II manuscript

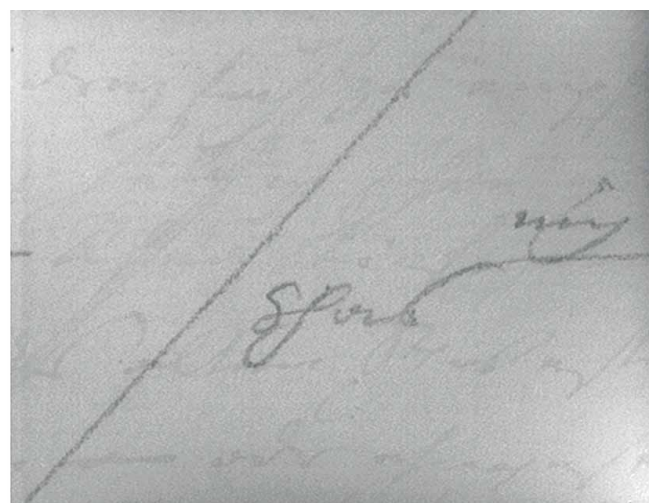
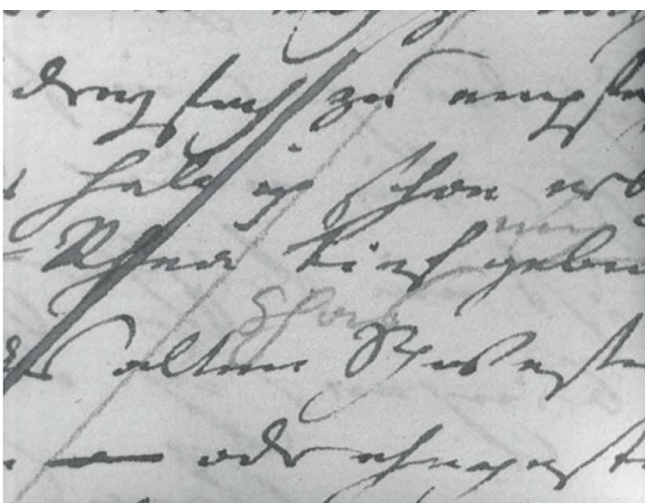


Fig. 2: GSA25/XVII, 8, 12; Johann Wolfgang von Goethe, Faust II, f. 1^r; IRR; left: 1000 nm; right: 1300 nm. At 1000 nm the iron gall ink as well as the pencil are visible, whereas at 1300 nm only the pencil is visible.

³ Lahanier et al. 1986, 1.

⁴ Asperen de Boer 1975, 1

⁵ Mrusek et al. 1995, 68.

contain conceptual texts written with a pencil. These texts were overwritten with iron gall ink. By means of IRR it was possible to visualize the first conceptual layer in order to compare the concept with the final text (fig. 2). Based on our analysis it was possible to show that most of the initial concept was executed.⁶

Sometimes this method is a useful tool for differentiating iron gall inks. However, different writing materials, restoration treatments, and the variation of ink thickness may influence the result and lead to misinterpretations.⁷

Unlike with IRR, it is possible to determine the elemental composition of writing materials by means of X-ray fluorescence techniques (XRF). XRF is one of the most suitable methods to obtain qualitative and semi-quantitative information on a great diversity of materials. Although XRF is a convenient method for investigating inorganic

compounds, it is not suited for determining organic materials since their main constituents (carbon, oxygen, nitrogen, and hydrogen) cannot be detected when applying this technique.

The object under analysis is irradiated with X-rays. As a result, the external primary excitation beam interacts with the atoms within the sample. An electron of the inner shell is ejected, creating a vacancy. In the next step another electron from an outer shell fills the vacancy. The energy of the emitted X-ray fluorescence is characteristic for a certain element, whereas the signal intensity allows the quantification of the element.⁸

As mentioned above, one has to consider that the character of artefacts entails several problems that may affect the interpretation of the results. 'Even plane objects such as manuscripts are usually not ideal but of complex shape, heterogeneous composition; they consist of several layers (support and colouring agent) and may show surface alteration'.⁹

This requires the development of specific procedures to quantify the composition of the inks and the supporting materials in an appropriate way. In case of iron gall inks, a fingerprint model was conceived based on inorganic

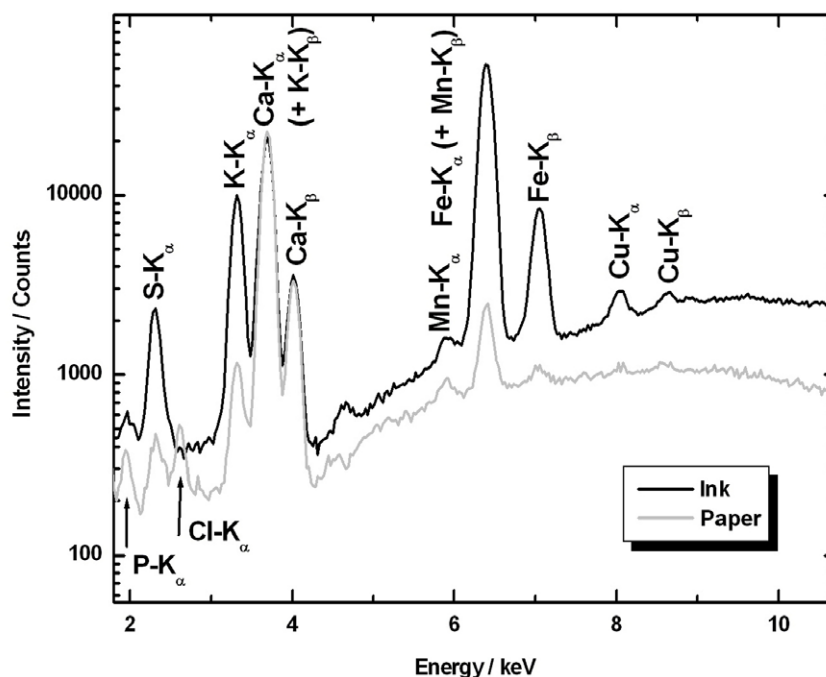


Fig. 3: Representative X-ray spectrum of an iron gall ink and a typical rag paper. The iron gall ink contains iron (Fe), copper (Cu), manganese (Mn), and potassium (K). The diagram shows that the quantitative analysis has to take into account the elements occurred both in the ink and in the paper (e.g. iron, potassium, and calcium).

compounds such as iron, manganese, zinc, and copper.¹⁰ The well-known fingerprint method relies on the determination of characteristic elemental compositions in samples.¹¹ The micro-XRF measurements of the iron gall inks were quantified using the composition fingerprint model, which is based on fundamental parameter procedures leading to the value W_i (weight concentration of the element i relative to Fe).¹² The respective calculations are based on a model ink containing a certain amount of iron sulphate as a constant parameter.¹³

Similarities of, and differences between, the IRR and XRF techniques have been illustrated using two pages from Wolfgang Amadeus Mozart's *Magic Flute* (f.34^r and f.38^r, State Library Berlin) as an example.¹⁴ The visual characterization of f.34^r indicates two different types of ink: light brown ink and dark brown ink (fig. 4a). Regarding f.38^r, it is possible to distinguish three different inks with the naked

⁶ Henke 2000, 387.

⁷ Hahn, and Maurer-Zenck 2003, 2.

⁸ Hahn et al. 2004, 234.

⁹ Hahn 2010, 43.

¹⁰ Malzer et al. 2004, 229.

¹¹ Hoffmann et al. 2000, 92; Werner et al. 1975, 158; Rye 1993, 39.

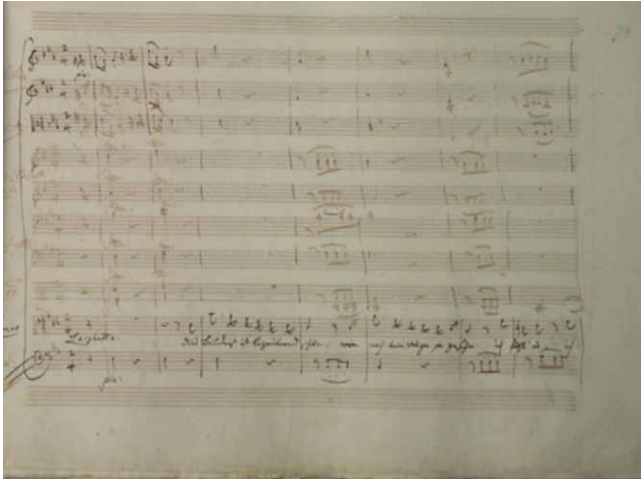
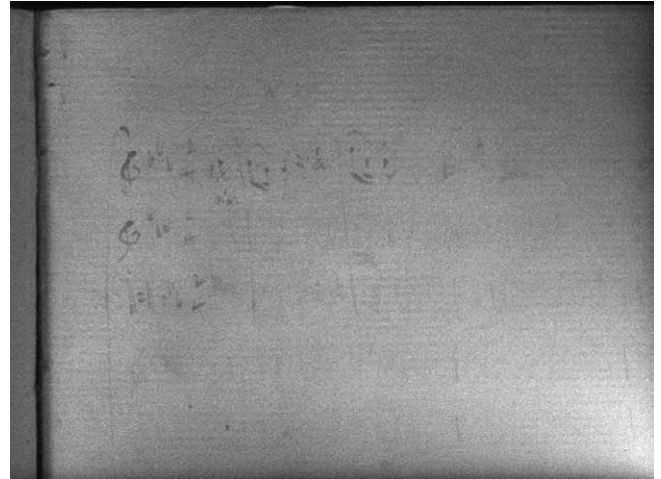
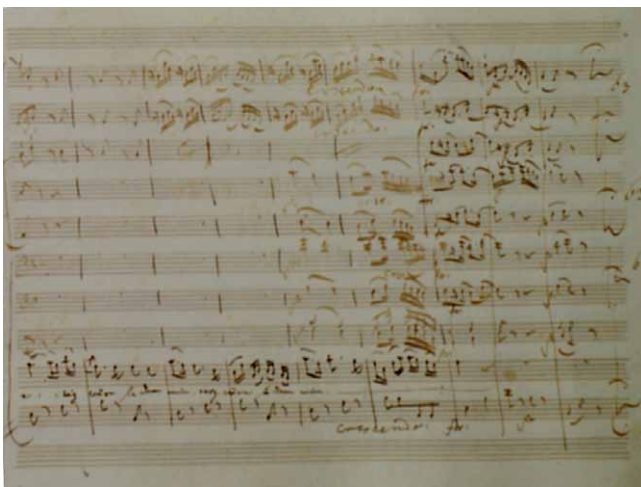
¹² The composition fingerprint value W_i mainly involves three different parameters: the experimentally determined transmittance of the entire layered system, the penetration depth of the writing material into the paper, and a normalized absorption coefficient that takes into account the matrix composition.

¹³ Malzer et al. 2004, 231.

¹⁴ Hahn 2006, 148.

eye (fig. 4c). This differentiation is confirmed by means of IRR (tab. 1). The dark brown ink from f. 34^r is visible up to 1100 nm, whereas the light brown one is only visible up to 1000 nm (fig. 4b). The three ink types from f. 38^r may be classified into two groups: the light brown and the brown ink disappear at about 1100 nm, whereas the dark brown ink is still visible (fig. 4d).

After carrying out the XRF analysis, we obtained a different result. Figure 5 shows the composition fingerprint of zinc as a function of the fingerprint of copper. All things considered, it is possible to distinguish two different types of ink: type I and type II.

Fig. 4a: f.34^r, VISFig. 4b: f.34^r, IRR, 1100 nmFig. 4c: f.38^r, VISFig. 4d: f.34^r, IRR, 1100 nmTable 1: IRR, f.34^r f.38^r

Folio	Visual Characterization	Visible up to a wavelength of ... nm					
		900	950	1000	1100	1200	1300
34r	dark brown	x	x	x	x		
	light brown	x	x	x			
38r	dark brown	x	x	x	x		
	brown	x	x	x	((x))		
	light brown	x	x	x	((x))		

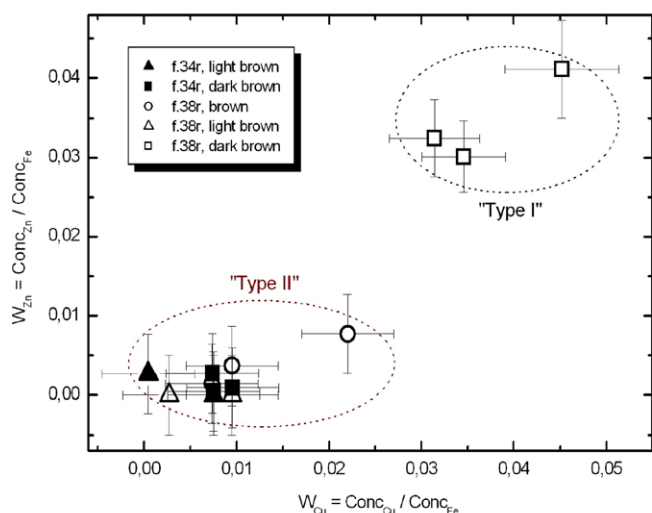


Fig 5: Composition fingerprint of zinc [Zn]/[Fe] as a function of the fingerprint of copper [Cu]/[Fe]; results of the XRF analysis, f.34^r, f.38^r.

On the basis of the inks on f. 38^r, the IRR results were confirmed by XRF. The dark brown ink is an independent ink type (type I), whereas the two brown inks belong to another ink type (type II). The different colours of the inks presumably result from different layer thicknesses. The two inks on f. 34^r certainly belong to one ink type (type II). The difference in the visual appearance as well as the different result of the IRR can be explained by different layer thicknesses or by a dilution of the ink with water during the writing process.

Unlike XRF, vibration (i.e. Infrared and Raman) spectroscopy techniques provide information on chemical composition and are therefore applied routinely to screen unknown assays. Both techniques take advantage of the fact that the bonds of atoms in a molecule interact with light at characteristic frequencies in the infrared region of the light spectrum. Therefore, their detection in an IR or Raman spectrum reveals the chemical identity of the materials under investigation. The type of interaction measured by infrared spectroscopy differs from that detected by Raman in such a way that they complement each other. Historically, IR spectroscopy has been commonly used for investigating organic materials. It is therefore a well-established method for classifying binding media. To perform a conventional measurement (so-called transmission mode), a thin or powdered sample is placed in the beam pass and the amount of transmitted light detected as a function of wavelength or frequency, producing an infrared spectrum. Hence, this method required samples to be extracted from an object. To reduce the sample size, special diamond cells were developed. Rapid technological progress in this field led to the appearance of non-destructive methods such as

Attenuated Total Reflection Fourier Transform Infra-Red (ATR-FTIR) spectroscopy¹⁵ to study surfaces, fibre-optic FTIR spectroscopy in reflection,¹⁶ and synchrotron-based FTIR spectroscopy.¹⁷ The miniaturization of infrared sources and detectors led to a new generation of portable FTIR spectrometers, for example a hand-held Exoscan.¹⁸

It is noteworthy, however, that none of these analytical techniques can be used for the direct dating of an art object. Only special techniques such as radiocarbon dating of organic materials (C14-method),¹⁹ dendrochronology for wooden artefacts,²⁰ and the analysis of thermoluminescence for ceramics²¹ permit age determination.

2. Writing support

Leather and parchment

Leather and parchment are skin-based writing materials known in the Mediterranean since Antiquity. Leather rolls were in use in Ancient Egypt at least since the seventeenth century BCE; the spread of the Aramaic language in Mesopotamia was accompanied by writing on leather; Herodotus reports that in Antiquity Ionian Greeks used leather as a writing material.²² In contrast to leather, the oldest known parchment documents, the Dead Sea Scrolls, are dated to the third century BCE. Unlike leather, parchment is prepared by drying an un-haired skin under tension and is usually not tanned.

In the Roman Empire, the replacement of papyrus with parchment coincides with the change from 'scroll' to 'codex' in the third and fourth centuries. However, the main cause for these changes is unclear. For a millennium, parchment becomes the main writing material in Europe.

There are no written sources on the preparation of ancient leather and parchment as writing materials. It is believed that animal skins were de-haired enzymatically (e.g. with urine or flour paste) prior to drying under tension. Chemical investigation of the Dead Sea Scrolls suggested that the parchments were superficially tanned at the finishing stage.²³

¹⁵ Marengo et al. 2005, 225.

¹⁶ Miliani et al. 2007, 3293.

¹⁷ Salvado et al. 2005, 3444 and Bartoll, et al. 2008, 1.

¹⁸ A2 Technologies, 2011, accessed 15 September 2011.

¹⁹ Jull et al. 1995, 11.

²⁰ Schweingruber 1988.

²¹ Goedicke 2007, 31.

²² Diringier 1982, 189.

²³ Poole, and Reed, 1962.

The modern definition of parchment includes the depilation of a precursor animal skin using lime in addition to the aforementioned drying under tension. However, this preparation technique is mentioned for the first time in the eighth century CE in the Lucca manuscript.²⁴ Theophilus Presbyter describes the use of lime for the preparation of leather and parchment in his *Schedula diversarium artium* in the early twelfth century. It is unclear when and where the use of lime was introduced.

Palm leaves and tree bark

Before paper was introduced, palm leaves of *Talipot* or *Talipot* (*Corypha umbraculifera*, *C. taliera*) and *Palmyra* (*Borassus flabellifer*) were a common writing material in South Asia. According to Diringner, however, it is only leaves of the *Talipot* palm that were used throughout India in the early times, whereas *Palmyra* palm was introduced much later and was mostly in use in South and East India.²⁵ The precursor palm for a manuscript can be easily determined by visual inspection. *Talipot* leaves are thinner and possess marked rills, whereas *Palmyra* leaves appear pitted.

Agraval reports that techniques for preparing palm leaves for writing varied from place to place. However, practically all techniques involved drying the leaves, boiling them in water (alternatively, in lime water or milk), and polishing using turmeric paste or sesame oil.²⁶ No advanced studies of the composition of the palm leaf manuscripts have been reported. However, the use of local materials during their processing raises hopes that palm leaf manuscripts could be sorted according to their origin.

The bark of birch trees was another writing material commonly used besides palm leaves in India. It is a naturally layered material held together by tree gum and bark knots. Usually, one peeled off the bark from the tree, dried it, smoothed it with oil, and polished it. Then the sheets were cut to the desired size. Diringner remarks that in ancient times a full length of peeled-off bark may have been used similarly to the papyrus rolls. In the Assam region, one used rather the bark of the agar wood tree (*Aquilaria malaccensis lamk*).²⁷ Traditional processing of bark consists of several steps described in great detail by Goswamee.²⁸ It is noteworthy that preparation involves dyeing with arsenic sulphide and/or mercury sulphide, which are easily determined by X-ray fluorescence.

²⁴ Reed 1975.

²⁵ Diringner 1982, 358.

²⁶ Agraval 1984, 24.

²⁷ Diringner 1982, 361.

²⁸ Goswamee 2006, 73.

Paper

Paper is best defined as a thin, matted sheet of intertwined fibres formed from a aqueous pulp suspension by means of a sieve-like screen. The invention of paper is traditionally attributed to Cai Lun in the early second century CE. After having been in use for at least several centuries, Cai Lun probably standardized and possibly also improved already-known processes: breaking textile fibres down into a pulp and draining the water through a sieved mould producing a matted layer of fibres.²⁹ Although technological progress considerably affected each step of the manufacture, the essence of the invention remains unchanged until today.

Papermaking reached Europe in the eleventh century through the Arab world, where it was known from the eighth century CE. However, it became popular and largely replaced parchment only after the invention of the printing press in the fifteenth century. By that time, water-powered paper mills considerably improved the process of breaking the fibres down into a pulp. In the nineteenth century, another revolutionary invention introduced wood pulp instead of textile fibres and led to the mass production of paper.

Archaeometric studies of the paper concentrate on precursor fibres that can be determined by means of microscopy,³⁰ mould imprints, and watermarks.³¹

3. Writing materials

Carbon or soot ink

According to its generic recipe, one of the oldest writing and drawing pigments are produced by mixing soot with a binder dissolved in a small amount of water. Thus, along with soot, binders such as gum Arabic (ancient Egypt) or animal glue (ancient China) belong to the main components of soot inks. From Pliny's detailed account on the manufacture of various soot-based inks³² we learn that, despite its seeming simplicity, the recipe for the production of pure soot of high quality was no easy task in Antiquity. Therefore, we expect to discover various detectable additives that may be indicative of the time and place of the production.

Among the first raw materials employed in the Arabian sphere to produce inks were soot from stone pine resin, fish

²⁹ Needham 1985, 1–3. – In recent decades, archaeological finds have prompted scholars to antedate the beginning of the use of paper by at least two hundred years: in Xuanquan, Gansu, a piece of paper with written characters dated 140–7 BCE was excavated in 1990. Already four years earlier, a map drawn on a fragment of paper dated 176–141 BCE had been unearthed in Fangmatan, also in the Gansu province; see Pan 2011.

³⁰ Helman-Ważny, and Van Schaik 2012.

³¹ Dietz et al. 2012, 1505.

³² Pliny, *Naturalis Historia*, Book XXXV, 25

glue, and gums. Later, more expensive raw materials were used, like sandarac resin from the *Sandarac Tree*, styrax resin from the bark of the *Oriental Sweet Gum*, and ladanum resin from various species of rock roses.³³

In Europe, the smooth carbon material came from burnt oil. Due to its quality, sesame oil was preferred for the preparation in China. Baldinucci mentioned in 1681 the preparation of ‘*inchiostro della China*’. Many recipes were known for the preparation of carbon inks at that time.³⁴ One differentiated between one’s own European products and materials produced in the Far East.³⁵ In general, carbon inks were used as printing inks, but also for drawing, especially washes.

Plant ink

The brown ink – best-known as blackthorn or Theophilus’ ink – is usually produced from the blackthorn bark and wine. In the early European Middle Ages, inks of this kind were widely used in the production of manuscripts in monasteries.³⁶

Usually, they are light brown,³⁷ so sometimes small amounts of iron sulphate were added, which led to what was called an ‘imperfect’ iron gall ink. The difference between ‘classic’ iron gall ink and such imperfect ink is therefore unclear, and the distinction – especially with the naked eye – is impossible.

Iron gall ink

Iron gall ink is the most widely used drawing and writing material in Western history.³⁸ In general, it is produced from four basic ingredients: galls, vitriol, gum Arabic as a binding media, and an aqueous medium such as wine, beer, or vinegar. By mixing gallic acid with iron sulphate, a water-soluble ferrous gallate complex is formed. Due to its solubility, the ink penetrates the parchment surface, making it difficult to erase. When exposed to oxygen, a ferric gallate pigment is formed. This complex is not water-soluble, which contributes to its indelibility as writing ink. Normally, when mixing gallic acid and iron sulphate, the presence of oxygen leads directly to the formation of the ferric gallate pigment. Gum Arabic acts like a suspension agent for the insoluble pigment particles. It also modifies the viscosity of the ink. Due to the variety of recipes and the natural origin of raw materials, there is a wide range of different components and impurities in historical iron gall inks.

Vitriol, the main source of iron in the iron gall inks, was obtained from different mines by means of various techniques.³⁹ Therefore, inks contain many other metals, like copper, aluminium, zinc, and manganese, in addition to the iron sulphate. These metals do not contribute to colour formation in the ink solution, but possibly change the chemical properties of the inks. In Goslar, Germany, for instance, a large concentration of natural vitriol served as a major supply in the Middle European market.⁴⁰ The determination of different inorganic components in iron gall inks provides the basis for differentiating these writing materials.

Colour inks

Colour inks based on pigments such as cinnabar or azurite were used since Antiquity.⁴¹ The minerals were finely ground and then dispersed in a binding media.⁴² In general, water-soluble binders such as gum Arabic or egg white were used. As an example we cite the medieval prescription for preparing red inks:

When you paint cinnabar or red lead on a parchment to form capital letters, take a well-slit quill, but not solely for this colour, but also for blue. For green colour, it should be less slit, because one applies it more thinly.⁴³

4. Case studies

The first two examples deal with the investigation of iron gall inks. As mentioned above, the distinction between these writing materials based on the amount of manganese, iron, copper, zinc, and lead is a suitable way to answer many cultural-historical questions. The analyses were carried out by means of a mobile X-ray fluorescence technique with helium purging. Details concerning the method are described elsewhere.⁴⁴ The third example shows the investigation of different parchments in order to distinguish between different preparation techniques. The last example focuses on the investigation of pigments in illuminated manuscripts by means of X-ray diffraction.

³³ Schopen 2004, 10.

³⁴ Krekel 2005, 631.

³⁵ Koschatzky 1996, 135.

³⁶ Trost 2011, 89.

³⁷ Hahn, 2011, 116.

³⁸ Krekel 1998, 25.

³⁹ Hickel 1963, Lucarelli, and Mando 1996, 644.

⁴⁰ Kraschewski 2001, 344

⁴¹ Oltrogge, and Hahn 1999, 383.

⁴² Oltrogge 2005, 535.

⁴³ ‘Cum membrana vermiculum vel minium inposueris ad formandum capitalis litteras, habeto pennam bene fixam; non solum autem ad istum colorem, verum etiam at ad azorium; ad viridem vero colorem minus sit fissa, eo quod tenuiter inponitur’ Straub 1965, 98 und Trost 2011, 89.

⁴⁴ Bronk et al. 2001, Hahn et al. 2004, Wolff 2009.



Fig. 6: The Erfurt Hebrew Giant Bible (State Library Berlin, Ms. or. fol. 1210/1211) under investigation.⁴⁵

Mass in B Minor

The *Mass in B Minor* (BWV 232) is now kept in the State Library in Berlin. It is a musical setting (or more formally a *missa tota*) of the *Latin Mass* by Johann Sebastian Bach. Although parts of the *Mass in B Minor* date to 1724 (and the model for one parody even to 1714), the whole was assembled in its present form in 1749, just before the composer's death in 1750.⁴⁵

After the death of Johann Sebastian Bach, the composition was passed on to his son, Carl Phillip Emanuel Bach. He studied the composition of his father intensely. Looking at the manuscript, it is obvious that the composition contains various amendments and corrections. It is possible to ascribe most of them to Johann Sebastian Bach or to Carl Philipp Emanuel Bach. However, the manuscript shows a certain amount of remnants and slurs whose correct attribution was previously impossible. By means of the XRF method it became possible to distinguish Johann Sebastian's from Carl Phillip Emanuel's ink.⁴⁶

Although the manuscript was subject to a conservation treatment, the splitting of the paper, the characteristic distinctive features were conserved. The inks used by

Johann Sebastian Bach contain lead sulphate, which probably originated from the transportation of tap water in lead pipes. The inks used by Carl Phillip Emanuel show no lead content.

The Erfurt Hebrew Giant Bible

Another valuable manuscript kept in the State Library in Berlin is the *Erfurt Bible* (fig. 6). The two-volume giant codex is a unique Jewish cultural artefact and extraordinary textual, material, and artistic product of the medieval German Ashkenazi heritage. Many pages are decorated with the arrangements of the text of the *Masora*, notably the beginning of the book of *Genesis*. It contains the whole Hebrew Bible, written on totally equalized parchment. In addition it includes the Aramaic translations, also written in Hebrew characters, which follow the Hebrew version verse by verse. The text is accompanied by the grammatical and lexical notes known as the

Masora Magna, written on the upper and lower margins, and the *Masora Parva*, written between and beside the three columns of the biblical text, in a minute script.

The investigation of the inks in the second volume shows a wider ink variation than in the first volume. These findings reflect the chequered history of this part of the book. Fire, the presence of water, and restoration interventions may have considerably influenced the ink composition. However, it was possible to analyze a variety of different inks, which allows us to reconstruct the complex history of the production of the *Erfurt Bible*. As an example, on the opening page of the duplicate quire, which was left unused, primary text, vocalization, both *Masoras*, and micrography were carried out with a single ink. This fact can be considered as a confirmation of the palaeographic hypothesis that the abandoned quire served as a sample before the Bible was commissioned. Moreover, the result that the same ink was used for the primary text in the second quire renders further support for the palaeographic reconstruction of events: after the Bible had been commissioned, the scribe went on copying from the second quire.

Other results suggest that a change of the scribes may have taken place during the production of the manuscript.

⁴⁵ Hahn, 2011, 206.

⁴⁶ Wolf et al. 2010, 117.

The successive similarity of the inks used for the primary text, vocalization with *Masora Parva* and *Masora Magna*, beginning exactly where the ink of the primary text changed, may indicate that the masorete alone completed the commission. At the end of the manuscript the masorete uses the ink of the *Masora Magna* for the corresponding colophon, which proves that he signed the manuscript immediately after completing the last step of work.⁴⁷

The Temple Scroll (11QTa)

The Dead Sea Scrolls (DSS) were discovered between 1947 and 1956 in eleven caves in and around the Wadi Qumran on the western shore of the Dead Sea. The collection consists of approximately 900 highly fragmented manuscripts produced between the end of the second century BCE and 68 CE. The aforementioned material study conducted in the 1950's suggested that the production process of the Jewish ancient parchment involved vegetable surface tanning at the finishing state.⁴⁸ This treatment is consistent with the brown colour of the majority of the fragments in the collection as well as the practices prescribed in the *Talmud*. In contrast, the *Temple Scroll (11QT^a)* was written on a particularly light-coloured parchment uncommon for tanned parchment. Text must have been written onto an easily detachable layer rather than directly on the parchment surface, since part of the text was found as a mirror image imprint on the back of the columns in contact leaving blank surface behind. Furthermore, on the basis of the palaeographic examination it was concluded that the scroll consisted of two parts considerably separated in time: the main scroll (columns VI-LXVII) and the 'repair' part (columns I-V)⁴⁹.

Systematic visual examination of the parchment surface of the scroll shows two obvious differences: the first columns have a greyish tint, whereas the rest of the scroll varies in

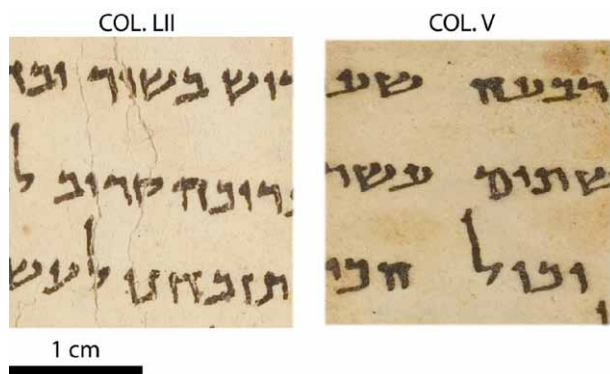


Fig. 7: The *Temple Scroll (11QT^a)*, details from col. LII and col. V.

⁴⁷ Hahn et al. 2008, 16.

⁴⁸ Poole, and Reed, 1962.

⁴⁹ Yadin, 1983.

colour from pale ivory to lemon yellow and brown; the surface of the first sheet is of uniform roughness while the powdery texture of the surface throughout the rest of the scroll displays multiple cracks and grooves (fig 7: columns V and LII). These differences are especially evident near the ruling lines, which are much more pronounced in the main part of the scroll. The examination of the surface of the selected fragments with stereomicroscopy at a higher magnification confirms these observations. Despite the advanced degradation and rather aggressive attempts to preserve the first columns, one can still deduce that the differences in the texture result from the original treatment in Antiquity rather than post-discovery intervention.

To understand the origin of these differences, we have investigated a number of fragments from the first and the second part of the scroll by means of scanning μ -XRF, SEM, ATR-FTIR, and Raman techniques.⁵⁰ Scanning electron microscopy and XRF analysis revealed that the parchment of both parts had a layered structure with an inorganic top layer that contained the elements sulphur, calcium, aluminium,

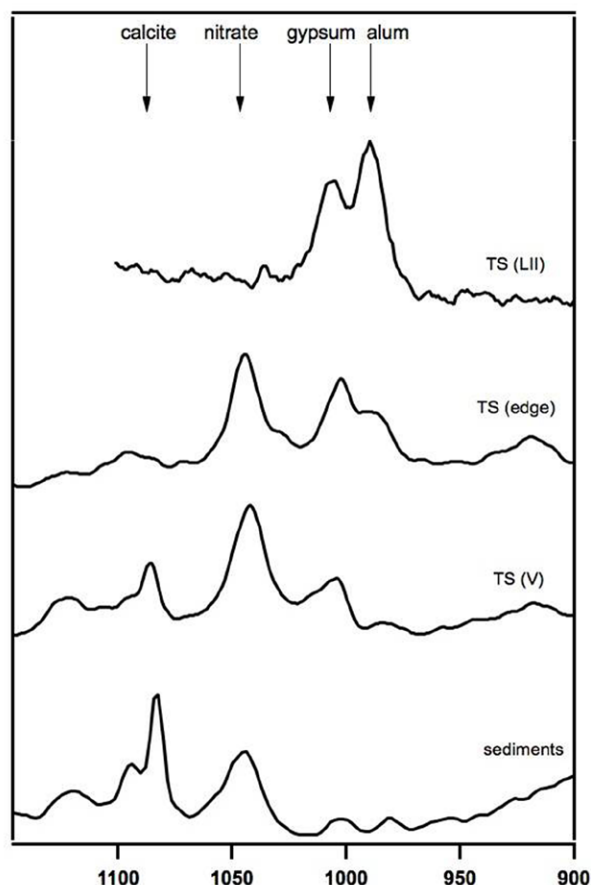


Fig. 8: Raman spectra of the *Temple Scroll* fragments and of the sediments from the Cave 11 in Qumran.

⁵⁰ Rabin et al. 2010.



Fig. 9: *Tucherbuch* (Nuremberg), detail. Posnjakite was used for the coloration of the bluish-green pleats; the green areas were colored with malachite.

and potassium, suggesting that the surface layer at least partly consisted of alum $KAl(SO_4)_2 \times 12 H_2O$ and a calcium-containing substance. The spectrum of the collagenous layer contained very little inorganic substance, suggesting that the finishing process of the parchment preparation included treatment with a dressing in the form of a paste rather than a powder. Parchments processed with dry chalk finishing would have displayed much deeper penetration of calcite particles into the fibre structure. Quantitative analysis indicated that potassium, sulphur, and aluminium were by far more abundant on the parchment of the main part of the scroll. ATR-FTIR and Raman spectroscopy helped us identify the inorganic compounds in the top layer of the main part as alum and gypsum ($CaSO_4 \times 2 H_2O$). Thus we may conclude that the skin was first tawed with alum and then dressed with gypsum to prepare the surface for writing, which was a common practice in Antiquity. The results of the top layer of col. V did not provide conclusive evidence a alum and gypsum presence. Instead, vibration spectra displayed a calcite ($CaCO_3$) peak. In this case we cannot exclude skin tawing in

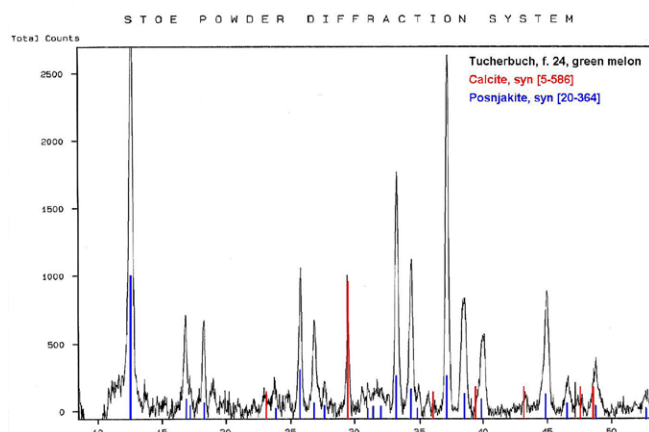


Fig. 10: X-ray diffractogram of a green area: posnjakite is mixed with calcite.

Antiquity, since water-soluble alum could have been easily removed during a rather aggressive conservational treatment of the fragments studied. The presence of calcite, however, proves unequivocally that the skins of the main scroll and the repair sheet were dressed differently. In the latter case, a chalk-containing paste was used. The use of paste dressing in either case explains why a transfer of writing text occurred indiscriminately in both parts of the scroll.

In addition, we found an interesting fingerprint on the first sheet and outer parts of the *Temple Scroll*: bat guano abundant in Cave 11 left a considerable trace on all the objects discovered in this cave. Figure 8 shows Raman spectra recorded on the main scroll column LII, on the edge part of the main scroll, on column V, and sediments from Cave 11 in Qumran (from top to bottom). The main scroll was treated with alum and gypsum in Antiquity, whereas the first columns bear calcite instead. The nitrate peak appears only on column V and the edges of the main scroll. We believe that ammonia, whose stinging odour was noticed in the cave, could not penetrate the inner parts of the tightly rolled scroll. Hence only the outer parts of the scroll and textiles carry nitrate traces, which are also found in the sediments (bottom curve). One should note that the doublet at the position of the carbonate does not correspond to calcite but to aragonite and dolomite, which are characteristic of the natural caves.

A rare copper green pigment in an illuminated manuscript
The *Tucherbuch* (Nuremberg) is characterized by elaborate and grand book illuminations containing a variety of different dyes and pigments. The genealogy of the Tucher family was commissioned in 1590 and completed in 1596. The manuscript contains a personal register of all family members up to 1618 and detailed prefaces concerning each family member, followed by a short biography including birth, profession, wedding, and death. Each biography is combined with a precious miniature. Overall, the manuscript contains 95 miniatures and overshadows all other genealogies

originated in Nuremberg. The miniatures were designed and partly executed by Jost Amman. After Amman's death, the illuminations were finished by Georg Hertz.

XRD in transmission mode is a convenient method for investigating colour inks used in book illumination. The whole sample, which means parchment or paper as well as painting layers, is virtually transparent for the X-ray beam. Furthermore, the organic matrix has no disturbing effect on the XRD results.⁵¹

In the *Tucherbuch*, the rare pigment posnjakite was used for the coloration of the bluish-green areas. Figure 9 provides an example of the appearance. When posnjakite was used, it was not mixed with other colouring pigments such as malachite, but with lead white or calcite (fig. 10). Furthermore, figure 9 makes it clear that this pigment was used in a very distinct way. It was identified in seven of 33 investigated miniatures, whereas malachite was identified in only two miniatures. Some single proofs of wroewolfeite or chalcocyanite combined with posnjakite allow the assumption that the mineral was produced artificially for use as a pigment.

5. Conclusion

This paper presents a short overview of the use of different methods for the analyses of manuscripts written or drawn with different inks. The determination of inorganic components by means of XRF provides elemental composition fingerprints that allow a differentiation between materials that do not differ on visual examination.

Additionally, vibration spectroscopy allows the identification of the different materials by determining their chemical composition.

The resulting classification of different writing supports and materials allows us to address questions concerning the origin and genesis of manuscripts or the ascription of later amendments or corrections.

Further developments such as combining microspectroscopy with fast imaging at a high resolution would provide information on all the materials simultaneously, including degradation patterns of each individual material. Rapid technologic progress raises hope that new instruments will combine high functionality, transportability, and ease of operation.

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⁵¹ The experiments were carried out with a STOE STADIP diffractometer (STOE & Cie GmbH, Darmstadt, Germany). The modular system offered the possibility of transmission measurements by use of a special stage. With a combination of a focused K α 1 incident beam (copper target) from a Germanium monochromator with a transmission goniometer and a linear position-sensitive detector (PSD), the equipment provides data of sufficient angular resolution and reliable intensities within reasonable acquisition times.

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